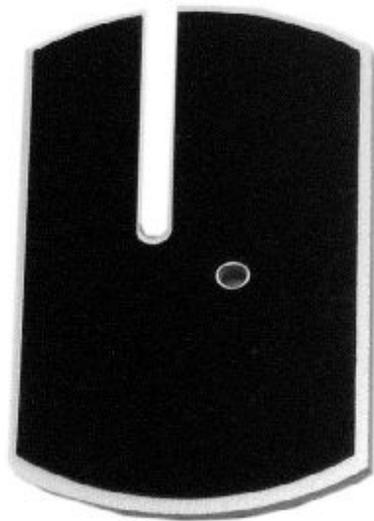


Setup Information For The Panosaurus

www.gregwired.com
Jan 2008

Please take the time to read all of the setup information to ensure success and ease of use of this tripod head. Much of the setup is a one time procedure which will then make it very easy to use your tripod head in the field.

Panosaurus Parts List



Camera Mounting Block



Upper Horizontal Arm



Rotator Arm And Turntable



Bubble Level



1 1/4" Washer



Wing Clamping Knob



1" 8-32 Bolts



Nail



3/4" Metal Washers



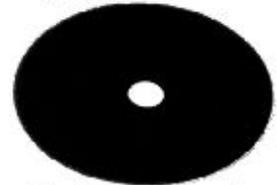
1/2" Bolts



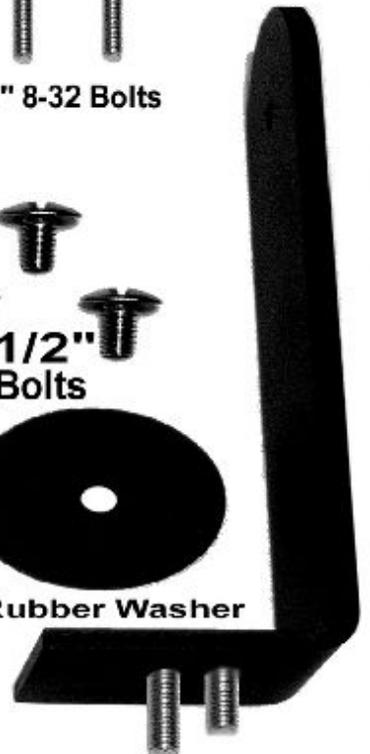
Clamping Knobs



3 X 5 Index Card

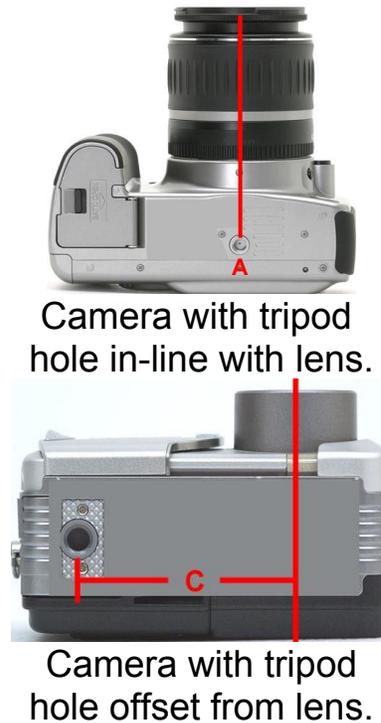
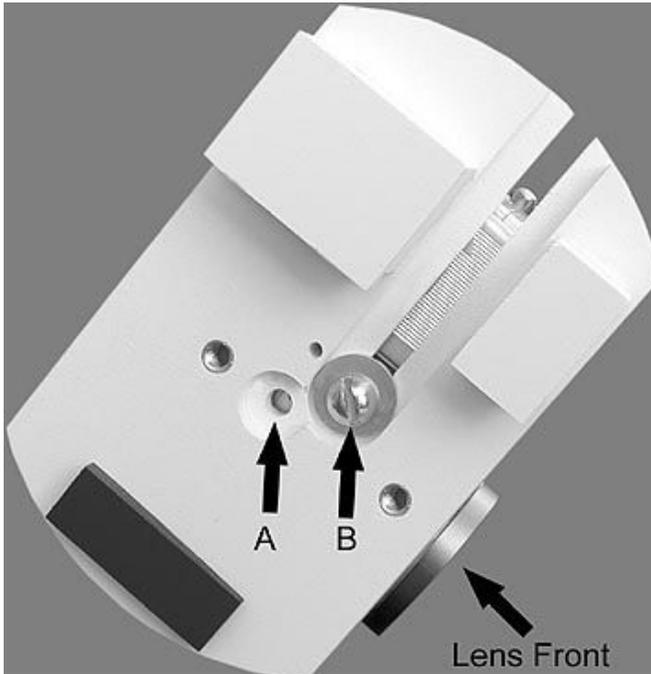


Rubber Washer



Upright Metal Arm

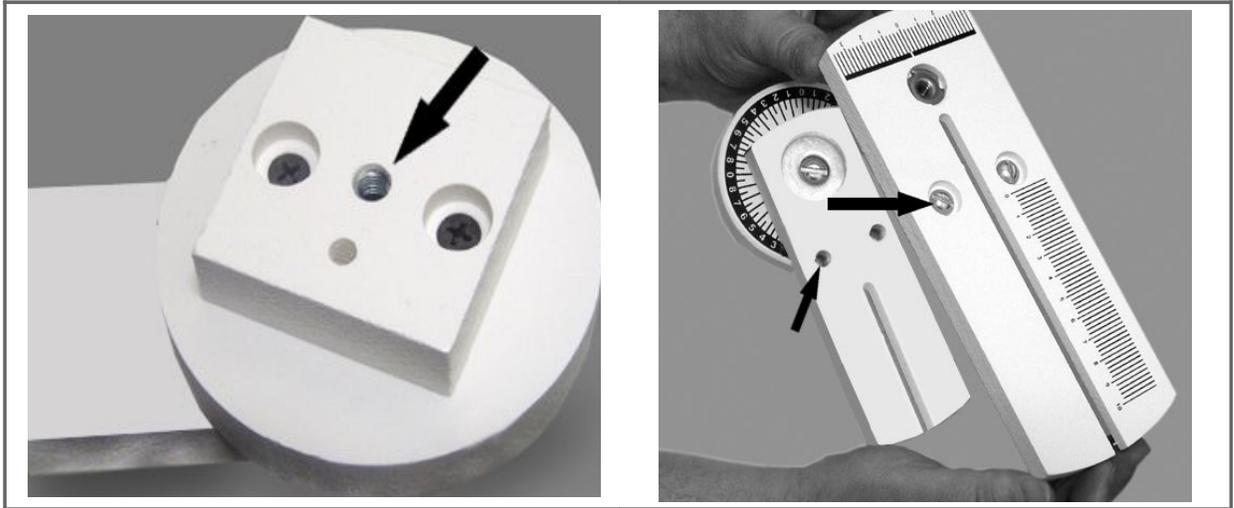
Step 1. Mounting the camera to the Camera Mounting Block.



If your camera's tripod mounting hole is "**INLINE**" with the center of your lens (like the digital SLR in the top right picture) then you will be mounting your camera in **HOLE A** using a 1/2" bolt **WITHOUT A METAL WASHER**. If your camera's tripod mounting hole is "**OFFSET**" from the lens centerline then you will mount in **SLOT B** using a 1/2" bolt **AND A METAL WASHER**.

Important: Tighten the bolt just enough so that you can still fairly easily shift the camera on the rubber pad of the camera mounting block.

Step 2. Mounting The Horizontal Arm in the Landscape Position.

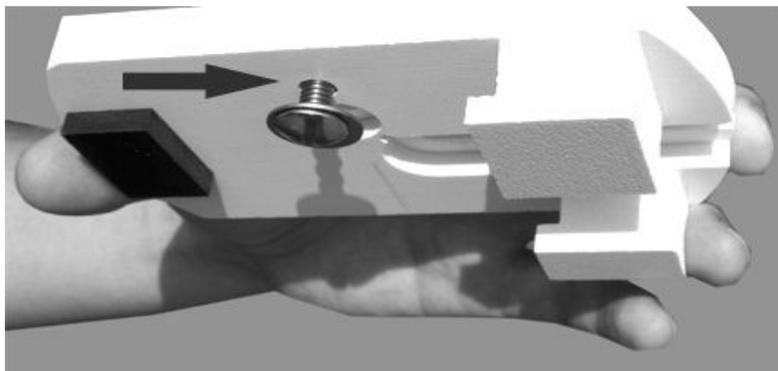


Mount the Panosaurus Rotator Arm onto your tripod or quick release plate using the standard 1/4" bolt which comes with most tripods. The above picture shows the receptor for this bolt on the bottom of the Panosaurus Rotator Arm.

Note: The smaller hole on the bottom of the rotator arm is designed to fit the stabilizer pin that some quick release plates have.

Remove the bubble level from the Rotator Arm and then mount the Upper Horizontal Arm onto the Rotator Arm using two 1" 8-32 bolts. **IMPORTANT!!** Make sure the long cut-out slot of the Horizontal Arm lines up with the slot of the Rotator Arm and the bolt holes of the horizontal arm are perfectly aligned with the receiving holes of the rotator arm before you attach the bolts.

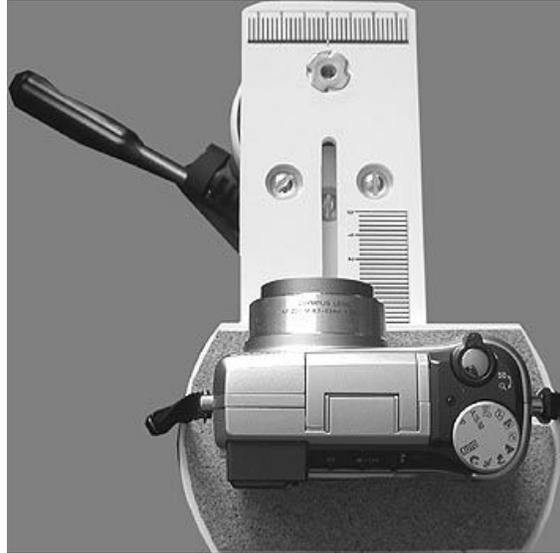
Next thread a 1/2" bolt and a 3/4" washer about 2 turns into the outer T-nut on the bottom of the camera mounting block.



Step 3. Mounting the Camera to the Horizontal Arm.

You now attach the Camera Mounting Block to the Upper Horizontal Arm. Slide the block all the way from the end of the Horizontal Arm - you may want to reach under the Horizontal arm and slightly tighten, with your fingers, the bolt that you treaded into the Camera Mounting Block. However, you do not want this bolt so tight that you can not freely move the Camera Mounting Block on the Horizontal Arm. This bolt is just a precaution to keep the camera from accidentally falling off the horizontal arm.

Remember you want the camera to be mounted loosely to Camera Mounting Block so you will be able to shift it freely on the rubber pad.

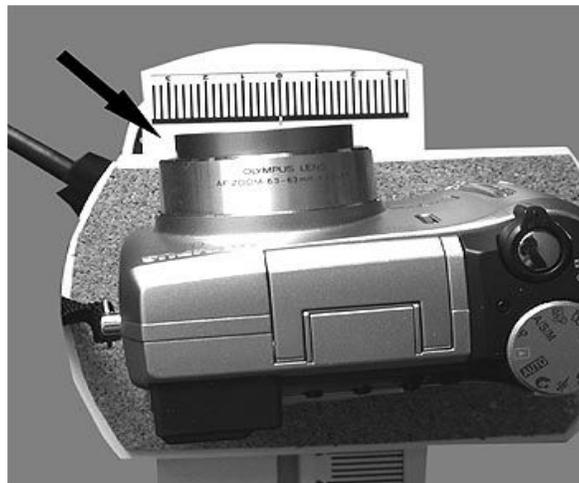


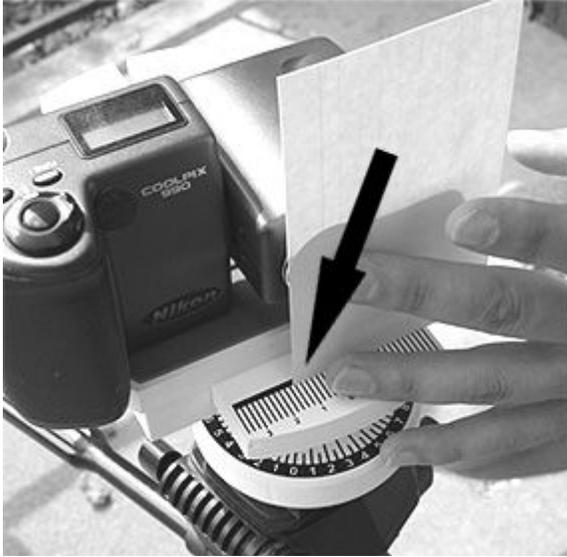
CAUTION:

Be very careful not to knock the Camera Mounting Block off the Horizontal Arm.

You now slide the Camera Mounting Block to the front end of the Horizontal Arm. The picture at right shows an arrow that points to a thick black line parallel to the ruled lines. Your goal is to position the front of your camera lens parallel to the thick black line - and also to align the center of your lens with the Number "0" on the ruled lines at the end of the Horizontal Arm.

Note: If your camera has a lens that physically zooms in and out of the camera body you may need to zoom it out to do this step properly.





The above pictures show how to use the 3 X 5 index card to help align the lens in the center of the ruled lines. First set the card on the extreme left of the lens and look to see what ruled line touches the bottom of the card. Then do the same thing on the right of the lens. Keep shifting the camera on the rubber pad until the distance from “0” is the same on both the left and right side of the lens barrel.

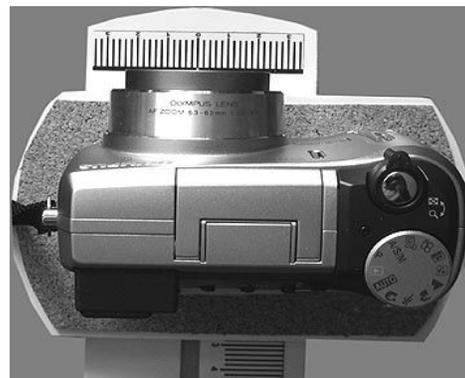
You can also use the 3 X 5 index card to ensure that your lens is parallel to the thick black line.

Note: If your camera’s tripod hole is in-line with the lens centerline (like all DSLR cameras) then this is the only thing you will need to do to position your camera correctly.



The Picture on the right shows the camera aligned properly.

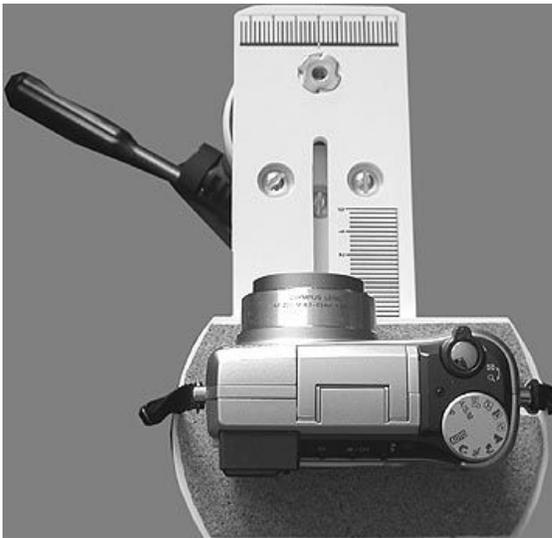
Note: If your camera tripod mounting hole is in-line with the lens centerline like all DSLR cameras and your lens face is parallel to the black line it will automatically be centered with the “0” mark of the ruled lines.



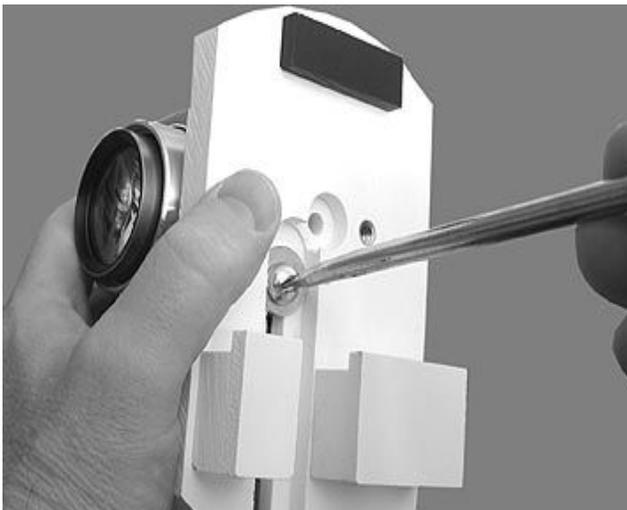
Step 4. Mounting camera to Camera Mounting Block.



Next, if at all possible, make marks somewhere on the rubber pad, or elsewhere, that will enable you to easily reposition the camera into this same mounting position each time you want to mount the camera to the Mounting Block.



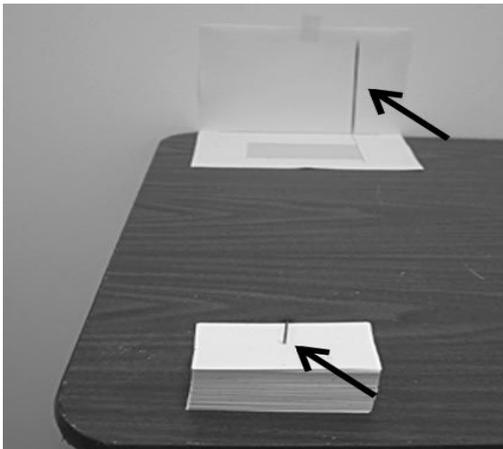
Now **very, very** carefully slide the camera and camera mounting block off the end of the Upper Horizontal arm doing your best to ensure that you do not move the camera from its current position on the rubber pad.



Holding the camera securely in the correct position tighten the bolt into your camera tripod hole so that the camera is securely mounted to the Camera Mounting Block.

Step 5. Preparing to find the optical center of the lens.

Every camera lens has what is sometimes called the optical center. (Other common terms used to describe this are Nodal Point and Entrance Pupil) This is the physical place in the lens where the light becomes almost infinitely small before again flaring out to proceed further back into the lens. (Imagine an hourglass shape - the smallest point of the hourglass would be the optical center.) For some lenses you can look down into the lens and see this spot. It is where the aperture will actually open. Lenses that have variable focal lengths (like 35-70mm) are called zoom lenses. Very often a zoom lens will have a different optical center for each focal length as it zooms in and out. You will need to decide **which focal lengths** of your camera's lenses you wish to calibrate for.

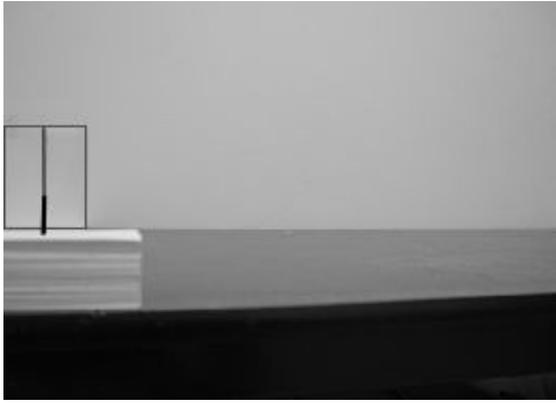


There are several methods you can use to find the optical center of lenses. The picture to the left shows the setup I use to find the optical center of lenses with focal lengths of **less than 70mm**. Stick a small nail through a business card and then place the nail and card on something to raise it slightly higher off a table. Then tape a piece of paper onto the wall about 30-36 inches behind the nail. Draw a dark straight line on the paper.



Proceeding from steps 2, 3 and 4 (**with the horizontal arm mounted to the rotator and the camera properly mounted to the camera mounting block**) now position the tripod in front of the nail and line with the camera **CAREFULLY** resting on top of the horizontal arm.

The front of the camera lens should be about 6-12 inches from the nail – or as close as you can get and still be able to focus the camera fairly well on both the line and nail at the same time.



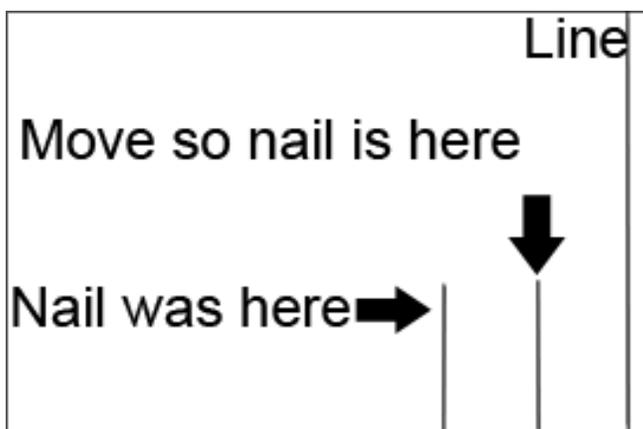
STEP A: Position the tripod so that when you look at the LCD screen or viewfinder this is what you see. The nail needs to be aligned with the line on the paper and in the **EXTREME** left hand area of the frame. **This is always the starting point of the procedure.** You will probably have to move not only the rotator of the Panosaurus but also the tripod in order to get into this starting position.



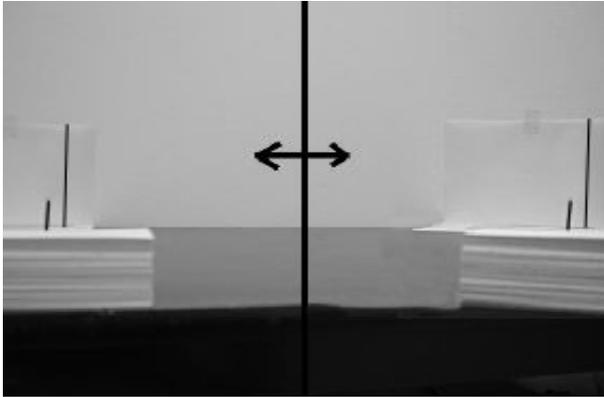
Now rotate the rotator of the Panosaurus (**DO NOT MOVE THE TRIPOD**) until you see the nail and line in the extreme right hand of the frame. The nail and line will **probably** now be out of alignment - either to the right or left of the line. If the nail is to the right of the line this probably means the camera needs to be further forward on the horizontal arm.



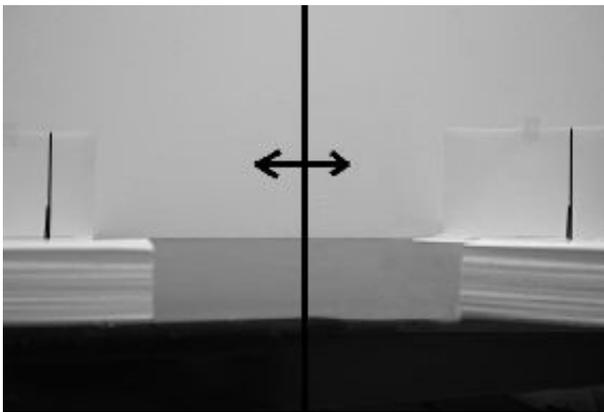
The nail in the picture on the left has moved to the left of the line when it was rotated from the left side of the frame to the right side of the frame. This means that you will probably need to move the camera back toward you on the horizontal arm.



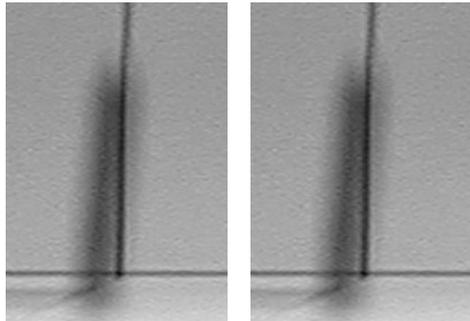
Now looking through the viewfinder or at the LCD of your camera **slowly** move the camera forward or backward on the horizontal arm until the nail is about **HALFWAY** from the distance it currently is from the line - as in the picture on the left. **Note:** If the nail had been on the right of the line to begin with then move halfway in other direction closer to the line.



Now rotate the rotator of the Panosaurus back so the nail and line are in the left side of the frame. **IF** you have moved the camera to the correct location on the horizontal arm the nail and line should now be out of alignment on the left side of the frame by the same amount that it is out of alignment on the right side of the frame and you may have found the optical center point. To make sure – go to step B.



STEP B: Ultimately you are striving to achieve the results seen in the picture on the left. The nail is aligned in the left of the frame and as you pan the camera with the rotator to the right of the frame the nail remains aligned with the line. In order to ensure that you have achieved this goal you now return to **STEP A** and precede to this point again and again until the goal is achieved.



To ensure that you are perfectly aligned you may want to take a picture of the left frame area and then pan to the right frame area and take another picture. Load the two pictures into your image editing software and greatly enlarge them. (If your camera allows you to enlarge in your LCD playback screen this is a good method also) If the two pictures are very similar (as are the two pictures on the left) then you have reached the optical center. Otherwise you will need to keep fine tuning the position of the camera on the horizontal arm. Once you are satisfied that you have reached the optical center be sure to note where on the Horizontal Arm the Camera Mounting Block rests. This will be the position you always place the camera on the horizontal arm when you shoot at that particular focal length.

Step 6. Finding the optical center for longer focal length lenses.



To find the optical center of a lens with a focal length of over 70mm you will probably need to set up your camera outdoors.

The picture on the left shows how I have set my camera to align with a pole and the edge of a window in the left of my frame. The pole is about 5 feet from my camera and the window is about 30 feet from the camera. The focal length of my lens is 100mm.

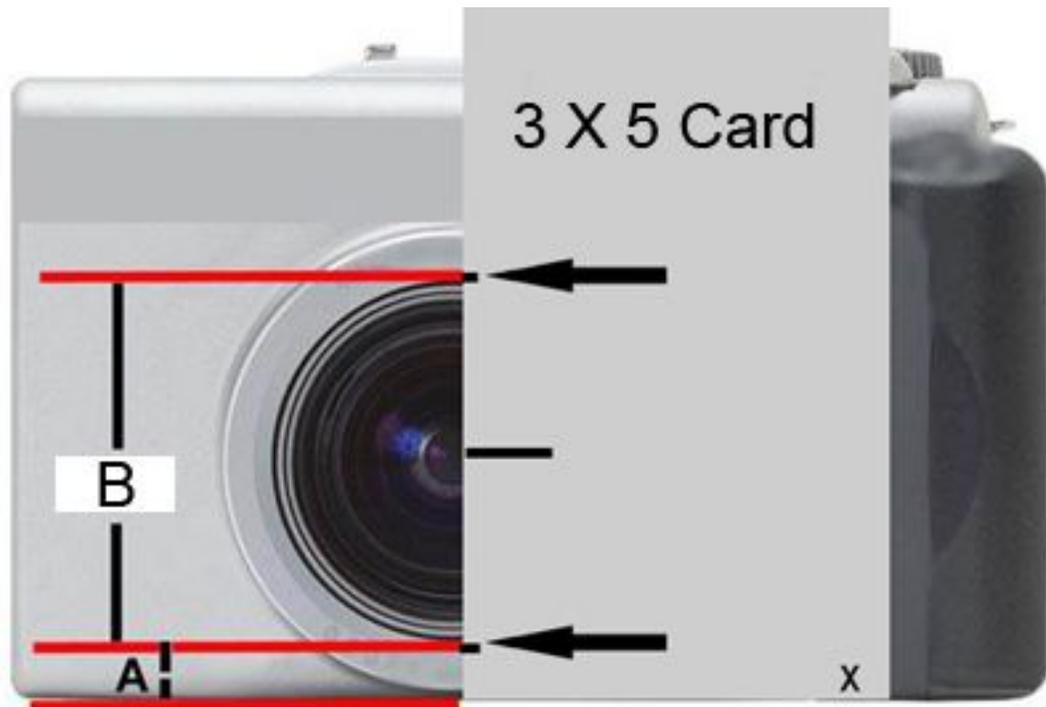


The picture on the left shows what my alignment looks like when I then pan the camera to put the pole in the right side of the frame.

I will follow the same procedure as with the nail and the line on paper to perfectly align the pole and the edge of the window in both sides of the frame.

Once you have found all the optical centers of all your lenses at the various focal lengths you wish to use you are ready to setup the camera to shoot panoramas.

Step 7. Setup in the Portrait Position.



Before you can mount your camera in the Portrait Position you will need to know the distance from the base of your camera to the center of your camera's lens. The formula is $(B \text{ divided by } 2) + A$

A good way to easily find this measurement is described below.

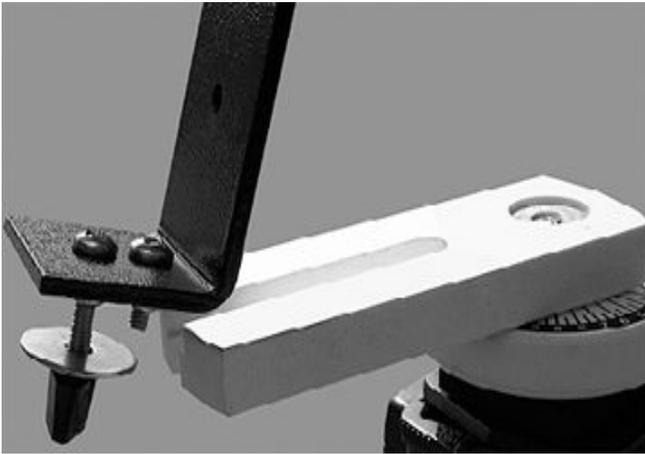
Place the camera on a flat surface. Hold a 3 X 5 index card up to the face of the lens so that the card edge runs approximately through the center of the lens – as in the picture above. Put an **X** at the bottom of the card to remind you where the base of your camera is. You then make a small pen or pencil mark on the edge of the index card at the top of the lens barrel. Then make another mark on the edge of the index card at the bottom of the lens barrel.

You then use a ruler to measure the distance between these two marks you have made. Then place a third mark on the edge of the card - the center between these two marks you have just made.

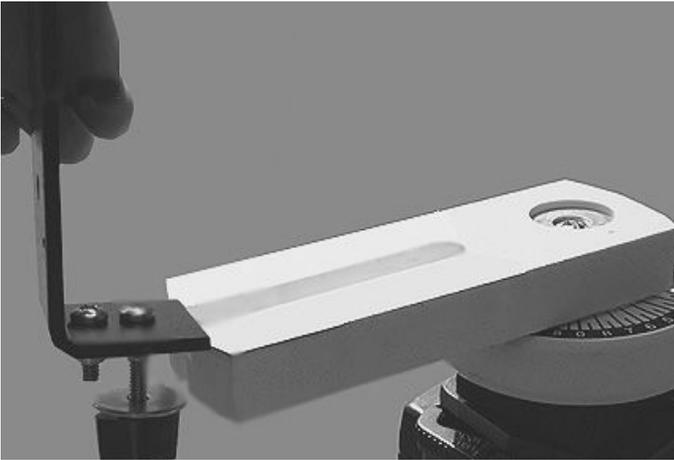
SO: The distance to the center of your lens is the distance from the bottom of the index card where the X is marked to the center mark on the index card. Measure this distance with your ruler.



Take the large 1 1/4" washer and place it on the longer bolt that extends through the upright metal arm. Then attach the **Wing-Style** clamping knob to the longer bolt by giving it about 2 full turns.



If the distance from the base of your camera to the center of your lens is less than 56mm (about 2.25") you will then slide the upper metal arm onto the rotator arm as shown in the picture above.



If the distance from the base of your camera to the center of your lens is more than 56mm (about 2.30") you will slide the upper metal arm onto the rotator arm as shown in the picture above.

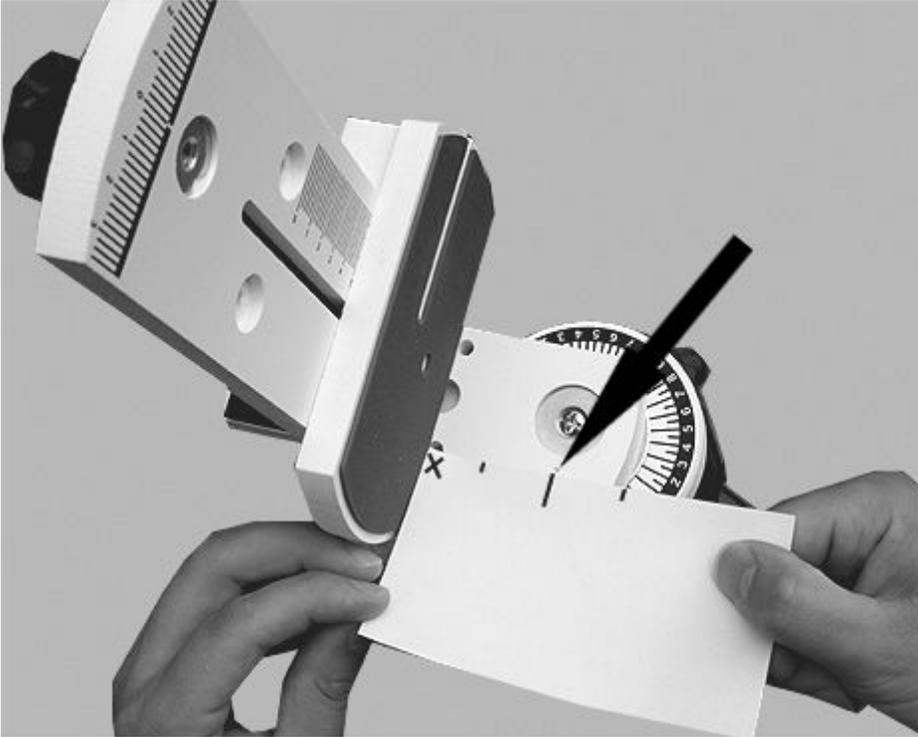
Slide the Metal Upright Arm about halfway onto the Rotator Arm and temporarily tighten it with the wing clamping knob.



Next - **WITHOUT** the camera attached to the Camera Mounting Block, bolt the Camera Mounting block so that it is **FLUSH** with the very end of the Horizontal Arm - Using a 1/2" bolt and a 3/4" washer a pictured above.



Next slide the **LARGE** Clamping Knob through the top hole of the Metal Arm and place the rubber washer on the threads - with the threads and washer facing **toward** the Bubble Level and Turntable of the Rotator Arm.



Next attach the Horizontal Arm to the Metal Upright Arm using the Large Round Clamping Knob. Swing the Horizontal Arm so that the Camera Mounting Block is straight down toward the Rotator Arm. Tighten the clamping knob so the horizontal arm is secure with the rubber washer squeezed tight between the horizontal arm and the metal arm.

You will then use the 3 X 5 index card which has your camera's height to center of the lens information to determine where the Metal Arm needs to be positioned for your camera. There is a **small hole** on the Rotator Arm where the arrow is pointing in the picture above. Loosen and slide the Metal Arm forward or backward until the Rubber Pad of the camera mounting block touches the end of the index card with the center mark on the index card aligned with the center of the little hole. When the arm is in the correct position tighten the Wing-Style Clamping Knob on the Metal Arm to make sure it does not move again.



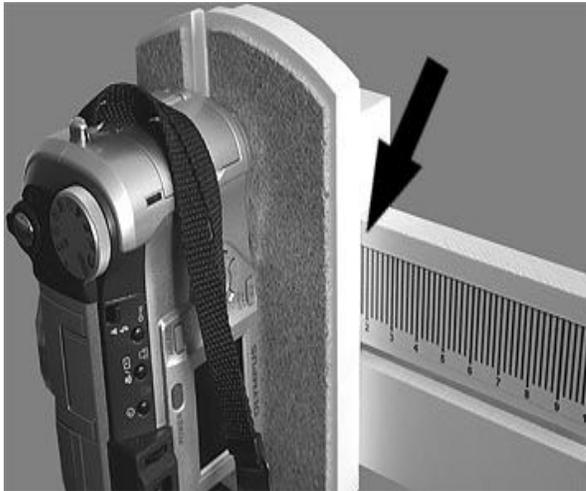
Now make some kind of mark on the Rotator Arm so you will be able to remember exactly where the Metal Arm needs to be placed every time you use this particular camera in the portrait position. You can use a pencil, pen or an sharp edge of some sort to make a permanent mark.

Step 8. Preparing to shoot in the Portrait Position.

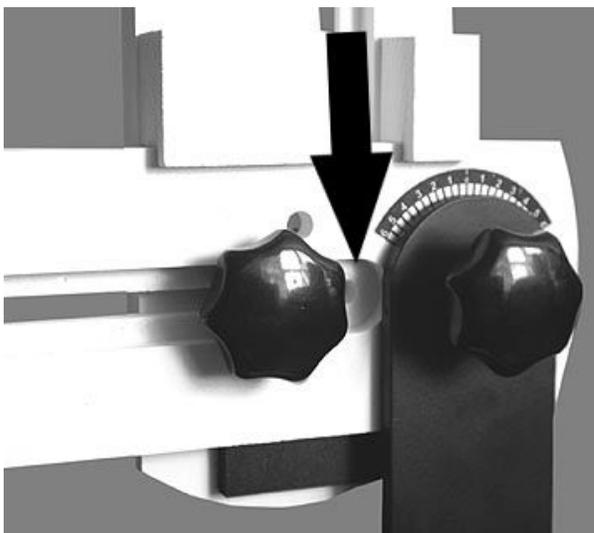


Now loosen the large clamping knob and swing the Upper Horizontal Arm up and into the 90 degree (or "0" marked position) The friction of the rubber washer holds the Horizontal arm in place. Remove the Camera Mounting block.

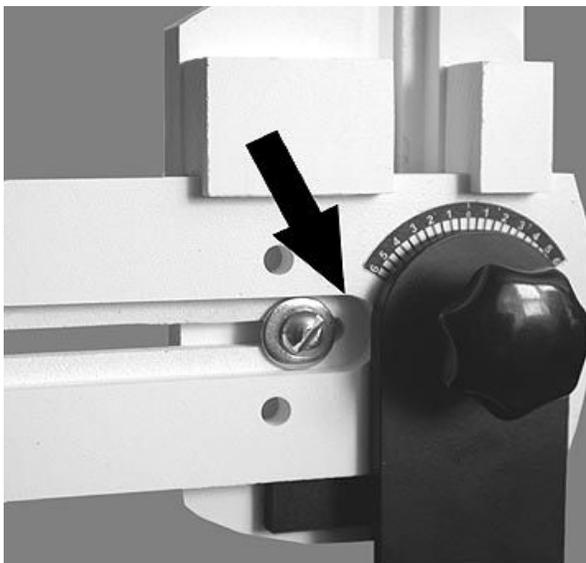
Note: Always keep the rubber washer clean and free of dust. There is a mark on the top of the metal arm that is used to point to the ruled white lines on the Horizontal Arm that correspond to 5 degrees of vertical pitch each. So each number would represent 10 degrees of pitch.



After securely mounting your camera to the Camera Mounting Block you are ready to slide the camera onto the Horizontal Arm. Slide the camera down the horizontal arm from the back end until you reach the ruled line that marks the spot for your particular lens' optical center - the focal length you plan to shoot with.



If the Camera Mounting Block is far enough back from the Metal Arm (and you do not intend to shoot fully spherical panoramas – by shooting straight up) you can secure the Camera Mounting Block with the small round clamping knob and a 3/4" washer.. If the Camera Mounting Block is far enough back on the Horizontal Arm you should be able to partially change the pitch of the Horizontal Arm without the clamping knob hitting the metal arm.



If the Camera Mounting Block is too far forward on the Horizontal Arm or you wish to shoot fully spherical, you will need to secure the Camera Mounting Block with a 1/2" bolt and a 3/4" metal washer rather than the small clamping knob. This will enable you to change the pitch of the Horizontal arm without the clamping knob hitting the metal arm.

You are now ready to shoot in the Portrait Position.

Step 9. Shooting and Maintenance.



The turntable is laid out in 5 degree increments. There are numbers on the turntable every 10 degrees. You use the extreme front edge of the metal strips screwed to side of the rotator arm (not shown in pictures) to point to the numbers or lines on the turntable. So for example - to shoot a full 360 degree panorama using 9 shots you would shoot your first picture at "0" and then shoot a picture at the numbers 4, 8, 12, 16, 20, 24, 28, and 32.

The bubble level that comes with the Panosaurus is **VERY** sensitive. In fact if you set up your tripod head so that the bubble level reads level - then rotate the head 180 degrees - you may find that the reading is no longer perfectly level. This is because the level is so sensitive that the mere variations in the thickness of the plastic of the rotator arm from one side of the head to the other can effect the readout.

So...realistically if you can set the rotator at level at any point in the rotation prior to shooting you can rest assured that you are rotating at "a realistic level" throughout the shooting sequence -and the stitching of your pictures will not suffer for being out of level.

Note: The level is held in place by the magnet glued to the bottom of the level. Be sure not to lose the level when you pack the Panosaurus for travel.

The amount of tension that exists between the Rotator Arm and the Turntable is determined by the bolt that is under the bubble level. If you need to adjust the amount of tension you will need a philips crewdriver. The tension is very sensitive - a very slight turn of the bolt will change the tension dramatically. Clockwise to increase tension. Counterclockwise to decrease tension.

Happy shooting.