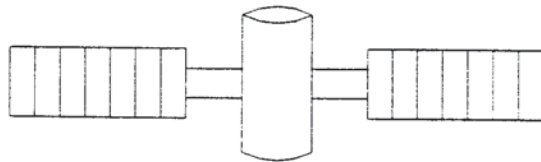
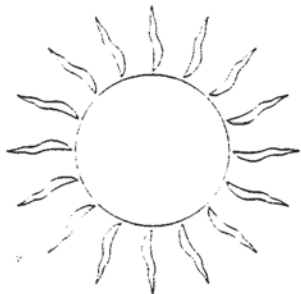


Paraclipse®

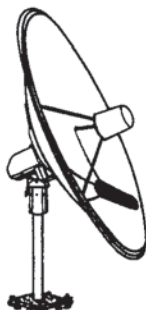
HIGH PERFORMANCE ANTENNAS

Your Complete Reflector Source



**BY
MICHAEL MCGEE,
TECHNICAL
SUPPORT
MANAGER**

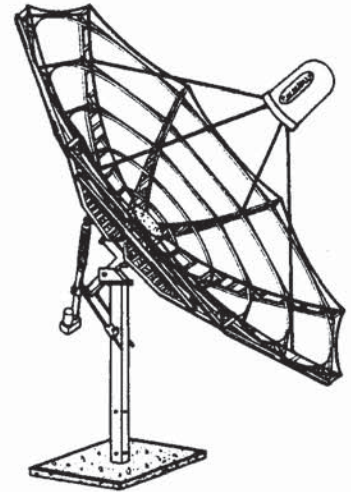
**TECHNICAL SUPPORT
NEWSLETTERS
9-94 TO 8-97**



PARACLIPSE CLASSIC SERIES ANTENNAS



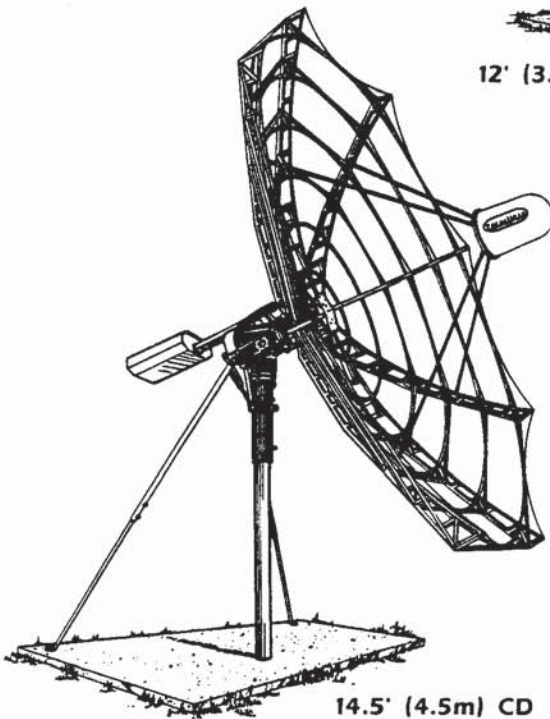
16' (4.8m) CD



12' (3.8m) PT



12' (3.8m) CD

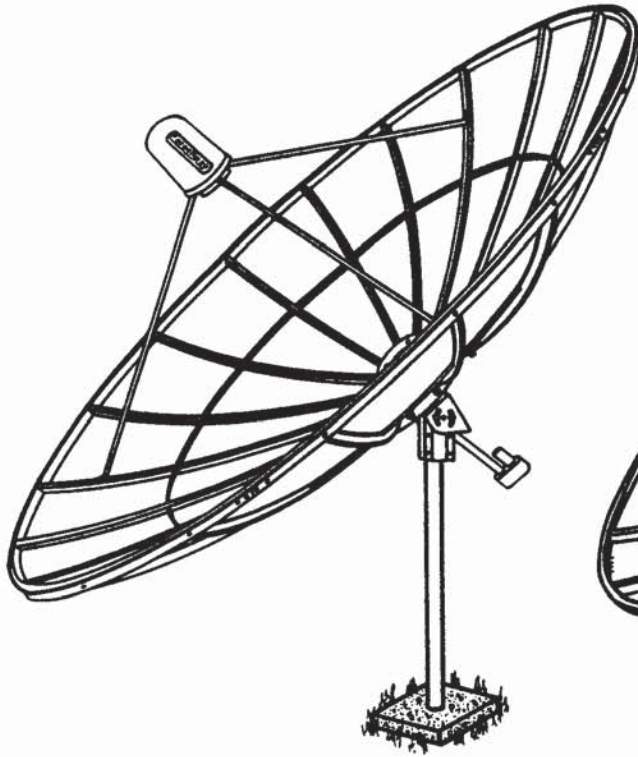


14.5' (4.5m) CD

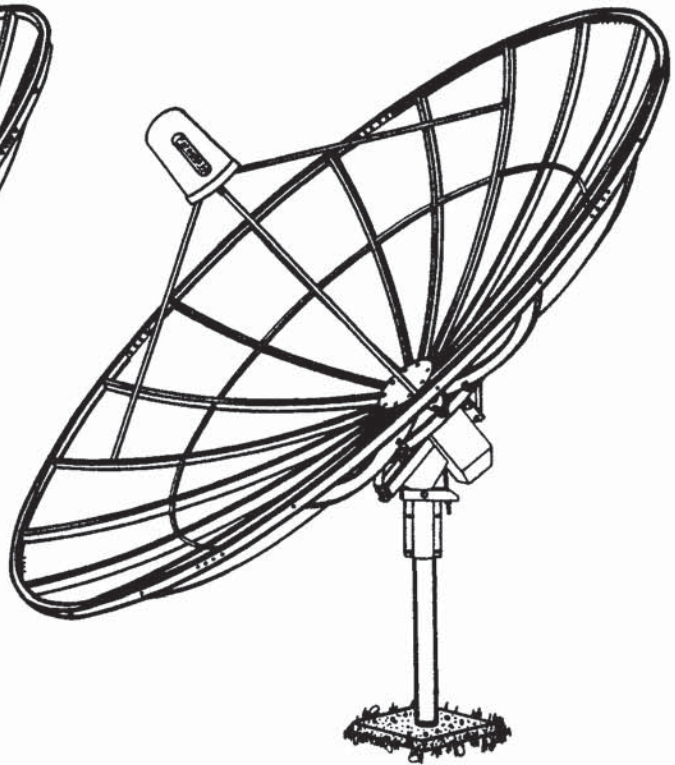


14.5' (4.5m)
Islander

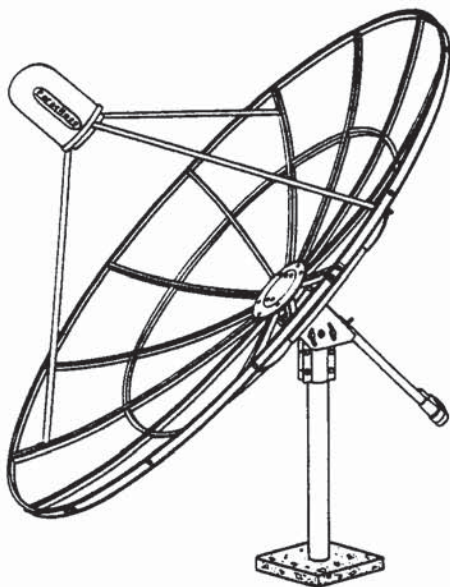
PARACLIPSE ECLIPSE SERIES ANTENNAS



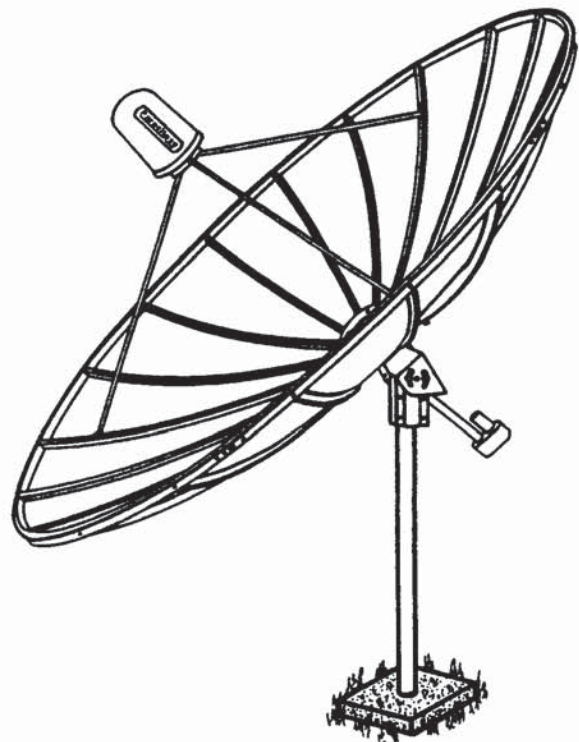
12' (3.8m) VP



12' (3.8m) H-H

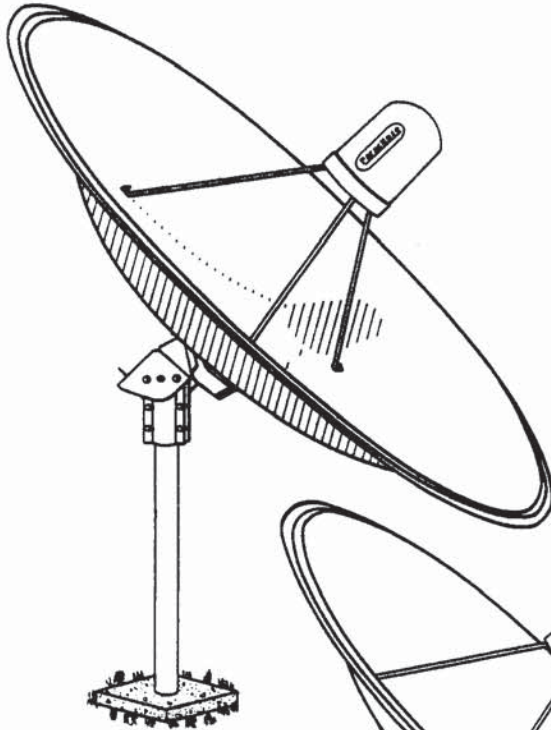


8.5' (2.6m) VP

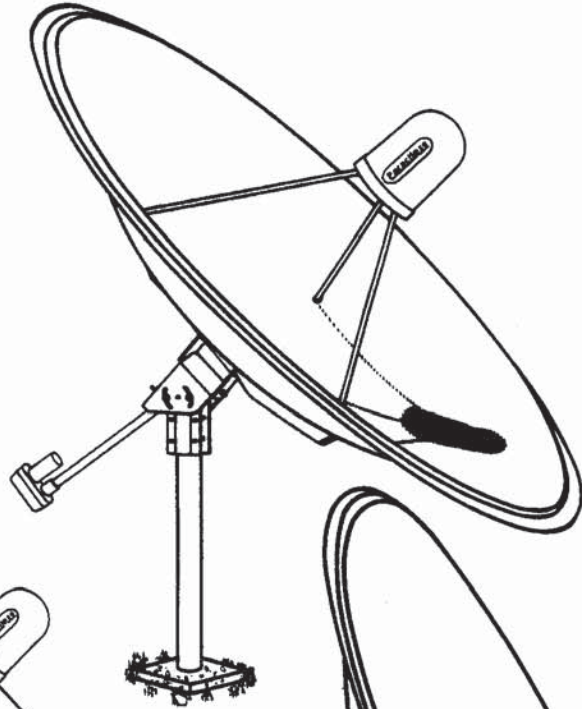


10' (3.0m) VP

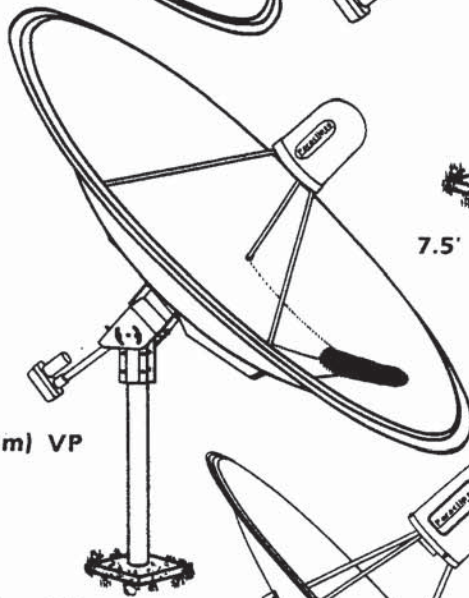
PARACLIPSE HYDRO SERIES ANTENNAS



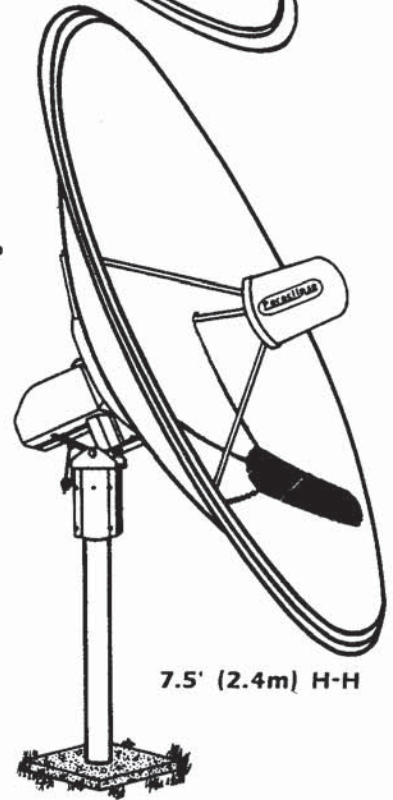
7.5' (2.4m) AZ-EL



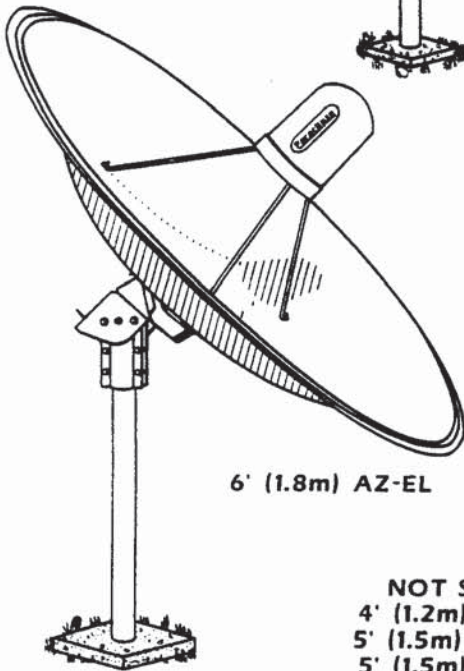
7.5' (2.4m) VP



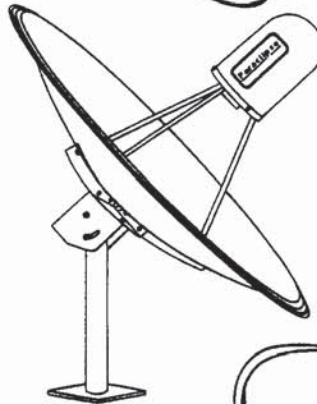
6' (1.8m) VP



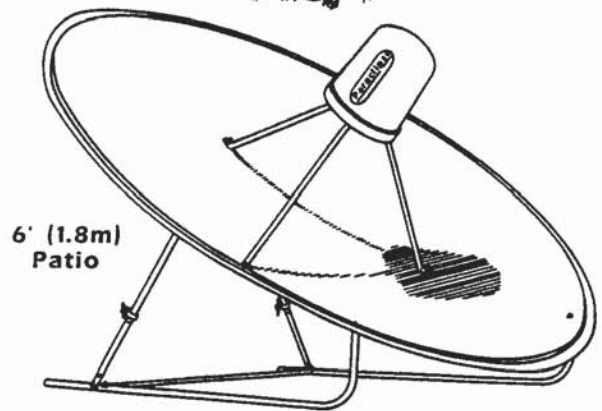
7.5' (2.4m) H-H



6' (1.8m) AZ-EL



4' (1.2m) SP
AZ-EL



6' (1.8m)
Patio

NOT SHOWN
4' (1.2m) SP Polar
5' (1.5m) SP AZ-EL
5' (1.5m) SP Polar

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Paracclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 1 Number 1 9-94

Compiled by:
Michael McGee,
Technical Support
Manager

OUR PURPOSE

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

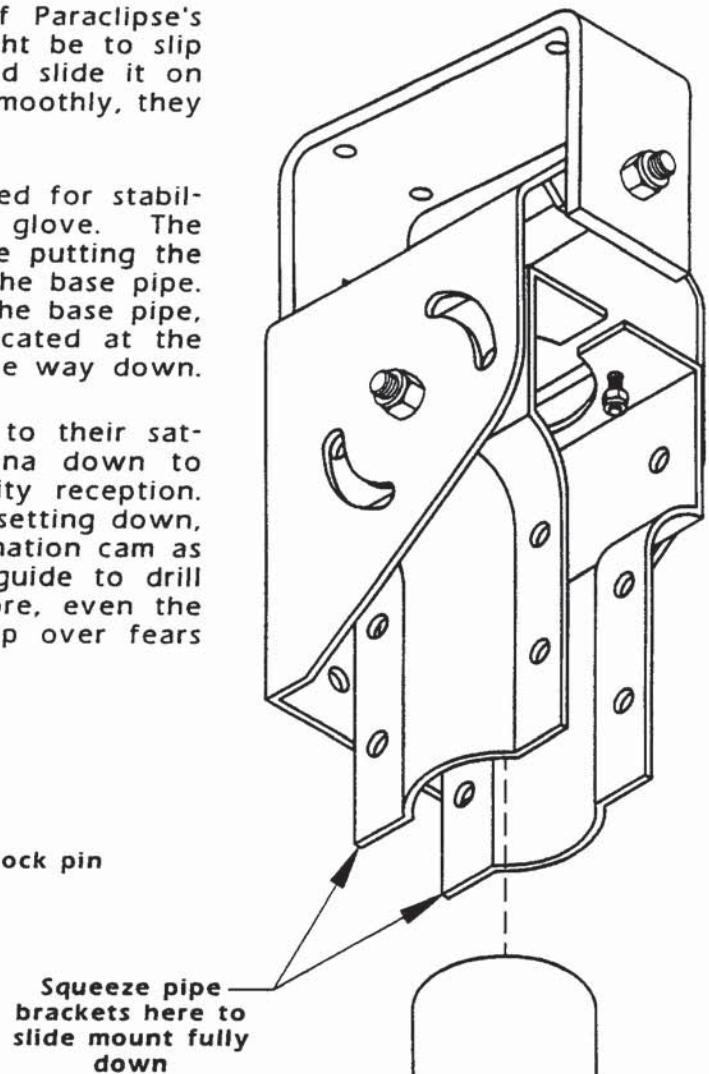
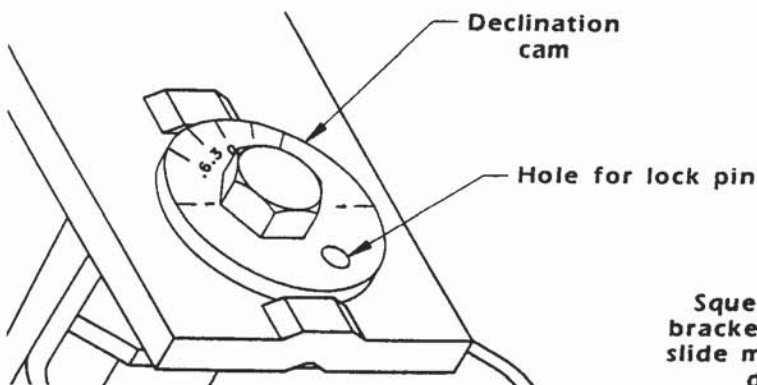
This newsletter, coupled with the installation manual that came with your antenna, should save you valuable time in dealing with situations that come up in the field. Please take the time to look over this sheet.

INSTALLATION TIPS FOR OUR NEW VP MOUNT

When someone first receives one of Paracclipse's new VP mounts, the first inclination might be to slip some bolts and nuts on the brackets and slide it on the base pipe. When it doesn't slide on smoothly, they might wonder what's wrong.

Well, since the VP mount was designed for stability, it fits the base pipe like a good glove. The following might make life easier. Before putting the bolts and nuts in, slide the mount over the base pipe. To get the U-bolt on brackets down to the base pipe, squeeze the brackets at the points indicated at the right. The mount should then slide all the way down.

Also, after tracking the satellite arc to their satisfaction, some like to lock the antenna down to ensure that the antenna maintains quality reception. To make it easier to lock the declination setting down, Paracclipse has added a hole on the declination cam as shown below. This can be used as a guide to drill a hole for lock pin placement. Therefore, even the most dedicated worriers won't lose sleep over fears that their declination might slip.



LET'S SAVE SOME TIME!

When I was looking over my log of calls recently, it seems that 20-25% of my calls dealt with three simple questions, the focal distance, the F/D ratio, and the base pipe requirement. While I don't mind getting to know everyone, I'm certain that these people have something

more important to do than spending time chatting with me (long distance at that).

As a result, I put together this simple, quick reference chart that you see below. It very likely will be a nice item to file away for future reference.

ANTENN	SIZE	MOUNT	FOCAL DISTANCE	F/D	BASE PIPE
CLASSIC	9'	ALL	43" (1.09 m)	0.4	3.5" o.d. (3" schedule 40 black pipe)
	10'	ALL	42.375" (1.08 m)*	0.352	3.5" o.d. (3" schedule 40 black pipe)
	12'	ALL	53.375" (1.36 m)*	0.375	3.5" o.d. (3" schedule 40 black pipe)
	14.5'	Islander & CD	53.375" (1.36 m)*	0.31	3.5" o.d. (3" schedule 40 black pipe)
		PRO	53.375" (1.36 m)*	0.31	Uses tower
	16'	ALL	56.25" (1.43 m)*	0.3	Uses tower
ECLIPSE	10'	ALL	35.875" (.91 m)	0.3	3.5" o.d. (3" schedule 40 black pipe)
	12'	VP & H-H	47.875" (1.22 m)	0.333	3.5" o.d. (3" schedule 40 black pipe)
		All others	47.875" (1.22 m)	0.333	4" o.d. (3.5" schedule 40 black pipe)
HYDRO	6'	All but AZ-EL	23.125" (.59 m)	0.335	3.5" o.d. (3" schedule 40 black pipe)
		AZ-EL	23.125" (.59 m)	0.335	4" o.d. (3.5" schedule 40 black pipe)
	7.5'	All but AZ-EL	28.125" (.71 m)	0.312	3.5" o.d. (3" schedule 40 black pipe)
		AZ-EL	28.125" (.71 m)	0.312	4" o.d. (3.5" schedule 40 black pipe)
PATRIOT	3.1 m	Polar	41" (1.04 m)	0.336	4" o.d. (3.5" schedule 40 black pipe)
		AZ-EL	41" (1.04 m)	0.336	5.5" o.d. (5" schedule 40 black pipe)
	3.7 m	ALL	57.6" (1.46 m)	0.4	6.625" o.d. (6" schedule 80 black pipe)
	4.5 m	ALL	63" (1.60 m)	0.35	Base pipe supplied

* If the Classic antenna serial number is 151076 or less and was manufactured before August 1993, the focal distance changes slightly. The 10' was 42" (1.07 m). The 12' and 14.5" was 52.625" (1.34 m). The 16' was 57" (1.45 m).

THE OLD BARREL HUB MOUNT

Every once in a while, I get a call from someone who has one of our old Barrel Hub antennas (made from 1979 to 1983). Because of the years of good performance, many just can't bear to part with it, but the mount stability is starting to go. Well, there is hope!

We have a Polar "T" mount upgrade kit available. To convert the Barrel Hub mount, customers will also need to purchase a special barrel hub that converts the barrel to a hub plate. The result? You don't have to part with an old friend.

ANY QUESTIONS?

If there is still anything else that is puzzling you about our Paracclipse antennas and you just have to know, feel free to give me a call. I'm even available by telephone, FAX, and mail.

My telephone number is (402)563-3625. My FAX number is (402)564-2109. My address is:

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2271 29th Avenue East
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Paracclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 1 Number 2 10-94

Compiled by:
Michael McGee,
Technical Support
Manager

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."

DO YOU WANT BETTER KU RECEPTION?

Every so often I get calls from someone who is in the process of moving their Paracclipse Classic satellite antenna. Basically, all they want is some tips on how to take it down and reassemble it. In the course of giving them some suggestions, I usually ask them something that seems to catch them by surprise. I mention that, if they are going to all this trouble, why not upgrade their antenna for KU at the same time? It seems that, since many have had such satisfactory performance for so many years, it never occurs to them that the product has improved over that period of time.

If anyone has an Classic antenna manufactured before June of 1991 (serial number below 106000), they can benefit from our C-KU upgrade kit or our quad pole upgrade kit. What are they? The quad pole upgrade replaces the old buttonhook feed with four feed support poles, a feed cover, and a special feed plate designed to accommodate the fine tuning of focal adjustments. You don't even have to run down to your local hardware store. We also provide the nuts, bolts, washers, etc. that you would need for this.

What about the C-KU upgrade kit? This is the quad pole upgrade kit plus our new preformed mesh designed for KU. How much has our mesh changed? First, the mesh comes to you preformed to

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.

correspond to the parabolic curve that your antenna needs to track at its best. Second, the mesh holes are now finer, with the percentage of surface area that is metal going from 37% to 55%. For all those out there that I hear groaning over the thought of reclipping their mesh, I have good news! We don't use those old U-clips anymore that turned your fingers blue trying to twist them into place. What we use now are J-clips that pull the mesh into place on the ring with the use of pliers. If your antenna uses hold-down strips to secure the mesh, you probably will also want to order some of these, too.

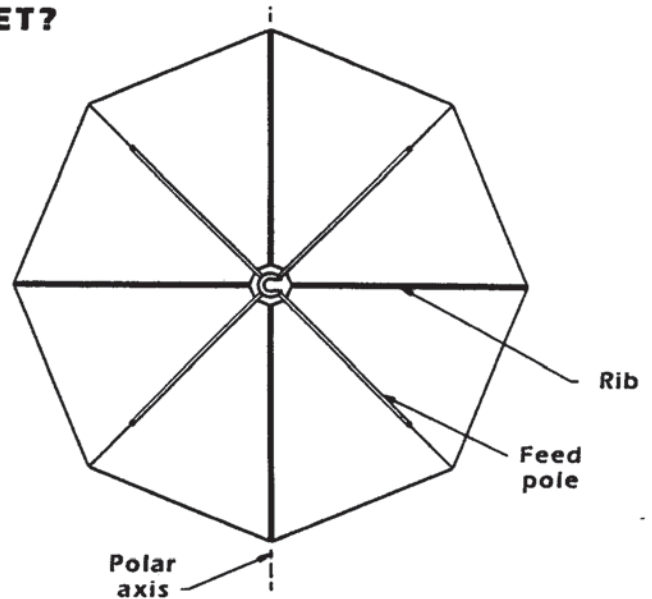
What does this mean for you? You will have a definite improvement in your KU reception. Why? The mesh will reflect more of the KU signal to your feed, the feed poles will accurately locate your feed in its optimum position, and the feed plate will allow you to precisely aim your feed.

How much work is this going to be? If you are already reassembling your dish, there will be very little that you wouldn't have had to do in the first place. The only additional operation necessary is to drill holes in four ribs. (For those owners of 9' Classic antennas, we don't have mesh specifically cut for these, but with some trimming, our 10' Classic mesh will work.)

WHERE IS THAT INSTRUCTION SHEET?

What if you are ready to drill the holes in your ribs, and you just can't seem to remember where you left your instruction sheet? If that is the case, you may find the following instructions and the chart below helpful.

The ribs that you drill will vary from feed to feed depending on the feed offset angle in relation to the polar axis. The figure to the right will suffice for most cases. For the 10', 12', 14.5', and 16' Classic antennas, drill the .25" diameter hole at the specified distance from the end of the rib (not the hold-down strip or the mesh). For the 9' Classic, the measurement is taken along the curve of the rib from the front hub plate.



SIZ	MEASUREMENT	FOCAL LENGT
9'	46.25" from hub plate along rib	43"
10'	12.5" from end of rib	43"
12'	16.375" from end of rib	52.625"
14.5'	35.188" from end of rib	52.625"
16'	39.625" from end of rib	57"

REPAINTING 6' & 7.5' HYDRO REFLECTORS

Occasionally, I get calls from owners of our Hydro antenna wanting suggestions on repainting their hydroformed dish. Perhaps the wife thinks that the color of the antenna clashes with her house?

After thoroughly cleaning the dish and removing any loose paint, give it a vinegar wash (50% water, 50% vinegar). Then, use either zinc chromate or cold galvanizing as the base (primer) coat. These are available in spray cans at automotive paint shops. After this is finished, paint your reflector with a low-gloss paint. This is a helpful step. Why? Because if too much heat is focused by a reflective surface, you could have a melted feed.

HALL EFFECT BOARDS

To all owners of our Classic 12' and 14.5' CD antennas, knowing the difference between a reed switch and a Hall Effect board may mean the difference between satisfactory tracking and pulling out any remaining hair. Why would this mean anything to you?

Because of the way that they read an electronic spike, Houston Tracker and Toshiba receivers need a Hall Effect board instead of the reed switch that is preinstalled in your motor/gearbox. Therefore, if you have one of these receivers, a Hall Effect board may be just the thing for your satellite antenna system.

ANY QUESTIONS?

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 1 Number 3 11-94

Compiled by:
Michael McGee,
Technical Support
Manager

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."

HAVE YOU CHECKED YOUR REFLECTOR?

Every so often, I will get a call from someone who replaced the mount of their antenna, and they can't understand why their signal quality ends up being worse. The first thing that comes into their mind is that the new mount is somehow faulty. As a result, there is sometimes a perplexed reaction when I start asking them about their reflector. They might think, "I replaced the mount, not the reflector!" That is true, but the reflector was moved. If the rings and ribs of the antenna have been jostled in any way, the parabolic accuracy of the antenna will need to be restored.

This is especially a concern with our Classic series of antenna, because the location of the rings and ribs are critical if good KU reception is desired. To a lesser degree, our Eclipse and Hydro series of antennas could have a problem in this regard, but these can be checked quite easily. Why should this be important to you? A precise parabolic surface that is both accurate and symmetrical (not elongated, warped or sagged in any way) is a must for good C-band and KU-band reception. In plain English, you need to put your gloves and work clothes on if you want a good picture.

When should the reflector be checked? I would strongly recommend that it be checked every time that the antenna is either moved or retrofitted. Also, if they are hit by something with some weight behind it (either an identified or an un-

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identified flying object), you can be pretty safe in assuming that your parabolic accuracy has been affected. In addition, a distorted parabolic shape wouldn't be a bad place to start if you are trying to troubleshoot poor picture quality.

How should the reflector's parabolic accuracy be checked? Since I am not one of those who enjoy spending all day tinkering with something, I start with the easiest test. That way I might see where I stand right away. With one eye closed, I sight across the reflector and hope to see a flat surface. If there is a variation of more than $\frac{3}{8}$ " or 9.5 mm, I have a problem. Thankfully, this test usually does the trick for Hydros and Eclipses.

Classic antennas, on the other hand, need a couple of more tests. Measurements from the outside of one ring to the outside of the opposite ring need to be taken all the way around at the same location on each ring. These must consistent within $\frac{1}{4}$ " to $\frac{1}{2}$ " (6 to 12 mm). Also, with a ball of string and some masking tape, find at least four identical spots on the antenna and run the string to the opposite side. Where the strings cross each other should be a perfect intersection, without horizontal or vertical gaps or any tension.

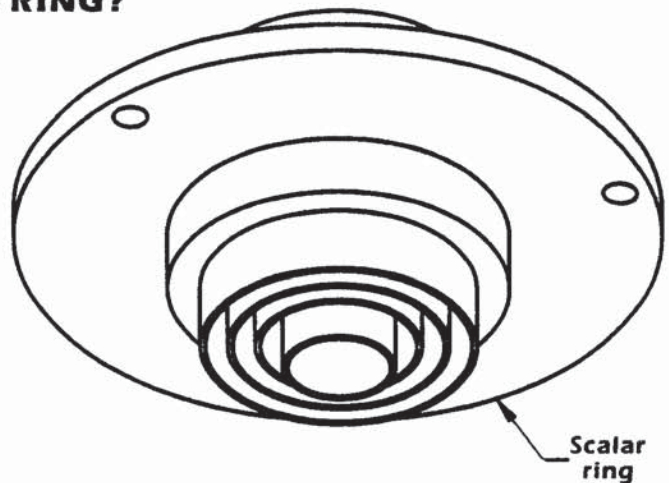
If the reflector accuracy is off, you have at least one consolation. You can probably stop worrying about your mount.

WHAT HAPPENED TO THE SCALAR RING?

One time, I received a call from an installer in Saudi Arabia who was trying to put in an integrated KU feed/LNB. (That job has to pay pretty good. The only other thing I could figure is that his boss must not check his expense reports.) The problem was that it didn't have a scalar ring familiar to him. It was similar to the figure at the right. As a result, his focal distance was off by about an inch.

Being that the closest hardware store was on the other side of the desert, I told him to replace the bolt holding the feed to the feed cover and feed poles with a longer one and slide a bunch of nuts on them for spacers. This will do in a pinch, but there's a better way. We carry a KU feed spacer kit (#65350) that will take care of that situation neatly.

Another situation that comes up involves Chaparral's new MicroPak, an in-



tegrated feed/LNB for C-band. In this case, all you need to do is to attach the thin scalar ring on the top of the feed pole tabs instead of underneath.

Hopefully, these tips will save some expensive telephone calls. That way the expense account will look a little better.

LET'S KEEP THEM HAPPY

Have you ever worked with someone who is grouchy and irritable? Thankfully, I don't have to handle that in my dealings with the parts department (most of the time). I would like to keep it that way. As a result, I thought that some of these tips might make life easier for those taking parts order (and therefore it makes life easier for me!)

First, take the time to look at your installation manual before you call. Almost all of them have the part numbers and names for every part of your antenna. Highlight the ones that you need. If you don't have one, I'll be glad to send it out to you. What if you aren't sure what it is that you need? Give me a call. We can figure that out, and I'll let the parts people know what you want.

Next, have your credit card number handy. This along with your preferred method of delivery will get what you need to you in no time at all. (Unless, of course, you want to order an entire antenna. These have to be ordered through distributors.) The result? We will have a happy parts department. (Not to mention the benefits to you and I.)

SPECIAL NEEDS AND ZONING BOARDS

What if you have special needs regarding your mount, foundation, etc.? Also, what can be done with zoning boards that require every antenna specification in the book? Don't despair. We should be able to help. If you need foundation, wind-loading, range testing, and other data, just give us a call. We'll be glad to mail you a package with the applicable information. Who knows? We might even have the specification that the zoning board thought you would never find.

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"MY FEED COVER WON'T FIT!"

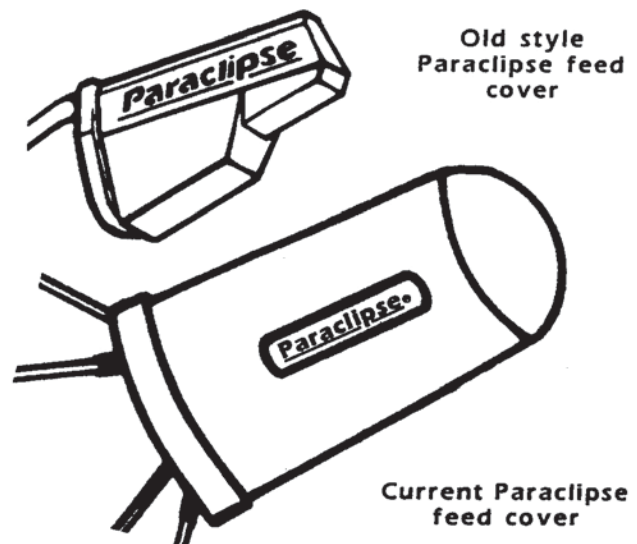
Living in an age of fast moving technology has many advantages. Unfortunately, this doesn't include simplicity. When some component is upgraded in the name of progress, it has a ripple effect that touches many things that most don't expect. On your satellite antenna, one of these may be your feed cover.

Feed covers were originally designed to make the feed electronics more pleasing to the eye and protect them from the elements. This was simple enough in the past, but now with the bewildering number of choices of feeds, LNBS, LNBFs, etc., fitting a feed cover may turn into a frustrating chore.

Originally, Paraclipse used a small feed cover (shown at right) that snugly fit over the standard electronics used at that time. Because of the variety of setups that developed, we now use a roomier version (shown at right). Unfortunately, some will still call hoping for another solution. Sorry! We only carry that one kind. There may be some solutions, though.

Sometimes, the situation can be easily cleared up by asking which way the "L" shape of the LNB is attached. A few times I've been told that the LNB sticks out too far. Upon finding out that the long end was attached to the feed, a simple flip can solve the problem.

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In other cases, just making some notches in the feed cover donut (the part that attaches to the bottom of the feed cover) will allow a smooth fit. If that is the case, you may want to seal around the notch for weather protection, etc.

Don't forget, though, that some feed setups were not designed for feed covers. For example, dual-band feed systems (used for tracking more than one satellite at a time) give off a fair amount of heat. Enclosing this system may damage it. Thankfully, only a small percentage of our customers fall into this category. Whatever your situation, as technology advances, I'm certain we are going to find more situations that will test our ingenuity, patience, and sense of humor.

WHERE DO THE SHIMS GO?

Several of our antennas use shims to set the declination angle (Hydro NP mount, Eclipse VP mount, and Classic PT mount). The problem is that sometimes the installers (probably not the ones reading this newsletter) will just look at the illustrations in the installation manuals and go from there. Since only one of many possible shim configurations is shown, they may assume that the shims only go in the direction that they saw, and when the antenna doesn't track properly, they blame the antenna.

These antennas are preset to 4° or 5° (these declination angles are used at 29.4° or 35.2° latitude), which are about the median for most customers. To increase the angle, shims need to be added between the hub plate and declination plate on the top (or if your antenna is pointed straight up, away from the equator.) To decrease, add shims to the bottom (or towards the equator.)

Of course, there is a simpler way of dealing with this. Just take the time to read the instructions in the installation manual that comes with your antenna (unless someone enjoys a life full of complications).

WHAT IS F/D?

Have you ever noticed in the back of your installation manual a specification that is labeled F/D? Perhaps you have also noticed this in your feed assembly instructions as a setting on your adjustable feed. While some may feel that it is a cryptic term for some obscure engineering calculation, it really isn't that complicated. In fact, you could figure this ratio out yourself.

First, you need the focal distance of your antenna. I could give you a long, involved formula, but I'm just going to tell you to look in the back of your manual. Take this number and divide it by the diameter of your reflector (not the lip, just the actual reflective surface). Therefore, focal distance (F) divided by reflector diameter (D) gives you F/D. While this little tidbit probably won't improve the quality of your life, some of you just might agree that it is interesting to know.

"I'M GLAD THAT'S NOT MY JOB!"

One responsibility that is not a part of my job (thankfully!) is the warranty department. So when I receive a call from someone who feels that they have a situation that comes under warranty (of course, an extremely rare situation for Paraclipse!), my response is: "I know just the person that you need to talk to about this." Then, I transfer them to the lonely and unappreciated person who takes care of that department.

In the unusual event that you do catch this individual in a good mood, how do you keep it that way? First of all, have your antenna serial number and an invoice showing your installation date handy. Next, look up the part numbers and/or names of the parts needed in the installation manual that came with your antenna. Knowing who the dealer or distributor is that you bought the antenna from may also be helpful. Therefore, when you do call, everything will be ready.

Please, be nice. It makes life easier for the one handling warranty, and in the long run, it makes my life easier, too. When you do request warranty reimbursement, please don't ask for labor or travel reimbursements as part of your warranty. That only makes this individual feel bad because the authority to offer that to you just isn't there.

In conclusion, treat the person nice because we don't want to forget how thankless a job it is. Also, be thankful that it is not your job.

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Volume 2 Number 1 1-95

Compiled by:
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Technical Support
Manager

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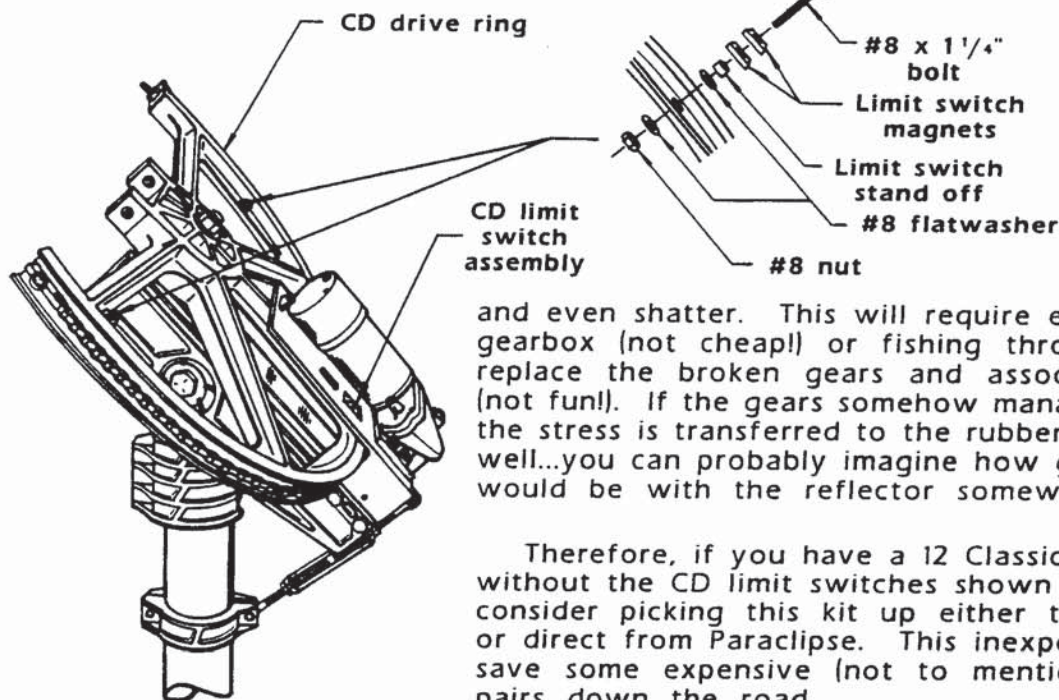
WOULD YOU LIKE YOUR CLASSIC CD MOTOR TO LAST LONGER?

I was looking over my log of technical support requests for the past year and noticed that 25% of them were on our 12 Classic chain drive or cog belt drive antennas. A good number of these calls were in reference to problems with the gears in the motor/gearbox assembly and the belt of the cog belt drive.

Since it's easier to fix a problem before it develops than to pick up the pieces afterwards, the following sugges-

tion may make life easier for us all. If you have a 12 Classic cog belt drive (or one that has been upgraded to a chain drive) that was manufactured before early 1987 (approximately a serial number below 80000), a CD limit switch assembly kit (#65475) may do the trick.

The problem with these antennas is that they have no backup limits, and the limits in your receiver may be overridden or even fail. When this occurs and someone tries to keep moving the antenna in that direction, one of two things will likely happen (neither of them positive!).



The gears in the gearbox may crack and even shatter. This will require either a new motor/gearbox (not cheap!) or fishing through the grease to replace the broken gears and associated ball bearings (not fun!). If the gears somehow manage to hold up, then the stress is transferred to the rubber belt. If this snaps, well...you can probably imagine how good your reception would be with the reflector somewhat crumpled.

Therefore, if you have a 12 Classic chain or belt drive without the CD limit switches shown to the right, please consider picking this kit up either through your dealer or direct from Paraclipse. This inexpensive kit will likely save some expensive (not to mention aggravating) repairs down the road.

CHAPARRAL "BULLSEYE" FEEDS

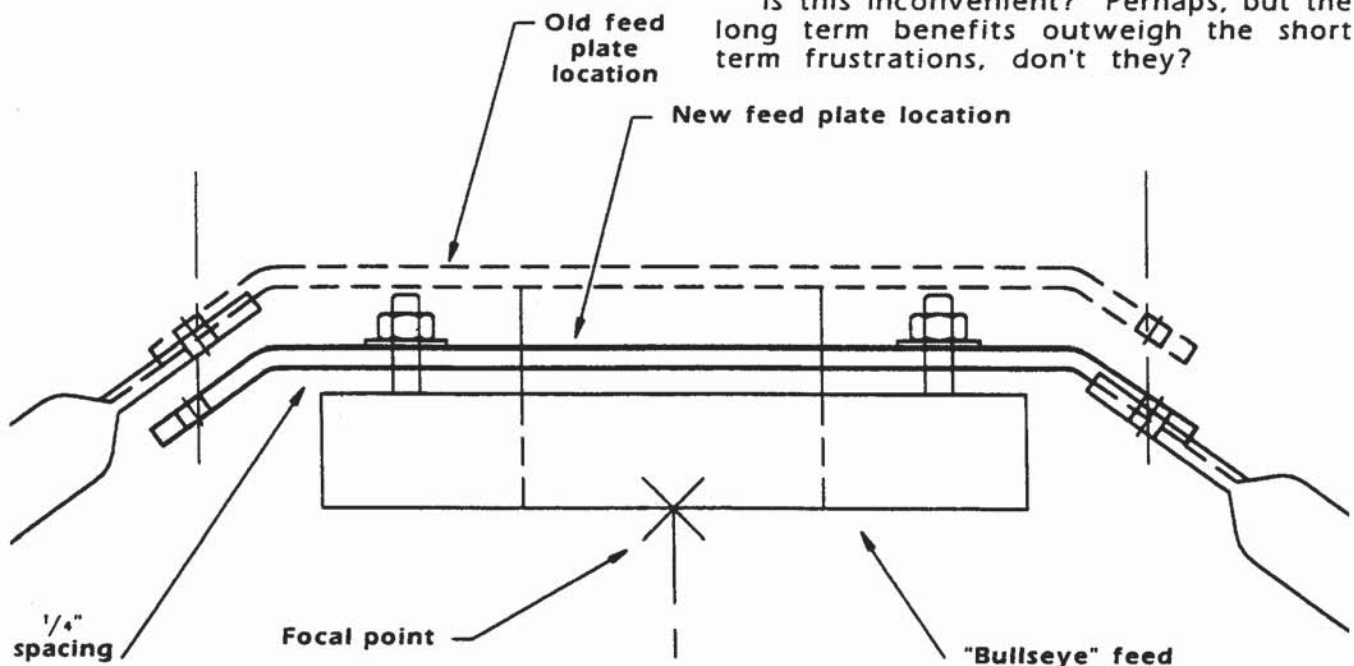
Some of our customers value convenience. So along with their Paraclipse antenna, they purchase a feed configuration that will allow them to either to pull in channels of both polarities on one satellite, two different satellites, or both. Since one of the Chaparral "Bullseye" feeds meets their requirements, they feel that they are all set. Unfortunately, convenience of satellite viewing doesn't necessarily translate into convenience of installation.

Because of the differences of focal point and scalar ring configurations, a small modification needs to be made to make these compatible with your Paraclipse antenna. For the 12' and 14.5'

Classic antennas, you simply drill new holes in the center of the top rib extrusion 1" out (towards the outer perimeter of the reflector) from the previous hole. Upon moving your feed poles, your feed plate will be lower (see below), allowing your "Bullseye" focal length to be met.

When you attach your "Bullseye" feed, $\frac{1}{4}$ " spacing is required between the scalar ring and the feed plate. To accomplish this, either trim the provided nylon thumb screws that thread into the feed plate or stack $\frac{1}{4}$ " flatwashers on $\frac{1}{4}$ " bolts for the correct spacing. For other Paraclipse antennas, let us know, and we will figure it out for you.

Is this inconvenient? Perhaps, but the long term benefits outweigh the short term frustrations, don't they?



WE GET ALONG WITH HORSES!

One customer from the high plains called because his horses kept knocking out the mesh on his Paraclipse Eclipse antenna. When he found out we had a mesh support ring kit for our 10' Eclipse and older 12' Eclipse style antennas that reinforces the mesh, he promptly ordered it (part #923787, which includes mesh support rings and J-clips for securing). As it turns out, he was quite happy with how the kit strengthened his antenna. Why not? There was now peace on his ranch between his horses and his Paraclipse antenna!

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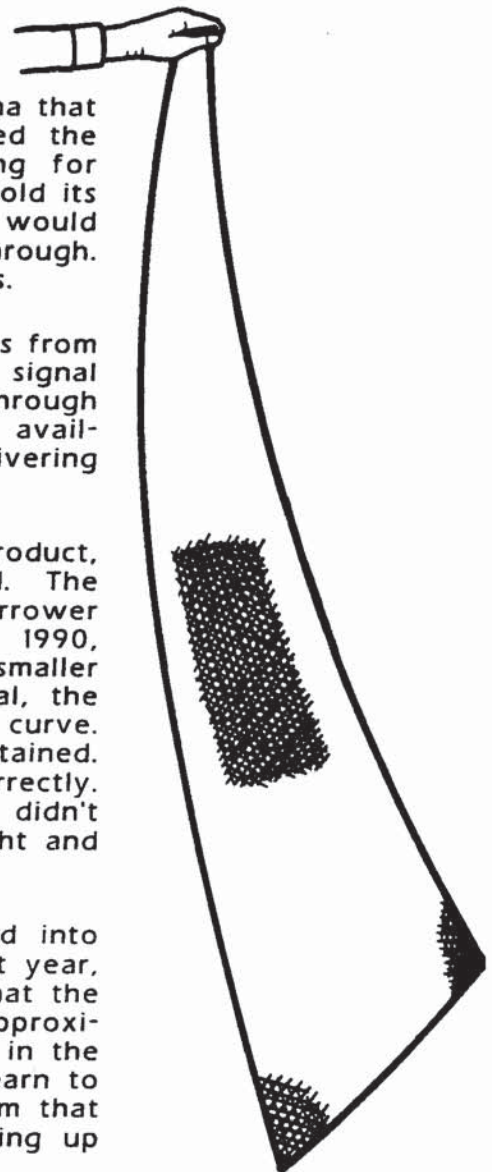
MESH IS MESH, RIGHT?

Let's examine a part of the Classic and Eclipse antenna that many take for granted. When someone first designed the reflector of the satellite antenna, they were looking for material that was lightweight, flexible, and yet would hold its form. Also, they were looking for something that would reflect the signal and yet allow wind and water to go through. The result was expanded metal aluminum mesh panels.

How does something as porous as mesh reflect signals from satellites to the feed? The key was the width of the signal wavelength, because it was large enough to not go through the openings of the mesh. Therefore, an antenna was available that reflected a good signal without a lot of quivering in the wind.

Unfortunately, someone had to improve on the product, and as a result, Ku-band transmission joined the C-band. The problem was that the Ku-band wavelength is much narrower and therefore harder to focus onto the feed. In 1990, therefore, Paracclipse went to a mesh that had much smaller openings. Also, to improve the focusing of the signal, the mesh is produced preformed to the correct parabolic curve. From then on, Ku-band reception is much more easily attained. Of course, this assumes that the mesh was put in correctly. Some installers (I'm not going to get into their motives) didn't take the time to look at the mesh as shown at the right and accordingly put it in backwards.

Therefore, mesh that was about 63% open evolved into preformed mesh that was about 45% open. In the past year, we went a step further with the Eclipse antennas in that the mesh opening was narrowed still further until it was approximately 35% open. What does this mean for those out in the field? I'm afraid that you are just going to have to learn to live with the fact that the product has improved. From that point, it is simply a matter of deciding whether keeping up with the times is important to you or not.



TRACKING INCLINED ORBIT SATELLITES

As if life wasn't already complicated enough with DBS satellites, so-called 2° spacing on C-band satellites, etc., something else has snuck up on many hard-working satellite antenna dealers and distributors. Previously, if someone requested a setup for tracking inclined orbit satellites, it was automatically assumed that they wanted to pull in some Russian programming. Hardly a big draw! Now if one looks at a satellite reference work (such as Jane's *Space Directory* of 1993-1994), they will find that of 201 satellites listed there are 117 satellites in inclined orbit. True, 32 of these are Russian satellites, but 42 are non-Russian commercial communication satellites.

What is involved? It is really not that difficult once an individual takes the time to investigate. Evidently, that is what many have done recently judging by the

IT REALLY IS WET OUT THERE!

For those of you who have chosen life next to the beauties of the ocean, the smell and mist of the salt air, along the associated winds and wildlife, you are going to have to put up with some inconveniences if you want satellite reception. This means rust, corrosion, mildew, etc. Before you accuse us here at Paraclipse of being unsympathetic because we are more than 1,000 miles from the closest ocean (an insignificant detail), take a look at what we offer to those fighting rust and mildew.

Besides the fact that a large proportion of our antenna is rust-resistant aluminum, there are some helpful options. On our Classic antennas, the steel front hub plate can be ordered in aluminum. Practically all of our antennas can be put together using stainless steel hardware. True, this is much more expensive than standard hardware, but ocean life makes up for it, doesn't it? Also, the steel parts on our Classic, Eclipse, and Hydro antennas can be ordered galvanized. True, it takes 6 to 8 weeks longer to get this done, but breathing that salt air makes the wait worth it, doesn't it? So, the next time we hear of someone complaining about how difficult it is off the ocean, you can just imagine how sympathetic we will be.

number of inquiries I have been receiving on this. Essentially, what is needed is a dual-actuator mount setup along with the appropriate receiver. In fact, some of the more inventive ones out there have rigged up their own version of inclined orbit tracking.

What if you are one of those whose joy in life is not spending hours tinkering with your satellite antenna system? A number of different inclined orbit tracking kits are available from Paraclipse, some of which have been field-tested for several years. Specifically, we offer inclined orbit tracking on our Classic 16 CD, Eclipse 12 H-H, Patriot 3.1 H-H, and Patriot 3.7 Polar. As a result, the hard-working dealer or distributor referred to earlier can replace the involuntary groan with a heartfelt smile when someone requests inclined orbit tracking.

WHAT'S THE FOCAL DISTANCE?

For those who hate instructions and throw them out at the least excuse, a problem comes along when the reflector focal distance needs to be adjusted. If it is embarrassing to have to ask for the specifications again, here is a simple formula that can be used to calculate your focal distance. $F=D^2/16d$ or focal distance equals the diameter of the reflector (the actual reflective surface) squared divided by 16 times the depth of the reflector. Using this, a reflector with a 98.9" diameter and a 15.3" depth would have a focal distance of 40". This is easy perhaps, but it is easier still to keep the instructions.

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NEITHER WIND NOR SLEET NOR SNOW...

You have probably heard this line or something similar regarding the postal service. Regardless of your opinions of that line of business, there is no way that they would be able to live up to that claim without the proper equipment. In other words, they prepare for inclement weather by investing in good boots, warm clothing, etc.

Correspondingly, many have high regard for the durability and toughness of their Paraclipse Classic antenna. As a result, it is a surprise to them when their antenna had difficulties with an Atlantic gale off the coast of Nova Scotia, heavy icing in central Alaska, or heavy snows in upstate New York as some of my callers attest. But, when I ask them what reinforcing they have on their antenna, it's almost as if this was something that didn't even cross their mind. While we are glad that our customers have high expectations of our product, most would probably agree that it is only reasonable to have to invest in reinforcing the antenna for extreme weather conditions.

Among other things, we have an extreme weather bolt kit (Fig. 1) that uses all-thread studs to reinforce the rib structure. Also, we have stabilizer struts (Fig. 2) to add stability to the mount. These are available for both our actuator-driven and our chain or belt driven Classic antennas. Let us know if you want more information. The result of such an investment? You'll be able to tell your local mail service that they have some competition in the area of reliability in the face of extreme weather conditions.

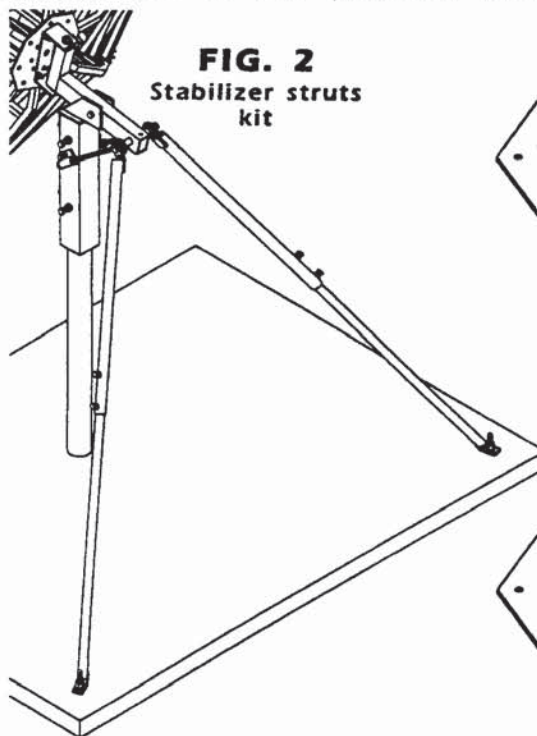


FIG. 2
Stabilizer struts
kit

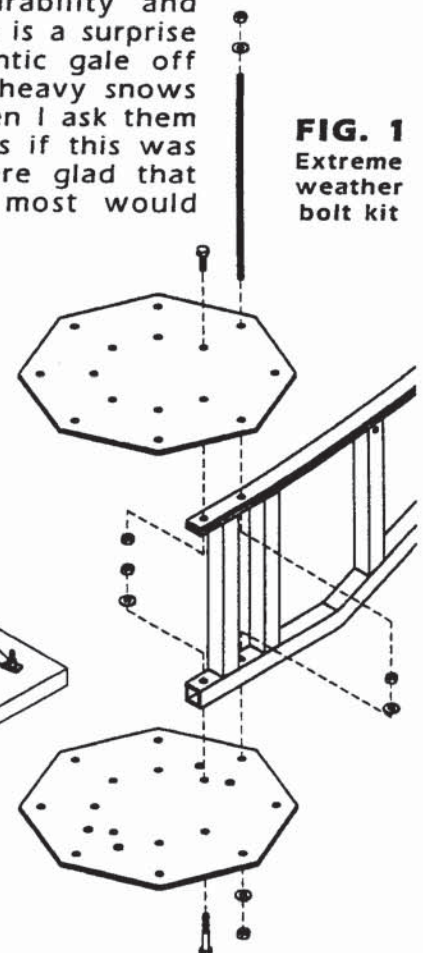


FIG. 1
Extreme
weather
bolt kit

BACK BY POPULAR DEMAND

It seems that the most popular of my articles was just a simple chart. That means either that the chart was that helpful or nobody read my articles. I like to think that the chart was very useful. As a result, below is an updated chart from the previous edition. You likely will find it a useful reference.

ANTENNA	SIZE	MOUNT	FOCAL LENGTH	F/D	BASE PIPE
CLASSIC	9' (2.8 m)	ALL	43" (1.09 m)	0.4	3.5" o.d. (3" schedule 40 black pipe)
	10' (3.0 m)	ALL	42.375" (1.08 m)*	0.352	3.5" o.d. (3" schedule 40 black pipe)
	12' (3.8 m)	ALL	53.375" (1.36 m)*	0.375	3.5" o.d. (3" schedule 40 black pipe)
	14.5' (4.5 m)	Islander & CD	53.375" (1.36 m)*	0.31	3.5" o.d. (3" schedule 40 black pipe)
		PRO	53.375" (1.36 m)*	0.31	Uses tower
	16' (4.8 m)	ALL	56.25" (1.43 m)*	0.3	Uses tower
ECLIPSE	8.5' (2.6 m)	ALL	40" (1.02 m)	0.4	3.5" o.d. (3" schedule 40 black pipe)
	10' (3.0 m)	ALL	35.875" (.91 m)	0.3	3.5" o.d. (3" schedule 40 black pipe)
	12' (3.8 m)	VP & H-H	47.875" (1.22 m)	0.333	3.5" o.d. (3" schedule 40 black pipe)
		EP	47.875" (1.22 m)	0.333	4" o.d. (3.5" schedule 40 black pipe)
HYDRO	4' (1.2 m)	ALL	17" (.43 m)	0.36	1.9" o.d. (2" schedule 40 black pipe)
	6' (1.8 m)	All but old AZ-EL	23.125" (.59 m)	0.335	3.5" o.d. (3" schedule 40 black pipe)
		Old AZ-EL	23.125" (.59 m)	0.335	4" o.d. (3.5" schedule 40 black pipe)
	7.5' (2.4 m)	All but old AZ-EL	28.125" (.71 m)	0.312	3.5" o.d. (3" schedule 40 black pipe)
		Old AZ-EL	28.125" (.71 m)	0.312	4" o.d. (3.5" schedule 40 black pipe)
PATRIOT	3.1 m (10')	Polar & H-H	41" (1.04 m)	0.336	4" o.d. (3.5" schedule 40 black pipe)
		AZ-EL	41" (1.04 m)	0.336	5.5" o.d. (5" schedule 40 black pipe)
	3.7 m (12')	ALL	57.6" (1.46 m)	0.4	6.625" o.d. (6" schedule 80 black pipe)
	4.5 m (15')	ALL	63" (1.60 m)	0.35	Base pipe supplied

* If the Classic antenna serial number is 151076 or less and was manufactured before August 1993, the focal distance changes slightly. The 10' (3.0 m) was 42" (1.07 m), the 12' (3.8 m) and 14.5' (4.5 m) was 52.625" (1.34 m), and the 16' (4.8 m) was 57" (1.45 m).

WHAT'S THE GAIN AND THE EFFICIENCY?

Many times individuals want to compare how well antennas pull in signals, but they can't do a full comparison because either the gain or the efficiency figure isn't there. Also, they may become suspicious at times because the gain seems quite high and either no efficiency number is provided or the numbers don't seem to match. It is possible to check this. How?

The basic formula is $G = E(\pi D / \lambda)^2$. G is the raw gain figure, E is the efficiency, π is 3.1416, D is the reflective diameter in centimeters, and λ is the wavelength in centimeters (or just divide 30 by the GHz frequency). To translate the raw gain figure (G) into the logarithmic dB scale, just take the 10 log of the number. As an example, our 6' Hydro has an efficiency at 12.2 GHz of 63.9%. Therefore, $G = .639(3.1416 \times 172 / 2.459)^2$ or 30,856. The 10 log of this figure is 44.9 dB. Armed with this formula and a good scientific calculator, one can check and see if the numbers add up. If they don't, you can ask some hard questions and watch the one who provided the numbers squirm. Who knows? You just might get a better deal.

ANY QUESTIONS?

If there is still anything else that is puzzling you about our Paraclypse antennas and you just have to know, feel free to give me a call. I'm even available by telephone, FAX, and mail.

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 Columbus, NE 68602-0686

Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 4 4-95

Compiled by:
Michael McGee,
Technical Support
Manager

OUR PURPOSE

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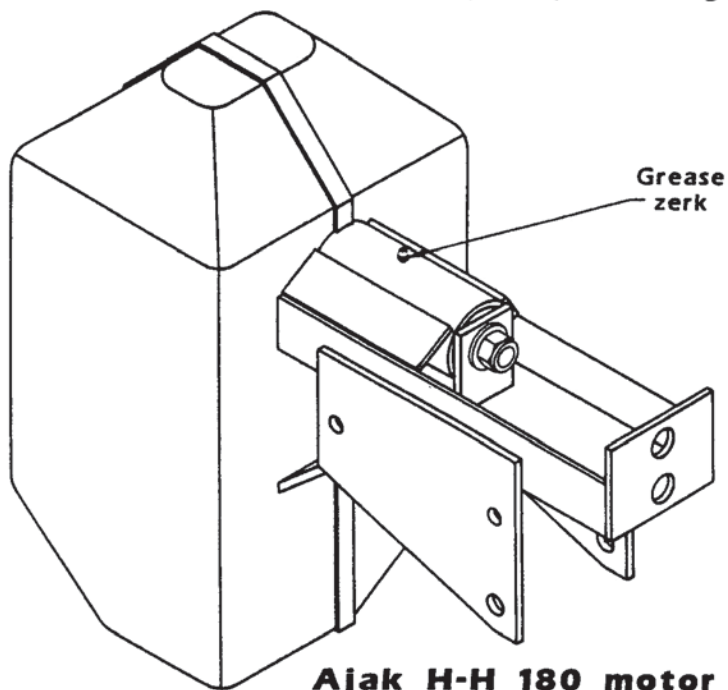
This newsletter, coupled with the installation manual that came with your antenna, should save you valuable time in dealing with situations that come up in the field. Please take the time to look over this sheet.

OLD AND COLD AJAK MOTORS

Those Paraclipse customers that have chosen to live in polar environments (and I'm not necessarily talking about Alaska) have already found out how important it is to change the lubrication of the motors in their cars, etc. As a result, they are very much aware of the advisability of replacing the grease lubricant in their chain drive motors. Many of our antennas (Eclipse, Hydro, and Patriot series) have been coupled with Ajak's horizon-to-horizon mounts, either the Ajak H-H 180 or Tracer 180. The problem is that some have been gritting their teeth over more than the cold, as a caller dealing with antennas in Michigan and Ontario has attested to recently.

The first problem that is being dealt with is that some lubricants work better in cold weather than others. With Ajak mounts being sold all over the world, a compromise was reached as to a lubricant that would work well in both hot and cold environments. Unfortunately for the caller mentioned previously, this has meant service calls in the dead of winter because the Ajak motor froze up. Upon calling the engineers at Ajak, we came up with a solution that will hopefully avoid some future grief. When the antenna is installed in cold environments, it is recommended to replace the lubricant with one called "Lubriplate" which is available at most automotive shops. Also, it was and is recommended to replace the lubricant on the motor and gear teeth periodically regardless of the local weather.

This leads us to the second problem. Older Ajak mounts (about 3 or more years old) have no grease zerk for someone to add more lubricant. The people at Ajak have something for this also because a free grease zerk retrofit kit is available upon request. Just call Ajak Industries at (719)784-6301 and they will send one out to you. I very much like that solution since they receive the callers with gritted teeth and not me.



Ajak H-H 180 motor

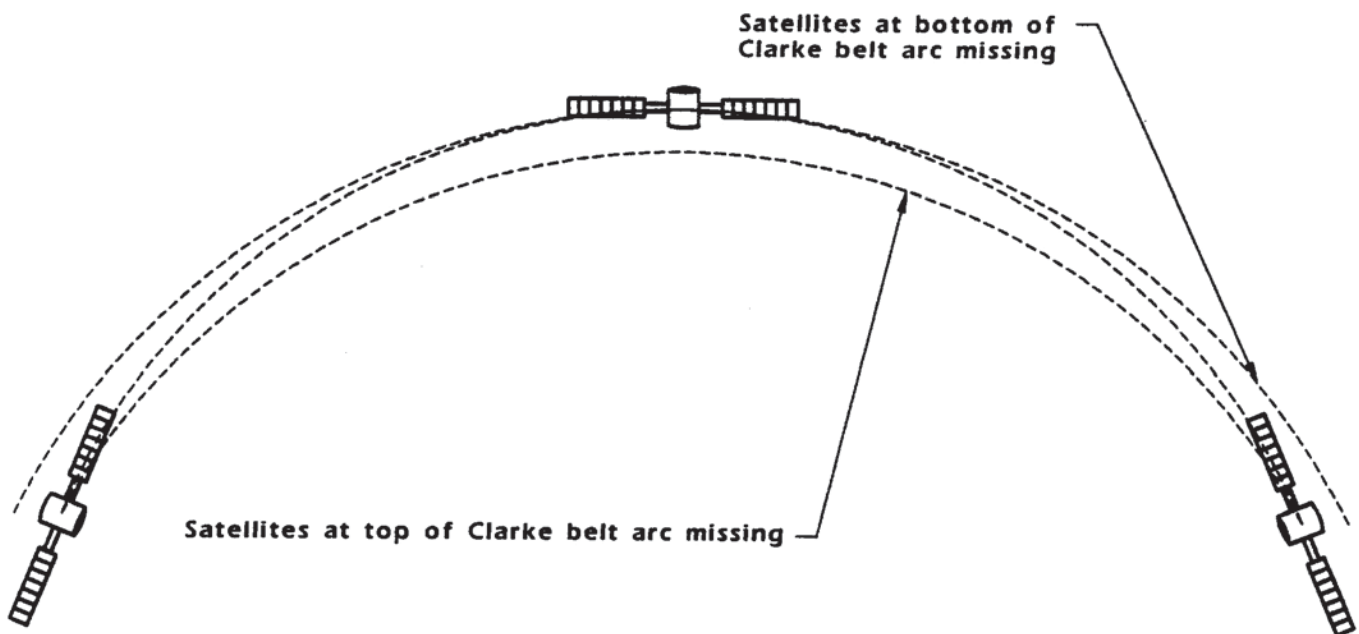
CHAPARRAL'S GOLDEN RING

To many individuals, it is a pain to take the time to read the instructions, but please don't forget that it is an even greater pain to put something together incorrectly and lose performance. A case in point are the Chaparral Polarotor and Corotor feedhorns which are used on a large percentage of Paraclipse antennas.

When Chaparral designed these, they chose to concentrate on the flatter reflectors (those with F/D ratios from .32 to .45). Four of the reflectors that Paraclipse makes fall outside that range (the Classic 14.5' and 16', the Eclipse 10', and the Hydro 7.5'). To compensate for deeper reflectors like those previously mentioned, Chaparral came up with the Golden Ring that adjusts the F/D setting from between .32 and .28 back to .36.

The problem comes when someone views reading the instructions and using the Golden Ring as optional. Why bother? If the feedhorn is just slapped up there on one of these deeper reflectors, the antenna is under-illuminated, or for those of us who enjoy plain English, the feedhorn can't pull in all of a .30 F/D ratio reflector, such as our 10' Eclipse.

The difference may not seem like much, but your reflective surface on the 10' Eclipse goes down from 91.0 to 85.6 square feet or a 6% loss. I think that I'm safe in assuming that people like to get the most out of their equipment. So please read the instructions and use the Golden Ring.



IS YOUR DECLINATION OFF?

Many times when I receive calls from someone who can't pull in all the satellites on the Clarke belt arc, I basically ask if they can get the top or the bottom of the arc. Why? As illustrated above, an inaccurate declination setting can mean just getting the top of the arc or just getting the bottom of the arc. Paraclipse's antennas can easily be fine-tuned to about an eighth of a degree. Taking advantage of this feature can mean the difference between frustration and contentment, both yours and mine.

ANY QUESTIONS?

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Paracclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 5 5-95

Compiled by:
Michael McGee,
Technical Support
Manager

OUR PURPOSE

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WHAT'S IN A NAME?

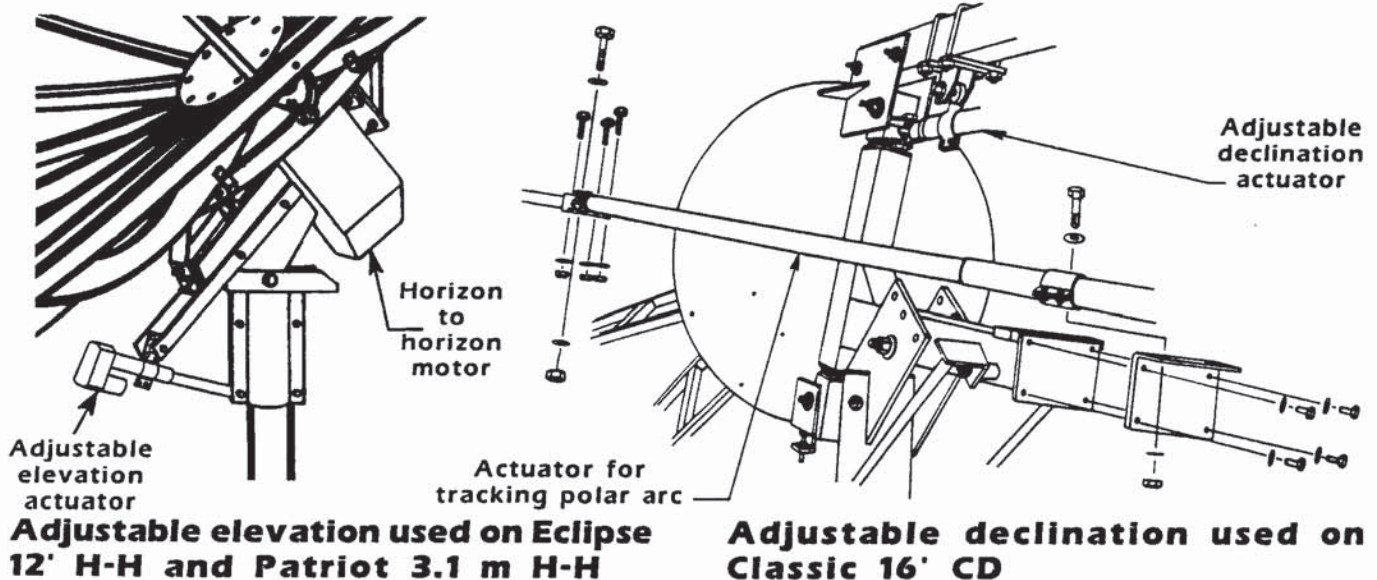
No doubt you have noticed the increasing popularity of tracking "inclined orbit" satellites. Why? As satellites near the end of their useful life due to fuel limitations, many are being realigned for "inclined orbit" or a "figure 8" rotation. This results in a 95% reduction of fuel consumption and a significant extension of its useful life. Doing so has become such an accepted practice that new satellites are now designed with processors to accommodate this eventual use. As a result, this tracking system likely has wormed its way into your life whether you like it or not.

Unfortunately, there is not one straightforward way to track "inclined orbit"

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satellites which only adds to the headache of the hardworking dealer and installer. When someone calls and requests an "adjustable declination" antenna or an "adjustable elevation" antenna, this only serves to increase the intensity of the headache. Why the variety of names?

An "inclined orbit" antenna only serves to designate the type of satellite being tracked. While it is possible to take a polar mount or horizon-to-horizon mount antenna and skew it to track properly, this is a laborious and time-consuming procedure. As if this wasn't bad enough, this process has to be repeated every time the satellite orbit is adjusted or a new satellite is tracked. To deal with



Adjustable elevation used on Eclipse 12' H-H and Patriot 3.1 m H-H

Adjustable declination used on Classic 16' CD

WHAT'S IN A NAME? (CONTINUED)

this, two different tracking systems were developed.

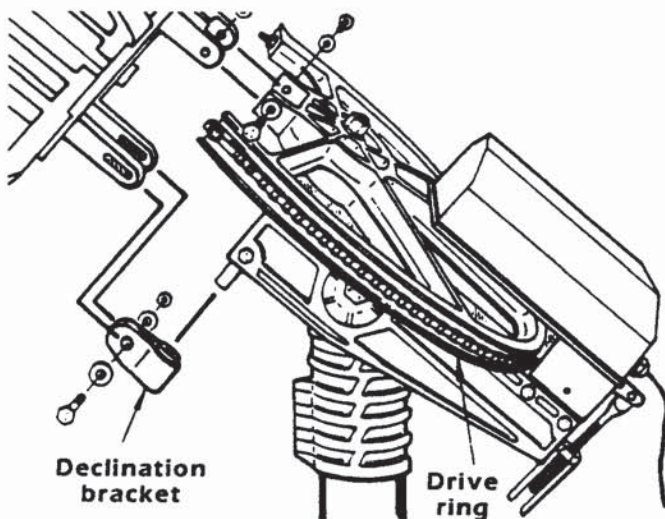
The most common is the "adjustable elevation" system. This is used in our Eclipse 12' H-H and Patriot 3.1 m H-H antennas (shown on page 1) along with the Patriot 3.7 m antenna. A separate actuator slightly adjusts the elevation to track the "figure 8" motion. This works well on the equator or directly north or south of the desired satellite. The problem is that the further away from the ideal area you are the more the "figure 8" skews. Therefore, you lose the signal for more and more of the day if you get further away from the ideal area because the "figure 8" goes past the antenna beamwidth.

To combat these shortcomings, the "adjustable declination" system was de-

COULD IT BE SOMETHING BESIDES THE MOTOR?

Your dish won't return to its pre-programmed position. The motor is laboring. Your motor is eight years old. Life is rough. It's time to replace the motor, right? Not necessarily. If you have a Classic 12' or 14.5' belt drive (or one that has been retrofitted to a chain drive) that was made more than seven years ago, it may pay to check if your dish uses bronze bushings. Why?

The original antennas used oil-impregnated bronze bushings in the drive ring and declination bracket for the pivot plate to turn freely. Unfortunately, it turned out that the oil evaporated while casting the bushings in these parts. As a result, rain



veloped as is used on our Classic 16' CD (shown on page 1). This system can track the "inclined orbit" satellite exactly at any location where it is visible. The problem with this is that the declination axis is difficult to motorize without severely weakening the antenna. Therefore, it is usually much more expensive than "adjustable elevation". From the customer's standpoint, though, there may not be much choice if he isn't close to the equator or is a good distance east or west of the satellite desired.

Where does that leave the hard working dealer and installer mentioned earlier? Whether the customer wants an "inclined orbit", "adjustable declination", or "adjustable elevation" antenna, just call us at Paraclipse. We might even save you the cost of the headache medication!

could then work its way into the pores of the bushing and start to cause binding. We replaced the bronze bushings in 1987 with UHMW nylon bushings. So please check the antenna for ease of movement before you suspect the motor. Too, it wouldn't hurt to replace the bushings before they cause a problem.

While these replacement bushings are available from us, they need to be pressed in and reamed so that the inside diameter is exactly perpendicular with the face of the part. You can have this done at a local machine shop or you can call us regarding our exchange policy. I much prefer helping people avoid problems than hearing how rough life is because the satellite antenna isn't working.

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 6 6-95

Compiled by:
Michael McGee,
Technical Support
Manager

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MY SATELLITE ANTENNA SHOULD WORK BETTER THAN THAT!

Many have been happy with their Paraclipse antenna for ten years and more. They were among the thousands that obtained the 12' Polar "L" mount antenna that was made from 1982 to 1984. These ones enjoy bragging to their friends about how good the durability and performance of their antenna has been. Trust me, I know. I've had a number of individuals spend several dollars of their long-distance telephone time telling me this.

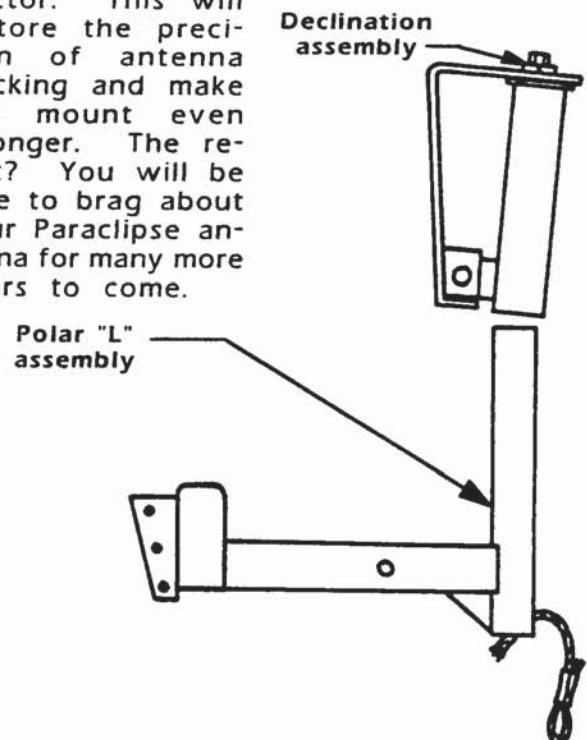
The problem is that, for some, the antenna has been having problems finding and holding on to the correct satellite lately. Since this may have happened gradually, they have just gotten used to compensating for this, perhaps gritting their teeth in the process. Finally, they get out and examine their antenna, and after pushing on the antenna in various places, they notice quite a bit of slop in the mount. Is this the end of the road for their antenna? No, for this looseness in the mount can probably be solved quite easily.

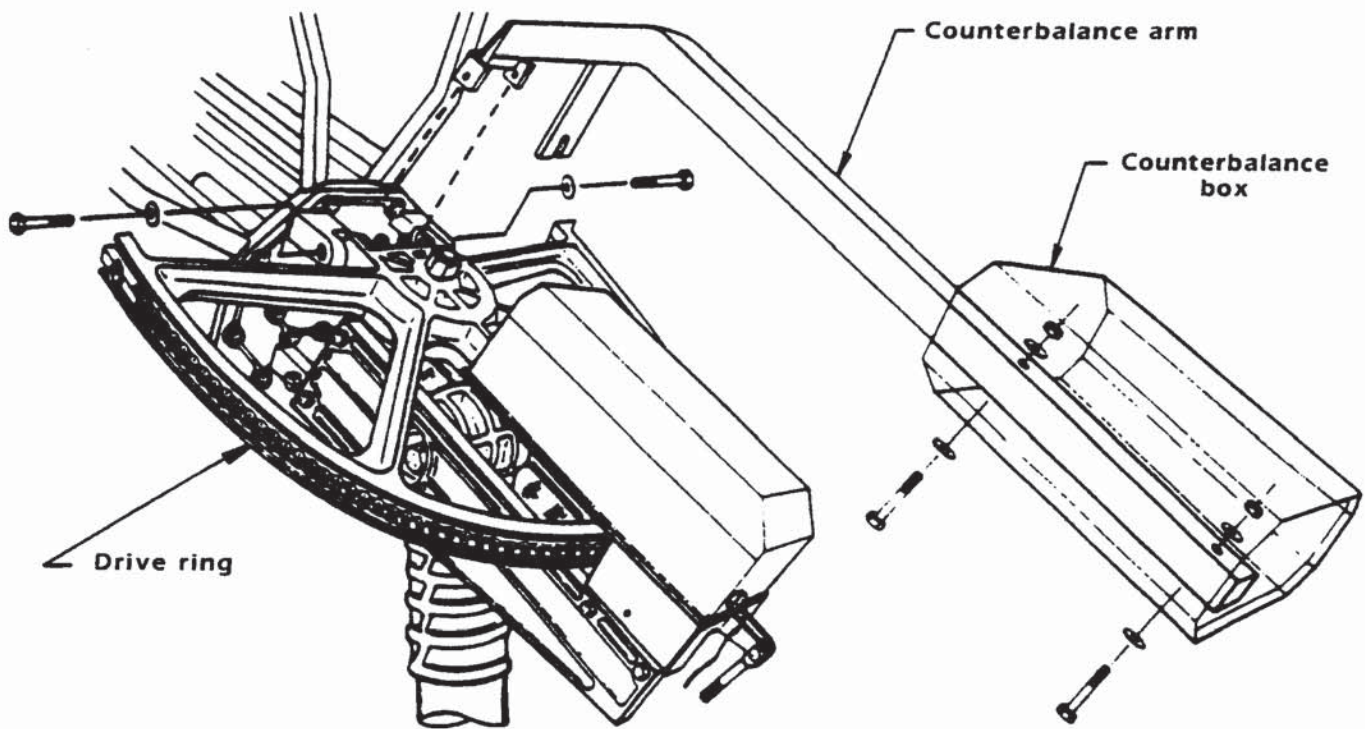
For most, the problem can be traced to a nylon shim that is in between (or used to be in between) the polar "L" assembly and the declination assembly as seen at right. It seems that after all these years, the shim has become quite worn and, in some cases, totally disintegrated. The answer? For those who like simple solutions, we still have those plastic shims. This can replace the worn-out shim and

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restore much of the integrity of the mount.

If you are one of those who really wants to solve the problem rather than just buy some time, we have a better solution. We offer an upgrade to our current polar "T" mount that replaces all of the parts between the square mount cap assembly that goes over the base pipe and the back hub plate of the reflector. This will restore the precision of antenna tracking and make the mount even stronger. The result? You will be able to brag about your Paraclipse antenna for many more years to come.





IMPROVING YOUR BELT DRIVE OR CHAIN DRIVE ANTENNA

Are you one of those who absolutely can't stand having equipment that doesn't work at it's best? If you are also one of the tens of thousands who purchased a Paraclipse 12' chain drive or belt drive antenna, this article is for you.

A counterbalance upgrade kit (shown above), which is standard on the 14.5' CD, is also available for your 12' belt or chain drive. What is the advantage? Without it, the weight of the reflector puts extra pressure on the mount. The stress then transfers to the gears in your gearbox. Also, when movement is started, the pressure on the mount must first be overcome before the reflector moves. Therefore, this upgrade will balance your reflector, give you smoother tracking across the

FOR THOSE WHO DON'T LIKE MATH

Occasionally, I receive calls from installers who ignore the F/D and focal distance that we provide for the antenna. They feel that the numbers are theoretical and therefore must be recalculated to obtain the best performance. Instead of sweating it out over a calculator, take our word for it! We have actually put up the antenna several times and found out which setting works the best on it. Unless you are one of those few for whom math is a hobby, save yourself the trouble and use our figures.

satellite arc, and reduce the wear on your gears.

Before you order one, there is a caution. Since your gearbox is now handling most of the movement, it also receives most of the buffeting from the wind. As a result, a counterbalance isn't recommended in high-wind areas because of the damage that the gearbox receives. This doesn't stop some people, though. I dealt with one individual on top of a windy mountain in California who insists on keeping his counterbalance even though his gearbox is worn out after just three years. Why? He loves the performance it gives him. He is probably one of those who can't stand not having equipment working at its best.

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 7 7-95

Compiled by:
Michael McGee,
Technical Support
Manager

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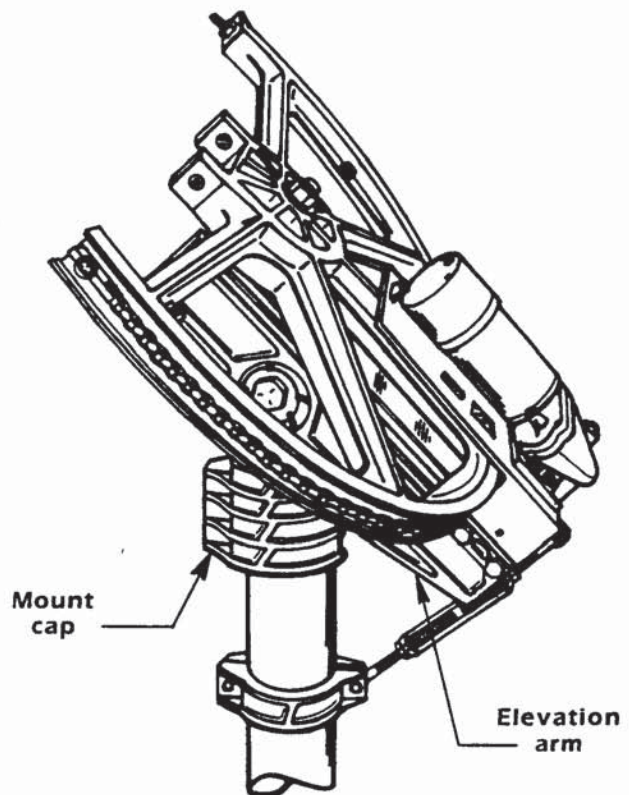
INCLINED ORBIT TRACKING AND OUR CLASSIC CD MOUNT

I've always found interesting the different uses people have found for our Paraclipse antennas. Various individuals have converted our antennas into solar collectors, sound projectors, and some uses that I have yet to figure out. For example, we don't sell these for birdbaths, but if that's what they want, we won't stop them.

If you want to track inclined orbit satellites, why not pick up one of our antennas that were designed and engineered for this purpose? These include our 16' Classic CD, our 12' Eclipse H-H, our 3.7m Patriot Polar, and our 3.1m Patriot H-H. Not that I'm trying to discourage creativity with our antennas, but why not try using this in areas that we don't claim expertise in, such as birdbaths?

With all of this, there is one conversion that Paraclipse definitely does not recommend. I've received a number of reports of different ones adapting our Classic CD (chain drive) antenna so that it can track inclined orbit satellites. There are several different ways that this is done, but basically they involve replacing the turnbuckle with an actuator and lubricating the contacts between the elevation arms and the mount cap.

Why have we tried to steer people away from this? Along with those reports of inclined orbit tracking conversions, Paraclipse also receives reports of problems. Elevation arms have snapped off. Since the elevation arms are no longer locked onto the mount cap so that it can move up and down, the mount integrity is lost, and the mount has difficulty staying on a satellite. Also, more stress is placed on the motor with the resultant counting errors because of lack of mount integrity. Therefore, I think it becomes fairly obvious why Paraclipse doesn't offer warranty on these modified antennas.



LOCKING YOUR NORTH-SOUTH ALIGNMENT

Some of those out in the field that install antennas go that extra step because it seems that they don't believe in taking any chances. After they have the antenna aligned to their satisfaction and they are absolutely certain that their north-south alignment is accurate, they lock the mount on the base pipe so that it will never move again.

While we do provide for north-south locking on our heaviest antennas and mounts, this isn't a necessary step if the antenna is installed correctly. It's not that we are saying it is wrong to do this, but some seem to go for overkill in this regard. Generally, what various ones have done in the field is drill a hole through the mount and base pipe and then tightly fit a bolt into place. What some others have done is predrill holes in the mount and use dog-point set screws to lock it onto the base pipe.

The frustrating part of all of this is when a customer has locked his mount's north-south alignment down about six to

eight times, and he still calls me to say that his antenna isn't holding its alignment. (I'm not exaggerating. People have told me that they have done this.) The next question I generally ask them is if they added rebar through the base pipe in the concrete. This prevents it from breaking free from its concrete base and rotating in heavy winds. Also, the concrete base can be moved by frost heaving if it isn't sufficiently below the front line. The point I'm trying to make is that locking the north-south alignment is not a cure-all.

Paraclipse hasn't forgotten those who just can't sleep unless they have locked the north-south alignment, though. We provide an optional azimuth alignment locking kit for the Classic 16' CD. Also, the horizon-to-horizon mount that is used on our Eclipse 12', Hydro 7.5', and Patriot 3.1m provides for alignment locking. So, if locking your north-south alignment is crucial to you, go ahead. That way you can concentrate on more important things, such as who won the game last night.

INSTALLATION TIP FOR OUR NEW ECLIPSE 8.5' VP ANTENNA

One thing that we at Paraclipse are always trying to do is finding ways of making things easier for the installer and end user. (That way we receive less technical support calls.) As a result, we were trying different methods of installation when we were fine-tuning our new 8.5' (2.6 m) Eclipse mesh antenna.

During this period, we found one method of mesh installation that cut the assembly time down. If this is interesting to you, please note the following steps:

- 1) Loosely attach the rings and ring connectors to the ribs while leaving approximately a $\frac{3}{8}$ " gap between the ribs and the rings.

- 2) Lay the mesh on top of the ribs with the small end right at the hub. Make sure that the mesh preform is curving in the right direction. The side facing the feed will be marked with a circular sticker. If someone has gone through the mesh and taken the stickers off, make him check each panel by holding its end and looking at it

sideways. The sticker should be on the inside of the curve.

- 3) Pull the mesh back towards the outer ring until both sides fall into place. Then, slide the mesh forward until its end butts up against the rib locator plate.

Hopefully, this tip will speed up your installation time and keep our relationship a happy one.

ANY QUESTIONS?

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TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 8 8-95

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ENGINEERED TO MAKE LIFE EASIER FOR YOU

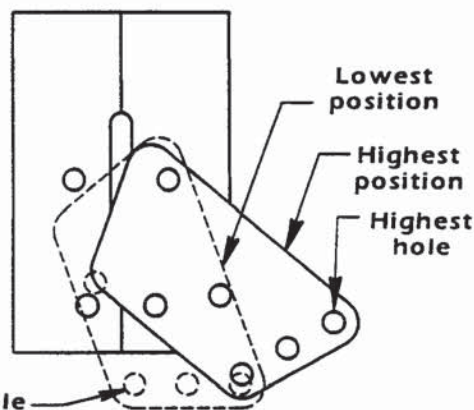
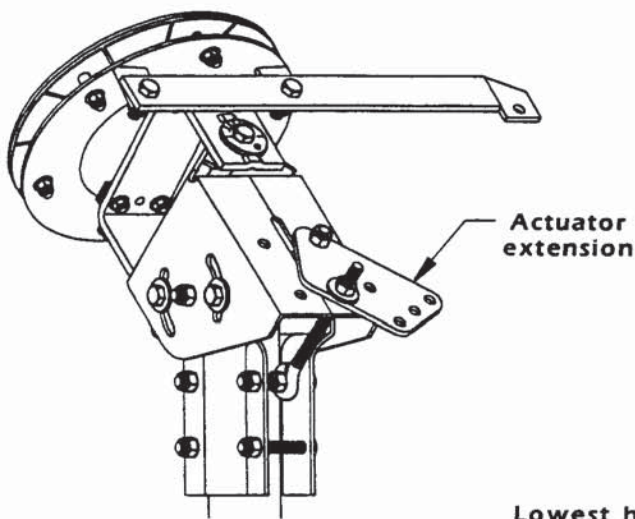
Many times when people call regarding our Eclipse and Hydro series antennas, they make a comment about how much they like our heavy-duty VP mount. Please keep the compliments coming! (We really enjoy the positive feedback.) While these callers appreciate the fact that the mount was engineered with them in mind, they may not be taking advantage of all of the features that the VP mount offers them.

Specifically, I am talking about the actuator extension. Some may just slap it onto the mount, attach the actuator, and call it good, but the savvy installers will find the actuator extension very useful. How?

The purpose of the actuator extension design is to allow the installer to customize the mount to the satellite arc that he wants to track. As noted in the figure below, the two different positions allow for six possible hole placements. This feature combined with a knowledge of the desired satellites will allow installers to get even more out of our VP mount.

How can this feature be used to advantage? First, attach your actuator to the lowest hole in the lowest position. Then, move the reflector a little below the satellite closest to the horizon that you wish to track. If your actuator is not fully retracted, attach it to the hole location that allows the actuator to be so. If none of the holes allow the actuator to be fully retracted, then you should be using the highest hole in the highest position. The result? Your mount will be

fine-tuned to your satellite arc thanks to this simple engineering feature.



PLEASE DON'T LET THEM BE CAUGHT IN THE MIDDLE!

To those of you who have ever been in a situation where you just can't win, perhaps you can muster up some sympathy for someone else in that situation. Who am I talking about? Those who work in Paraclipse's shipping and receiving department.

Picture the following scenario. One of Paraclipse's customers returns some item that they received. When the Paraclipse employee is given the package, he realizes that he now has a headache. Why? There is no return authorization number on the package. As a result, he is not supposed to receive the returned item.

Why would this put the employee in the middle? If the returned package is accepted, he then faces the wrath of the shipping supervisor because he accepted something without authorization which then possibly exposes the company to some problems. What if he refuses the package? Then the upset customer vents his anger on the shipping supervisor. I'm sure you can guess who hears about it next.

GO TO THE TROUBLE TO ALIGN IT RIGHT!

A frustrated voice reaches me in technical support. He is installing one of our large antennas (12' or 3.8m on up). The Ku signal is not as it should be even though more than one person tried to correct it. What is the problem?

95% of the time the problem is one of two things. Either the parabolic accuracy of the reflector is off or they didn't fine-tune the feed electronics while actually on a satellite. I covered checking and reworking the parabolic accuracy of the reflector in my 11-94 Technical Support Newsletter. What about fine-tuning while on a satellite?

Usually this problem comes up when someone is close to the equator, such as southern Florida or the Caribbean. The reflector is pointed very close to straight up. As a result, it is extremely difficult to reach in and adjust the feed electronics to maximize the signal. The technique that some develop is to adjust the feed to where they think it should be and swing the antenna up to the satellite. When that doesn't work, they swing the antenna down, adjust it and try again.

Therefore, the moment the employee sees a package without an authorization number on it he knows that he is in a no-win situation. How can we be sympathetic to these poor individuals? Just two simple steps will solve this problem.

First, if you ever need to return something, talk with Paraclipse and get a return authorization number. Next, put that authorization number on the OUTSIDE of the box. It doesn't do the Paraclipse employee any good if the number is inside the package. A very convenient spot to locate this number is in the address, something like this:

Paraclipse, Inc., RA #1269
2271 29th Avenue East
Columbus, NE 68601

That way there should be no reason for confusion.

The result? Those employees in Paraclipse's shipping and receiving department will be able to keep their stress down to a more manageable level. This goes a long ways toward making them more enjoyable to be around!

This is an increasingly frustrating procedure that rarely gets the signal peaked.

What should someone in low latitudes do? First, find a satellite low enough on the horizon and peak the signal while actually on it. If this is impractical, go to the trouble of setting up scaffolding so that you can reach in and adjust it. I think some people will be amazed at the results this produces. I just goes to show what happens when someone goes to the trouble to do it right.

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Manager

OUR PURPOSE

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GETTING PAST THE HYPE OVER ANTENNA SURFACE

Recently, some marketing claims within the mesh antenna industry have caused some to start barking up the wrong tree as it were. In their search for better antenna performance, a few have been swayed by marketing hype into thinking that mesh with smaller openings is the all-important criteria. Is it really, though?

According to Frank Baylin (a widely accepted authority in the satellite antenna field) in his book *Home Satellite TV Installation and Troubleshooting Manual*: "In general, if the holes are less than one tenth of the wavelength used...losses through the holes are negligible." In other words, hole reduction below a certain size is mathematically insignificant when it comes to increasing gain. What size hole would this be?

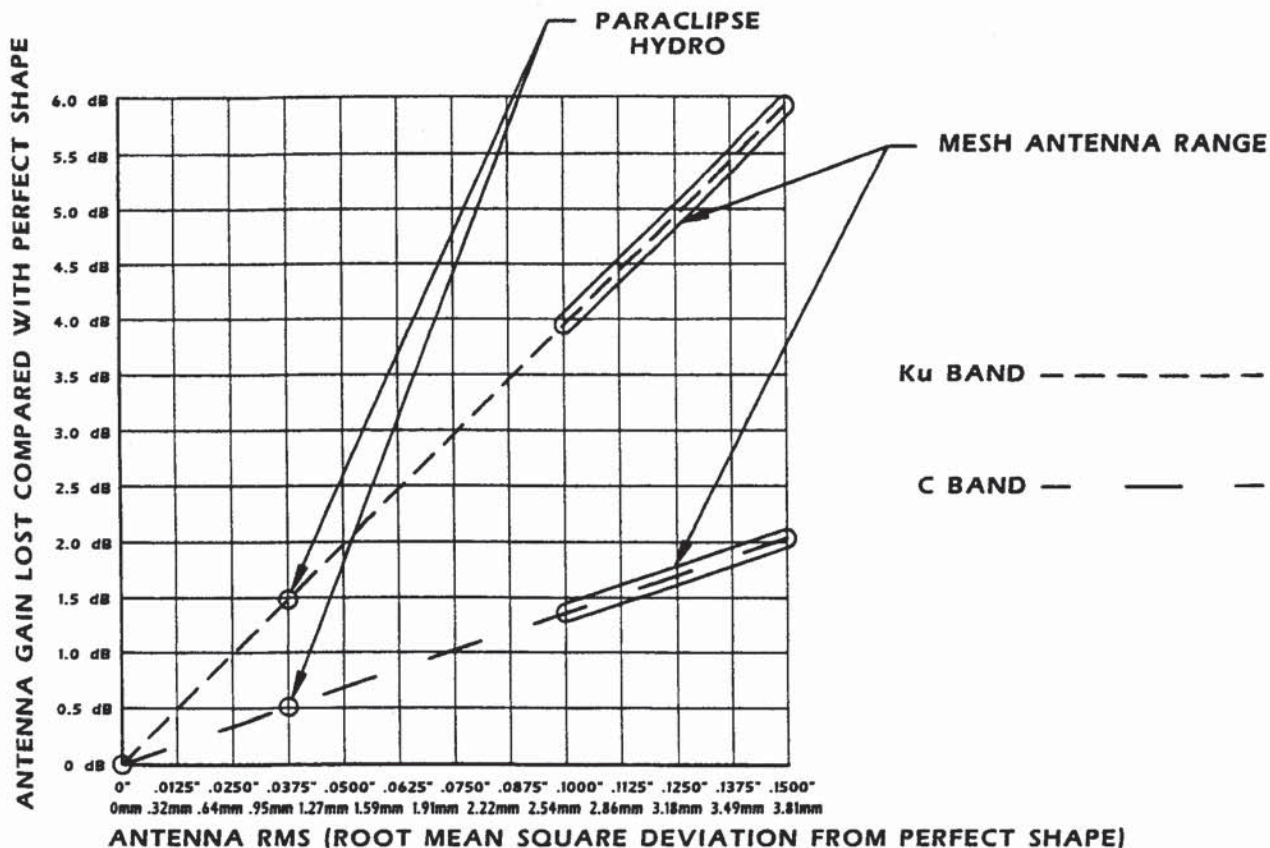
The C-band wavelength that is received by your antenna is from 3.7 GHz to 4.2 GHz with a width from approximately 3.2" (81mm) to 2.8" (71mm). The Ku-band wavelength is from 11.7 GHz to 12.2 GHz with a width of approximately 1.0" (25mm). So according to the rule of thumb noted above, a hole of about $\frac{1}{8}$ " (3mm) may mathematically be improved upon, but to you and I who hopefully live in the real world, there will be no practical difference. Remember also, the lower the wavelength the more that this $\frac{1}{8}$ " (3mm) hole becomes mathematically insignificant.

Where do Paraclipse's antennas fall in this regard? The mesh on our Eclipse mesh antenna has diamond-shaped holes that are $\frac{1}{8}$ " (3mm) long and $\frac{1}{16}$ " (1.5mm) wide. Our perforated Hydro reflector has $\frac{1}{8}$ " (3mm) perforations for water drainage and appearance. There is therefore no reason to worry about losing signal through these openings on your reflector surface.

Earlier I commented on how some were barking up the wrong tree. If so, where should we be focusing with regard to mesh surface and antenna performance? The prime thing is to have an accurate parabolic shape. In mesh antennas, this is accomplished by preforming the mesh to allow for this shape. Also, rings within the reflector are used to tie the mesh down to achieve the correct shape. As a result, mesh antennas can perform very satisfactorily. Regarding the advantages of our Hydro reflector in this regard, please see page 2 of this newsletter.

Does this mean that nothing is accomplished by going to smaller openings in the reflector? Well, this does increase resistance to the wind and make the reflector heavier. The problem is that I don't think these changes are the ones that you are looking for in an antenna. Isn't it interesting when you get past the hype?

HOW DOES OUR HYDRO OUTPERFORM LARGER MESH ANTENNAS?



To start with, let's discuss a theoretically perfect antenna (one that doesn't exist). There is absolutely no deviation from an accurate parabolic shape to reflect the signal anywhere else except where it should go, the feed-horn. The problem is that most of us live in the real world. Therefore, your antenna will have some deviation that will affect its performance.

What you need to look for, then, is how accurate your reflector is. This is noted by an antenna's RMS specification, or its average deviation from a perfect shape. Paraclipse's Hydro reflector is outstanding in this regard with an average deviation of 0.038" (0.96mm) RMS. What this means is that according to the chart above (I didn't want to bog you down with the formula), the Hydro only loses 0.5 dB when compared to a perfect reflector on C-band and 1.5 dB on Ku-band. What about mesh dishes and other sectional solid reflectors?

While some may claim low RMS figures, this only refers to when the

sections were stamped. This is not held in the field. Mesh antennas are doing good to get to 0.140" (3.56mm) RMS, although some like to think that they can achieve 0.100" (2.54mm) RMS. As can be seen from the above chart, this results in a significant loss.

So when someone claims a gain figure better than or equal to our Hydro for their mesh antenna, tell them you live in the real world.

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 2 Number 10 10-95

Compiled by:
Michael McGee,
Technical Support
Manager

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HAVE YOUR ELECTRONICS KEPT UP WITH YOUR ANTENNA?

As with anything else, the Paraclipse satellite antenna has been revised to meet the changing circumstances of the world around us. If it has anything to do with electronics, this change means downsizing. A case in point are the satellite antenna feed electronics. Prototypes have been sent out of a dual C-band and Ku-band feed that is about the size of a man's fist. You can probably picture how awkward this would seem in those large, old-style feed covers.

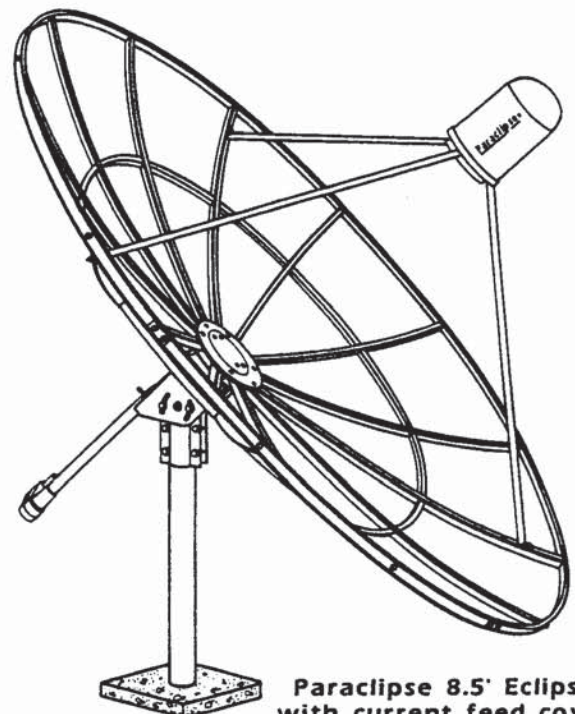
axial cable without kinking it. Also, avoid LNB setups that require a 90° elbow. Most current LNBs attach directly to the side of the feed.

What if this still doesn't help? We still have a good supply of old-style tan feed covers (part #579106). These may clash with your color scheme, but at least you can have your old feed configuration and cover it, too.

The situation that comes up for some is when they try to salvage their old feed configuration and fit it into the current Paraclipse feed cover. Unfortunately, the two do not mix in most cases. The LNB setup will likely be inconvenient by either sticking out on the side or by being too long.

The solution? Well, a person could upgrade to one of the more recent feed configurations, but this solution makes the pocketbooks of some hurt too much. Also, there are a few current setups out there that are likewise difficult to fit in. What then?

One thing that might help is to have some 90° F-connectors handy to attach your coaxial cable to the LNB. That way you don't have to worry about finding room to loop the co-



Paraclipse 8.5' Eclipse
with current feed cover

MATCHING AN ACTUATOR WITH YOUR PARACLIPSE ANTENNA

Fairly often, I receive questions about which actuator should be used. There seems to be a few misconceptions out there along with the many choices to pick from in the way of actuators. People want to make the right decisions so as to have quality throughout their satellite antenna system.

First of all, does bigger mean better? Not necessarily. For the Hydro (6' & 7.5') and the Eclipse (8.5', 10', and 12') series, all that is required is an 18" actuator. In fact, the 24" actuator is not recommended because the actuator runs into the VP mount used on these antennas. Besides this, the 24" actuator is not needed. Why? Because of Paraclipse's unique actuator extension (discussed more thoroughly in the 8-95 newsletter), an 18" actuator can pull in 120° of the Clarke belt satellite arc.

What about on Paraclipse's Classic line (12' & 14.5')? Either an 18" or a 24"

actuator can be used in this case supplying about 115° of the satellite arc. The advantage of the 24" over the 18" actuator is not in the amount of satellite arc tracked. The extra length mainly gives extra strength for when the actuator is extended.

How can you compare 18" and 24" actuators? While warranty, price, and reputation will no doubt play a part, check for these three things:

1) Look for an actuator rated for 36 volts. This will aid in compatibility with your receiver.

2) Look for a rating of 500 pounds of actuator thrust. In fact, this is an absolute minimum on the 14.5' Classic.

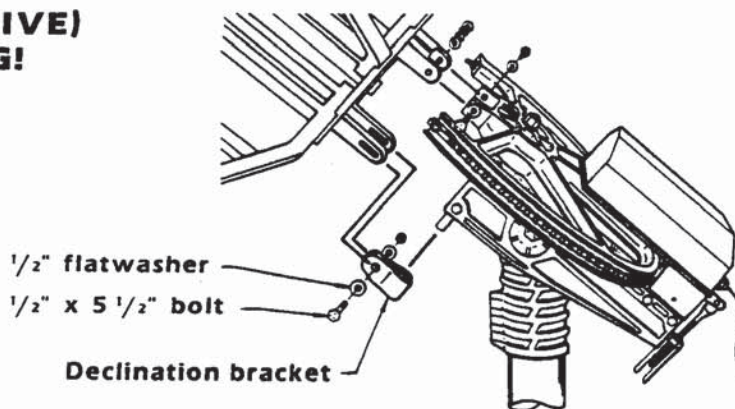
3) Additionally for the Classic antennas, look for an actuator rated for antennas with up to 250 lbs. reflector weight.

The result? Likely, you will have a quality actuator to go along with a quality antenna (Paraclipse, of course).

MY CLASSIC CD (CHAIN DRIVE) DECLINATION IS SLIPPING!

Occasionally, we get tips from those in the field. The following has been found helpful by some. A few have found it difficult to precisely hold their declination setting on their Classic CD (chain drive) antenna, with most of these being the 14.5' antenna. Whether it is due to weather conditions, invisible pranksters, or whatever, it is annoying.

While the 1/2" flatwashers, 1/2" nyloc nut, and 1/2" x 5 1/2" bolt should sufficiently tighten the declination down on the back hub plate and declination bracket, some have tried substituting star washers. They say that the star washers dig into the tab of the back hub plate and therefore hold it better than the current flatwashers. While I haven't tried this personally, it sounds like a reasonable idea. I'm always willing to listen to ideas for optimizing the Paraclipse antenna. It makes things easier for both you and me.



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DEALING WITH EXTREME WEATHER CONDITIONS

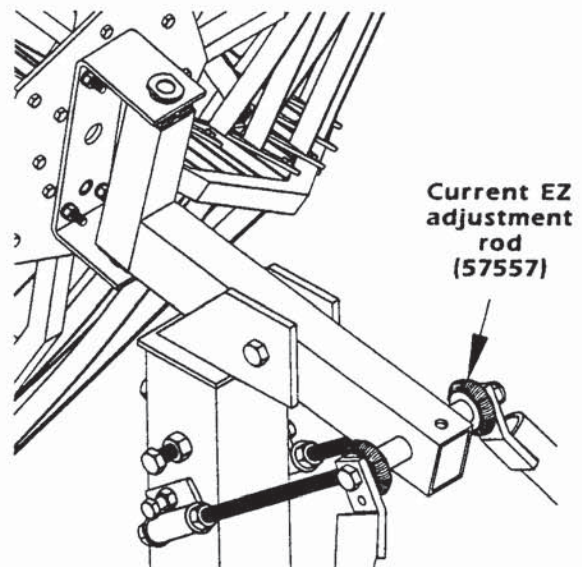
For years, Paraclipse has developed and maintained a reputation for strength and durability. Despite this, we can't rest on our laurels. Why? People have used our antennas, especially our Classic line, in just about every place conceivable (including some places that I thought were inconceivable). This naturally creates a wide variety of situations, some of which may not have been foreseen.

One thing that Paraclipse has run into is that some are pushing the elevation adjustment (done with the EZ adjustment rod) to the limits. This is seen in extreme latitudes such as in northern Alaska and even Antarctica. With the EZ adjustment rod fully extended, extra stress is put on this part of the mount. This is in addition to the extreme weather faced there.

Also, our antennas go into areas prone other kinds of extreme weather. Recently, I've received quite a few testimonials from the Caribbean area as to the durability of our Classic antennas after they were repeatedly clobbered by hurricanes. One homeowner said that his 14.5' (4.5m) Classic Islander was on the beach during a hurricane with 140 mph (225 kph) winds gusting to 170 mph (274 kph). The only damage he said he saw was that one of the EZ adjustment rods was cracked at its head. (What did you expect? It's a Paraclipse.)

Recently, we decided to strengthen the mount even further. An even stronger EZ adjustment rod with a reinforced head was developed (seen in the figure below). We also lengthened it so that those with extreme latitudes (greater than 62°) will have more to work with on their mount.

This new EZ adjustment rod (part #57557) is standard on our 12' (3.8m) PT and 14.5' (4.5m) Islander. It is also available for those who wish to reinforce their antenna even further. This along with the extreme weather bolt kit and stabilizer struts will reinforce your antenna for many years to come.



"I WANT THE BEST ANTENNA MONEY CAN BUY"

There are actually people out there that do serious homework before they buy something. This combined with some available money leads to questions that I occasionally receive regarding a prospective antenna purchase. They want the best in performance and durability. Somehow I'm viewed as someone who knows what he is doing and I'm asked what antenna I would buy if money were no object.

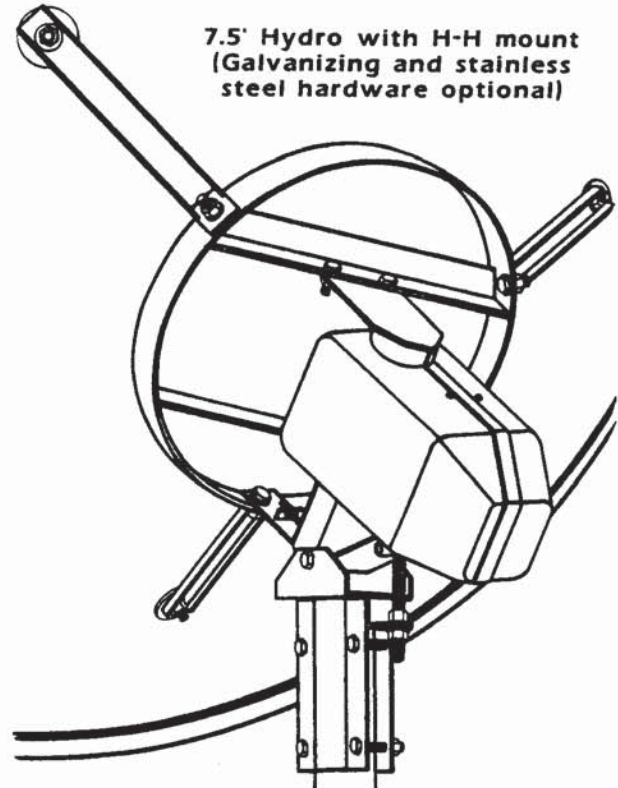
As for the best antenna that we offer, I would have to say it is the Classic 16' (4.8m) CD galvanized antenna. Why? It has the tracking capability of 180° to pull in everything that can possibly be pulled in. With its standard stainless steel hardware and galvanizing option, it will last. The problem is trying to fit a 16' (4.8m) antenna in your back yard.

What's next? I've had antenna enthusiasts tell me that the one they go for is our 7.5' (2.4m) Hydro with a horizon-to-horizon mount. This also tracks 180° of the arc with a strong motorized drive (shown at right). Also, it now comes with optional galvanizing and stainless steel hardware. Therefore, it will be durable too.

This along with its outstanding parabolic accuracy, due to its hydro-

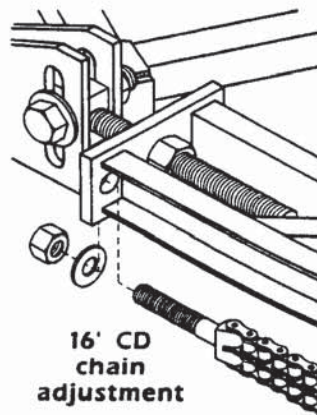
formed one piece construction, makes it the best antenna of its size available for C and Ku band reception. For what it's worth, that is my personal opinion, but I feel safe in assuming that it is Paraclipse's opinion, too.

7.5' Hydro with H-H mount
(Galvanizing and stainless
steel hardware optional)



IS YOUR CHAIN TENSIONED CORRECTLY?

On our chain driven antennas [Classic 16' (4.8m) CD, 14.5' (4.5m) CD, & 12' (3.8m) CD], there is one installation and maintenance procedure that seems to be commonly bypassed. The chain tension needs to be set to 7 ft/lbs (9.5 Nm). What happens if this is ignored? The chain is either too loose (which leads to sloppy tracking) or too tight (which can damage the antenna and also cause tracking problems). To solve the problem, take the time to locate a torque wrench with a 1/2"



deep socket (they do exist). With this, you can adjust the tensioning nut on the chain correctly [16' (4.8m) CD shown at right]. This is worth it because it can save time for both you and I.

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Volume 2 Number 12 12-95

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DOES YOUR MOUNT GIVE YOU THE STABILITY YOU NEED?

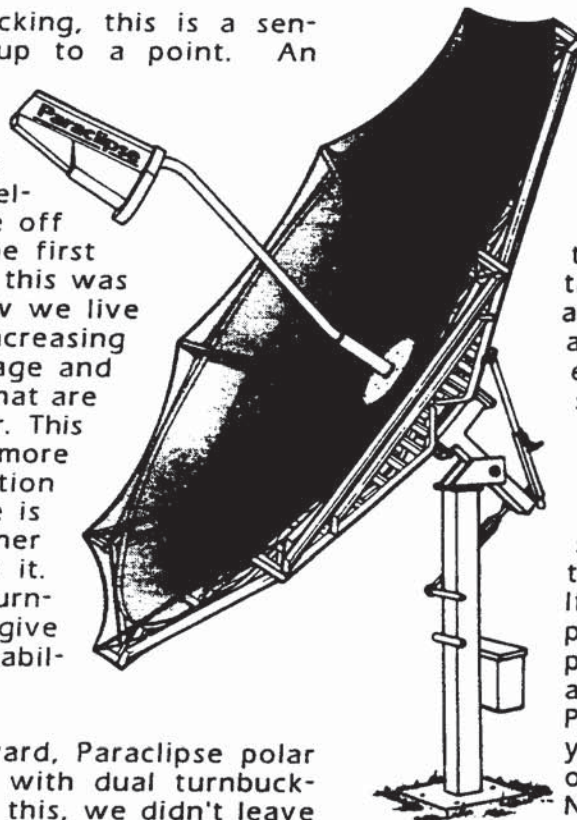
In a world where planned obsolescence seems to rule, there are still those who follow the philosophy of "If it isn't broke, don't fix it". (I couldn't help it. I had to correct the grammar.) They don't have to have the latest gadgets and upgrades, but instead, they take care of what they have.

In satellite tracking, this is a sensible philosophy up to a point. An example of this is the antenna shown at right. You will notice that it has only one elevation turnbuckle off to the side. In the first half of the 1980's, this was sufficient, but now we live in a world of increasing Ku-band signal usage and C-band satellites that are ever closer together. This can be a cause for more and more frustration when one satellite is desired and another signal bleeds into it. Why? The single turnbuckle just doesn't give you the mount stability you need.

From 1986 onward, Paraclipse polar mounts went out with dual turnbuckles. When we did this, we didn't leave

previous customers out in the cold. For those with the old Polar "L" mount antennas (manufactured from 1982 to 1984), we put out a Polar "T" mount upgrade kit (#653947) which is the same as our current mount. This will give their antenna the stability needed to properly track satellites. For more details, see our 6-95 Technical Support Newsletter.

What about those who have the Polar "T" mount antennas that were made in 1985? We have a simple kit, called a Dual Turnbuckle Upgrade Kit (#65392), that will give them what they need. All it involves are two turnbuckles, the appropriate hardware on each end, and the appropriate spacers to balance the mount. This simple modification should give you all the mount stability needed for many years to come and still allow you to be content with what you have. If contentedness is an important quality to you, I probably shouldn't tell you about our C-Ku upgrade for Paraclipse reflectors. (If you do want to know, see our 10-94 Technical Support Newsletter.)



HAVE YOUR CHECKED YOUR ANTENNA LIMITS?

Perhaps you have experienced the frustration that some of my callers have related to me. The antenna will only move in short (about a second or so) bursts. The motor seems to be fine and it doesn't make any unusual noises. What it acts like is that the antenna is at its east or west limits, but the antenna is pointed due south.

When they come to the realization that this seems to be the cause, they try resetting their receiver limits, but this doesn't make any difference. Before you start beating on your receiver, consider another possible cause. Almost all of our motorized horizon-to-horizon antennas have backup limits built in just in case your receiver limits fail. That way your antenna won't be trying to pick up a signal from the earth's core.

These limits come in several different shapes and sizes. On our Classic 16' CD, it comes in the form of magnets on the azimuth ring and a limit switch sensor on the Polar T assembly. Most of our Classic 12' CD and 14.5' CD antennas are similar except that the

limit switch (which looks like a diode board) is on the motor mount. The oldest Classic 12' CD antennas went out without these. If that is the case with you, I very much recommend the CD Limit Switch Kit (#65475) so that your antenna won't be damaged if your receiver limits fail. Starting in 1996, the limits for 12' CD and 14.5' CD antennas will be in the actuator motor head. Also, our 7.5' Hydro H-H antenna has limit switches inside its cover.

How can these be checked? While keeping an eye on the reflector so that it doesn't run into anything, bypass the limit switch wiring and see if it moves normally again. If it does, it is simply a case of getting another limit switch sensor from us at Paracclipse.

Why did the limit switch sensor fail? It's hard to say. It could be anything from voltage surges to the local neighborhood prankster. Regardless of the cause, the good side is that this is a relatively simple problem to diagnose and fix. The main thing that you have to do is to be aware of the existence of backup limits.

DO YOU NEED INFORMATION ON OUR ANTENNAS?

If you like making an informed decision, you need information to properly make that decision. When it comes to satellite reception, that is why we are here. Basically, the needed information falls into three areas: 1) Pricing, 2) Technical specifications, and 3) How to assemble or fix it. Regarding pricing, complete antennas are only sold through distributors and therefore the pricing for these would have to come from them. All other pricing can be obtained from our sales department. The technical support department should be able to handle everything else.

Here are some tips for locating the needed information. 1) Look in your installation manual that came with your antenna. 2) If it is antenna descriptions or prices that you need, call your local distributor. Distributors can find this information in the handbook provided to them by Paracclipse. If another one is required, they can request one from their account representative here at Paracclipse. The result? Now you can make good decisions.

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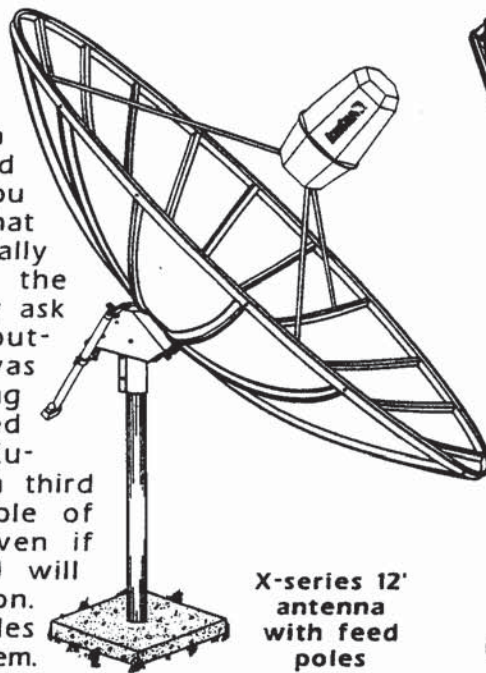
AN INEXPENSIVE WAY TO GET MORE Ku-BAND SIGNAL

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.)

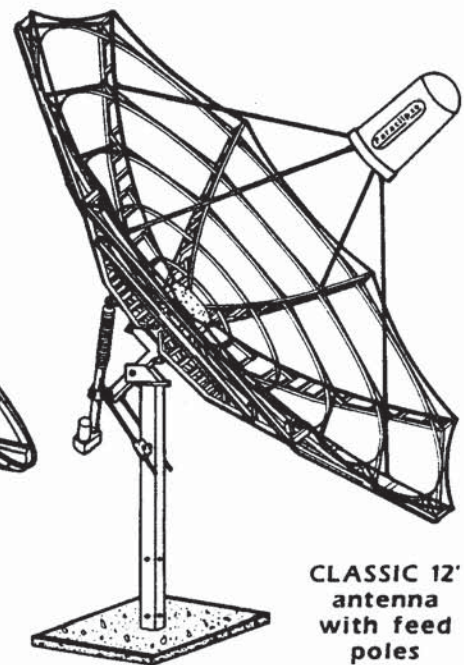
Another feature of this upgrade that will improve your Ku-band reception is Paracclipse's specially designed feed plate. With the three thumb screws built into it, you can precisely align your feedhorn so that it will point accurately at the reflector's center.

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.

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?



X-series 12'
antenna
with feed
poles



CLASSIC 12'
antenna
with feed
poles

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 simply a lack of knowledge of what we make. If you have a Paraclipse 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	Polar T to Chain Drive Kit	Upgrades CLASSIC 12' & 14.5' Polar T mount to a chain drive mount
350507	CD Counterbalance Kit	Adds counterbalance to CLASSIC 12' CD & older 14.5' CD
35060	Boston to Sipco Gearbox Kit	Upgrades older CLASSIC 16' CD gearbox to current Sipco gearbox
62177 (12' PT), 65565 (12' CD), 65578 (14.5' PT), 65579 (14.5' CD)	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 & chain drive
65358	CD Motor/Gearbox Retrofit Kit	Upgrades older CLASSIC 12' & 14.5' CD antennas to current Sipco gearbox and Venture motor
65380 (9' & 10'), 65381 (12' & 14.5'), 653826 (16')	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'), 65384 (12'), 65386 (14.5')	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 and X-series antennas (inquire if interested)
65392	Dual Turnbuckle Retrofit Kit	Upgrades older CLASSIC PT from one to two turnbuckles for stability required for Ku-band reception
653947	Polar L to Polar T Retrofit Kit	Upgrades older CLASSIC Polar L mount to current Polar T mount
65405	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	Chain drive Retrofit Kit	Upgrades CLASSIC 12' & 14.5' Cog belt antennas to current chain drive
658267 & 658287	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' HHH 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 with 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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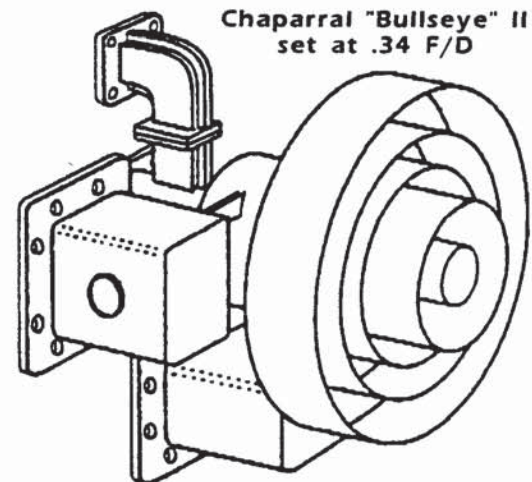
USING CHAPARRAL'S "BULLSEYE" FEEDS

In today's world, a common desire is to try to get it all in one package. When one looks at satellite antenna feed systems, this desire many times points them to one of the feeds in Chaparral's "Bullseye" line. These feeds pull in both C-band and Ku-band signals in both polarities (horizontal and vertical) at the same time. While this sounds good, please remember that accomplishing this created some design limitations. (That's life.)

First of all, the F/D settings (the settings that match the feed to the shape of the dish) are very limited. The scalar ring will only move about $\frac{5}{16}$ " or 8 mm in or out. Basically, there are two settings; .42 F/D with the throat of the feed flush with the scalar ring and .34 with the throat of the feed all the way out. Chaparral's instructions say that it will work from .32 to .45 F/D, but their technicians tell me that it works best for from .36 to .40 F/D.

With all the different F/D reflectors we make, how do you choose between .34 and .42 F/D? Those with settings outside that range have an obvious choice. If you are somewhere in between these two settings, there are two considerations, terrestrial interference (TI) and signal strength. The .42 setting will avoid TI, but it will also underilluminate the reflector (reduce the actual reflective surface). The .34 setting will give you more signal, but if TI is a problem, you will also get more noise in your signal. Therefore, you may have to try both settings to see which is best.

More important than the F/D setting is the focal distance. The problem is that Paraclipse antennas are designed around the most common feeds. So if you use the .42 setting for our Classic 12' (3.8 m) antennas, this will move the throat of the "Bullseye" feed $\frac{7}{16}$ " or 11 mm further out from the focal point. To remedy this, a modification is required. This is accomplished by means of spacers or moving the feed poles on the ribs. (The changes for the Classic 12' [3.8 m] are detailed in the 1-95 newsletter.) For Paraclipse antennas other than the Classic 12' (3.8 m), give me a call if you can't figure out how to do it. We here at Paraclipse have been known to figure things out.



I AM MISSING SOME OF MY HARDWARE!

Quite a number of our customers are very detail-conscious. While that is commendable, it can cause some to jump to conclusions (not a very desirable place to be). What happens is that to avoid problems during installation, they take inventory of the antenna. Upon noticing a hardware list in the back of the manual, they open up all the pre-bagged hardware and start counting. Then, the perplexed and even upset calls start coming. Why?

It is because the hardware list in the back of the manual includes *ALL* of the hardware needed for the antenna. The discrepancy exists because they don't take into account the hard-

ware in the preassembled parts of the antenna. As an example, the Eclipse 12' (3.8 m) requires 251 pieces of hardware. Of these, 41 pieces have already been preassembled in the VP mount and the hub support ring assembly. If this isn't taken into account, it would seem that 16% of the hardware is missing when it really is not.

So by all means, take the time to inventory your antenna, but please don't be quick to assume that we put out a faulty product. We here at Paraclipse take pride in our work. This includes making sure that sufficient hardware goes with each antenna.

CONVERTING POLAR MOUNTS TO AZ-EL MOUNTS

Most of our customers are always looking for ways to keep the price down. (Some do get a little carried away, though. One installer in the Caribbean only used an 18" (45 cm) x 18" x 18" foundation for our Classic 14.5' (4.5 m) antennas. They pulled right out of the ground in high winds.) The large majority of our customers are sensible, though. Therefore, on antennas focused on only one satellite, they inquire about our fixed mounts.

While it is true that fixed or AZ-EL mounts do have less parts, the cost savings generally come only if you are dealing with large quantities of antennas. As a result, those needing only one antenna this way usually end up getting one with a polar mount.

The next idea that comes up is to get rid of the actuator and replace it with a fixed bar. That's a good idea, right? Most of the time it is, but consider the possibilities. For one thing, satellites or satellite programming do change locations. This would require a new bar or retooling the old one. Also, what if a machine shop is not handy? One caller was trying to set up an antenna in Turkmenistan, one of the former Soviet republics deep in the middle of Asia. He didn't want to guess wrong and then have to send someone there to rework it.

What is the next option? Some have acquired hand-cranked actuators. That way they at least save money on the actuator motor head. The problem with this solution is that I don't know of anyone who still makes these things. You could have someone put one together, but that might cost more than simply buying a motorized actuator in the first place.

Where does that leave us? Many times it is just simpler to move the antenna to the necessary location with a motorized actuator and then leave it there. It might seem to cost more, but when you consider all of the possibilities, it really may not.

ANY QUESTIONS?

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Paraclipse

TECHNICAL SUPPORT NEWSLETTER
Volume 3 Number 3 3-96

Compiled by:
Michael McGee,
Technical Support
Manager

OUR PURPOSE

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"I WANT MORE OUT OF MY ANTENNA"

Probably one of the most common calls I receive are from those who are trying to tweak the absolute most out of their antenna motor drive on their Classic CD antennas. When you consider that they have bought the high-end version of home satellite antennas, it is easy to see why they want the best out of it. The problem was that there was only so much you could do to peak the tracking accuracy and durability.

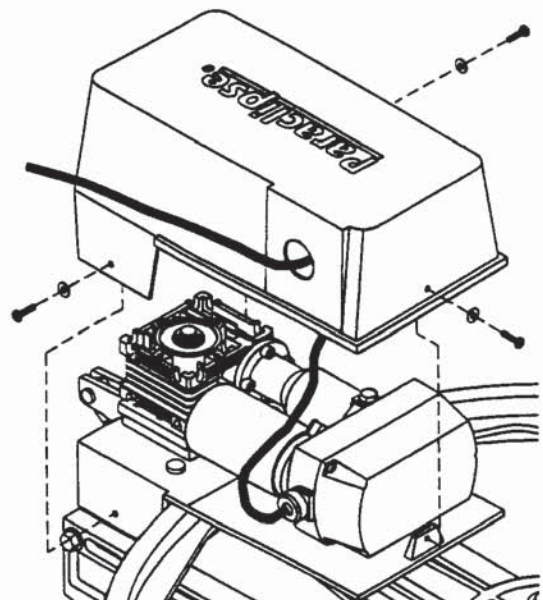
As a result, we looked into improving the motor drive while trying to keep the cost about the same. Also, when you consider what customers expect out of this, it had to be tough and durable (or else!). We finally decided that to accomplish this, a total redesign of the motor and gearbox system was required.

The result? A completely new motor and gearbox system is now standard on all new Classic 12' (3.8 m) and 14.5' (4.5 m) CD antennas. It also is designed to be retrofitted to practically all Classic CD antennas in the field, including 9' (2.8 m) and 10' (3.0 m) CD antennas. It basically consists of a new motor (a heavy duty actuator motor head), a new gearbox, a new motor cover, and the necessary adapters, all in place of the old combined motor/gearbox.

To make sure that we had improved the system, we put it through some rigorous testing. Basically, we tried to imitate the roughest, most demanding customer. We intentionally put more stress on the motor

and gearbox by damaging the mount and simulating many years of use. Despite all of that, the new motor and gearbox not only started off stronger and more accurate, but it maintained that increased accuracy with practically no gear slop!

In conclusion, if it is worth it to you to get more toughness and accuracy in your antenna motor drive, this is the way to go. I definitely feel you will be pleased with it.



USING ADL FEEDS WITH PARACLIPSE ANTENNAS

Recently, I've had some discussion with various ones from Australia and New Zealand about the appropriate feed to use with our antennas. It seems that many down there as well as other places seem to favor the ADL feeds.

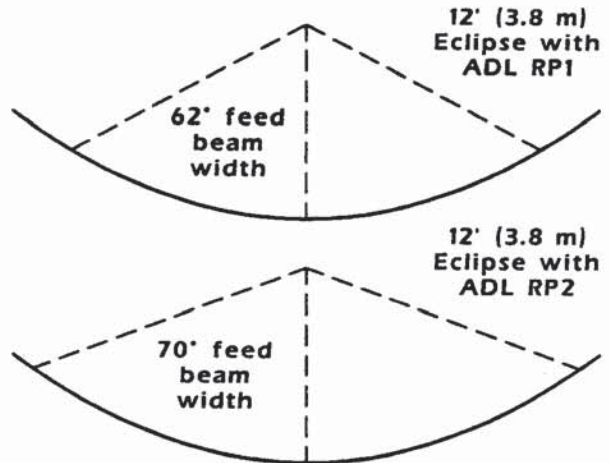
One thing that will probably simplify things is noting the difference between optimum performance and what will work. The difference might be illustrated with driving in a nail. A rock will drive in the nail (it might be a bruising experience though), but a hammer is best for the job.

A case in point is using ADL feeds on our Eclipse 12' (3.8 m) antenna. ADL's RP1 line of feeds have a specified F/D ratio range of .335 to .425. The Eclipse F/D ratio is .333. That should be close enough, right? Not really. The RP2 version (range of .335 to .275) is a better choice. Why?

The RP1 line of feeds works best from .40 to .375. The difference is the

feed beam width or angle of illumination of the reflector. As the illustration to the right shows, the 62° beam width of the RP1 loses part of the reflector while the 70° beam width of the RP2 catches almost all of it.

The moral of the story? Don't bruise yourself because you think that you don't have a big enough antenna. Maybe you just don't have the right feed.



"I JUST BOUGHT A USED PARACLIPSE"

People love it when they get a bargain. My wife just walks on air when she gets "a steal". Unfortunately, not every bargain is what it appears to be. This includes sales of "Paracclipse" antennas.

The quality of Paracclipse antenna being what they are causes some to snap up used ones when they are available, even ones as much as 15 years old. The problem comes when they call me with some questions. They try to describe something on the antenna and it just does not make sense. Then, I start asking if they have this or that and it becomes obvious that they have been victimized by counterfeiting.

The source of the problem is that back in the 1980's, Paracclipse was imitated by several companies, and some unscrupulous individuals passed these off as the real thing. Of course, these companies didn't last long, and when the customer wanted replacement parts,

they had gone out of business. A few are still making the same claim now.

Unfortunately, there is not much you can do with fixing up the fakes, but one can be cautious when buying used antennas in the first place. Don't take their claim for granted. If in doubt, call us up. We will be glad to let you know what it is.

ANY QUESTIONS?

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 3 Number 4 4-96

Compiled by:
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SO-CALLED "PARACLIPSE" DIAMETER EXTENDERS

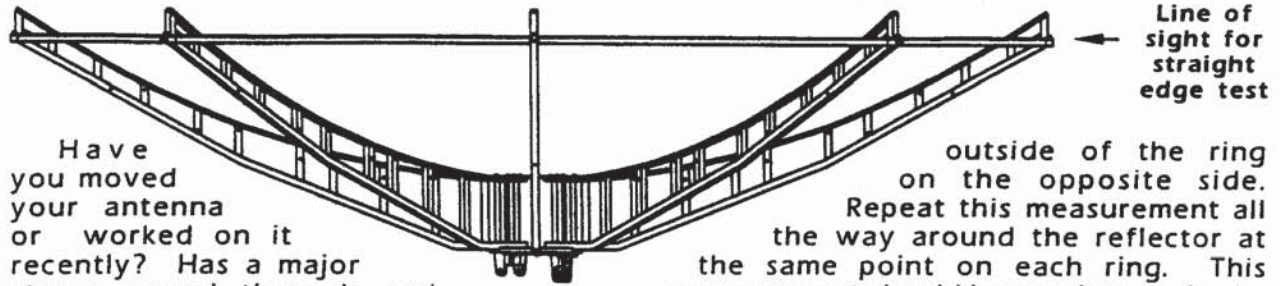
It seems that people are always trying to get more and more out of what they have. There comes a point, though, when investing in a new system is the only thing that will give any more noticeable improvement, but this is not what salesmen of "after-market" products (products that upgrade your current antenna) want you to believe. There are products that will improve existing antennas, and as a result, Paraclipse makes a number of retrofit and upgrade kits. (See my 1-96 Technical Support Newsletter.) On the other hand, it is not to our advantage to offer a product that does not improve and can even damage the antenna. Any short-term gain in sales would be more than offset by long-term damage to our reputation. As a result, Paraclipse does not make or recommend diameter extenders or extender panels on our antennas.

Diameter extenders have been offered by some to increase the diameter and therefore the gain of our *Classic* series antennas. While in times past reports on these products have been passed along me (none of them positive), we have recently received a surge of calls from customers running into serious problems with these. What is particularly disturbing about this recent trend is that these diameter extenders have been passed off as genuine "Paraclipse" products. This has led to customers calling us to find out why their diameter extenders are not performing as a Paraclipse product should.

Why don't we recommend diameter extenders? 1) Paraclipse antennas have mounts that are engineered to match the stresses that are put on the reflector. Adding additional diameter to the reflector adds to the strain on the mount. This has caused and will continue to cause structural damage to the mount and will compromise its integrity as to tracking accuracy and locking onto a satellite. 2) Customers are having great difficulties positioning their feed electronics in the proper location. Since the diameter and depth of the reflector is changed by diameter extenders, the customer has to recalculate the focal distance and F/D ratio. Also, Paraclipse maintains a high accuracy in the parabolic curve. The difficulties customers are reporting appears to indicate that the parabolic accuracy of these diameter extenders is highly questionable. As a result, it should be easy to see why using diameter extenders immediately voids any warranty the customer may have from Paraclipse.

If a customer wants to increase and improve his signal, there are a number of things that can be done to optimize the reflector and feed electronics that will not cause problems. Feel free to contact me as shown on page 2 for some suggestions. Also, I have a package of Technical Support Newsletters available. Why do we go to this trouble? We here at Paraclipse want to maintain that high reputation we have earned with people around the globe.

HOW TO TELL IF YOUR REFLECTOR IS STILL GOOD

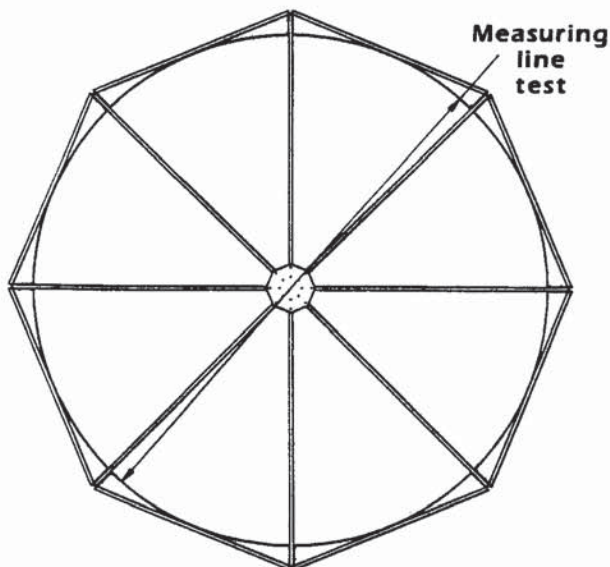


Have you moved your antenna or worked on it recently? Has a major storm passed through and damaged your antenna? Have you noticed that your picture quality is not as good as it used to be? If you answered yes to any of these questions, you need to do a basic bit of maintenance—checking your reflector's parabolic accuracy. Before you shy away because it sounds too complicated, this actually can be checked quite easily by three simple tests. Of course, if you don't believe in maintenance and prefer to buy new things all the time, this wouldn't be for you.

The first and easiest test is shown above. Look at your Paraclipse antenna from the side, close one eye, and check if your reflector looks flat. If you notice any deviation along this edge, you can be sure your reflector doesn't have an accurate parabolic shape. If you have one of Paraclipse's *Classic* series, don't forget that there is more than one set of rings. Each of these needs to be checked. The second test is shown below. With an accurate measuring tape, measure from the outside of the ring across the reflector to the

outside of the ring on the opposite side. Repeat this measurement all the way around the reflector at the same point on each ring. This measurement should be consistent. Again, don't forget that the *Classic* series has more than one set of rings. The third and most accurate test can be done with a ball of string and masking tape. Find at least four identical spots on the reflector and run the string across to the opposite side. Where the strings cross each other should be a perfect intersection without horizontal or vertical gaps or tension.

A variation in the second or third test of $\pm 3/16$ " (4.8 mm) is enough to seriously compromise your picture quality. If any of these tests indicate poor parabolic accuracy, loosen the ring and rib bolts (and if necessary the hub bolts) and make the necessary adjustments and retighten. On the *Eclipse* series, make sure that the ribs are firmly butted into the hub. The *Classic* and *Eclipse* series mesh antennas can be readjusted this way if they haven't been too badly damaged. These tests can be used to make your reflector give you the absolute maximum signal. Some even strive for accuracy down to a few hundredths of an inch. The result? You will have your antenna performing as good as before (if not better). Maintenance doesn't have to be difficult to benefit.



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Volume 3 Number 5 5-96

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A STORM IS ON ITS WAY!

One time I received a call from a Puerto Rico that carried a great sense of urgency. He said that a major hurricane was on its way, and he didn't want to lose his satellite antenna. While I did my best to help him out, this really is something that should be planned for well in advance.

Whether a hurricane, a major storm, or a long unattended period of time is anticipated, a plan of action laid out beforehand could save a lot of grief. People have tried a number of things over the years, some helpful and some useful only for a good laugh (this is assuming that the person has a good sense of humor). One homeowner disconnected all his wiring and loosened his hardware holding the mount to the base pipe so that the antenna would just spin in the wind. This is NOT recommended. What can be done?

First, get the antenna facing a horizon so that its actuator is fully retracted. This will put the actuator is at its strongest position. If possible, it is also helpful to have the antenna sideways to, not facing, the wind. Unfortunately, the wind direction is not always known in advance. What if more is necessary? This is where advance preparation is necessary. One individual had access to an airplane hanger. He set up another base pipe inside the building so that he could move the antenna there in an emergency. For most, things are not usually this convenient.

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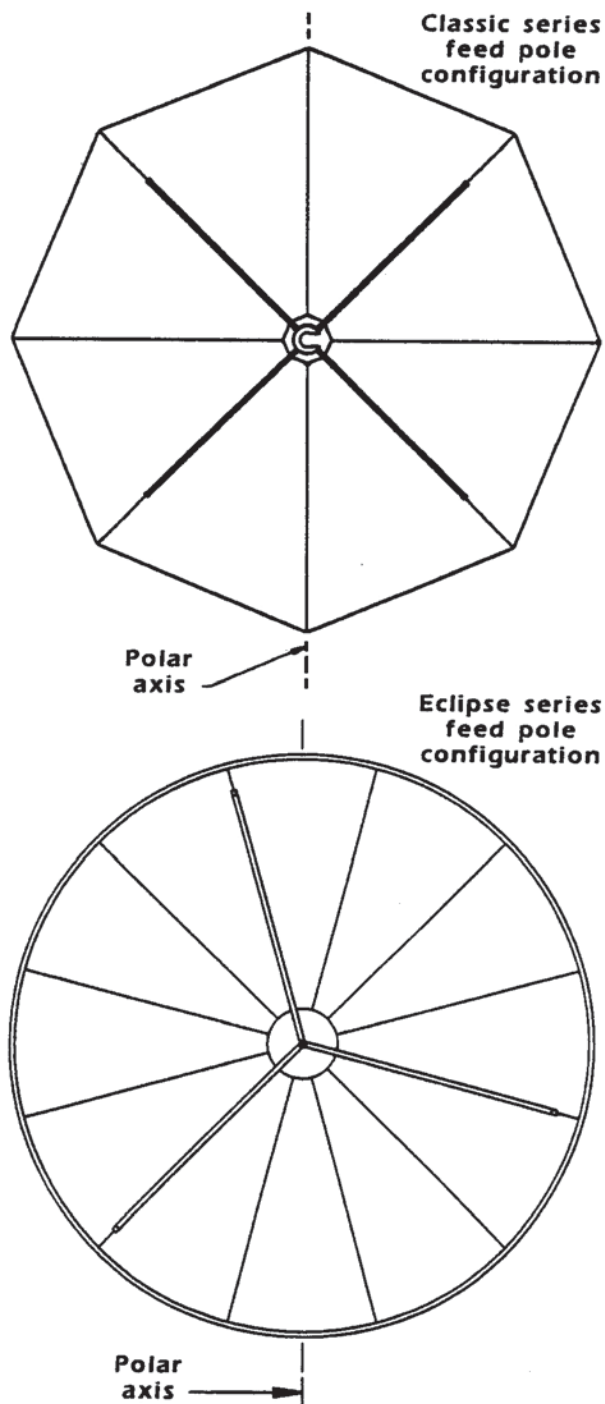
Others have put in eyebolts into their foundation to tie down the antenna, but caution is required here. You don't want to tie the antenna down in such a way that its parabolic accuracy becomes warped. Remember, the strongest point of attachment is always at its actuator attachment. In addition to this, some have also used the end of the support arms on our Hydro series and the ends of the ribs on our Classic series.

Of course, the most sensible thing to do is the strengthen the antenna itself. This can be as simple as using more J-clips to hold the mesh in on our Classic series or using our mesh locking procedure on our Eclipse series. Also, Paraclipse has kits that are designed to strengthen various parts of the antenna. Examples of these are discussed in a number of my Technical Support Newsletters (11-95, 3-95, & 1-95). Feel free to contact me for some suggestions that would be tailored to your specific circumstances.

Even with all the foregoing suggestions, nothing replaces basic common sense. There are myriads of situations out there in the real world, and what works for one may not work for another. Forethought and advance preparation are always better than racing around at the last minute trying to not lose your antenna. The consolation prize? At least there is now an excuse to buy a brand-new antenna.

CROSS-POLARIZATION PROBLEMS

Have you ever tried to set up your feed and found that a signal from the opposite polarity was bleeding in? A couple of recent callers described this, but they couldn't understand how it was possible. You don't have to question your sanity. It is possible. There are a couple of situations that could cause this and both of them can be corrected.



First of all, the antenna's parabolic accuracy could be off. To get more in a signal, opposite polarities are sent at the same frequency. This usually doesn't cause any problems, but you and I live in the real world. It is a problem when the reflector becomes warped and signals are reflected improperly. (Some antenna specifications call out cross-polarization isolation to give an assurance that you won't have this problem.) The solution basically involves reworking your reflector. As to how to do this, read the "Checking Your Reflector" page in your manual or my 4-96 Technical Support Newsletter.

The second possible problem is that the feed offset angle in relation to the polar axis (as in the north and south pole) could be wrong. The feed electronics instructions should give this angle to you. If these instructions are not available, it then becomes a matter of trial and error. If your feed pole configuration (typical ones shown at left) doesn't allow for the correct feed offset angle, rework your reflector so that your feed poles are in the correct location. Of course, if your reflector is already assembled, this may not be an appealing solution. A shortcut that some have tried is drilling holes for the feed poles in the correct ribs and just moving the feed poles.

If you find yourself fighting this problem, please remember that you are not alone. Others have questioned their sanity because of this, too.

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Volume 3 Number 6 6-96

Compiled by:
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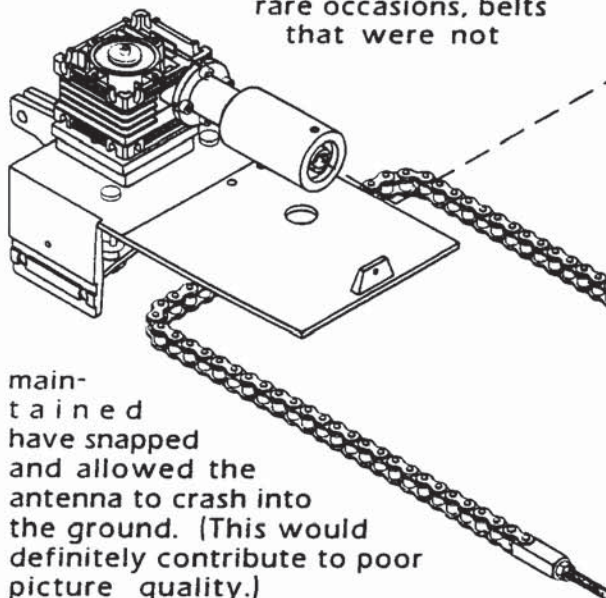
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THE COG BELT DRIVE VERSUS THE CHAIN DRIVE

One reputation that Paraclipse 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.

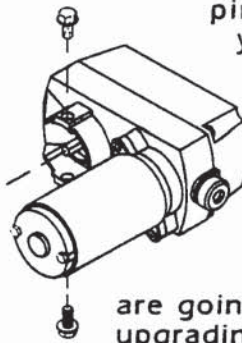
At first, we used a cog belt to drive the antenna. Its durability was based on the premise that the customer would maintain the belt with a special lubricant and would replace the belt about every three years. Unfortunately, people's view of what was necessary maintenance differed. As the years go by, 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.)

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Therefore, Paraclipse 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 many years to come.

I HAVE A QUESTION

If you contact me requesting technical support, the following points may be helpful. Please be patient while I get your name, location, and telephone number. Since the majority of my calls are repeat calls, this allows me to build on what was discussed before. Forgive me if I don't remember you when I first hear your voice, for I have received thousands of calls over the years. Also, please remember that Paraclipse has sold dozens of different antennas over the years. That is why I ask for the exact antenna under discussion. Just telling me it is a 12' Paraclipse doesn't help much. In addition, some may find it more convenient to use our newly installed E-mail address shown below. If you are patient, who knows? I might even come up with something for you.



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 slightly 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.

ANY QUESTIONS?

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Paraclipse

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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.

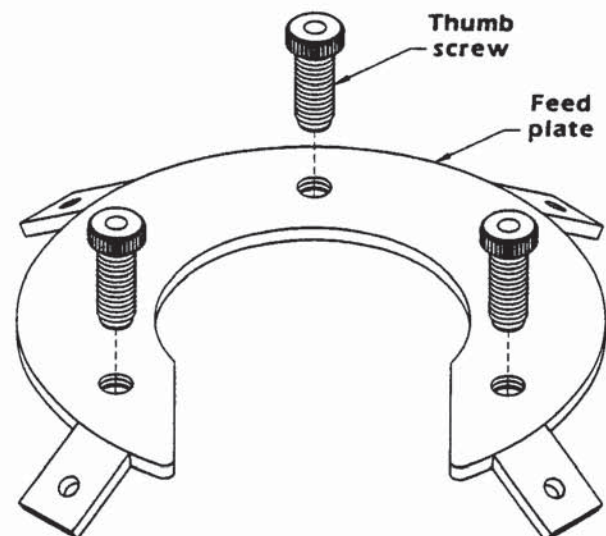
Probably the biggest thing I run across is that people don't use the features available to them. In our Classic series and our Eclipse series 10' (3.0 m) and larger, this is Paraclipse's feed plate and thumb screws. Our feed plate does more than just hold the feed. The position of the feed can be adjusted. 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.)

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.

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 to 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 "Paraclypse" 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.

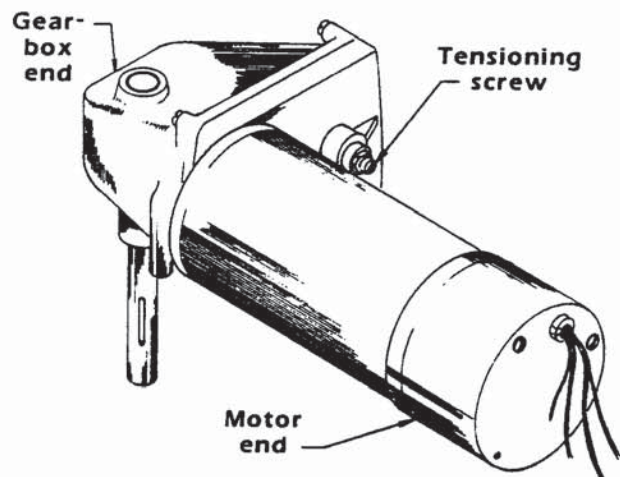
Another helpful reminder is that the tensioning screw is not for adjustment. Its purpose is to keep the worm gear in place. If it is too tight or loose, it will interfere with gearbox operation. If you want to make sure it is set right, loosen the nut holding it in place. Turn the screw until you first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



ANY QUESTIONS?

If there is still something that is puzzling you about our Paraclypse antennas and you just have to know, feel free to contact me. I'm even available by telephone, FAX, mail, and e-mail.

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Paraclipse

TECHNICAL SUPPORT NEWSLETTER
Volume 3 Number 8 8-96

Compiled by:
Michael McGee,
Technical Support
Manager

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."

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 satellite 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 $1/4^\circ$, 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 $1/8^\circ$. 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

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your declination on the chart below. 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°
22°	3.26°	58°	7.30°
24°	3.54°	60°	7.45°
26°	3.81°	62°	7.59°
28°	4.08°	64°	7.72°
30°	4.34°	66°	7.84°
32°	4.60°	68°	7.95°
34°	4.85°	70°	8.06°

THE VALUE OF SERIAL NUMBERS

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.

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' (1.8 m) and 7.5' (2.4 m)] and the Eclipse [8.5' (2.6 m), 10' (3.0 m), and 12' (3.8 m)]. How does this one kit work for all 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

206312

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 these, contact your dealer for them. Also, you can find it on the antenna mount, and in the case of 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?

AZ-EL Lockdown Kit which works on our heavy-duty polar mounts on our Classic 12' (3.8 m) and 14.5' (4.5 m). 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' (1.8 m) to 14.5' (4.5 m). 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?)

ANY QUESTIONS?

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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 length 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 we discussed previously and the reflector. Obviously, this would become more difficult and expensive with larger antennas.

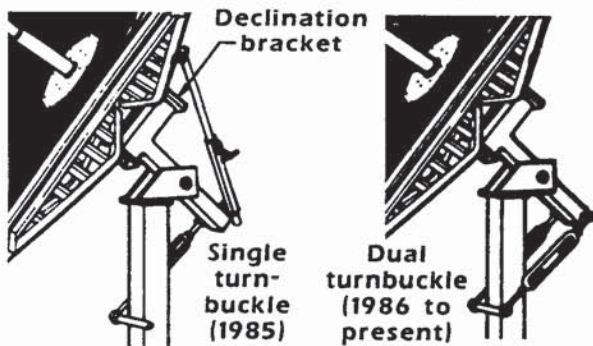
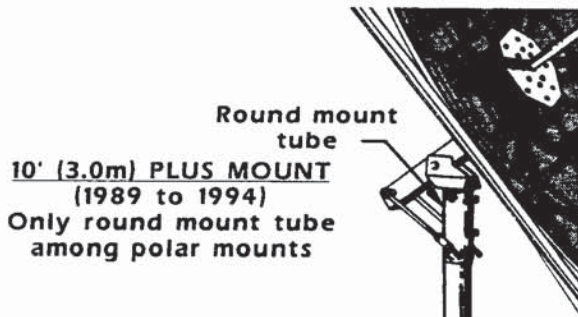
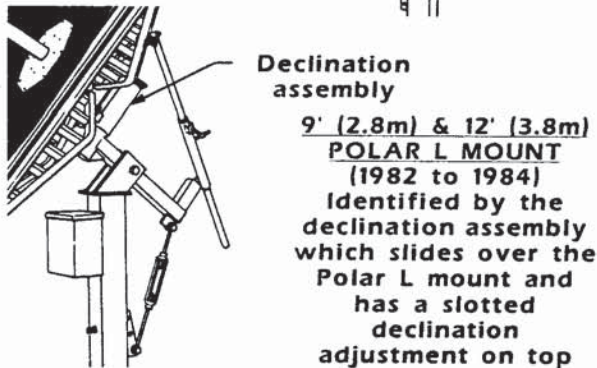
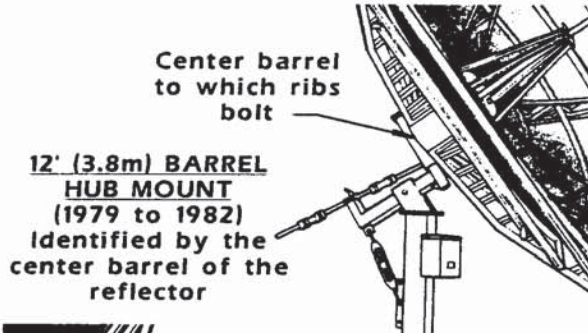
Another problem with these heating systems is that it doesn't work very well for mesh antennas. I have heard of companies putting out a kit that lays heated strips on the back of the mesh. I haven't heard how well this system works, but it sounds like they are on the right track.

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.

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

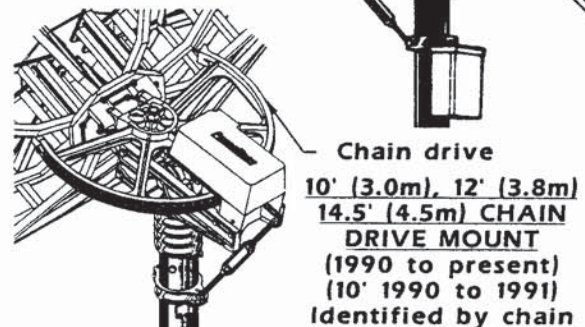
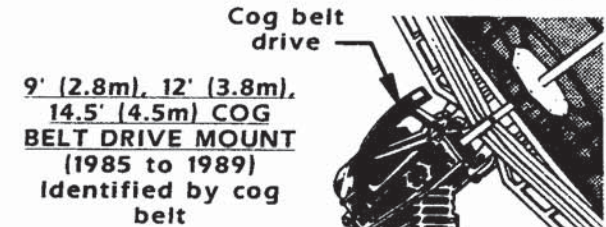
POLAR MOUNTS



9' (2.8m), 12' (3.8m), 14.5' (4.5m) POLAR T MOUNT
(1985 to present) (9' 1985 to 1989)
Identified by Declination Bracket using shims to set declination

antennas (identified by truss-rib construction) since there are tens of thousands out there still being used. Detailed below 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



16' (4.8m) CHAIN DRIVE MOUNT
(1984 to present)
Identified by tower, chain drive, and fabricated steel mount



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Paracclipse

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WHICH SIDE DOES THE ACTUATOR GO ON?

A few years ago, we had an inquiry passed along to us from Mongolia. They asked, "Are we east or west of 105°W longitude?" Considering that they are on the exact opposite side of the world, that was a difficult question to answer. Why did the question even come up?

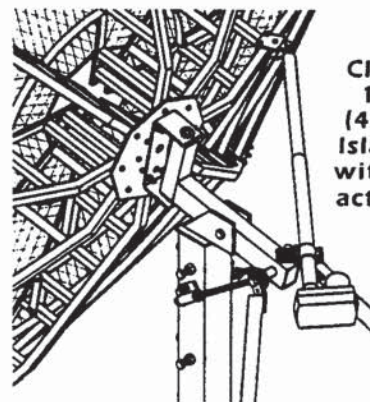
For North America, conventional wisdom has dictated that 105°W is about the middle of the satellite arc. Therefore, many instructions used that as a dividing point. If you are east of that, put the actuator on the right side (looking from back of the antenna). If you are west, put it on the left. Obviously, the inquiry from Mongolia had received one of those older instructions.

As laughable as that situation might seem to be, it was a situation that needed to be addressed. Basically, two things need to be considered. First of all, which satellites are going to be tracked? Second, which side of the antenna will avoid leaving the actuator in its most vulnerable position, which is fully extended? When this is figured, please remember that our mounts are only designed to track about 110° to 120° with an actuator without running the actuator into the mount. This applies even if you go with a 36" (about 1 meter) actuator.

To start off, determine the extreme range of your satellites. If it is greater than 120°, you have three choices. You can (1) buy a horizon-to-horizon mount, (2) decide which satellite over 120° you don't want, or (3) watch your antenna constantly as you move it back and forth to avoid damaging it.

Next, put your actuator on the side of the antenna that has the majority of the satellite arc. When you do that, check to see if the actuator is fully extended at any point. If you have our VP mount (used on our Eclipse and Hydro series), the actuator extension can be used to adjust the location so that your actuator is not quite so vulnerable. (Please see my 8-95 Technical Support Newsletter for more information.)

The result? Your actuator will likely last longer, and I will get less questions regarding longitude.



Classic
14.5'
(4.5 m)
Islander
with 24"
actuator

DOES YOUR ANTENNA NEED TO BE OFFSET OR PRIME FOCUS?

Recently, this question has become an issue due to the advent of direct broadcast systems (DBS). Many have gotten on the bandwagon with this and have become quite satisfied with the small dish package that they have received. Unfortunately, there is a problem with this "one-size-fits-all" system.

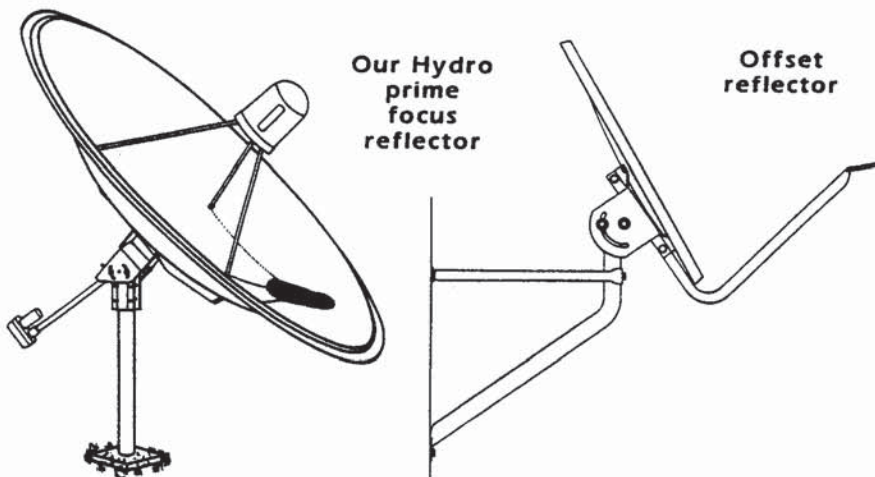
Why the problem? First of all, the signal is broadcast on the high end of the Ku-band frequency in a digital format (either linear or circular). The problem is that these Ku-band frequencies have more severe problems with moisture in the atmosphere. So if the customer lives in an area with regular heavy precipitation, he can lose his signal fairly frequently. Second, not everyone lives where the broadcast signal is strong. With that, the signal is even more unreliable.

The first logical idea in this situation is to go to a larger antenna. The problem is that the electronics in DBS packages are set up for offset reflectors. What is an offset? Try visualizing taking a section of a prime focus antenna (like our Hydro shown here) and using it by itself. The main advantage is that since the feed electronics aren't in the way of the signal, it is easier to have better efficiency in reflecting the signal. Also in areas a good distance away from the equator, it sheds water and snow better. What are the negatives? When you increase its size, it becomes more and more difficult to set it up with any ease (especially as you get close to the equator). This is something to keep in mind when you consider the standard one man DBS installation crew.

The next logical step some have come up with is to use one of our highly efficient prime focus antennas such as our Hydros including our soon to be released 4' (1.2m) & 5' (1.5m). (Prime focus means centering the signal in the middle of the reflector.) We have listened and are progressively testing and putting together solutions to this. The

problem, as I mentioned, is in the feed electronics all of which were designed for offset. An offset feed has to be a good distance away from the reflector. To avoid collecting outside signals, the feed throat was set to focus only the signal from the reflector. As you can see from the picture below, the focus needs to be much wider on a prime focus reflector. In other words, you would only be using a small part of your reflector if you put an offset feed on our prime focus antenna.

Don't give up! We have gotten around that obstacle. We found a company that makes an insert that widens the aperture or view of an offset feed. Also, we designed a feed plate assembly that will hold this feed at its correct location. Please remember. It is a rapidly changing market out there. As a result, we are continuing to test and develop products that meet these changing needs. Hopefully, these include your needs too. Stay tuned.



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POWDER COATING VERSUS PAINTING

Occasionally I receive calls asking what kind of paint we use on our antennas. When I explain that we don't paint, but we use powder coating instead, I generally get as much of a blank stare as a person can get over the telephone. Yet this is a widely used process that is employed from subsea steel pipelines to highly decorative finishes on architectural metal.

Perhaps it would help to explain what powder coating is and its advantages. A reference work defines it as "coatings that are applied as powders to a given surface." That probably didn't help much, but maybe I can do better. We use a polyester powder sprayed from a nozzle with an electric charge. The product to be coated is charged with an opposite electric charge, and the powder is then baked on. Obviously, the product has to be able to hold an electric charge.

Our powder coating has been marketed as a 6 step powder coat process. They are (1) a phosphoric acid wash, (2) & (3) two rinse stages, (4) a dry-off oven to remove moisture, (5) an electric charge is given to the product and it is sprayed, and (6) the product is baked in an oven which melts the powder and allows it to flow evenly and cure. The next question is why do we go to all this trouble?

There are many advantages to powder coating over painting. (1) Powder coating is more resistant to impact and

abrasion, so it is less likely to flake off later. (2) It is more resistant to salt spray. For many, this is an important consideration. (3) It is more resistant to light fading, including the ultraviolet light present in the sun's rays.

Another important factor is that powder coating is nonpolluting in comparison to painting. No solvents, filters, or wash chemicals are required. Very little powder is wasted because it can be swept up and reused. As a result, there is no expensive hazardous waste disposal. Not only is it better for the environment, but it is also less expensive which makes it easier for us to keep our costs down to the end users.

The question coming up in some reader's mind is, "How do you paint over powder?" For those who need to cover scratches, etc., we have spray paint to match the powder coats and they adhere very well. For those who want to repaint an entire antenna, all they need to do is to (1) give it a vinegar wash (50% vinegar, 50% water) to clean the surface, (2) use an automotive primer such as Cold Galvanizing or Zinc Chromate, and (3) use a thin, even coat of a low-gloss paint. The low-gloss paint is important so that you don't reflect heat back to the feed and make it one melted plastic mass. If you have any more questions, give me a call. I'm happy to remove those blank stares from people's faces.

WORKING WITH OUR PARTS DEPARTMENT

Most of us like working with friendly, helpful, agreeable people. As a result, the most successful people in business are usually those who keep people in this desirable state. Unfortunately, there are some who are of a different opinion. They feel that if you demand something in the most irritating way, you will eventually get what you want. This opposite opinion does not get the best results out of our parts department. They get downright cranky dealing with these individuals.

How do we keep the smile on the faces of our parts people? One method that helps a great deal is knowing the part numbers of the items you need. Failing that, at least try to precisely identify which antenna you have. If you can't do either of these, probably you need to call me in Technical Support to identify your needs. Trust me. I would rather help you figure out what you want than deal with a cranky individual in the parts department.

Another thing that can keep the smile on their faces is to be patient with them. Not only do they have to enter



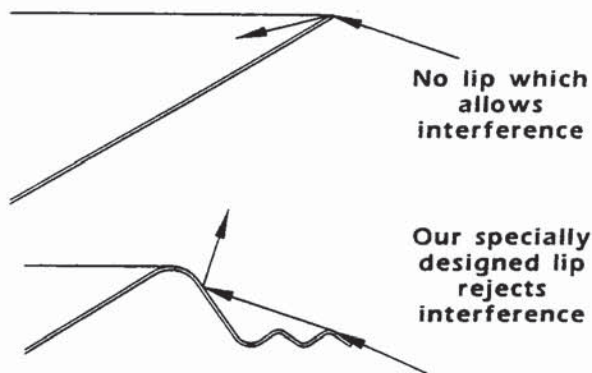
your order, they also have to figure out the payment method and the shipping method and cost.

Therefore, I'm giving you a helpful hint. If you want top notch service (we are very capable of giving it), deal with our parts department in a patient and friendly way. This would make them more pleasant for me to be around, too.

ADVANTAGES OF THE HYDRO REFLECTOR LIP

I just wanted to call your attention to a feature of our Hydro reflectors that you may have taken for granted. We don't design products just because someone thought that it looked interesting.

First of all, the lip of our 6' (1.8 m), 5' (1.5 m), and 4' (1.2 m) Hydro reflectors (shown below) were designed with strength in mind. The extra ridges in the rim help keep the reflector from warping with regards to both flatness (evident by sighting across the top with one eye closed) and circularity. Also, basic phys-



ics teaches us that wave patterns (such as the signal frequency your antenna receives) have a tendency to bend around objects. This is demonstrated in the figure below at left.

Keep these points in mind. They make up another bragging point about your Paraclipse antenna.

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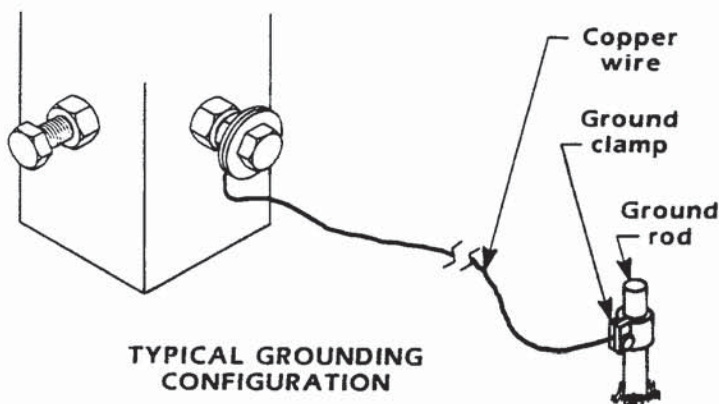
THERE HAS BEEN A LIGHTNING STRIKE!

Lightning is possibly the most concentrated bundle of energy that many of us ever experience. Therefore, it shouldn't surprise us if that burst of power should rearrange (to put it mildly) your antenna. When I refer to lightning strikes, I am not discussing a direct hit. There would be nothing left to work with if that was the case. This article will deal with the affects of that power surge being transmitted to your antenna.

Remember that the sensors, limit switches, and other electrical components of your antenna work by detecting minor changes in current. This sensitivity becomes a drawback when a voltage surge comes down the line (possibly even from several miles or kilometers away). How would this be evident?

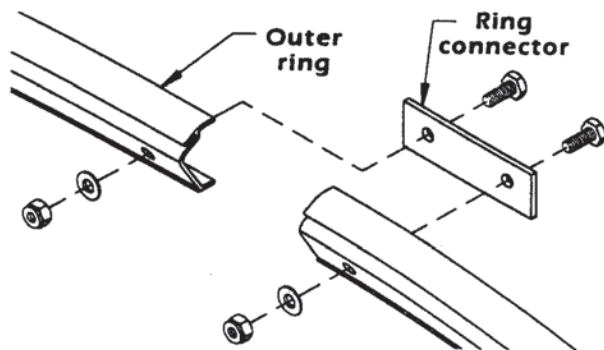
Basically, a lightning strike can be some distance away and still raise havoc with your satellite receiving system. Even though there are fuses and breakers, this surge is usually so strong and sudden that damage is done before the fuse or breaker has a chance to work. Many times the damage will not be noticed until you try to move your antenna. Why?

Many receivers will give a message similar to "actuator error" because the sensor (whether in the actuator or part of our motor system) no longer responds to it. Also, the sensor may count so erratically that your antenna won't go to the correct location of the satellite anymore. Another thing that can happen is that your antenna may only move in 1/2 second jogs. This likely means that your limit switches are damaged. If that is the case, your receiver act like your antenna is past the limits.



What can be done to prevent this? By all means, provide a grounding system for your antenna. This won't do much for a direct hit, but it will certainly save you much grief from the rest. Shown at left is a typical grounding configuration. Multiple grounding (such as at the mount and back hub plate) may be required to thoroughly ground the antenna. This may seem like a waste of time to some, but don't tell that to those who have had their antenna fried!

TIPS FOR ASSEMBLING YOUR ECLIPSE REFLECTOR



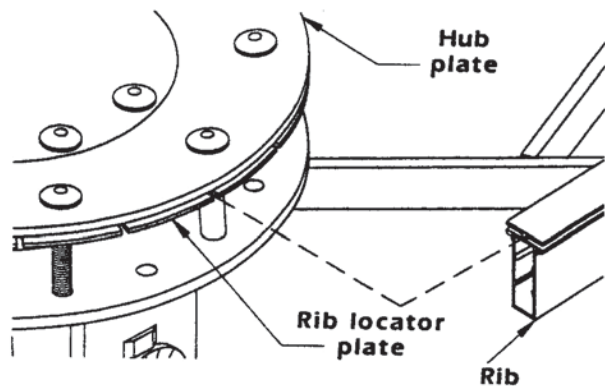
MAKE SURE ENDS OF OUTER RINGS EXACTLY MATCH EACH OTHER WHEN ASSEMBLED

When something is more easily shipped, you can count on me getting questions from a variety of places. With our Eclipse series, this has definitely been true. This is a mesh antenna available in 12' (3.8 m), 10' (3.0 m), and 8.5' (2.6 m) that can be securely shipped in small boxes to just about anywhere. Being that it has been on the market for more than five years, I have gotten calls on it from places as diverse as Great Britain, Vietnam, and Saudi Arabia. While it is easily shipped and assembled, taking the time to do a good job will still reward you with a better signal. Going along with a few helpful tips accomplish this.

First of all, the ribs need to be firmly butted up into the hub. Even 1/8" or 3 mm will make a difference here. One caller said that his mesh was different lengths and his signal was poor. It

FINDING PARTS FOR OBSOLETE ANTENNA COMPANIES

In the 17 years Paraclipse has been around, many antenna makers came and went. Recently, a few more have joined their ranks. The sad part is that their customers are now caught in a bind. They may only need one simple part to get their antenna up and running, but it isn't available. Many have called us to see if we can help, especially regarding garmotors. While it is possible that we could cobble something together for them (we can't help with garmotors), they would likely come out ahead in the long run by starting all over again. Remember, if you want an antenna to last more than a couple of years, go with a company that is in it for the long run.



MAKE SURE YOUR RIB IS FIRMLY BUTTED INTO THE RIB LOCATOR PLATE

turned out that some ribs were not all the way in which left the mesh a distance from the hub plate. Despite the importance of this, don't pound in the ribs with a hammer! One person did this and bent his ribs to his surprise.

Next, when you attach outer ring to outer ring, make sure that the end of one outer ring exactly matches the other. You don't want one outer ring to be lower or higher than the other. This will help ensure a good parabolic shape to your reflector.

One more thing. Something that frustrates some installers is getting that last piece of mesh in. A very useful trick I learned is to have a very fine-tipped screwdriver on hand. Just insert it into the mesh near the hub plate and use it to slide that last piece in place.

Following these tips and using basic common sense will give you a very accurate reflector. Also, you didn't have to call technical support to do it!

ANY QUESTIONS?

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Paraclipse®

TECHNICAL SUPPORT NEWSLETTER
Volume 4 Number 1 1-97

Compiled by:
Michael McGee,
Technical Support
Manager

OUR PURPOSE

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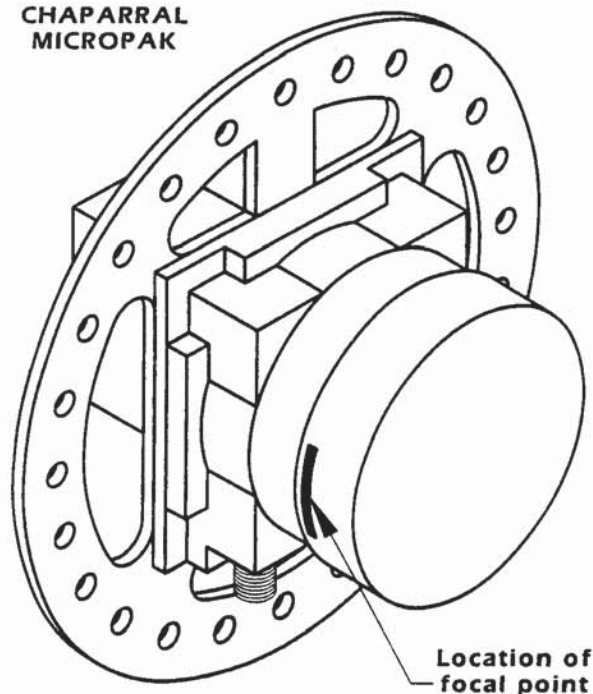
USING THE CHAPARRAL MICROPAK ON PARACLIPSE ANTENNAS

Occasionally, a popular product comes on the market that causes people to have to rethink how something is done. A case in point is Chaparral's MicroPak shown below. Chaparral's goal was to have a quality integrated feed/LNB that was smaller and affordable, but there are two features to which people will have to adjust.

First of all, you will notice that the scalar ring is much thinner and not adjustable. Many seem to have grown

used to the convenience of an adjustable scalar ring to the point where they don't know how to locate the feed any other way. The second difference that some seem to miss is the location of the focal point of the signal. If you notice in the illustration below, the focal point is deeper into the throat than Chaparral's other products. Thankfully, Chaparral took the time to show us where the focal point is by making a prominent mark on the cap that covers the feed throat.

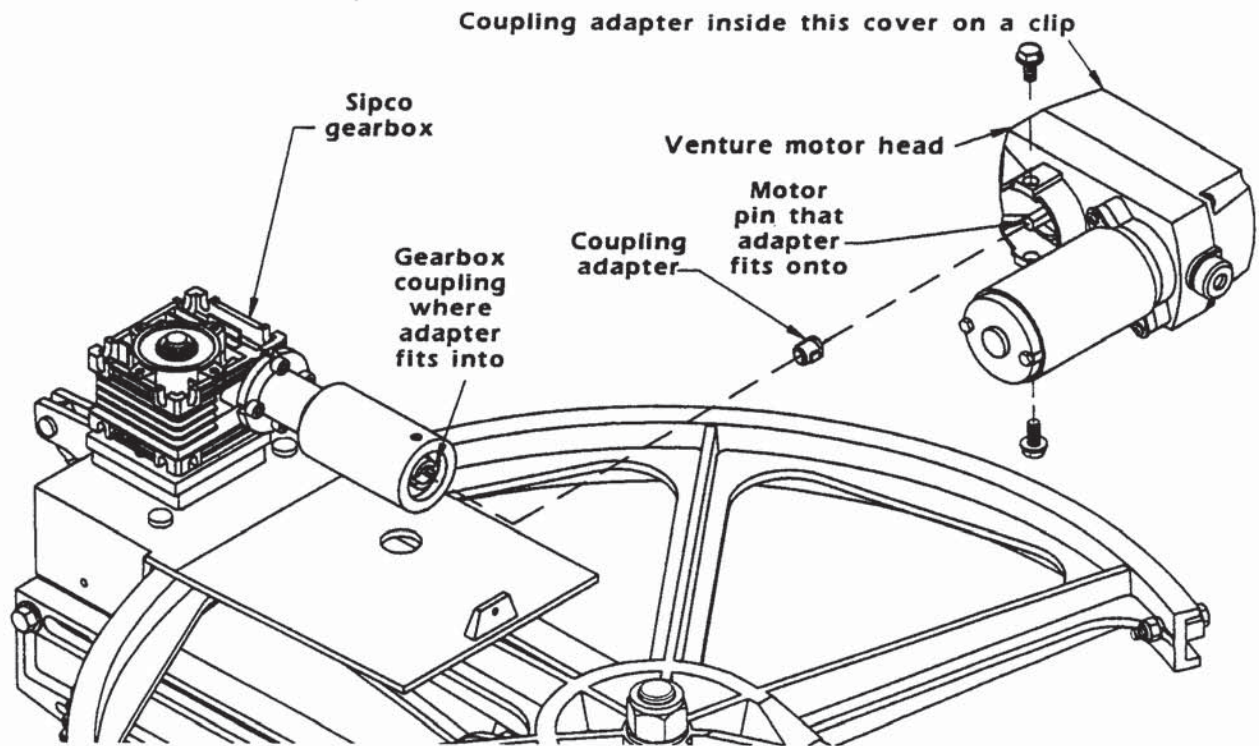
CHAPARRAL
MICROPAK



What's nice is if you are using our Classic antennas or our 12' (3.8m) & 10' (3.0m) Eclipse antennas, you have our feed plate with adjustable thumb screws. (See my 7/96 Technical Support Newsletter.) The thumb screws have enough adjustment to cover all the focal point settings. What if you are using one of our antennas without a feed plate? This would include our Hydro antennas and our 8.5' (2.6m) Eclipse antenna. If this is the case, all you have to do is shim the MicroPak out far enough using washers. For our deeper dishes (such as our 7.5' or 2.4m Hydro), just one washer might do the trick. Our shallower dishes (such as our 8.5' or 2.6m Eclipse and our 4' or 1.2m Hydro) may require more substantial shimming. These may require as much as $\frac{3}{4}$ " or 19mm of washers to put the MicroPak out far enough.

I suppose it all boils down to whether someone is willing to accept change or not. The problem is that today's world doesn't give us a lot of choice.

THAT PESKY COUPLING ADAPTER BETWEEN THE GEARBOX AND MOTOR



Recently, Paraclipse released an upgrade of the Classic CD antenna motor/gearbox system. Besides being standard on all of our new Classic CD antennas, this stronger and more accurate system (shown above) has proved to be very popular among the thousands of owners of CD antennas out in the field. When I started getting feedback from a few of the many customers that are using this new system, I learned a couple of things. First, we cannot assume that all people are going to take the time to read instructions carefully. Second, we need to be even more specific in our instructions. Both of these points involve the coupling adapter that connects the Sipco gearbox to the Venture motor head.

Regarding not reading instructions carefully, several times we have gotten calls that the coupling adapter is missing from the antenna. The instructions explain that it is on a clip inside the cover of the Venture motor head. It seems that when they read the instructions (we know everybody carefully reads instructions), they totally missed that point. While I don't mind explaining that to people, it just seemed simpler to emphasize that point in the instructions. It should be harder to miss now.

The second point is the insertion of the coupling adapter. It seems that if you put the coupling adapter on the motor pin first instead of the gearbox coupling, it sometimes doesn't get down far enough into the gearbox coupling for the motor to turn the gearbox. If it just barely engages the gearbox coupling, the coupling adapter can work out if the antenna is pointed close to the horizon. So, put the coupling adapter fully in the gearbox coupling before you put on the Venture motor head.

Thanks for taking the time to read these instructions. It makes a difference!

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WE HAVE A WEB SITE ON THE INTERNET!

Have you ever had a question about one of our antennas but our business hours (8:00 AM to 5:00 PM Central Time) never worked with your schedule? Have you lost contact with what we do here at Paraclipse? Perhaps you have a nagging question in the middle of the night that just won't allow you to sleep. If you have a computer and a modem connection, we have something that you may find useful. Paraclipse now has an official presence on the internet. You can find us at **www.paraclipse.com**. This site has been in operation since February, 1997.

Right about now I am starting to hear, "So what!" True, all of this information is available through other sources, but this method offers a number of advantages. Since we are going to attempt to update the web site at least on a monthly basis, you will have access to the latest information on our products. In fact, you may be the first individual in your area to receive this information (this would especially be true outside of the United States). If you are able to log on, please check out our page entitled "What's New".

What are some other features available? Perhaps you have only dealt with one of our lines of products. What we currently offer may surprise you. Perhaps you have found this or earlier versions of my Technical Support Newsletter to be quite helpful. You will find the

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latest edition on the web site. Also, you may be wondering if the specifications you have on file are current. That too is available. Likely, the ones who will benefit the most from our new service are our overseas customers. For most, our web site will be more inexpensive and convenient. Also, don't forget our e-mail address (paraclps@megavision.com). E-mail links are liberally sprinkled throughout our web site.

So please remember. Our web site is **www.paraclipse.com**. I feel that you will find it to be a useful addition to our repertoire.



LEAVE YOUR OPTIONS OPEN, DON'T JUST GET THE MINIMUM REQUIRED

Let's lay out a scenario that seems to repeat itself on a regular basis. Someone decides that they want to receive a particular signal. The requirements are determined and the minimum required equipment is ordered. At that point, someone changes all the requirements on you and you're in trouble.

Unfortunately, this happens all too often. I received a call from the Middle East from a gentleman who had set up dozens of our 6' (1.8m) antenna to receive specific programming. The problem was that the programming was moved to another satellite that had too weak of a signal to be received with a 6' (1.8m) antenna. He was desperately trying to find a way to get around buying dozens of new antennas. While I mentioned the possibility of upgrading his

electronics, that probably didn't help him much.

As a result, I repeatedly tell people not to lock themselves into situations, such as with AZ-EL mounts when a polar mount is available. Plan on the possibility of the signal going to a weaker satellite by going with a larger reflector than what seems initially necessary. Figure out what can be done for unusual storms and the like.

The moral of the story is don't stick to the minimum required. True, money may be tight, but it will hurt even more if your equipment ends up being inadequate. If you push for more than what is required and look to the long term, customers will likely be appreciative in the long run, too.

WHAT IF YOU NEED SOMETHING OTHER THAN A GROUND MOUNT?

Probably one of my more common requests I receive is when someone calls me up asking for a roof mount. (I am lumping wall mounts, eave mounts and other mounts into this same category.) They want to know (1) what alternative mounts do we offer and (2) what specifications we have for these mounts.

While there may be situations that require one of the mounts that I mentioned above, all of the specifications and mounts that I can offer are for a concrete foundation in the ground. Why? When you put an antenna on top of a building or against a building, that really needs to be engineered. I have no idea of the structural strength of the building or of the wind forces. Since there are so many possible combinations of situations, we have chosen not to get into this field.

This doesn't mean that we won't try to help. There are companies that specialize in the accessories required to mount an antenna against or on a building, and there are also companies that will design a strong enough mount to hold the antenna and not damage the building. We will readily refer you to a company that provides the mount you will need. Also, we provide engineering calculations that local engineers can use to calculate the stresses that will be

encountered and what supports to provide.

The one thing I cannot provide is assurance that your design is correct. A number of times I have had people describe their setup over the telephone and ask me whether I think that the design is strong enough. I can provide a listening ear, but I don't think that is what they were looking for when they called me. If you need confirmation, go to a local design firm. They may be expensive, but at least they can provide assurance that what you have is adequate.

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OUR NEW 1.5m HYDRO MEASURES UP

Have you ever dealt with "conventional wisdom"? An example of this is when someone says that you have to have a certain size reflector to pull in the satellite signal in a certain area. The problem with "conventional wisdom" is that it doesn't take into account something that performs past all expectations.

A case in point is our new 1.5m Hydro reflector. You can see the difference in size between it and our Hydro 1.8m reflector. Take a look at some of the results that we have already received.

We sent a sample down to Melbourne, Australia in conjunction with a recent satellite show. It was independently tested against a 1.5m commercial antenna from Andrews on the Optus satellite. Not only was its gain on Ku-band of 44.0 dB verified, this matched the gain of Andrews' commercial antenna. On top of that the Hydro 1.5m was 0.5 dB to 0.75 dB better on C/N ratio. The C/N ratio was 28 dB.

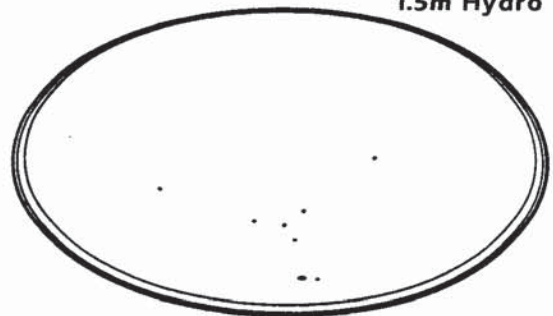
Another sample was sent to Dubai, United Arab Emirates in connection with the recent Cable & Satellite show there. This time it was compared against a 1.8m Jonsa solid prime focus antenna on C-band. The satellites tracked were Intelsat 714, PanAmSat 4, ArabSat 2a, and ArabSat 2b. Our Hydro 1.5m matched Jonsa's 1.8m reflector.

At the time of this writing, we are in the process of testing the 1.5m Hydro and also the 1.2m Hydro in a number of

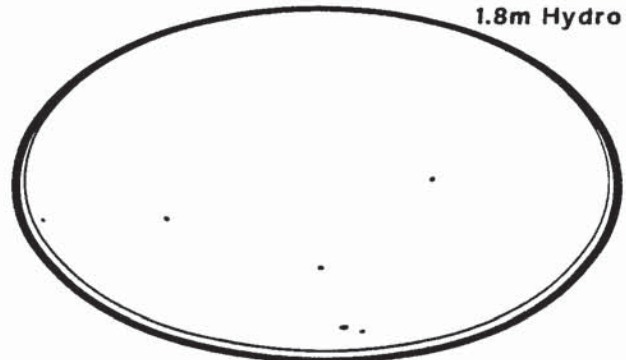
different situations worldwide. We will keep you informed of our future findings.

What conclusions can be drawn from this so far? First of all, "conventional wisdom" that a 1.8m reflector is required for certain area doesn't take into account the performance of our 1.5m Hydro. Second, our newest addition to our line of satellite antennas meets up to Paraclipse's standards. Check it out for yourself.

1.5m Hydro



1.8m Hydro



YES, OUR MESH IS DESIGNED FOR KU-BAND

One question that I seem to hear over and over again is whether our mesh is designed for Ku-band. In a word, yes. All of the mesh that we have put out since 1991 has been designed for Ku-band signal reception. Why is it that this seems to be a recurring question? I would say that there are three main reasons.

First of all, some of our customers have lost contact with what we have been doing in the last few years. At the risk of telling you something you already know, the satellite antenna industry (in the United States especially) has gone through several dramatic changes the last few years. This has resulted in a major shaking out of our distributor, dealer, and customer base. Many times callers don't even realize that we are located in central United States in Nebraska (we moved from California on the west coast 6 years ago). If you fall into this category, let us know. We will be happy to fill in the gap and answer whatever questions you may have.

Second, there was a lot of hype recently about reducing the size of holes in the mesh and the supposed improvement it gave. Our mesh went down to the optimum hole size back in 1991. (See my 9/95 Technical Support Newsletter.) Anything past that point will not give a person any appreciable improvement. This has been shown mathematically and by field testing.

Third, a lot of individuals out there are trying to pull in more and more with the size antenna that they already have. So, to pull in that extra bit of signal to get rid of "sparklies" or "ghost images", they think that upgrading the mesh is the solution. If your antenna was manufactured before 1991, we can help you out. We have kits that upgrade the antenna for Ku-band. (See my 10/94 and 1/96 Technical Support Newsletters.)

What if it was made after 1991? Well, you could try checking the parabolic accuracy of your reflector and optimizing your feed. (See my 11/94, 4/96, and 7/96 Technical Support Newsletters.) The problem is that you probably have already done that. The only option left



is to go to a larger size or to a high performance solid reflector like our Hydro series. Some try to get around this by replacing the mesh with something solid. The problem is that this will likely make the signal worse. Our mesh is made with a preform and cut to precise curves by complex dies. Replacing this with a custom design will likely lose the parabolic accuracy that is required to pull in a good signal.

Where does that leave you? If your antenna has been

upgraded and optimized, there are essentially two options. One, you can be content with your current system and its limitations. Two, you can decide to invest in a new system to pull in what you want. If you decide to go this route, make sure to allow for changing system requirements that will inevitably come. While I will be glad to give you whatever information you think would be helpful, the decision rests with you. Is it worth it to you to pull in that extra signal and improve what you already have? You decide.

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DO YOU HAVE THE RIGHT FEEDHORN ELECTRONICS?

The following information may be pretty basic to some of the technicians out in the field, but many are becoming downright intimidated by the choices that are piling up out there. So many are used to one setup to the point that they don't even seem to have a clue as to any other options. To do it right, you need to be able to answer questions in the following categories.

FREQUENCY: This is a big category. (We are talking about downlink frequencies only.) First of all, you have the standard C-band from 3.7 to 4.2 GHz with which many are familiar. Many are also familiar with Ku-band which, for most, is from 11.7 to 12.2 GHz. Unfortunately, Ku-band and C-band are not limited to these. As an example, some parts of the world use higher ranges of Ku-band, such as from 12.2 to 12.7 GHz. Then there is L-band and S-band, from 1.5 to 2.7 GHz, such as is used by many weather satellites. Of course, there are still others, such as X-band, Ka-band, etc.

F/D RATIO: This is probably one of the most overlooked areas. Your feedhorn must have an aperture that matches the shape of your reflector. That is why a feed setup designed for an offset reflector would not be used on a prime focus reflector. As an example, Paraclipse's reflectors run from .40 (flat) to .31 (deep). If you tried to use a feedhorn with an aperture (or an angle of view) designed for a flat dish on a deep dish instead, you would pull in all the interference outside in addi-

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tion to the signal. If you did the opposite, you would be using only a small part of your reflector. Even though some setups have adjustability, they are still optimized for a certain range. As a result, it is vital to match your feedhorn to your reflector.

POLARITY: This is a simple one. Basically, there are circular (right-hand & left-hand) and linear (horizontal & vertical) polarity.

DIGITAL VS. ANALOGUE: This category becomes more complex as time goes on. At one time, all signal transmission were analogue (a simple signal modification). Now, digital is coming more and more to the fore. The problem is that there is no one world standard. MPEG-2 is an effort (still in process) to come up with a worldwide video compression standard, but it is still best to go to the broadcast source for the exact digital standard used before choosing your feed electronics.

HOW MANY SATELLITES AT ONCE: If your reflector is large enough, you have the option of fixing your antenna on 2, 3, or even 4 adjacent satellites at once by using multiple feeds. These are commonly used by cable system head-ends.

COMBINATION SYSTEMS: There are systems out there that use multiple combinations of the above. The thing to remember is that this usually sacrifices signal strength. If signal strength is at a premium, stick to a dedicated system.

Hopefully, this brief overview didn't overwhelm you. If it did, give me a call and I will show some compassion.

HOW DO YOU ATTACH THE KU-FEED?

As Ku-band satellite broadcasting expands and diversifies, companies producing a bewildering varieties of LNBS and LNBFs seem to multiply. The problem comes from the lack of standardization that seems to plague our industry.

On the C-band side of things, it seems that most are getting along by using a standard set of scalar ring hole locations to attach the feed electronics to the antenna. Unfortunately, Ku-band feed electronics have not progressed that far. Wide variations exist in length and diameter of the feed throat. Some provide a hole pattern by which to attach and some don't. Some allow for adjusting the feed location for focal distance and even for F/D ratio, but the

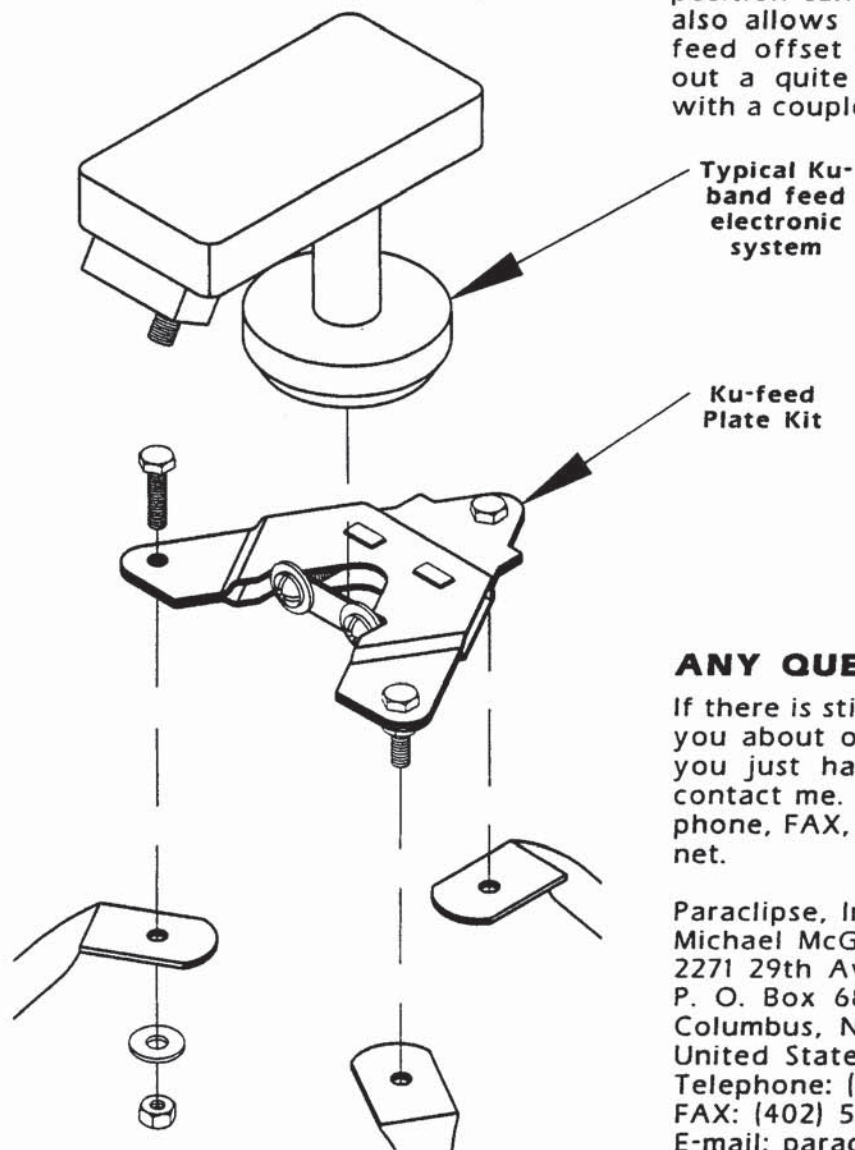
majority do not. Some are LNBFs (feed-horn and LNB integrated together) and some are not.

In grappling with this potentially confusing situation, the Paraclipse engineering department came up with a kit for attaching this wide variety to the majority of our antennas. Our new Ku-feed Plate Kit will work on all of our Eclipse and Hydro lines of antennas (from 4' [1.2 m] to 12' [3.8 m]).

We have dealt with the variations in throat diameter by putting in an adjustable clamp. The need for variations in feed location was met by making the Ku-feed Plate Kit thin enough so that its position can be adjusted in and out. It also allows for rotating to the correct feed offset angle. We have tested it out a quite a variety of setups, and, with a couple of exceptions, our new kit

accommodates them nicely. Even those couple of exceptions will work with minor modifications.

This is just another example of how we here at Paraclipse listen to the moans and groans out there in the field. We are doing our best to keep up with the fast changes and multiple variations that are popping up. Keep in touch.



ANY QUESTIONS?

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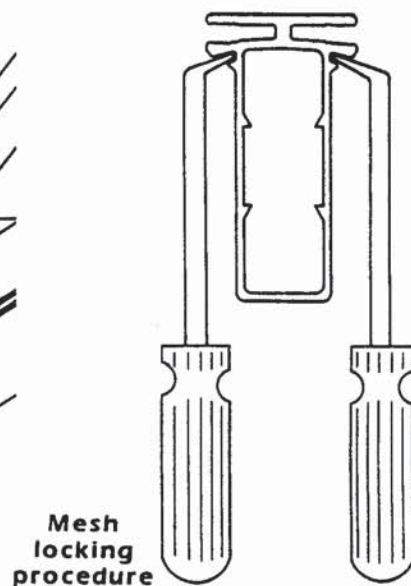
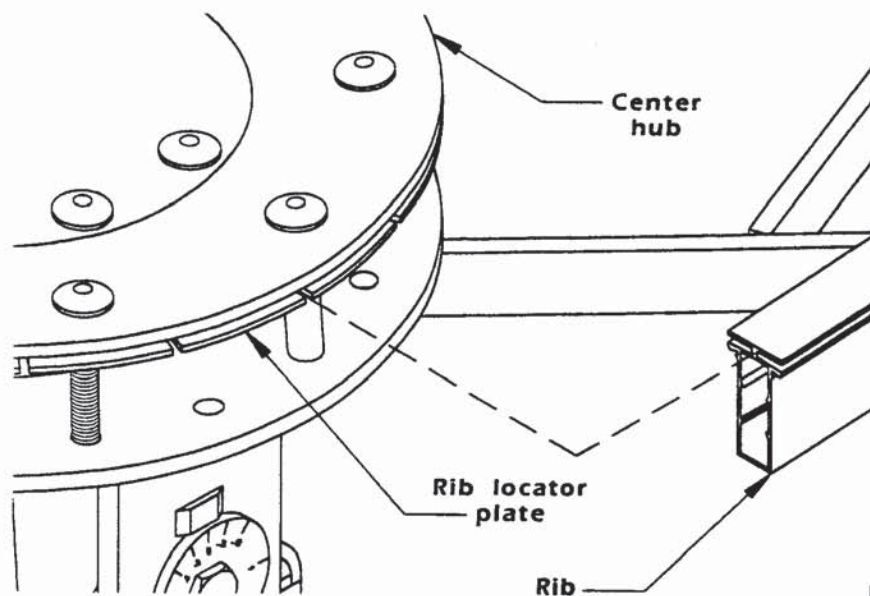
ASSEMBLY TIPS FOR A STRONG ECLIPSE REFLECTOR

I am sure that most are like me in appreciating tips that help us do our job better. The following are some pointers I have been sharing recently with regard to our Eclipse series reflectors.

1) Make sure that all of the ribs are firmly butted all the way into the rib locator plate in the center hub. Not doing this probably accounts for about 75% of the problems people have run into with the Eclipse. (See the illustration below.) 2) When the mesh is installed, it doesn't have to touch the center hub. Make sure it is pulled as far back in the groove on the outer ring as it can go. This will

keep the mesh from pulling out at the outer ring. 3) Make sure that the mesh support ring (optional on the 10' or 3.0m) is slid as far down in the rib groove towards the center as possible. This will wedge the mesh support ring and keep the mesh in place. 4) Use the mesh locking procedure for the 10' (3.0m) and 12' (3.8m). This procedure (shown below) is mandatory in extreme weather conditions. Of course, we recommend that people invest in our heavy-duty Classic series antennas if they regularly face extreme weather conditions.

As I said before, I listen also. If you have some other tips, pass them along.



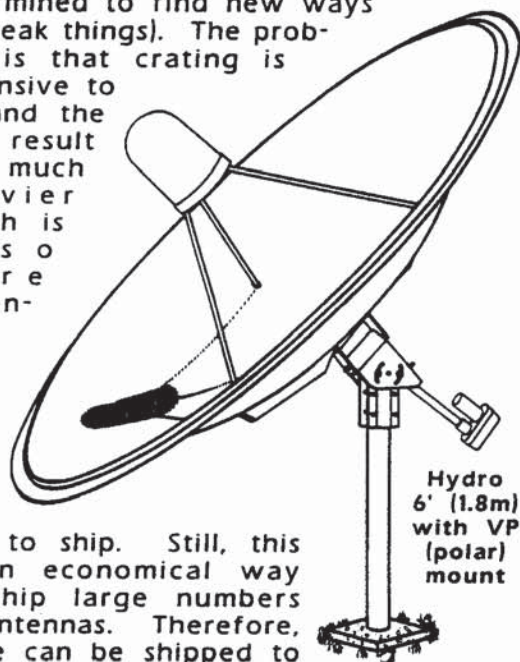
THE UPS & DOWNS OF SHIPPING HYDRO REFLECTORS

To meet the needs of those working with our products in the field, we have to do more than provide a high-quality, economical product. We have to get the product to the customer in an economical fashion, too. Specifically, I am referring to Paracclipse's Hydro antennas that range from 4' (1.2m) to 7.5' (2.4m).

I quite often receive calls or letters from people who were, as one said, "blown away" by the performance of our one-piece reflectors. Often they will say that they will never use anything else. The problem is getting it from point "A" to point "B" at a price the customer can afford. Why?

A Hydro reflector is anywhere from 0.03" (0.75mm) thick on the 4' (1.2m) to 0.07" (1.75mm) thick on the 7.5' (2.4m). Despite this, the Hydro rim is formed in such a way that it holds its parabolic shape even under heavy pressure. (See my 11/96 Technical Support Newsletter.) With support arms holding it at the three contact points, people have found it to be surprisingly sturdy. Unfortunately, this doesn't help when people stack things on top of it or it isn't secured properly in the back of a truck.

There are basically two methods of shipping, boxing or crating. A wooden crate will protect the Hydro from all but the most determined manhandlers. (Some seem to be determined to find new ways to break things). The problem is that crating is expensive to do and the end result is much heavier which is also more expensive to ship. Still, this is an economical way to ship large numbers of antennas. Therefore, these can be shipped to



sive to ship. Still, this is an economical way to ship large numbers of antennas. Therefore, these can be shipped to

various locations and distributed from there.

The problem is that changes in the market in North America have caused most distributors to stop stocking satellite antennas. That leaves the customer who wants a Hydro facing the prospect of paying for the shipping of a heavy crate. So they ask, "Why not put it in a cardboard box?"

That again brings us back to protecting it in shipping. Despite all of the "FRAGILE" and "DO NOT STACK ON THIS" stickers we put on, we have found that only a few shippers were trustworthy enough to consistently deliver it undamaged. After grappling with this dilemma the last couple of years, we feel we have found a solution.

We found a freight company in the USA that uses adjustable shelves with lockdown bars and straps. This allows our Hydro to be suspended above the rest of the cargo. That way you don't have to worry about it tipping or something stacked upon it. (What a revolutionary concept!) Currently, they don't serve the entire USA, but they are rapidly expanding. (At this time, the states covered are Alabama, Arkansas, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin.) For further questions on this, give our sales department a call. With this, we will get the Hydro to you, and you can take it from there.

ANY QUESTIONS?

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Paraclipse

TECHNICAL SUPPORT NEWSLETTER
Volume 4 Number 6 6-97

Compiled by:
Michael McGee,
Technical Support
Manager

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.

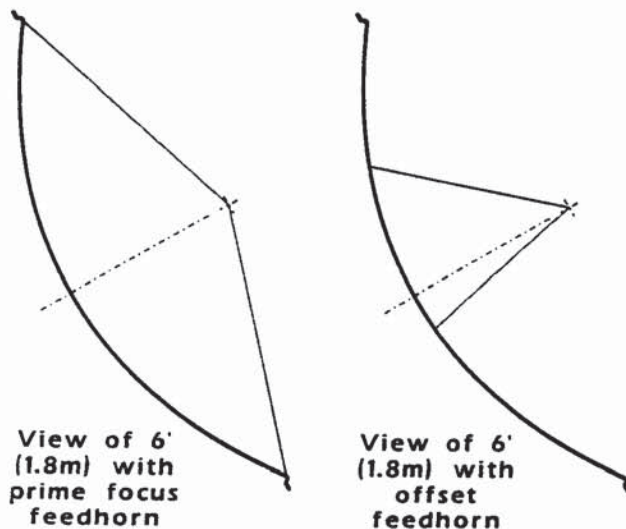
ADAPTING DBS TO PRIME FOCUS REFLECTORS

In my 10/96 Technical Support Newsletter, I reported on the growing interest that was developing in using prime focus reflectors in fringe areas of DBS (direct broadcast satellite) signals. Since then, I have received a number of inquiries along with much appreciated feedback. (Sometimes I learn more from the callers than they learn from me.)

One thing that I have to keep explaining over and over again is that you gain very little by just switching the DBS feedhorn over to our Hydro reflectors. Why? As the illustration below shows, the DBS feedhorn is designed only to illuminate the area covered by an offset

reflector. If you put it on our Hydro prime focus reflector, your feedhorn will still only view the same area. What is needed is something to widen the view or more fully illuminate the reflector.

One caller was telling me that he was trying out one of the inserts on the market that are supposed to widen the view. This insert was advertised to give you a 4dB to 6dB gain. While he only picked up 2dB of gain on our 6' (1.8m) Hydro, he was happy with that. The reason for the difference was likely because our 6' (1.8m) Hydro is a fairly deep reflector at 0.34 F/D. That particular insert probably was designed for a flat reflector and would therefore underilluminate our deeper reflector. In his case, he probably would have gotten the advertised results with our 5' (1.5m) Hydro because it is relatively flat at 0.39 F/D.



Another thing to remember is that where the DBS signal is already strong (such as most of the USA), you will notice little if any improvement of the reception. That's why I appreciate the feedback from those on the fringes of the signal footprint. Keep the feedback coming. It is a learning process for both you and me which hopefully will be for the benefit of us all.

IS WHAT YOU ARE WORKING ON REALLY A PARACLIPSE?

Probably my most frustrating calls are from those who are trying to upgrade or repair an older antenna that turns out not to be a Paracclipse. By the time they get to me, they have already spent some time trying to figure out why it just won't work. As they are pouring out their frustrations on me, some of the things they say to me just don't add up. After asking a few questions, I end up being a bearer of more bad news, that they just wasted all of their time. They don't have a Paracclipse antenna.

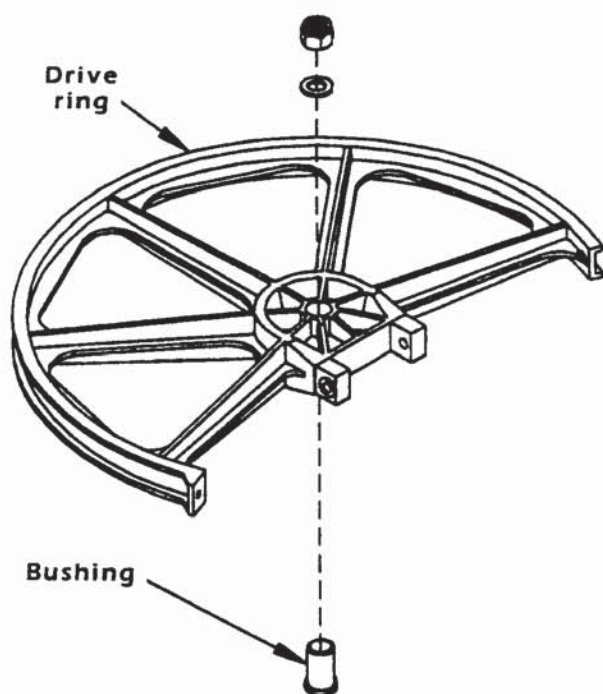
Unfortunately, our kits and parts won't work on antennas of other companies. Adding to the problem is that the company has very likely

gone out of business. In those cases, a person is usually better off starting over, but they say, "I don't want to throw the antenna away just because I can't get this one part!" While I do understand, I can't offer much help.

What can be done? Don't assume. If you didn't install the antenna, make sure that what you have is a Paracclipse. There were a number of antennas made in the 1980's that had similar ribs on the reflector, a similar motor drive, etc. I would be happy to help you with the identification. That way I don't have to be a bearer of bad news when the part or upgrade doesn't work.

WHEN CD DRIVE RINGS RUB ON THE MOUNT

One of our more durable antennas is our Classic CD 12' (3.8m) and 14.5' (4.8m) which we have been selling since 1985. As durable as they are, they still will occasionally show signs of age. One thing that sometimes happens is that the drive ring becomes cocked. This becomes obviously when it starts to rub on part of the mount. Sometimes, the belt or chain will be off center enough to the point where it looks like it is about to slip off.



Is the whole part bad? No. The culprit is a worn bushing that is inside the drive ring as shown at right. So is the solution just to get a new bushing? Unfortunately, it isn't that simple. When the bushing is pressed into place, the center bore becomes smaller. It needs to be reamed in place exactly perpendicular to the face of the drive ring. If it isn't exactly perpendicular, you will be right back where you started with a cocked drive ring. So unless you have a good machine shop handy, you might be better off in the long run ordering the drive ring with the bushing installed. It's more expensive, but it may be cheaper in the long run.

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SETTING UP FOR KU-BAND DIGITAL SIGNALS

For many, the information they usually want seems to be in a format for which they are not set up. Recently, this appears to be the case regarding digital signal transmission on the Ku-band frequencies. The problem with this situation is that the feed electronics and receivers are not the only things that are recommended to be replaced or upgraded. People are told that, in addition, their reflector is not adequate. If you go to the source of the signal you are trying to receive (the company owning the satellite or using the satellite transponders), they will likely tell you that you have to have a solid reflector of a certain size (usually quite large). They don't do this without good reason.

First of all, the digital format was designed with a high signal cutoff level to prevent poor signals. In other words, poor analogue signals will give you a poor picture while poor digital signals will give you no picture. As a result, you need a fairly strong signal to get a consistent picture.

The second reason stems from the fact that the Ku-band signal is only about a third of the width of the C-band signal. What many people try to do to get around this is to try to get smaller hole sizes in their mesh. Unfortunately, this doesn't

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help once you get below a certain hole size. (See my 2/95 & 9/95 Technical Support Newsletters.) Paraclipse mesh has been revised with this in mind since 1991. What does help is the reflector's RMS or accuracy of the parabolic curve. Most mesh reflectors have poor RMS unlike most solid reflectors.

What the previously mentioned reasoning doesn't take into account are high quality mesh antennas such as Paraclipse's Classic antennas when they are properly installed with our current mesh. Despite this, you will still hear me recommend solid reflectors such as Paraclipse's Hydro series for Ku-band digital signals. Why? No matter how well a mesh antenna is built and installed, it cannot match the high accuracy of our one-piece solid reflectors.

Still, some prefer to try to go with mesh. This may be because they want to keep their current antenna and just upgrade the mesh. Others don't like the disadvantages of solid antennas such as added wind-stress and weight. That is their choice. If the signal strength is high enough and the antenna is properly assembled, it probably will work. If probably isn't good enough, go with one of our solid reflector antennas. It is basically up to you.

ANTENNA ALIGNMENT TOOLS - USE AND MISUSE

What would you think of someone who decided to build a shed in his backyard without acquiring the proper tools? Instead of a hammer, he just grabs a convenient rock. Or suppose he does get a hammer, but he also uses it to put in screws. While this may seem ludicrous, some do essentially the same thing when installing their satellite antenna.

It seems that many of the problems I hear about can be blamed on not having the proper tools or misusing the tools they have. You might be surprised at how many try to install an antenna with just a protractor and a television signal. Most realize that you won't get what you should out of the satellite antenna unless you are working on an 18" (45cm) antenna focused on one satellite (even then it won't be easy).

What would I recommend then? Please remember that I am not trying to sell anything. I am just trying to eliminate a source of frustration for myself and the one working with the satellite antenna. First of all, you need a way to accurately and precisely measure angles. An inexpensive inclinometer will take care of this nicely. Many have gone the extra step and gotten a tool precisely set for their exact location such as Gourmet Entertaining's "ARC-SET" shown at right. As good as this is, it can be misused. Jim Roberts of Gourmet Entertaining said that his tool is only made to be used within 50 miles (80km) of the specified location. Also, it must be put on the correct surface. Otherwise, you will not get an accurate setting.

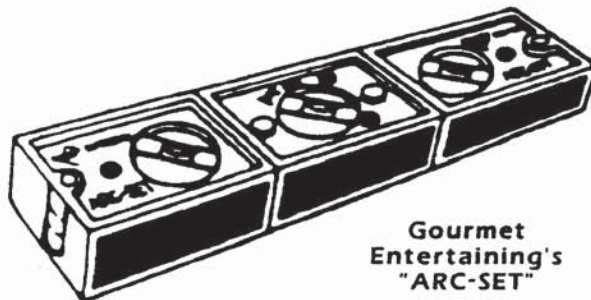
Next, you need to know when you have peaked the signal reaching the feed electronics. A television is just not adequate for this. Many signal strength meters are available that are relatively simple and inexpensive such as Gourmet Entertaining's "CANARY" shown at right.

Gourmet Entertaining's "CANARY"



Also, it is very helpful to have on hand a voltage meter for troubleshooting purposes. If something isn't moving, it is nice to know if the power is actually getting to the actuator or drive motor. All the alignment in the world won't help bad wiring or a bad cable run. Another tool that I find very helpful is a centering tool. This is especially valuable when working with larger antennas. The bandwidth is so narrow and the center of the reflector is so far away. If the feed electronics are pointed even slightly cocked (not straight), you won't get a good signal. Also, a good compass is not to be forgotten.

These and other tools may seem to be expensive, but when you total up all the unnecessary time and frustration that comes from doing without them, I personally feel that they are worth it in the long run. If you obtain the proper tools and use them as they are designed, you will have gone a long way towards getting and maintaining a good satellite signal. That's the whole purpose of getting a satellite receiving system, isn't it?



Gourmet Entertaining's "ARC-SET"

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DEALING WITH EXTREME ENVIRONMENTS

This is a subject that covers a quite a broad range: from simple convenience (not wanting to go out and operate a manual actuator at -80°F [-62°C]) to the very critical (maintaining your only link to the outside world). The above scenarios were selected from real-life situations. While these are special challenges, I think that most can empathize with wanting to stay inside at -80°F (-62°C).

It is true that there are a variety of ways to deal with challenges posed by extreme environments. Still, the best way (although certainly not the cheapest) to combat any extreme environment is probably the radome. Basically, this is a geodesic dome designed to cope with harsh weather such as temperature extremes, blowing sand or dirt, salt spray, freezing rain, etc. Being geodesic means a roughly spherical shape using a framework of geometric patterns such as triangles or hexagons. What having a radome means is with minimal signal loss (it isn't possible to be totally transparent to all signal transmission), you can eliminate buffeting, corrosion, etc. that can degrade or destroy your signal. True, it is expensive, but when you compare it against the cost of continually repairing or replacing a system that may not function all of the time, it may be considered cost-effective by some.

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What if you (like most of us) simply don't have a budget that allows for this? There are still adjustments that can be made. The example I mentioned earlier about moving the antenna at -80°F (-62°C) refers to a cable system operator who didn't think motorized drives such as actuators could work reliably at that temperature. I passed along to him a suggestion that several have recommended to me. Replace the lubricant with one designed for extreme cold. For example, Lubriplate puts out a lubricant designed for small motor applications that is tested to be reliable at -70°F (-57°C). This suggestion would be helpful even for those who only deal with -20°F (-29°C). (See my 4/95 Technical Support Newsletter.) A heavy-duty actuator is also vital because of the extra resistance these conditions add to the mount.

Of course, there are simple common sense practices: such as anticipating bad weather and stowing the antenna, strengthening the antenna and making it more resistant to corrosion, and regularly inspecting and maintaining the antenna. (See my 5/96 & 9/96 Technical Support Newsletters.) So for those who have to live in areas with extreme environments (or surprisingly, even prefer to do so), I will continue pass along what I have learned. Keep the tips coming, for I appreciate them.

CHECK OUT OUR UPGRADED INTERNET WEB SITE

I love something that saves me work. Back in January, Paraclipse established a web site. Since then, it has been upgraded to provide more of the information that people have been requesting. It will answer the following questions: What product lines do we offer? What are the advantages and specifications of each one? What do they look like? What retrofits are avail-

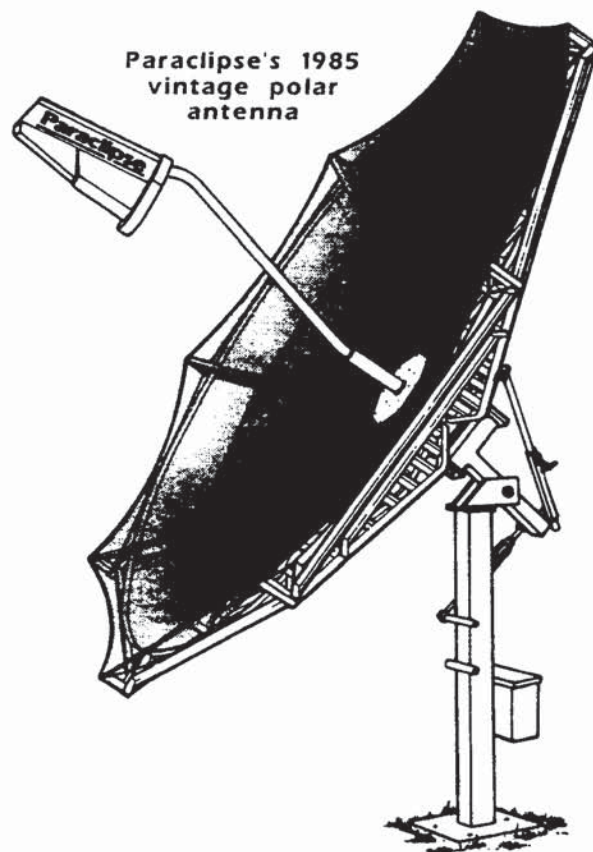
able for older Paraclipse antennas? How can specific antennas be identified? What is the latest Technical Support Newsletter covering? What topics were covered in past Technical Support Newsletters? What innovations has Paraclipse come up with recently? If these or other questions are bugging you, log onto www.paraclipse.com and check it out.

ARGUMENTS AGAINST BUTTONHOOK FEED SUPPORTS

Tens of thousands of Paraclipse satellite antennas were sold in the 1980's with what is now a very obsolete feature, the buttonhook feed support. While it was sufficient in its time, the crowding together of satellites and the popularity of other signal frequencies have pushed it into the outmoded category. As a result, Paraclipse switched over to feed support poles bolted to the ribs (with a special feed adjusting plate on the larger antennas) in 1991. Also, we have been actively encouraging owners of antennas manufactured before 1991 to upgrade.

Why are we making this effort? It doesn't make much sense to obtain a quality antenna and to cancel out what is gained by poorly locating the feed electronics. True, the feed support poles block slightly more of the signal than the buttonhook, but this is more than compensated by the superiority of precision location of the feed electronics. Even if the buttonhook feed support puts it in the proper location at the beginning, the buffeting it receives from natural forces knock it off. Also, other forces such as rust and metal fatigue can gradually shift it over time. True, it can be tied down with guy cables, but we have found these to be inferior to feed support poles.

The above points are very useful on C-band frequencies, but they are critical on Ku-band frequencies. (See my 1/96 Technical Support Newsletter.) As a result, buttonhook feed supports are not available for replacements at Paraclipse, but we do offer retrofits for all of the buttonhook antennas we have made.



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