

OBSESSION TELESCOPES®

Using your 15", 18", 20", 25" Obsession Telescope

CONGRATULATIONS!

You have purchased one of the finest large aperture, portable telescopes made in America. You are probably excited and want to set it up as soon as possible so you can have "first light". **WAIT, BE PRUDENT.** Take a Saturday or Sunday when you have time and assemble your telescope in the day light. Be sure to read all the instructions completely. Center dot the primary and install it correctly in the cell. Collimate the scope. Practice set-up and take-down in the daytime. After a couple of trials you'll find you can do it in a few minutes. Don't rush it! You'll only damage your telescope, hurt yourself, or suffer poor images due to lack of collimation. Read this paragraph again.

INITIAL ASSEMBLY

MIRROR BOX AND ROCKER

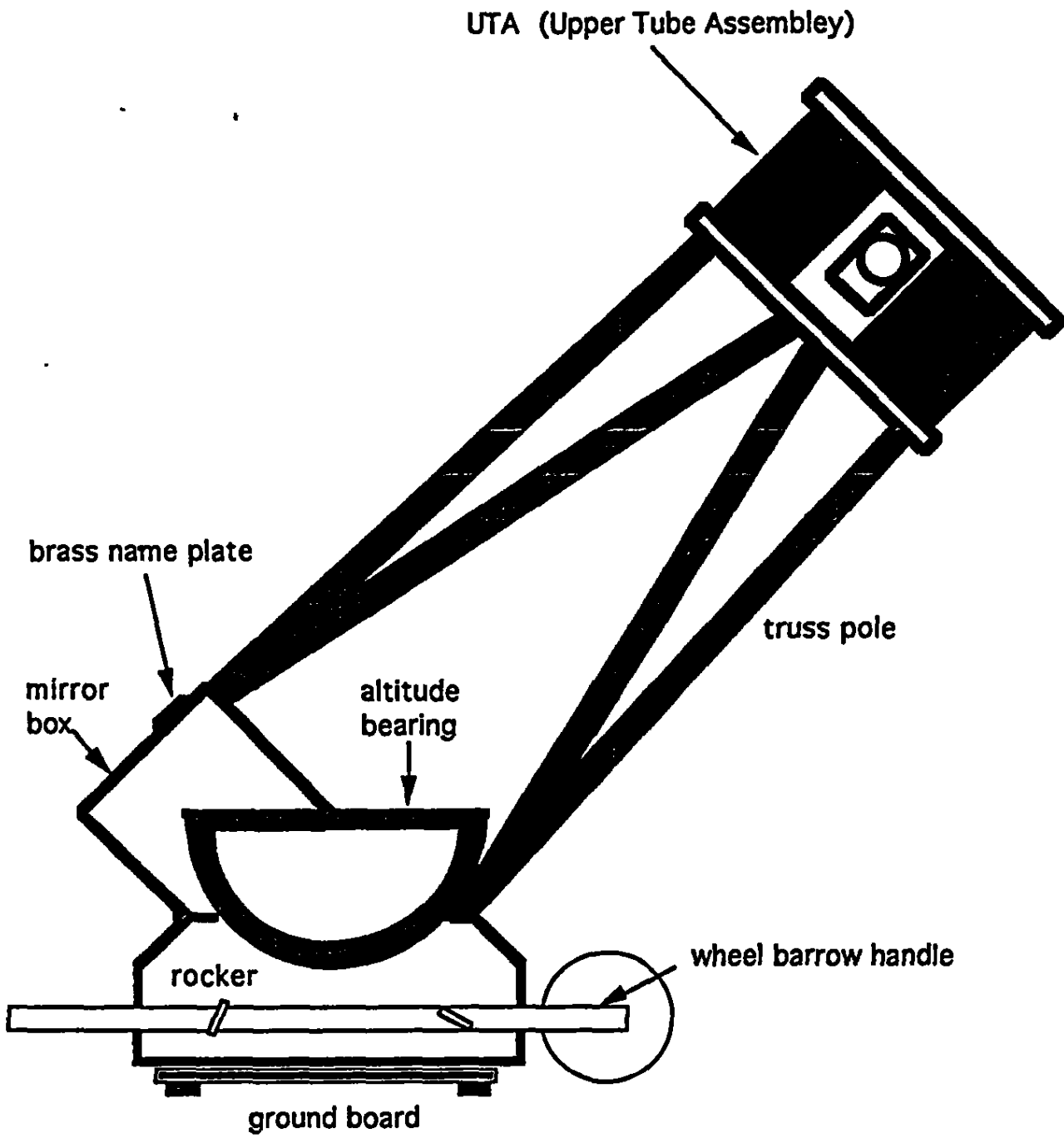
Before you begin, now is a good time to give all the varnished wood surfaces of the scope a wipe down with Armor-all to help protect the finish. Armorall is available at most hardware/discount stores in the automotive department. It is a silicone spray that also protects wood finishes very well. Don't worry if it gets on any other scope components, just buff it in. Attach side bearings to mirror box. Tighten cap nuts (screws on 15" and 18") until snug but do not overtighten. Install the carriage bolts in the eight split blocks on the mirror box from the inside of the mirror box. The black knobs and washers go on the outside on the split blocks. Seat all eight carriage bolts fully by tapping the heads with a hammer from inside the mirror box. The flat surface of the bolt heads should be contacting the inside surface of the mirror box. If the carriage bolts are not seated completely with a hammer, the bolt will turn instead of the black knob when tightening. Place the mirror box in the rocker such that it can rotate about the side bearings. If it won't, take it out, turn it around 180 degrees and put it back in.

CENTER DOT THE PRIMARY

Before installing the primary mirror, you should "center dot" it. (use one of the black self-adhesive circles (rings) in the tiny plastic envelope). This is very important as collimation is impossible without it. The exact center of the mirror has usually been located for you with a cross (+) etched into the glass. Just center the black collimation ring on the cross in the center. The ring is left on permanently. Do not be concerned about getting fingerprints on the mirror when applying the ring. Your fingerprints and the ring are well within the shadow of the secondary mirror anyway. If your mirror doesn't have an etched cross you will need to locate the center by making a simple paper template. Take a piece of gift wrapping paper a few inches bigger than your mirror. Set paper on the kitchen table. Set the mirror (reflective side up of course) on top of the paper and trace around the base of the glass with a pen or pencil. Put the mirror aside. Cut out the round disk on paper.

Fold it in half aligning the edges evenly a crease the fold. The fold it in half again making sure the edges are aligned evenly and crease the fold. Now open up the template. The center is where the creases intersect. Take a pin or sharp object and make a tiny hole at this point. Lay the template on your mirror. Align the edges of the template with the sides of the mirror evenly. Take a black felt tip pen and press it on the pin hole in the paper transferring a little ink thru the paper onto the glass. Remove the paper and apply the little black ring around this ink mark.

BASIC TERMINOLOGY



INSTALLING THE PRIMARY MIRROR

Loosen the nuts on the two bolts that the sling connects to. Lay out the sling so it loops unraveled around the two lower pins (the grey plastic dowels) out of the way. You will need to pull most of the sling off the bolts to do this. Be sure you don't pull it off the bolts completely though.

Tighten the nuts on top of all three grey pins (under each mirror clip) until snug. Loosen the locknuts on top of the mirror clips and turn them aside so you can install the mirror.

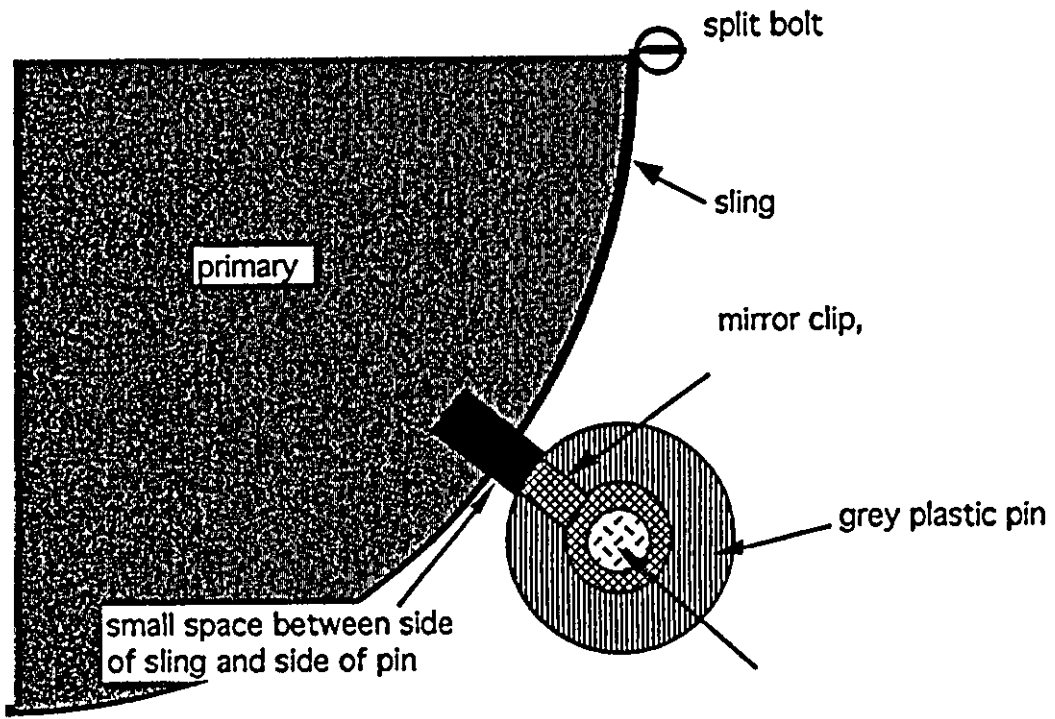
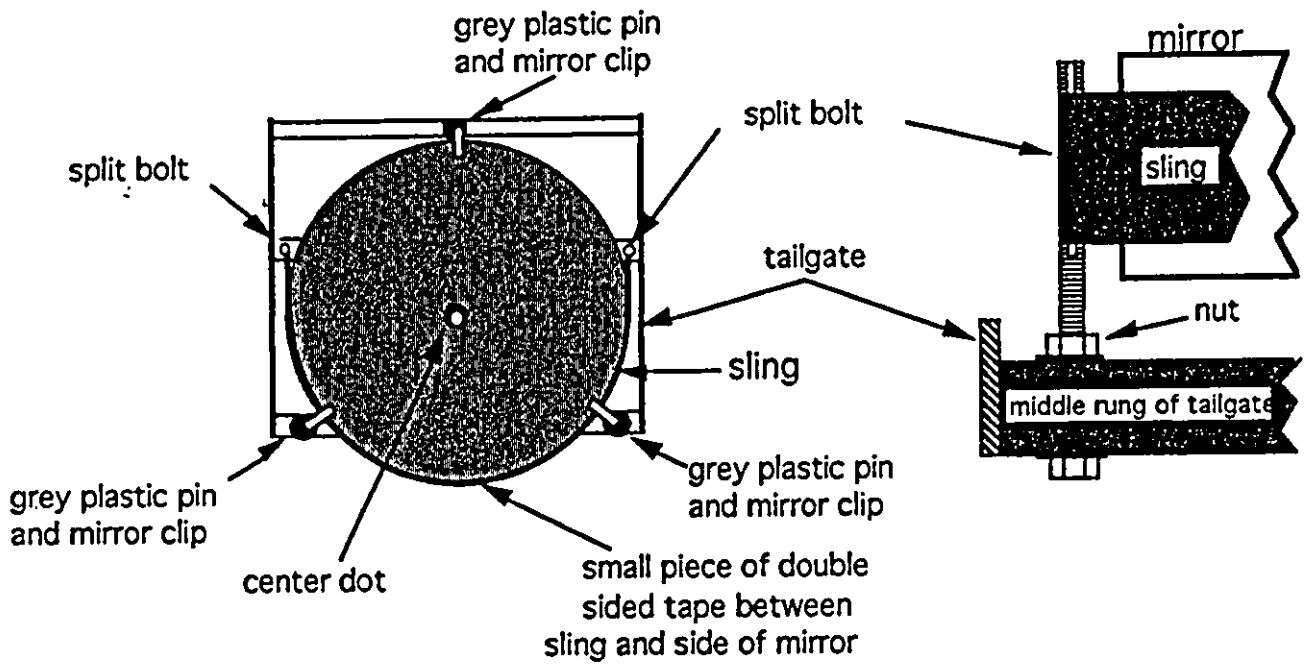
Place your "dotted" primary in the mirror box and center it. Now slip the sling up and over the two lower pins and mirror clips and place it in ~~between~~ the side of the mirror and the side of the two lower pins leaving it slack. Place a short piece of double sided tape (found inside the little plastic envelope) on the side of the mirror where it will contact the bottom of the sling. Wrap the sling around the mirror loosely. Attach the sling to the double sided tape in the middle of the side of the mirror so there is 1/4" of glass above and below the sling. The tape only helps hold the sling to the mirror so it doesn't slip off when the telescope is in an upright position. Leave the sling loose. You will adjust it after the scope is fully assembled.

NOW-BE VERY CAREFULL, DON'T DROP A WRENCH ON THE MIRROR! Place some newspaper or a clean bath towel on top of the mirror when using wrenches in the mirror box to protect it. Position the mirror clips over the mirror and tighten the locknuts. Don't drop the wrench on the mirror!

Notice that the function of the three pins is solely to keep the mirror captive in the mirror cell during transportation of the telescope (when your car is bouncing down the road or when you roll the lower unit around with the wheelbarrow handles). They must be completely non-contacting in actual use. If the primary is contacting a pin you will need to adjust the sling. Failure to remedy this will make it difficult to turn the collimation knobs on the tailgate and also warp the mirror slightly degrading the image. When the mirror is centered in the box it should not touch any of the three pins. After the sling is adjusted the mirror will be suspended and there will be a small space between the side of the mirror and the pins. More instruction on this subject will follow under sling adjustment. Obviously the mirror clips are always non-contacting and only serve to "catch" the mirror in the event that the mirror box is accidentally dumped over. Put the dust cover on the mirror box. Notice, your mirror remains in the mirror box permanently.

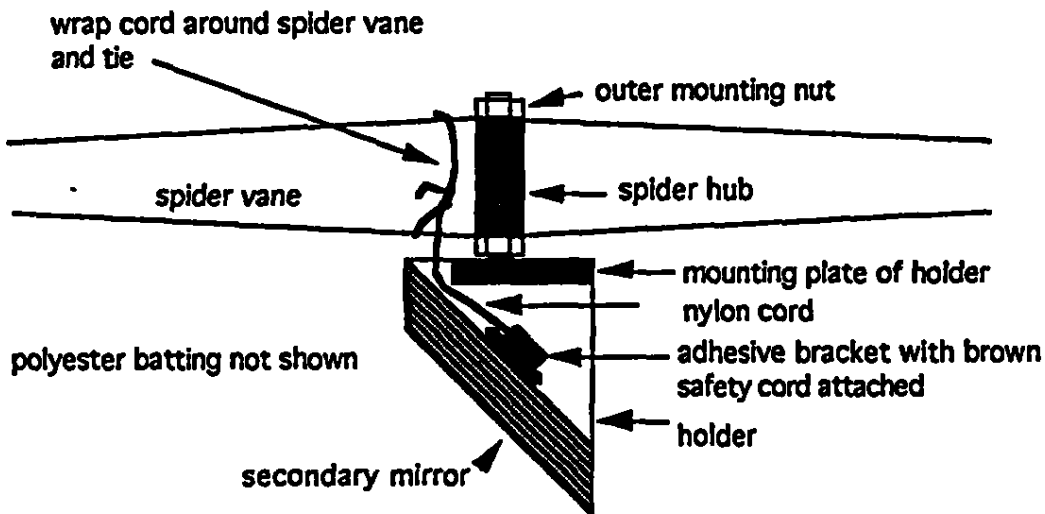
SQUARE THE FOCUSER (UTA means Upper Tube Assembly)

It's a good idea to square (collimate) the focuser. It's easy and fun. You will need an inexpensive cross hair collimation tool or a laser. Set the UTA on the kitchen table. To accurately locate the center of the focuser you will need to install a cross hair collimation tool in the focuser backwards, that is, from inside the UTA. (If you have a laser install it normally from the outside and leave it turned off) Now with a ruler, measure from the top edge of the UTA down to the peep hole to the cross hair tool (exit hole if laser). Remember this distance. Now, go directly opposite the focuser and measure down the same distance with the ruler. Paint a white dot on the inside of the black plastic of the UTA. The white dot needs to be directly opposite the focuser and exactly the same distance from the top edge as the center of the focuser. Remove the cross hair and install it in the focuser the normal way, that is, from the outside of the focuser. Look through the cross hair tool and sight across to the white dot. Loosen the four focuser mounting screws slightly. (use the small allen wrenches found in the tiny plastic bag that came with these instructions) Adjust the four alignment screws around the focuser until the cross hairs center on the dot. Laser owners simply turn on the beam and adjust the screws until the beam hits the dot. Tighten mounting screws and recheck your work.



INSTALLING THE SECONDARY MIRROR

You do not need to have the scope set up to do the following. All you need is the Upper Tube Assembly (UTA). Remove the secondary holder from the spider.



Safety cord installation for 18, 20, 25, 30, and 36" Obsessions. If you install a heat rope the two ends exit the holder along with the safety cord.

Note: the 15" Obsession mounting plate has a hole drilled in it for the cord and heat rope.

Before installing the secondary mirror attach the safety cord. Secure the small square self adhesive bracket with its brown cord to the back of the secondary mirror. Remove the four tiny screws attaching the holder sleeve to the mounting plate. Remove the holder sleeve from the mounting plate. Slip the mirror into the sleeve. Place the white polyester batting over the back of the mirror inside the sleeve. (It keeps the mirror gently seated in the lip of the sleeve). Re-attach the holder sleeve to the mounting plate with the four tiny screws, running the cord out the back of the holder sleeve through the narrow space between the glass and the mounting plate. (or thru the hole in mounting plate on 15" scopes only) Install the assembly into the spider hub. Tie the other end of the cord around one of the spider vanes. See drawing (note, the three white tubes, long screws and brass nuts not shown for clarity.)

This safety cord will "catch" the mirror should it slip out of the holder and prevent it from falling onto the primary, an obvious catastrophe. In addition, by attaching the cord to the spider vane it can catch the entire mirror-holder assembly should you forget to secure the outer mounting nut properly.

Novak secondary holders are the best in the industry. They are designed to "loosely" hold the secondary mirror so it is not warped. We have never had a mirror slip out yet. However with the severe bouncing some of our scopes are getting inside trailers and other vehicles traveling over rough terrain on the way to remote dark sites, the potential for mirror dislodgement is real. Be smart and attach a safety cord. An ounce of prevention may save your primary!

Heat Rope. A good way to prevent dew from forming is to use the enclosed "heat rope". Lay it out on the back of the secondary in between the glass and the polyester batting. Exit the wires out of the secondary holder between the back of the mirror and the aluminum mounting plate (or through the little hole in the mounting plate on 15" scopes only). Run a pair of wires (cheap lamp cord works well) up one of

the truss poles to the UTA for power. Use only a 12 volt power source. 12 volt Gel Cells like the Porta Pak sold by various outfits listed in Sky and Telescope and Astronomy magazine work the best. The wire will only prevent dewing, it can't remove dew. Connect one end of the heat rope goes to the positive and one end goes to the negative side of the battery.

Using a sight tube in the focuser, adjust the position of the secondary holder so that the outline of the secondary mirror is concentric with the outline of the sight tube barrel. If you use a laser collimator, adjust the position until the beam hits the dot on the glass. After you have the secondary positioned under the focuser, tighten the nuts on each side of the spider hub firmly. Now check your work to confirm that the secondary mirror is secure in the holder and that the holder is secure in the spider. You don't want anything falling off some night even with a safety cord! It's also prudent to inspect the secondary mirror assembly nightly.

Note. It is not necessary to offset your secondary mirror. Doing so makes collimation difficult. Your secondary mirror is large enough to accept the full cone of light from the primary.

SLING ADJUSTMENT

You cannot adjust the sling until the telescope is fully assembled. Set up the telescope as instructed below under "set-up" and return to this section later. Protect your primary. Be sure you put the mirror clips over the primary and the dust cover on the mirror box before you set up! Rotate the fully assembled telescope down towards the horizon but not completely horizontal, just enough so you can comfortably gain access to the back of the tailgate (the black steel framework that supports the mirror cell). From the back of the tailgate confirm that the sling is around the mirror properly. (If not or if the sling is twisted you will need to rotate the scope to vertical, remove the dust cover and reach in through the truss and into the mirror box to correct it). It is imperative that your large aperture mirror be suspended in the sling. Right now it is resting on the two lower grey plastic dowel pins. When the mirror rests on these two pins you cannot collimate the primary, in addition the mirror will deform slightly around the pins distorting the image. To suspend the mirror, first wrap at least a turn or two of sling material onto the left sling bolt and then lock the bolt. You will need two wrenches to do this. Simply rotate the head of the bolt with one wrench and with the other, reach in to the opposing nut on the other side of the tailgate and lock it tight. Remember you should be doing this from the back of the tailgate and not through the top of the mirror box. Now go over to the sling bolt on the right side. Loosen the opposing nut. Now rotate the bolt drawing up the slack in the sling until the mirror raises off of the two lower pins. Raise the mirror until it almost touches the upper gray pin. Lock the bolt in this position by tightening the opposing nut the same way you did on the left side. Check to see that both split bolts have the sling wrapped on the same side of the bolts. That is, both bolts should have the sling wrapped on the outside away from the mirror or both bolts should have the sling wrapped on the inside towards the mirror. It doesn't matter as long as the sling is the same on both bolts. Otherwise if the sling is on the inside next to the mirror on one bolt, and wrapped on the outside away from the mirror on the other, the mirror will always want to shift to the side. Now check to determine that the mirror is truly suspended by pushing on the back of the glass with your finger tips. With the scope in a nearly horizontal position you should be able to push the mirror off of the floatation cell triangles quite easily. Check to determine that the primary is supported properly in the sling occasionally. **At the start of each observing session it's a good idea to rotate the scope down towards the horizon and let gravity

center the primary in the mirror box so it's not contacting either of the two lower side pins. ** You may need to adjust the sling once a year to allow for normal stretching or if there is a large change in air temperature from season to season in which case the sling will shrink or expand slightly.

SET-UP AND TAKE-DOWN IN THE FIELD

SET- UP

Note: "UTA" means Upper Tube Assembly

Attach the wheel barrow handles to the rocker sides. Always attach the handles so that the brass name plate is facing you when you lift. If you put them on the other way the mirror box will tilt out over the wheels as you lift possibly slipping out of the rocker and crashing to the ground. Lift and roll the entire lower unit (mirror box, rocker, and attached ground board) out onto a flat level surface. Remove the handles. STOP!!! The primary mirror must be in place before you continue. If you have not inserted the primary do not assemble the telescope. NEVER ASSEMBLE THE TELESCOPE WITHOUT THE PRIMARY IN THE MIRROR BOX. It will be grossly out of balance and crash. And of course make sure the dust cover is on. Its a good idea to have a friend help you with set up the first couple of times until you are confident you can do it alone. Insert the eight truss poles into the wood split blocks on the mirror box and gently tighten the knobs . Put the two poles with the shorter black foam (20" only, on the 15", 18" and 25" they are all the same and interchangeable) adjacent to the aluminum side bearings, otherwise the poles are interchangeable. Always put the same ends of the poles into the blocks, (the ends marked with the black ring). This is because the ends of the poles that attach to the UTA can be deformed slightly from the wedge pressure so you'll always want to keep those ends out of the maple split blocks on the mirror box. Note: insert the poles fully into the split blocks. The black ring is NOT a depth mark. The black ring is only there to show you which end of the pole goes in the blocks.

Place your ladder next to the scope but far enough away so that it will just clear the rocker base when it is rotated. Prepare the UTA (Connecting Ring, CR on the 30") for placement by checking to make sure the cylindrical nuts in the four cam levers are even with the ends of the flat ended bolts. If not, rotate the levers until they are. Stop. Is the dust cover on the mirror box? It better be. With the four wedge-clamp assemblies dangling by their cords, carry the UTA up and set it on top of the truss poles. Be very careful! Don't bump the secondary on the pole tips. Always leave the wedge-clamp assemblies dangling from the UTA by their cords when you carry it up. Now make sure the UTA is sitting on top of all eight poles evenly. Also make sure it is positioned where you want the focuser. At night, it helps to hold a small flashlight in your mouth so you can use both hands freely and still see what you are doing.

After the UTA (CR on the 30") is in place insert a clamping wedge in between the two truss poles. Push the flat ended bolt (with the cam lever attached to the bottom end) up through the hole in the wood and insert the hitch pin through the hole in the flat ended bolt. Throw the cam lever. You will usually have to adjust the cam lever on the bolt some to achieve a snug fit with the wedge. Simply disengage the lever and rotate it a turn up or down and flip it up again. Don't jam the wedges too tight or it will be difficult to remove them when you are finished observing. Now grasp the lower wood ring of the UTA and slowly rotate the telescope in azimuth until the next clamp wedge assembly is in front of you. (on the 15" and 18" simply walk around the scope to the next clamp assembly) Engage the clamp and rotate the scope 90 degrees again. Repeat until all four wedges are firmly clamped in place.

Again, have someone help you initially until you are confident you can do it alone. If it is windy, be

extra careful. Also use a good quality ladder. A 6 foot ladder is best for a 20", an 8 foot for a 25", 10 foot for the 30", and 12 foot for the 36". A small step stool with lean bar for the 18". (No ladder needed for the 15") The top half of the ladder is not used to stand on obviously but to lean on so you don't lose your balance. With a little practice set-up takes only a few minutes.

TAKE-DOWN

Put the dust cover on the mirror box. You don't want to accidentally drop something onto the primary during take down!!! Remove the eyepiece and Telrad and anything else that may fall off. Remove the light shroud if necessary. Now rotate the telescope to a vertical position. Place your ladder next to the scope but far enough away so that it will just clear your ladder when it is rotated in azimuth. Release the cam lever nearest you and pull out the hitch pin. Rotate the scope in azimuth 90 degrees and release the next cam lever and pin. (Again on the 15" and 18" simply walk around it to the next clamp) Do this until all four cam levers and hitch pins are released. Grasp the lower wood ring of the UTA (CR on the 30" after the UTA has been removed and the scope safely rotated to vertical) with one hand on each side and shake firmly with a twisting motion. All the clamp assemblies will drop out and dangle by their cords. Confirm that all four clamps are fully released and dangling. If not shake again. Lift off the UTA (CR on the 30") and carry down the ladder. Take care not to bump the secondary. Remove the eight truss poles. Attach the wheel barrow handles so the brass name plate is facing you when you lift and roll away. After a little practice take-down will take you about three or four minutes.

NEVER REMOVE THE UTA (CR on the 30") UNLESS THE TELESCOPE IS IN A COMPLETELY VERTICAL POSITION. Removing the UTA (CR) with the telescope at an angle will cause the lower unit and truss poles to rapidly rotate to vertical with possible injury to you or your optics.

LIGHT SHROUD

The black ripstop nylon light shroud is placed over the fully assembled telescope. Before you attach your Telrad, eyepieces, or anything else to the UTA. Rotate the scope down to a comfortable height and slip the light shroud over the end of the fully assembled telescope like a sock. Make sure the focuser is racked in completely. Carefully tease the end with the draw string over the focuser. Align the shroud as you slip it on so the upper draw string slider will be hanging down, that is, facing the ground. The embroidered emblem should end up just above the focuser. Loop the two continuous bungi cords around the top two wooden blocks on the mirror box. The two cords with the hooks are threaded through the side bearings then stretched around the blocks on the 20", 25", 30", and 36" scopes.

(Note. On the 15" and 18" Obsessions the bungi cords on all four corners loop around the blocks. The cords adjacent to the bearings simply pass between the bearing and the mirror box.) After the cords are secure adjust the tension at the opposite end with the draw string and slider. It may be necessary to tighten the draw string as the night air cools or if there is a substantial amount of dew. This is because the nylon fabric expands at lower temperatures.

Before removing the light shroud remember to take the eyepiece out of the focuser, rack it in all the way, and remove the Telrad. Dry the shroud after it gets wet from dew in a standard clothes dryer on air fluff or very low heat. Do not use the regular setting or the fabric may melt.

It is a good idea to loosen the draw string and release the four lower bungi cords if you leave the scope assembled in the daylight. This will reduce the stress on the fabric and the seams as the shroud will

contract in the hot sun considerably.

You may need to initially adjust the bungi cords the first time you install the shroud to attain the desired fit. Simply retie the knots. Also it's a good idea to gently singe the frayed ends of the cords with a cigarette lighter. Careful, don't burn the fabric!!!!

HELPFULL HINTS AND TROUBLE SHOOTING

FOCUSER IN-TRAVEL INSUFFICIENT

Obsession Telescopes are designed to perform best with the newer types of 2" wide field eyepieces such as the Naglers and Panoptics by Tele Vue. Almost any other type of 2" eyepiece will work but you may find you cannot get the focuser racked in far enough to focus! Don't worry. You simply need to customize your telescope to the set of 2" eyepieces you have. (for 1 1/4" eyepieces that won't go in far enough, simply order the "ultra low adaptor" for 1 1/4" eyepieces from Astrosystems, 970-284-9471) You do this by trimming the ends of the truss poles. For 2" eyepieces only, you trim until the eyepiece that has the most in-travel in your set just forms a focused image when the focuser is racked in completely. Make sure you have pushed the eyepiece into the focuser barrel completely and that the focuser is racked in completely and again be sure you are using the 2" eyepiece with the most in-travel. Trimming the poles is easily done with a "tube cutter" available at most hardware stores for \$20. Most hardware stores have a tube cutter on hand that they use to cut pipe for their customers and they will probably do it for you if you ask them nicely. Be sure to shorten all eight poles equally! I recommend removing only 1/4" at a time until you reach the focus. Again, if its only your 1 1/4" eyepieces that won't reach focus simply order the adaptor from Astrosystems.

OUT-TRAVEL INSUFFICIENT? Simply order a 2" extension tube

BALANCING THE TELESCOPE

Your telescope is balanced to handle a Telrad and most 2" eyepiece. However if the scope drifts up when you change eyepieces you may need to fine balance your telescope by adding a little weight to the UTA. There are many ways you can do this. If you are really close and are just a tiny bit bottom heavy, try putting an extra set of batteries inside the Telrad to make it perfect. Whatever you do, make sure you secure any weights to the telescope firmly so they can't come loose and drop onto the primary!

Some eyepieces on the market today are extremely heavy such as the 35mm Panoptic and 20mm Nagler. It can be tricky balancing the scope with such a vast range in eyepiece weights. Add weight to the UTA until the scope almost drifts up when there is no eyepiece in the focuser. Don't give up. A properly balanced smooth moving telescope is a joy to use.

It will be necessary to add weight to the bottom of your telescope if you want to install a traditional finder scope to the UTA or if you often observe with very heavy eyepiece-barlow combinations. This is easily accomplished by ordering our counterweight kit. (See last page of this document).

FINDER SCOPES

Almost any type of finder scope available can be attached to the side of the mirror box (the side with the brass name plate). The balance will be affected slightly necessitating a little more weight at the UTA. You cannot install any other finder scopes to the UTA except a Telrad. Doing so will make the telescope top heavy. If you want to add a traditional finder you need to add about 5 pounds of weight to

the tailgate for every pound you add to the UTA. Don't under estimate the Telrad. Many observers including myself can find ourselves around the sky quite well with only a Telrad (and I use a 25"). Attach your Telrad base to the aluminum cage strut above the focus board with cable ties found at most hardware stores. A good atlas for use with the Telrad is the "Mag 6" from Edmund Scientific. Or better yet get Sky Atlas 2000, a super star chart and the choice of most deep sky observers. It can be purchased already laminated. The lamination protects them from dew and permits you to write on them with a grease pencil that can be wiped off later with a towel.

Now if you don't like to spend time "finding" objects then order digital setting circles. The NGC-MAX by JMI is incredibly accurate and easy to use. It has over 12,000 deep sky objects and all the planets in memory! Expanded object descriptions tell you what you are observing. Even a fanatical star hopper like myself enjoys using it. Call me to order so I can customize the mounting hardware to your Obsession.

SET-UP

Always put the dust cover on the mirror box when setting up or taking down the scope. That way you won't drop anything on the primary. Make sure your Telrad is secure and all four clamps are secure before removing the dust cover. Always remove the your Telrad, eyepiece or anything else that may be dislodged from the UTA before take down.

Remember to always put the same ends of the poles into the blocks, the ends marked with the black ring. This is because the ends of the poles that attach to the UTA can be deformed slightly from the wedge pressure so you'll want to keep those ends out of the maple split blocks on the mirror box. Remember to use the two poles with the short foam adjacent to the aluminum side bearings, otherwise the poles are interchangeable.

Use a good quality ladder to set-up and observe. Obsession Telescopes are huge world class instruments. Have someone help you carry the UTA up and attach it to the truss poles until you are sure you can do it by yourself. At night, hold a small flashlight in your mouth so you can use both hands freely and still see what you are doing. Use the longest ramps possible to roll the lower unit in and out of your vehicle. 1x12 clear pine works very well. Clear means no knots, ask for it by name. Ramps made of clear 1x12 pine are very strong, wide enough that you won't roll the lower unit off the side and are flat so they store easily. You'll pay more for clear pine but now's not the time to be frugal! (30" to 36" inchers should use 2x12's) ****Bring along an extra 1/4-20 wing nut in case you loose a cam lever on the UTA in the grass.****

TAKE-DOWN

After removing the UTA when you are done observing, its a good idea to spin the cam levers up on the flat ended bolts a bit so you won't loose a lever in the field. Remember though, to return the cam levers to the ends of the flat ended bolts before you set-up the telescope the next time you observe. A convenient place to store the cam lever wedge assemblies is upside down in the holes on the UTA. Remember to remove them and let them dangle by their cords before set-up though.

Remember to always attach the wheel barrow handles to the rocker so that the brass name plate is facing you as you lift. Rotate the tires on the handles every 5000 miles.

During transportation, always position the lower unit (mirror box and rocker base) so that the brass name plate faces the back of your vehicle. This allows the rocker to prevent the mirror box from slipping forward out of the rocker in the event of a sudden stop and the sides of the rocker can retain the mirror box when you drive around corners.

TRUSS POLES and SPLIT BLOCKS

Because wood breathes it changes dimension with changes in humidity and temperature. Your particular part of the country may have a significantly different climate than in Wisconsin where your telescope was built. As a result, the truss pole tips may not line up into the aluminum poles seats on the UTA making placement difficult. You can easily correct this. Place the poles in their split blocks and tighten the black knobs. If a particular pole needs to be corrected loosen the four screws on that block with a phillips head screw driver and place a paper or thin cardboard shim under the block. Put the shim between the top screws to shim the pole tip out and by the bottom screws to shim the pole tip in.

Sometimes a split block won't close enough to clamp the truss poles securely. Again this is a result of the difference in climate between you and me. You will need to either line the inside of the hole with a few layers of polyurethane using a small brush or you can put a layer of tape around the pole end. Mark the pole and remember which block it mates to. This problem is minor and unavoidable because it is impossible to fabricate the blocks to match all the different climatic conditions that exist throughout the world. For sticky blocks try coating the poles ends with silicone spray. Remember to spray the ends of your poles well away from the scope so the aerosol won't contaminate the optics.

If your foam tubes slip up and down on the poles too much, apply a six inch strip of double sided carpet tape to the pole and slide the foam back on. A convenient way to store your truss poles is inside a length of "stove pipe" found at most hardware stores. Be careful not to gouge the foam when inserting them into it.

LIGHT SHROUD

If you did not purchase a light shroud from us you should make your own immediately or reconsider. The shroud is very difficult to sew and fit properly. It is an essential element in preventing image fogging and loss of contrast from stray light entering the truss assembly. It also keeps dirt off the primary when you climb up and down your ladder. Most importantly it deflects falling objects from crashing onto your expensive primary. Eyepieces, eyeglasses, filters, books, cigarette ashes, and curious children all have a great affinity for high quality paraboloidal optics.

It is a good idea to loosen the draw string and release the four lower bungi cords if you leave the scope assembled in the daylight. This will reduce the stress on the fabric and the seams as the shroud will contract in the hot sun considerably.

BEARING SURFACES

Two or three times a year apply ordinary "Armor-all" to the laminates on the bottom of the rocker base and on the side bearings to decrease the friction and make the motions smoother. Armorall is available at most hardware/discount stores in the automotive department. The resultant ease of motion is excellent. Clean the surfaces with Armour-all only. NEVER EVER USE ACETONE TO CLEAN THE BEARING SURFACES. ACTETONE, ALCOHOL, AND MANY SOLVENTS WILL DISOLVE THE BEARING SURFACES. Clean the bearing surfaces with Armour-all only and wipe dry. The scope will move very easily again. After observing in dusty conditions the teflon pads may become contaminated. The dust gets embedded in the pads making it more difficult to finely aim the telescope. To restore the smooth handling of the scope simply clean the dust off the pads with a little rubbing alcohol. (Do not use alcohol on the bearing surfaces tho) Then reapply the Armour-all to the bearings.

You can drastically decrease the resistance to turning the scope in azimuth (20", 25", and 30"

only) by shimming up the central "pivot" pad on the ground board. Have a friend help you lift the mirror box out of the rocker and set it on the ground. You can leave the mirror in the mirror box and yes, you can set the mirror box on the collimation knobs on the ground without harm. Be careful not to tip the mirror box when it is removed from the rocker and placed on the ground so as to avoid bumping the exposed portion of the primary. Next, remove the azimuth bolt with a socket wrench and slide the rocker aside. Put a couple pieces of cardboard under the center pad just enough to allow the scope to turn easily but not too much or it will become wobbly. Experiment until you achieve the desired friction.

PRECAUTIONS

NEVER EVER leave the telescope fully assembled and operational in the daytime unattended. Make sure the dust cover is on. Large aperture telescopes can start a fire in seconds should sunlight reflect off the primary. They will also set the UTA on fire in a moment if aimed at the sun. Unwary observers or someone passing by can sustain eye injury if they happen to catch the reflection. Children should never have access to your telescope to prevent them from trying to look at the sun. Do not attempt to project the image of the sun onto a piece of paper as many people do with smaller scopes. The light cone from the primary is so hot it will melt or set the UTA on fire. Please be careful.

Obsession Telescopes are quite large and care must be taken when leaving them outdoors unattended as most observers do during the day at star parties, or when they take a nap after a long observing session. If you decide to leave your scope fully assembled and unattended keep in mind two things. First, other observers will probably try to use it, and second very large telescopes are especially vulnerable to wind. Even a mild breeze will push your telescope around like a giant weather vane. It is often wiser to take-down the scope if the weather looks threatening. Put the UTA in your vehicle. Remove the truss poles and leave the lower unit in the field covered with a blue or grey plastic tarp. The truss poles can be left out as they are weatherproof. If after it rains you set-up again, wipe any moisture or debris off the poles so it doesn't fall onto the primary.

Never wrap your telescope in clear plastic during the daytime. The greenhouse effect is quite severe and the black plastic light baffle in the UTA will melt. Worse, the glues in the plywood can gas out resulting in delamination. Never store the telescope components in a closed vehicle in the hot sun for more than a few minutes. Leave the windows open. Temperatures in a closed vehicle or under a clear plastic tarp can exceed 200 degrees in some parts of the country. Cover the telescope during the day with a blue plastic tarp available at most hardware stores. Don't wrap it so tight that air cannot circulate under it. This will also help prevent the primary from heating up considerably so you won't have to wait longer for it to equilibrate with the cool night air later.

IMPORTANT. When returning to the telescope after it has been left unattended, always check the clamp assemblies to make sure everything is secure and that nothing will come undone and fall onto the mirror. It is not uncommon for unfamiliar observers, children, or even skilled observers who should know better to "play" with your scope. Because you probably own the biggest telescope they have ever seen their curiosity takes over and they want to see how it works. A few moments of inspection can prevent significant damage.

Avoid moving a fully assembled scope around with the wheel barrow handles. It can slip out of the rocker unit and crash to the ground. It's okay to reposition the fully assembled scope a little to a flatter

observing spot or to roll it a few feet if necessary, but if you do, be sure to rotate the telescope to a semi upright position before lifting up on the handles. It's a good idea to have a friend keep a hand on the scope to steady it as you lift and roll everything with the wheel barrow handles. Most importantly, try not to lift up on the handles excessively. Be careful. And always remember to attach the handles so the brass name plate is facing you as you lift. Always transport the lower unit in your vehicle so the name plate faces the rear.

STORAGE & TRANSPORTATION

Obsession Telescopes are designed to be portable. They are broken down, transported back home, and stored disassembled. If you are fortunate enough to have an enclosed permanent site where you wish to leave the telescope fully assembled indefinitely, you should store it in a completely vertical position to relieve the strain on the truss assembly, spider, and on the sling.

In storage and transportation always set the UTA on the aluminum pole seats. That way dust won't collect on the secondary. More importantly, the secondary mirror holder and spider can withstand the strain of road bumps during transportation. This is especially true on scopes with secondary mirrors larger than 3.1 inches. These mirrors are heavy and need to be supported evenly around the lip of the holder during bouncy rides down the road. Hauling the UTA on its pole seats is the best way to keep the mirror secure. Failure to do so will result in a mirror slipping out of the holder or a bent holder. You have been warned.

Dew

Large aperture primary mirrors rarely dew up in use. They dew up in storage. Dewing is a chronic problem in the more humid areas of the country. Generally dewing occurs when the moisture in the air condenses onto the surface of the mirror whenever the temperature rises. This usually happens when the telescope is stored in a garage or shed. The mirror becomes cooled during the night. The sun rises in the morning rapidly warming the building. As the air inside the building (or vehicle) gets warmer it can hold more moisture which condenses out on the cooler mirror. This daily cycle can expose the coating of the primary to repeated dewing. The air pollutants in the dew (it's actually acid dew) will rapidly deteriorate the coating. The problem is that large mirrors have considerable thermal inertia, that is they lag behind the rise in air temperature. It's the reverse of the evening problem when you are waiting for your mirror to "cool down" as the night air drops. Dewing will especially occur in a trailer or enclosed vehicle like a van. Leave the doors or windows open so the sun can't warm up the air as much and park in the shade. In a garage or shed that has electricity, a simple 15 watt appliance bulb will prevent dewing very effectively. Place the bulb under the mirror in the rocker unit or attach it to the middle rung of the tailgate. Be sure to support it properly in a small fixture so it doesn't contact any wood. Don't use more than 15 watts. Higher wattage bulbs are overkill and can cause a fire. Leave the bulb on permanently in storage. The slight warming of the primary that it provides will prevent dewing. Put a "bulb extender" in the socket too. You can find them at most hardware stores for about \$2 and they will increase the life of the bulb many times. You won't get caught with a dead bulb so often.

Secondary mirrors generally dew up in use. This can be dried off by blowing warm air on it with an electric hair drier or 12 volt heat gun available from various suppliers. A good way to prevent dew from forming is to use the enclosed "heat rope". Lay it out on the back of the secondary in between the glass

and the polyester batting. Run a pair of wires up one of the truss poles to the UTA for power. Use only a 12 volt power source. Heat ropes also work great on Telrads and finderscopes. The wire will only prevent dewing, it can't remove dew. Now some clever fellow may approach you some night and say "doesn't the heat from the rope warp the secondary mirror". Who knows, maybe it does. But at least you'll be observing while he's waiting for a view through your scope because his dewed up!

FAN

All Obsession Telescopes are supplied with a 12 volt fan attached to the tailgate. Its purpose is to help cool the primary down faster after you set-up so you can enjoy deep sky observing sooner. Without it, it can take hours for your mirror to settle down. You will have to supply your own 12 volt power source. A car battery or Porta-pak work well. You can also attach rechargeable gel cell batteries to the tailgate of your telescope if you desire. This eliminates external cords to trip over. Turn the fan on as soon as you have set-up. While its running collimate the primary, have a cup of coffee, and review the nights agenda. Now turn the fan off. After about a half hour the 20" will have equilibrated to the air temperature sufficiently to give good images. The 25" will take longer. If you are lucky enough to have electricity at your dark site an ordinary house fan works even better. Just rotate the scope down exposing the back of the mirror and aim the fan at it. Be patient, the images will get better and better as the night goes on. Don't observe with the fan on though, it distorts the images.

If you decide to stop observing and take a nap, turn the fan on. It will help keep the glass the same temperature as the air if the night is getting cooler. Turn it off when you observe again. In cases when there is high humidity and you decide to leave the scope set up through the following morning as many people do at star parties, turn the fan on. (this assumes it won't rain!) It will help prevent dewing of the primary should the sun warm up the mirror box. Also line up the scope and rotate it down so that the rising sun will strike the back of the primary.

OBSERVING TIPS

Obsession Telescopes are extremely sensitive to light, any light. Deep sky objects appear brighter and more exciting the darker the sky because image contrast is a function of how dark the sky is. Urban light pollution greatly reduces the usefulness of the telescope. It's worth it to spend the extra time to travel to a truly dark site. You really do not know the potential of your scope until you do. Its like owning a Ferrari in the city. You can't let it run flat out until you're out in the country. Words cannot describe the feeling you'll get when galaxies, planetary nebulae and globulars come screaming out of the eyepiece. Get as far away from artificial lights as possible. Try using a or Oxygen 3 filter on nebulae, it's very effective. If the moon is 50% or more illuminated forget deep sky observing and go after solar system objects, the moon, double stars etc. On the brighter planets and moon try a neutral density filter to reduce the glare. Under good seeing conditions you'll find your Obsession Telescope works better at full aperture on the planets than with an apodizing mask.

Just as large aperture telescopes are very sensitive to light they are equally affected by the seeing conditions. A large scope cuts through a larger portion of the air mass than a small scope, hence you are looking through a larger section of the distorting air cells in the atmosphere. There is no cure for this, if the seeing is poor just grin and bear it and hope for a better night next time.

The best time to observe is from 1 AM until dawn. It gets darker as many lights are turned off after midnight but most important the seeing improves dramatically. That's because the temperature is stabilizing and the atmosphere is becoming more and more steady. If possible, set up your scope in the evening and then take a nap in your vehicle until 1 or 2 AM. You'll find yourself rested and more alert and the sky will reward you with the best it can offer.

Take the time to collimate your telescope. You'll be glad you did. Initially collimate it during the daytime using a Cheshire eyepiece and a sight tube. Once collimated the secondary is remarkably stable. You will have to collimate the primary each observing session. Use a Cheshire eyepiece or laser to do this. Turn the knobs on the back of the primary until the black dot of the Cheshire appears in the center of the black ring on the primary. With a laser, align the beam to hit the dot on the secondary. Alone it will take you a few minutes. With two people you can collimate the primary in a minute. A good reference is "Collimating your Telescope" in the March 1988 Sky and Telescope magazine. Laser collimators are also an excellent collimation aid. Lasers can be purchased from Obsession.

TRANSPORTATION SUGGESTIONS (to dark sites)

Although the Obsessions will fit in most minipick-ups or minivans you'll soon find out that loading and unloading is a chore. Anticipating the work involved with loading your scope, ladder, eyepieces, atlases, warm clothing, flashlight, etc can sometimes deter you from going out on a clear night. The solution to this is a small enclosed trailer. It's like a storage shed on wheels. A dedicated 8 foot trailer (about \$1500) will swallow your gear and has many important advantages. All your equipment is together and ready to go. Just hook up the trailer to your car. And when you return in the wee hours of the morning simply unhitch it. No need to offload everything when you're tired. In addition, all your gear can be locked up in the trailer where it is protected from kids, pets, dirt, and all the clutter that accumulates in many garages. Another significant advantage is the low load height that trailers offer. This is especially helpful when rolling the lower unit up and down ramps. And if you get tired during an observing session you can nap in your trailer quite comfortably.

There are many brands on the market. I personally own a trailer manufactured by a company called American Pace. Another excellent trailer with probably the best overall quality is available from an outfit called Wells Cargo. See their ad in the Yellow Pages under trailers. The deciding factor as to size is dictated by the length of your observing ladder. Bring it along and try it in the trailer before you purchase one. You will soon find that the telescope is the least of your worries, it's the ladder that takes up so much space. One more bit of advice. Specifically request a cantilever torsion bar suspension. It is much more stable. Ordinary leaf spring suspensions hop up and down to much tossing your equipment about.

CARE OF YOUR TELESCOPE

Your Obsession Telescope requires very little maintenance. Wash the optics only when they become truly soiled, generally once a year. Don't worry about the dust on them, it is not visually significant. Under conditions of high humidity or air pollution your optical coatings will deteriorate. This is unavoidable. All mirrors need to be recoated eventually.

Rain and dew (especially the "acid dew" some of us have) is the enemy of your telescope. If your optics dew up or get wet don't touch it! Let it dry off naturally or use a hair dryer or portable heat gun.

Never ever wipe off the optical surfaces to dry them. You will scratch the coatings. However, all the other surfaces of the telescope can and should be wiped dry with a towel after a heavy dew. Doing (no pun intended) so will prolong the beauty of the finish. A coating of Armor-all can be used to protect the wood and make it look good. Be sure you don't get any Armor-all spray on the optics! If you scratch or gouge the wood use a little Colonial Maple stain by Minwax on a Q tip to restore the color.

CLEANING YOUR OPTICS

Dust on the primary and secondary optical surfaces is generally insignificant. That's because the dust obscures only a tiny fraction of the total surface area. The benefit from frequent washings to remove the dust probably is negated by abrading the coatings. I recommend washing your optics only once a year (assuming you get out 24 nights per year). However after about a year, air pollutants that precipitate out on the coatings or heavy dust will eventually decrease the performance of your optics and you will then want to clean them. So resist the impulse to wash your mirror frequently just to remove the "dust". If it bothers you when you see dust on the surface of your primary, don't look at it!

Materials Needed

3 gallons distilled water
spritzer bottle
sterile cotton wadding (lint free type if you can get it)
dish detergent (only need a drop or two)
paper towels, facial tissue, or toilet paper
two bathtowels

The primary can be left in the telescope during washing! Yes it can be done this way and there is less risk of dropping it. Here's how to do it:

- 1 Place the lower unit (mirror box and rocker) on a flat surface so that the mirror is as level as possible.
- 2 Dissolve one drop of Dawn or Ivory dish detergent in one quart of distilled water. Don't be stupid. Use only one drop of detergent. More than a drop or two and you'll end up with a soap film on your mirror.
- 3 Assemble the telescope but don't put on the nylon light shroud. Tilt the scope down to about 20 degrees above the horizon and line the bottom of the rocker base with plastic film and/or a couple of heavy bath towels to catch the water. Lay them flat so that the scope can be easily rotated without the mirror or the lower collimation knob catching on the towels. (If you have installed an azimuth shaft encoder in the rocker unit for digital setting circles you must remove it to prevent water damage.)
- 4 Now crawl or reach inside the truss assembly and kneel before the primary. Using a clean spritzer bottle (like the ones used to wash windows or spray house plants) and distilled water, rinse off the mirror thoroughly to remove the heavy dirt particles. Just let the water run down the face of the mirror onto the towels below. Water from over spray will not harm the inside of the telescope wood. Just let it air dry later.
- 5 After the heavy dirt is rinsed off, rotate the scope to the straight up position so the mirror is as level as possible. Reach into the mirror box and fill the concavity of the mirror with the soap solution. About two thirds of the surface should be submerged. Using sterile cotton wads from a pharmacy, swish

the soap solution around and around in a circular motion starting from the center of the mirror working outward. Don't press on the cotton. The weight of the water soaked cotton dragging over the surface is all that's necessary. Do this washing step two or three times until the entire surface is clean. It's a good idea to change the cotton wad frequently. Don't worry about the solution running down the sides of the mirror over the sling and onto the mirror cell. The water won't hurt anything.

6 After the mirror is clean, rotate the scope down to about 20 degrees above the horizon again letting the soapy water run off onto the towels. Reach inside the truss assembly again and rinse off the soap solution completely by pouring distilled water over the face of the mirror starting at the top and working down. Copiously pour the distilled water right out of the gallon bottle onto the glass. Do this rinsing at least three times. After the water has drained off, gently blot up most of the water droplets with a few paper towels, facial tissues or toilet paper. Paper products are very abrasive so don't rub, just blot. Wipe off any remaining water droplets with a glob of dry sterile cotton. Start at the top and work down. Change the cotton wad when it becomes too wet. You are finished and have a very clean optic. Remove the towels and leave the scope set up until the rocker and mirror cell dry.

WASHING THE SECONDARY MIRROR

You can remove the secondary from the holder and clean it in plastic bowl in the kitchen sink following the same method above. But if you want to be really smart wash it right in the holder in the telescope. Then you don't have to re-collimate or risk damaging the secondary during removal. Water won't harm the polyester batting behind the glass or the heat rope. Wash it using the same technique above except soak a wad of cotton in the soap solution and slop it onto the mirror. Wipe it until clean with liberal amounts of soap solution and then pour distilled water over the face of the mirror. Just let the soap solution and rinse water run off the face of the mirror onto ground. Note: you don't need to set up the scope to clean the secondary. Only the UTA. Blot the glass dry, wipe with dry sterile cotton and leave the UTA to air dry thoroughly.

Loading ramps for your Obsession--Call Northern Supply 800-533-5545

This is a mail order catalog outfit that sells ramp kits. The ramp kits are inexpensive, easily attached to ordinary wood planks, and lap over the loading edge of your trailer or vehicle. Highly recommended for all "wheeled" scopes.

DIGITAL SETTING CIRCLES

Obsession Telescopes are compatible with the latest version digital setting circles. The unit that best adapts to your telescope is the JMI NGC-Max. It is a powerful unit and always the most current. Call me to order everything including the mounting hardware.

Balancing your scope

Counterweight Kit \$20 (You supply the lead shot or sand) Recommended if you intend to use heavy barlow/eyepiece combinations, a Paracorr coma corrector, or a traditional finderscope. Three 1.5" diameter aluminum tubes that attach to your tailgate. Fill with sand or lead shot. Very effective and easy to use. If you want a counterweight kit send a check for \$20 plus \$5 shipping.

Obsession Telescopes PO Box 804 Lake Mills, WI 53551

WANT TO LEARN MORE ABOUT LARGE APERTURE DOBSONIANS?

You can learn about the research, engineering, history and evolution of your telescope from my new 500 page book, **THE DOBSONIAN TELESCOPE, A Practical Manual for Building Large Aperture Telescopes** by Dave Kriege and Richard Berry. Willmann-Bell Publishing. Also has sections on collimation, selecting a dark site, and other helpfull hints on using your telescope. See enclosed flyer for more info.

Remember, this is strictly a visual telescope. It is designed for people who enjoy the "real time" wonder and beauty of visual astronomy. If you've got a problem with your scope **PLEASE CALL OR E-MAIL**. We want you to be fully satisfied and having fun!!!

PROBLEMS?

****If you are on line please contact me via E-mail. I'm often easier to reach this way and I have more time to think clearly about your questions and can help you better.**

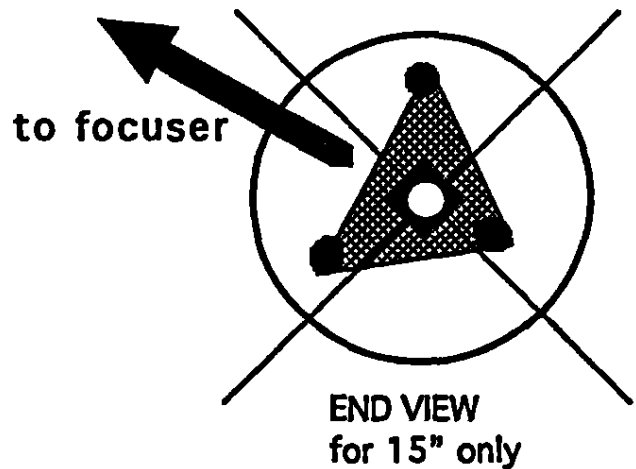
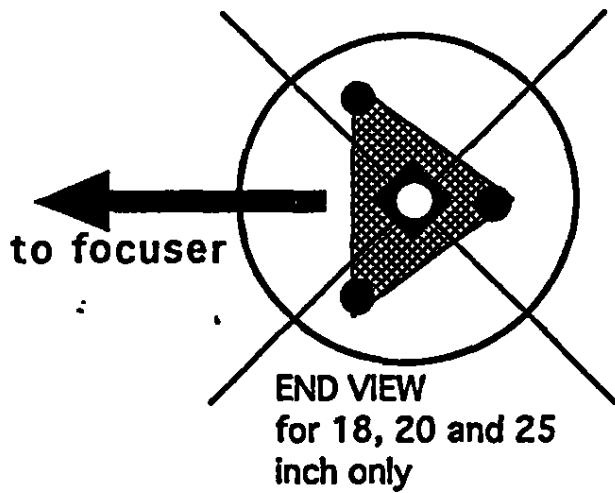
email obsessiontscp@globaldialog.com

*****Also try the Obsession users egroup at:**

<http://www.egroups.com/group/obsessionusers>

It's free to subscribe and your fellow obsession owners are a great resource for information on everything from collimation to dark sites. Archived info too.

Obsession Telescopes @ Phone 920-648-2328 (9 AM to 5 PM M - F)
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SECONDARY MIRROR HOLDER ALIGNMENT IN SPIDER

It is imperative that you aim the secondary mirror holder towards the focuser when you install it. See diagram above for correct orientation. During collimation, if one of the white plastic tubes on a long adjustment screw contacts a spider vane preventing you from aiming the holder completely, simply bend that screw away from the vane with finger pressure. The screws bend easily by grasping the brass nut at the top and pulling away from the vane. Don't worry, the adjustment ability is not affected. This is usually not needed with the 18, 20 or 25 inch holders, but often required with the 15" holder.