

Sky-Watcher EQ6 Permanent Pier Mounting

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This article describes the construction of a permanent observatory pier mount for a Skywatcher EQ6 Pro equatorial head.

All of my articles can be found on www.astrosoft.co.uk.

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1 Overview

The pier in my observatory consists of a simple (and cheap) solution whereby a metal lintel was concreted into the ground around which some corrugated plastic was used as a mould and filled with concrete. Details on my observatory and the pier construction can be found in my article *Build a Roll-off roof observatory* on www.astrosoft.co.uk.

This article deals with how to fix an EQ6 equatorial head (and the principles can be applied to any equatorial mount) to any old permanent pier that has a metal post of some kind. The finished configuration is shown in Figure 1 below.



Figure 1 – Completed Pier Layout

2 Construction

The basic concept is to use two plates; the bottom one is attached to the metal pier (in my case I welded it in place) and the top plate is held via four antagonistic bolts as shown in Figure 2 below. Such an arrangement means that the pier and the bottom plate itself does not have to be level so you just need to ensure that the pier and bottom plate are as solid as possible without worrying about levelling.



Figure 2 – Bottom and Top Plates

To mount the EQ6 to the top plate I used an aluminium EQ6 Pier adaptor which can be found on the websites of many astronomy suppliers. They are designed so that the collar on the bottom of the EQ6 fits into a recess on the adaptor which is then secured (in this case to the top plate) by four bolts. The EQ6 has a 12mm thread in the bottom so a bolt can be used to securely hold the EQ6 to the adaptor

Figure 3 below shows the adaptor just sitting on the top plate; you can also see the central 12mm clearance hole, the 4 bolt holes for securing the adaptor to the plate and the tapped hole for the azimuth post.

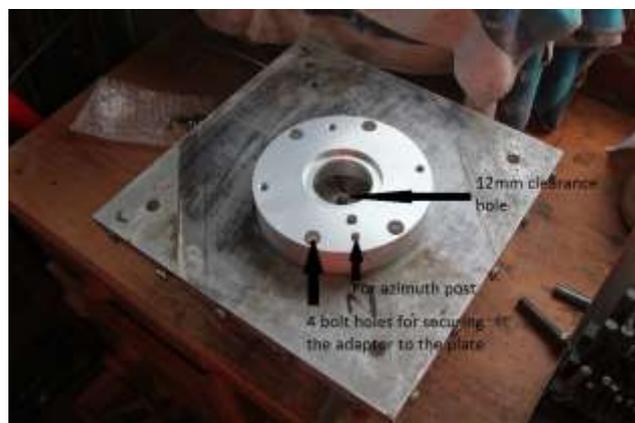


Figure 3 – EQ6 Pier Adaptor

The EQ6 azimuth adjustment uses two antagonistic bolts working against an azimuth post to move the EQ6 as you loosen one and tighten the other. A tapped hole is supplied on the adaptor for the azimuth post. Rather than spending money on an 'official' azimuth post I simply locked in a bolt as can be seen in Figure 4 below ensuring that flat sides of the bolt head were at the same height as the EQ6 azimuth bolts so that they had a flat surface to engage on.

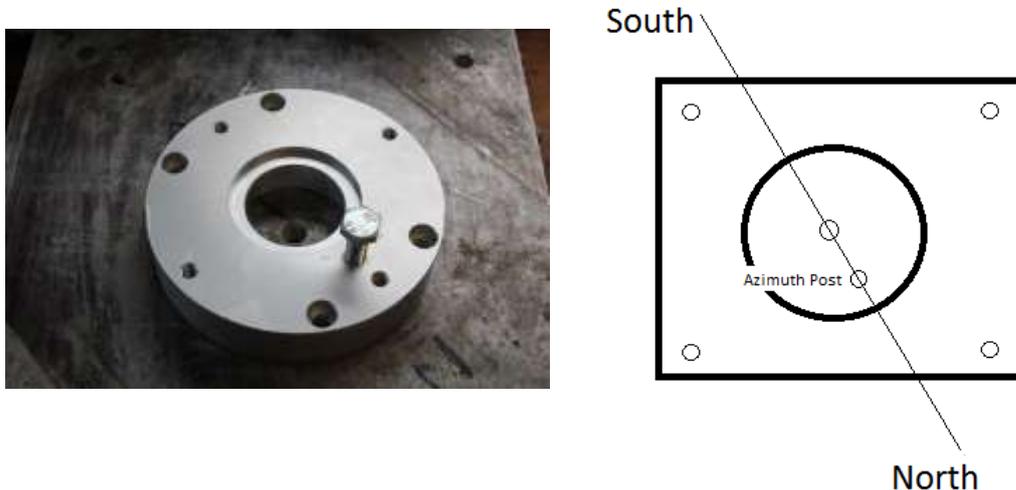


Figure 4 – Azimuth Post Orientation

It is absolutely vital that the azimuth post is on the North side of the North-South (meridian) line when this adaptor is finally secured on the pier so that subsequent polar alignment will require little azimuth adjustment. To ensure this I scribed a North – South line on the top plate (use a compass to establish North-South) while it was in position bolted to the bottom plate and then placed the adaptor on this line so that it intersected the line with the Azimuth post on the North side as shown in Figure 4 above. I then marked where the four adaptor plate securing holes were so that I could drill the four clearance holes in the top plate to bolt the adaptor down onto it. This is very important as the one thing you absolutely don't want is when you come to finishing off the assembly and bolting everything down on your pier is to find that you have not got enough azimuth adjustment on the EQ6 to get your scope polar aligned.

Drill the four clearance holes marked on the plate (as described above) so that you can bolt the adaptor plate to the top plate. This is shown in Figure 5 below.



Figure 5 – Drill 4 holes for bolting the adaptor to the top plate

Next, bolt the adaptor to the plate – two of the bolts can be seen loosely protruding in Figure 6 below.

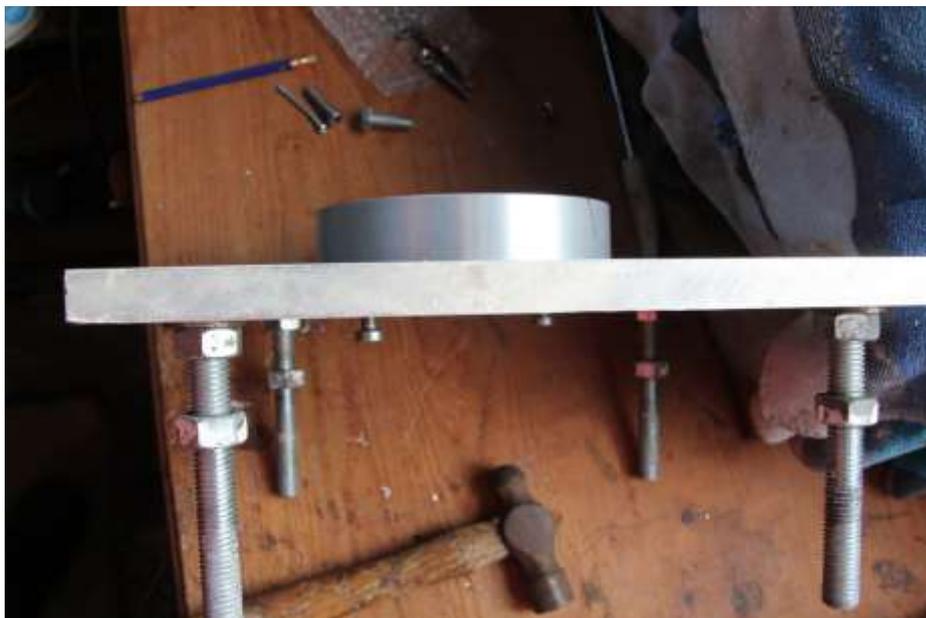


Figure 6 – Bolt the pier adaptor to the top plate

Now place the EQ6 on top of the adaptor and make certain that you can slide the 12mm bolt through the 12mm clearance hole in the plate and engage it with the EQ6 head. This is shown in Figure 7 and Figure 8 below.



Figure 7 - Offering up the EQ6 to the pier adaptor



Figure 8 – Check that the central bolt engages with the EQ6

Now you can carry out the final assembly. With the adaptor firmly bolted onto the top plate, bolt the top plate to the bottom plate ensuring that that the adaptor is level by adjusting the four antagonistic bolts – this is shown in Figure 9 below.

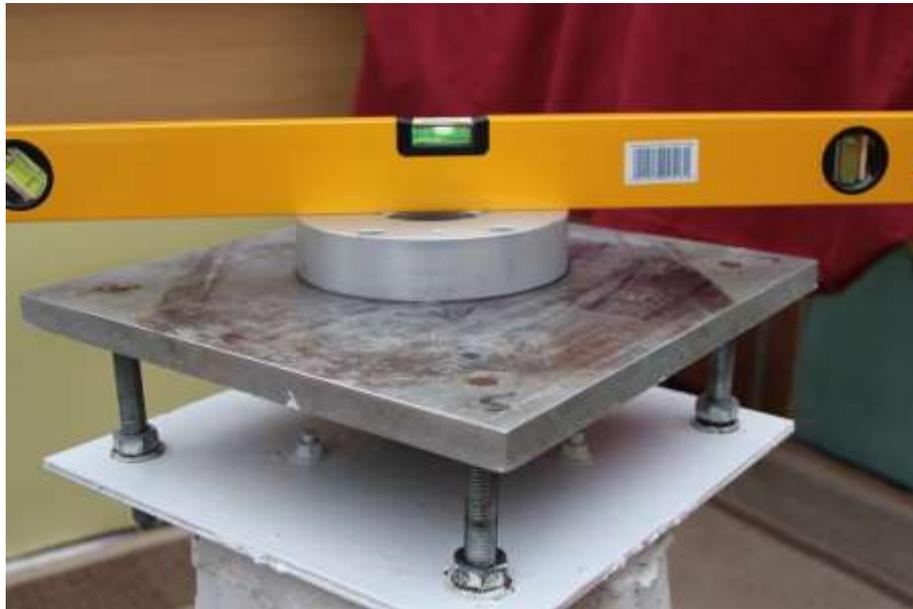


Figure 9 – Ensure top plate is square

Now push the 12mm bolt through the top plate clearance hole, and place the EQ6 on the adaptor and tighten it in place. This is shown in Figure 10 and Figure 11 below.



Figure 10 – Get ready to bolt the EQ6 in place



Figure 11 - Tighten the EQ6 central bolt

Figure 12 below shows the EQ6 bubble level. My advice is to be cautious of it – it was an absolute mile out of square on my mount and the very thin casing wall had been cracked where it had been forced in. If you have previously independently levelled the adaptor (see Figure 9 above) then you know that everything is level.

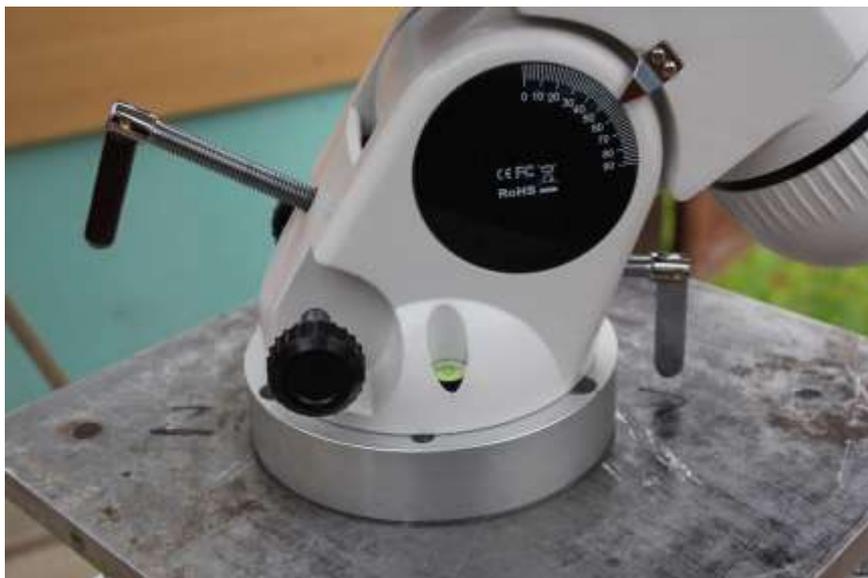


Figure 12 – EQ6 Bubble Level

It is now also evident why the azimuth post needed to be accurately aligned on the North-South line. With reference to Figure 13 below the azimuth adaptor post bolt is protruding up inside the EQ6 mount and the two EQ6 Azimuth adjustment bolts (marked A and B in Figure 13 below) have been tightened up against it showing that you only have a probably a few degrees of azimuth adjustment in the mount East and West. By ensuring that the post was on the Meridian line you should only need a small adjustment when polar aligning (see my article on www.astrosoft.co.uk for Polar Aligning an EQ6).

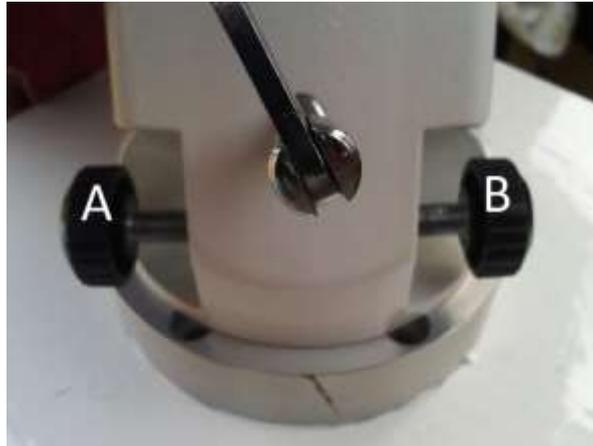


Figure 13 – EQ6 Azimuth Adjustment Bolts

The final assembly is shown below (my latitude is 52 degrees).



Figure 14 - Final Assembly