

Mounting Instructions

Brand:	Obsession
Model:	N/A
Size:	20"
Axis:	Altitude
Options available:	None
Revision Level (mechanical instructions):	1.2
Software Revision Level required:	any
Hardware Revision Level required:	any

Parts Check:
(Standard kit)

- Gearbox mounted on 3" x 3.5" x 1/8" plate
- 1" diameter cable drive roller, flanged
- 57" length of 0.047" SS 19 strand cable
- Spring 7/16" diameter
- Pull-down clamp assembly
- Edge roller for cable with 4 6-32 x 3/8" TF screws
- Teflon pads (2)
- Mounting screws #10 - 1" SS (4)

Tools Required:
(Standard kit)

- Hand drill
- Drill bit for mtg hole pilot size = 1/8"
- Screw drivers (flat and/or Phillips)
- Tape measure
- 0.180" drill for #10 thread forming screw
- Socket set or crescent wrench
- Soft cotton bath towel

Estimated Assembly time: 45 – 90 minutes

NOTE: Descriptions and details of any options could also be included in these instructions. If so they are prefaced with the term "(option)". If the item is ultimately required but could have been provided by RXDesign or by the end user, this is where the user would do the installation of the item using his own or the one purchased from RXDesign.

- 1) FINISH INSTALLING THE AZIMUTH AXIS BEFORE DOING THE ALTITUDE AXIS. This means the mirror has been safely stored away and the mirror box has been separated from the rocker.
- 2) Remove the 2 teflon pads that currently support the mirror box altitude bearing on the eyepiece side of the scope (this should be the left side as viewed from the front of the scope).

Teflon pads to be removed and replaced

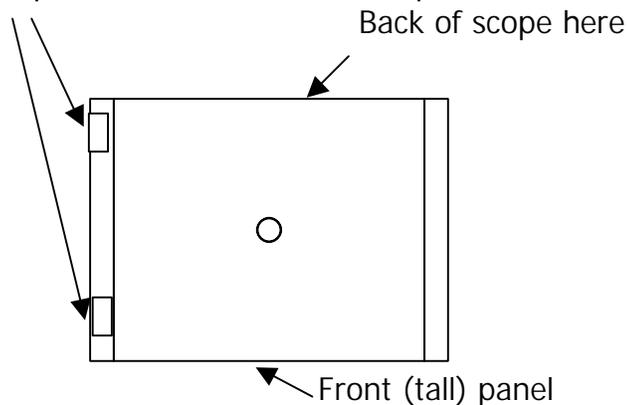


Figure 1 Rocker box top view

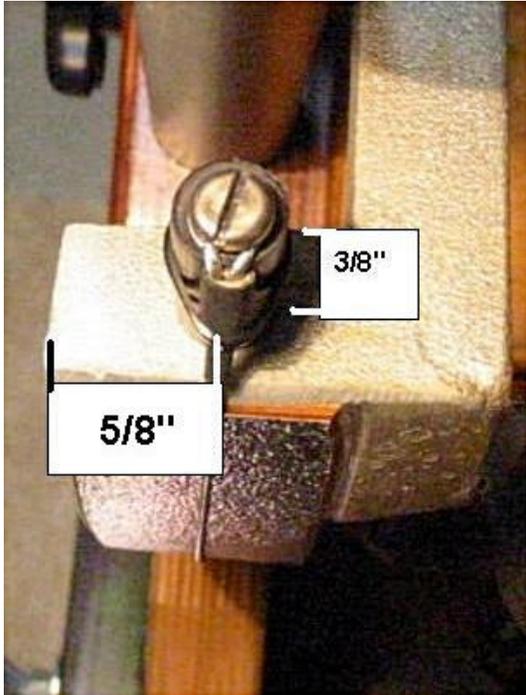


Figure 2 Alt teflon pad

- 3) Locate the 2 supplied Teflon pads. These pads are ~3" long and 1" wide and have a groove milled down their length. Align each pad from just where the edge of the wood curve starts. Lift one pad at a time, run a bead of wood glue along the length of

the pad and distribute into a thin layer covering the bottom of the pad. Tape or otherwise hold the strips in place until the glue is set. Small brads can be used to hold the pads IF and only IF the heads are NOT protruding above the teflon - whether in the groove or on the pad. A nail set can be used to recess the heads.

- 4) Measure a point on the outside front tip of the eyepiece side altitude bearing of 5/8" from the outside edge and 3/8" from the inside back edge - mark this spot. Drill a pilot hole of 5/8" depth at this mark using a 1/8" drill. Re-drill the hole using a 0.180" drill bit. (for self threading 10-24 screw). see figure 3



- 5) After the glue has dried for the Teflon pads place the 57" cable assembly with the "bolt end" laid into the altitude bearing curve on the front of the scope and the other end of the cable laid towards the back of the scope. Make sure the cable lies in the groove on the teflon pads. Some small pieces of tape will help accomplish this - but not on the pads as you will not be able to remove the tape!

Figure 3 Alt cable attachment

Put the mirror box back on the rocker. Remove the tape (if used) and ensure the cable freely "pulls" from one end to the other. See figure 4.

Front (tall) board



Figure 4 Alt Cable Routing

The following instructions (steps 6-12) describe the mounting of the altitude clamp using either the standard truss tube clamp bracket [marked BRACKET] or the altitude bearing corner roller (marked BEARING] with bearing mounting of the altitude clamp.

PLEASE ONLY USE THE ONE(S) RELEVANT FOR YOUR KIT!

- 6) [BRACKET] Taking the Altitude toggle clamp assembly place it into the side mounted back truss tube supports' "slot" as seen in Figure 5. The shrink-wrap around the aluminum should just allow the assembly to slip into the slot - it will be tight - but that is good. It should be inserted as shown in figure 5 to the left. The clamp handle should be as shown - up. This is the "Engaged" position.



Figure 5. Alt Clamp placement.

- 7) [BEARING] Install the supplied roller (nylon roller with bottom spacer) by first marking the center hole for the roller. This hole should be centered in the width of the bearing and 1.1" from the metal edge of the bearing. A template has been provided to mark this hole (on the AZ template sheet). Drill this hole using a pilot and then follow up with a 0.140" bit (9/64"). It needs to be a minimum depth of 1/2".
- 8) [BEARING] Using the supplied 8-32 self tapping screw and its lock washer mount the roller as shown below. The spacer is to keep the roller off the metal surface. Tighten up with the roller face parallel to the bearing edge. The steel cable will rest in the center of the nylon roller. See figure 5b below.



Fig 5b bearing roller placement

- 9) [BEARING] Measure along the top surface of the aluminum altitude bearing a distance of 8" from the rear edge. Mark a line on the altitude bearing top surface at this point. Use pencil. This line marks the rear screw line for the altitude clamp. Visually center the clamp holding it with the rear holes on its plate lined up with the line drawn above. See figure 5c below.
- 10) [BEARING] Mark the inside rear hole as well as the outside rear hole. Drill each of these with a 1/8" bit to a minimum depth of 3/8". If desired you can do the other 2 holes - but they are not necessary. The 2 above will be more than sufficient.
- 11) [BEARING] Use the 2 included 6-32 x 3/8" self tapping screws to secure the clamp in this place.



Fig 5c Clamp Mounting

- 12) [BEARING] Assemble the clamp.
- 13) Install the bronze flanged roller onto the shaft of the ALT gearbox assembly. It should end up centered (the flat portion of the bearing) on the center line of the altitude bearing. You can hold it up behind the bearing to see this placement. The exact position is not overly critical. Tighten the 2 set screws - use Loctite to ensure they do not loosen.
- 14) Looking at Figure 6 below hold the ALT motor assembly up to the side of the rocker box. The roller needs to be behind the ALT bearing by no more than 1/8" (the inside edge will be the close edge due to the draft taper). Also the roller should be ~ 1/8" from the top of the flat side wall of the rocker. Holding the assembly here have someone pencil mark the 4 mounting holes. Set the assembly aside.



Figure 6 Alt motor assembly

- 15) Drill each of the 4 holes from above using an 1/8" pilot drill to a depth of 1". Install the motor assembly with the provided 1" #10 wood screws ensuring one more time the roller position is as described in instruction 14 above.
- 16) Gently pulling the cable forward through the groove in the teflon bring the #10 thread forming screw to the hole in the top front of the bearing drilled in step 4 above. Insert the 1/2" black spacer onto the 10-32 screw and screw the assembly into the bearing as shown in Fig 3. The cable should be pointing down and centered on the bearing.

In the following steps you will have to maintain tension on the cable as you complete each step - not releasing it until all is done. The help of another person may aid this process.

- 17) Holding the cable taught so as not to lose its "wrap" - wrap the cable around the roller twice. It needs to wrap from the inside - coming from the front of the scope, passing over the inside of the roller (between the roller and the bearing) around the roller and then back up again in between for a total of 2 turns. The end result if done right is the cable is always no more than 1/4" from the bearing surface.
- 18) Continue to hold tension on the cable and attach the end of the cable to the alt spring - the end that is formed into a tight bend (it loops around).

19) Still holding tension on the cable so as not to lose the wrap on the roller hook the other end of the spring onto the ALT clamp. You can bring the clamp arm down to give you more room to do this. Pull the clamp back to the "engaged" (up) position and tighten the end nuts on the clamp "U" bracket. See figure to identify the "nuts" to tighten. Tension should be just enough to keep the scope from slipping under normal circumstances (it is NOT designed to work against extra-ordinary tension!). See figure 7.

Adjust Nuts (2)



Figure 7 Alt Clamp spring assembly

20) [BRACKET] When going manual lower the clamp **ONLY** as much as is needed to go manual - any additional amount could cause the cable wrap to get tangled around itself on the roller. ***This is simple to do - not difficult at all and just takes a couple times to know where the right point is on the toggle clamp.*** If the cable does get caught on itself - just look at the cable on the roller and using a pencil or small screw driver move the turns so as not to be caught and apply the clamp again. In practice this should never happen though.

21) [BEARING] When going manual raise the clamp arm relative to the bearing support arm **ONLY** as much as is needed to go manual - any additional amount could cause the cable wrap to get tangled around itself on the roller. ***This is simple to do - not difficult at all and just takes a couple times to know where the right point is on the toggle clamp.*** If the cable does get caught on itself - just look at the cable on the roller and using a pencil or small screw driver move the turns so as not to be caught and apply the clamp again. In practice this should never happen though.

22) Route the motor and encoder wires to the ServoCAT box - plugging them in appropriately. RUN THE MOTOR LEADS (brown cable from motor/gearbox) separate from all other scope cables including power, encoder (from gearbox), DSC encoder, etc. Except for very short distances maintain at least 2" spacing between motor and all other leads. Refer to the ServoCAT manual to set up the gearing.

The ServoCAT configuration file for Obsession retro kits is "Obs Retro.dat". Copy it from the CD under \tools and into the C:\program files\servoCAT-Sky directory. Run the ServoCAT program and \file\open this file to change any variables. Defaults are already set. Click on "20 Obs" for this scope size.

**WARNING! DO NOT OPERATE YOUR ALTITUDE AXIS WITHOUT HAVING ALL OF THE SCOPE ASSEMBLED - this means secondary and truss system!!
It is NOT designed to lift an unbalanced load!**

This completes the installation of the Altitude gear system mechanics