
WATCH FIRST

Unboxing https://www.dropbox.com/s/ktjlfo07mnstscw/AEON%20LASER%20UNBOXING%20v4.mp4?dl=0

Alignment Overview https://www.dropbox.com/s/itgqxxqhbhjn0g4/AEON%20ALIGNMENT%20VIDEO%20Part%201%20v3.mp4?dl=0

MIRROR ALIGNMENT

TOOLS YOU WILL NEED

2mm Allen Wrenches x 1
3mm Allen Wrenches x 1
Philips Screw Driver x 1
Side Cutters or Scissors x 1
Blue Painters Tape (or other low tack non-clear tape) x 1
Acrylic Targets (located in the clear tote) x 3
Thin Funnel x 1
Distilled Water x Less than 1 Gallon

STEP 1: UNPACKING

1. Before you begin, please make sure you inspect the crate for any damage. Remember, the time to report any damage during shipment is now. There will be no recourse if damage is reported several days from now.
2. Using your work gloves and a pry bar, remove the lid to the crate and then proceed to remove the outer walls being careful not to cut yourself with any of the nails.
3. Using the proper lifting technique, get some help from a co-worker and carefully lift the machine off the crate and on to a workbench or stand. If using your own work bench, please ensure that the workbench is strong enough to hold the weight of the machine.
4. Remove the wrapping on the machine and again, inspect the shell for any damage that may have occurred during shipping.
5. Open the Laser Tube Bay in the back of the machine and inspect the laser tube for damage.
6. Also check to make sure the wires attached to both ends of the laser tube are still secure. Close the Laser Tube Bay.
7. Open the Lid and flip down the Pass Thru at the front of the machine. Remove the honeycomb table, exhaust hose and rotary device.
8. Use the side cutters to cut the zip tie holding the clear tote to the side of the machine. Set the tote aside.
9. Use the side cutters to cut the zip tie at the laser head that is holding the acrylic block and USB stick. Place them in the clear tote.
10. Use the side cutters to cut the zip tie that is securing the gantry to the rear vents being careful not to let any of the zip tie pieces fall down into the vents.

STEP 2: WATER CHILLER

1. Remove the metal cap from the chiller reservoir located at the rear of the machine.
2. Place the thin funnel in the opening and hold it steady while you use your other hand to pour in the distilled water. Be mindful to quickly clean up any water that might leak, particularly beneath the opening where water can seep into the machine.
3. Fill till the water level is just above the Green Full section.
4. Remove the funnel.

STEP 3: POWER ON THE MACHINE

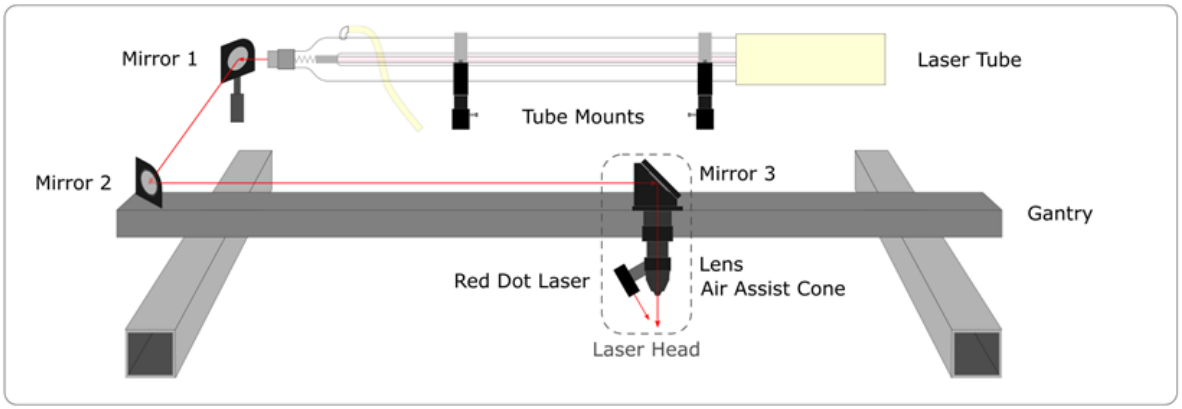
1. Check the work area to make sure there are no items left inside the cabinet that might result in a collision during the initialization process.
2. Open the clear tote and locate the power chord.
3. Connect the power chord to the back of the machine and into a standard 120V/60Hz outlet.
4. Locate the power dial on the right side of the machine and turn it clockwise to power on the machine.
5. The laser will now home itself at which point the control panel on the machine will read “Initializing”
6. Once complete, use the arrow keys to carefully jog the laser head to all 4 corners to ensure the laser head does not collide with any part of the machine.

STEP 4: MIRROR 1 PARALLEL CHECK

1) Using the Philips screwdriver, remove the small/square access panel at the rear left corner of the machine. Place the hardware in the clear tote.

2) Using the supplied compartment key, remove the long rectangular top access panel on the left hand side of the machine. Place it somewhere safe.

3) Locate Mirror 1 which is directly in front of the laser tube and Mirror 2 which is mounted on to the cross beam (gantry) that is in charge of forwards and backwards motion (Y axis). The goal in this step is to ensure that the laser beam runs parallel to the left gantry rail as it travels from Mirror 1 at the back of the machine to Mirror 2 at the front of the machine.

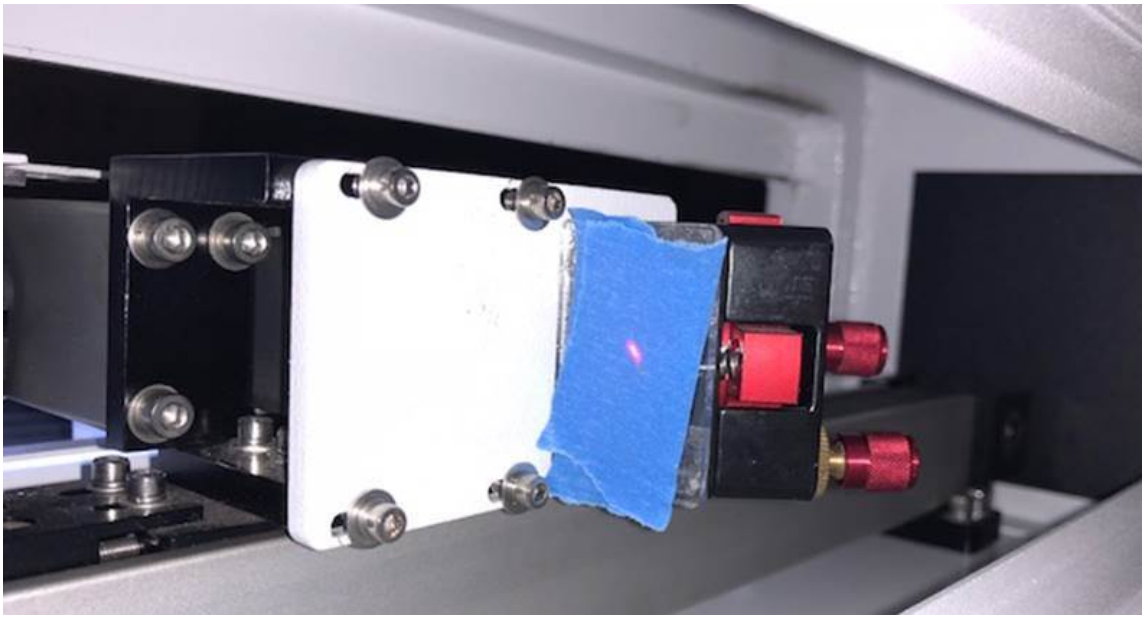


4) Locate the long rectangular clear acrylic target from within the clear tote and peel off the paper backing to expose the adhesive.

5) Place the target over the entrance to Mirror 2 so that it faces Mirror 1.

6) Make sure the target is evenly flushed with the top and bottom of the black Mirror 2 housing and that it is pushed back against the tan metal bracket as well.

7) Tear a small piece of blue painters tape in half and then place them both (one on top of the other) over the acrylic target.

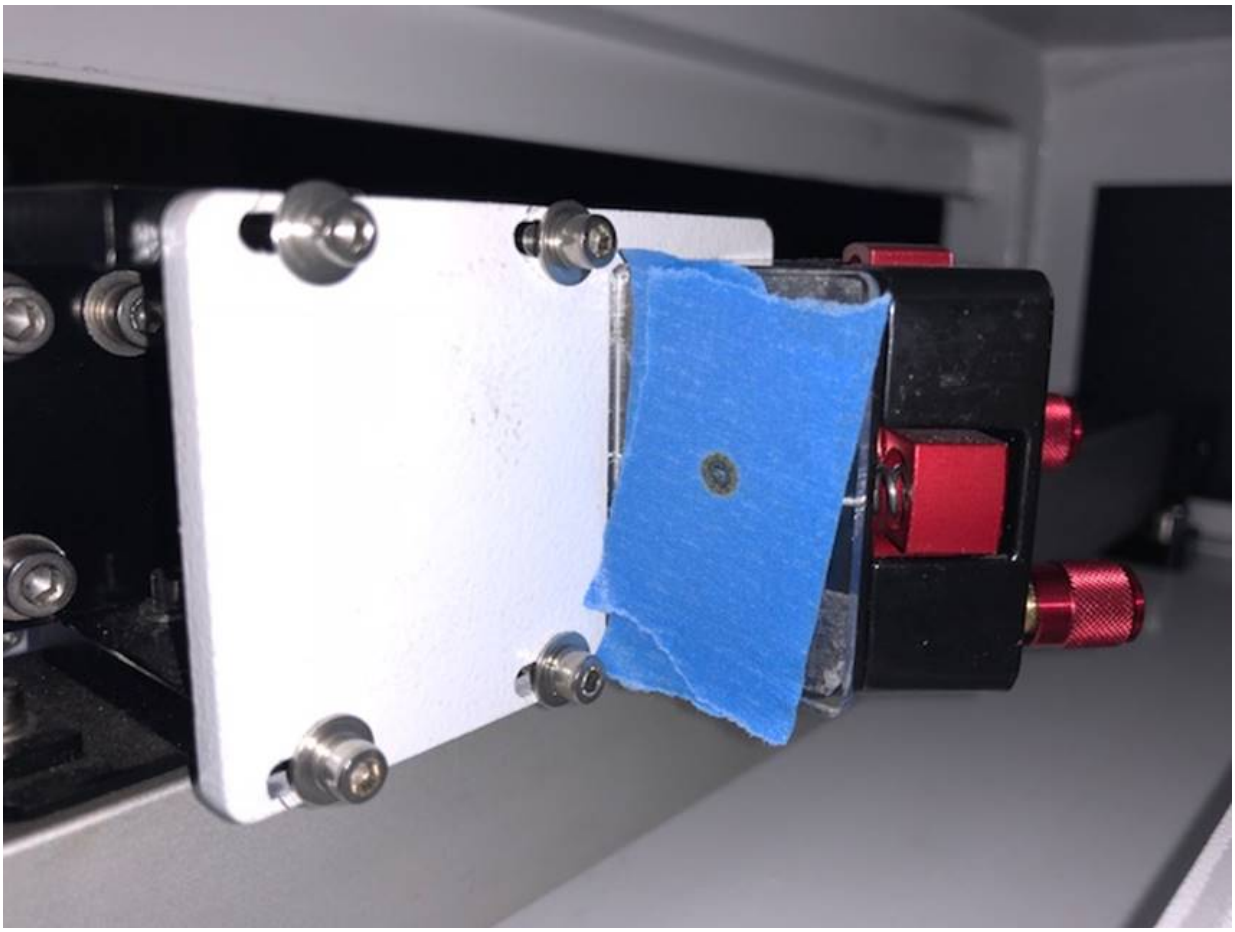


8) Press and hold the Up arrow key on the control panel until the gantry stops all the way at the extreme rear of the machine.The goal is to bring the target as close to Mirror 1 as possible.

CAUTION: when pulsing, ensure your hands, face, head, hair, etc. are not in the machine or near the openings where the access panels were removed. When you pulse, an invisible laser beam shoots out the laser tube and towards Mirror 1, which then redirects the beam 90 degrees toward Mirror 2, which then redirects the beam 90 degrees toward Mirror 3 and so on. Also, take note not to hold down the Pulse button or it will incinerate the blue painters tape and burn the acrylic target below.

9) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

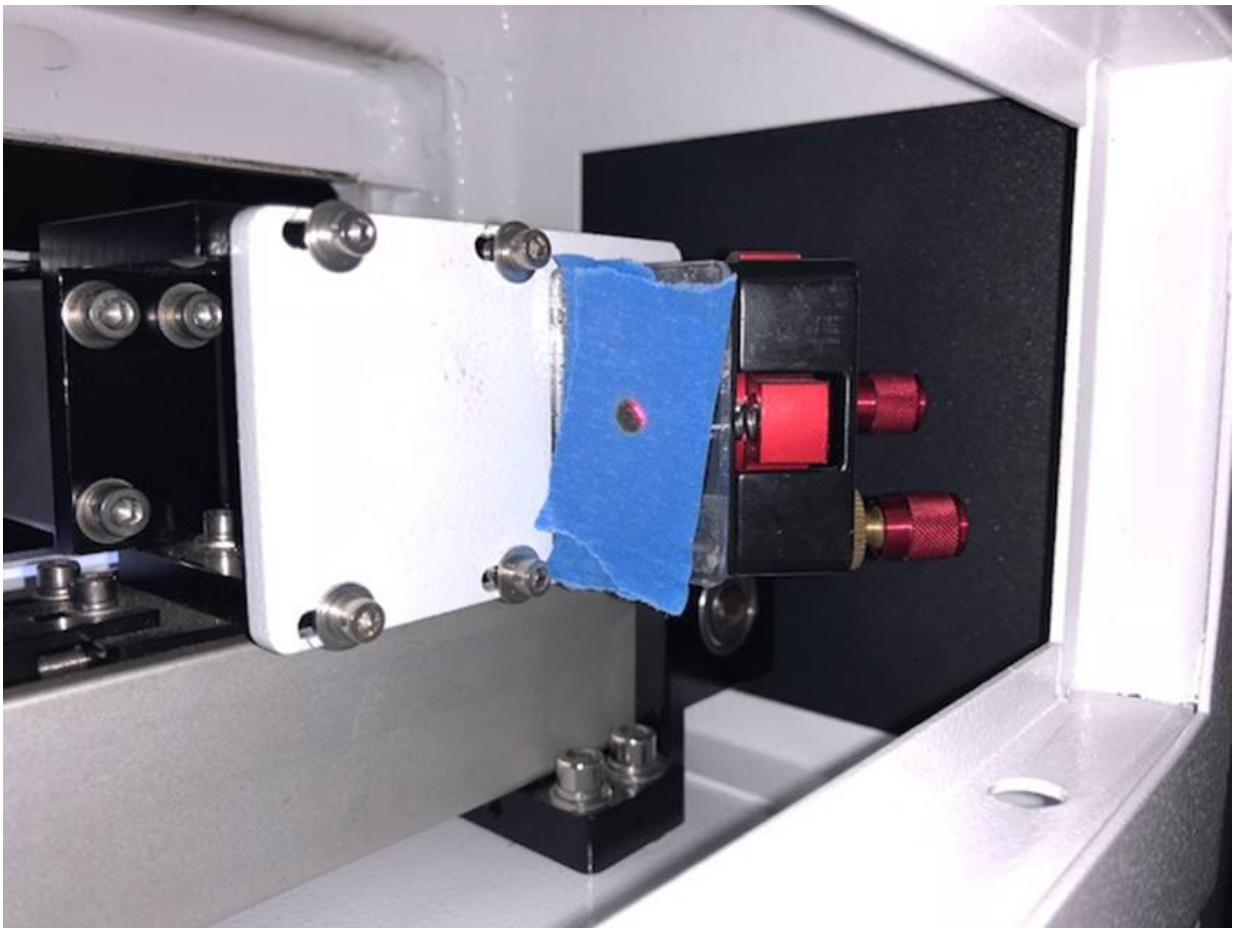
10) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.



11) Now press and hold the Down arrow key on the control panel until the gantry stops all the way at the extreme front of the machine.

12) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

13) If the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling parallel to the left gantry rail and you can skip steps 5 and 6 and move on to Step7: Mirror 2 Entry Point.



STEP 5: MIRROR 1 ADJUSTMENT

1) Assuming the second burn mark did not overlap the first burn mark, then this means you will need to adjust Mirror 1 and then repeat the Mirror 1 Parallel Check until both burn marks overlap.

2) Leave the gantry where it is sitting at the extreme front of the machine.

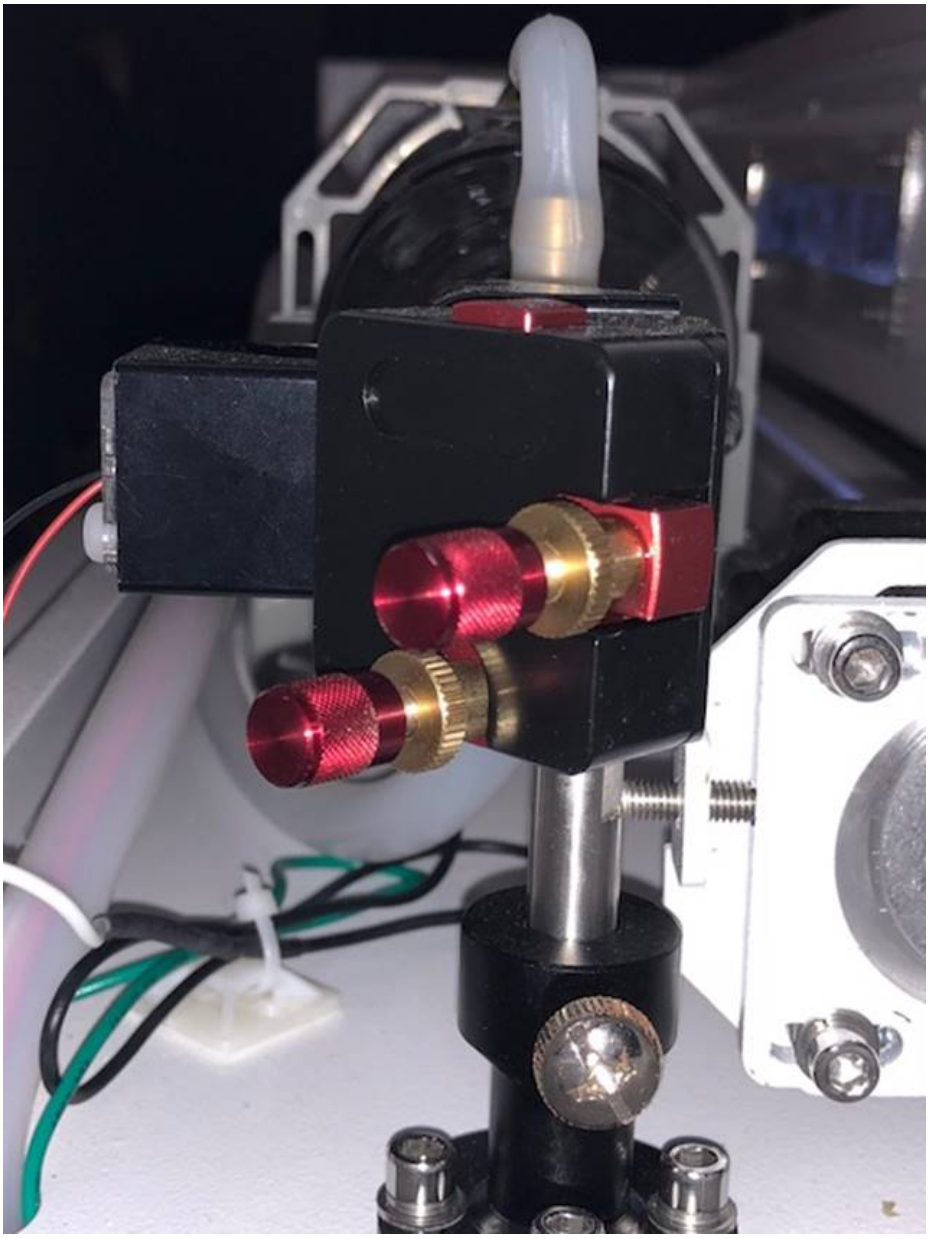
3) Locate the two red adjustment knobs on Mirror 1 at the rear left hand corner of the machine.

4) Loosen the bronze locking nuts while making sure to hold the red adjustment knobs in place. **NOTE: You will want to be very careful not to accidentally turn either of the red adjustment knobs while loosening the bronze locking nuts.**

5) Before making an adjustment, first study the two burn marks and identify which direction the second burn mark needs to move in order to overlap the first burn mark.

6) Then take a second to familiarize yourself with the adjustment knobs.

NOTE: The knob located at the bottom will move the beam downwards when turned clockwise and upwards when turned counterclockwise. The adjustment knob on the right will move the beam towards the right when turned clockwise and towards the left when turned counterclockwise. If your machine has the adjustment knobs in a differentlocation, for example, the bottom knob is located at the top of the Mirror 1 bracket, then the opposite is true. Rotating the top adjustment knob clockwise will move the beam upward and counterclockwise will move the beam downwards.



7) Make a small adjustment in the direction(s) you see fit.

8) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape. If you turned the knob(s) the right way, this burn should be closer to overlapping your first burn mark.

9) Continue to adjust the knobs and pulse as needed until the second burn mark is shooting directly over the first burn mark.

10) Once the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling parallel to the left gantry rail and you can skip Step 6 and move on to Step7: Mirror 2 Entry Point.

11) If the painters tape gets too burnt and it becomes difficult to see where the laser is shooting any longer, then remove the blue painters tape from the acrylic target and replace it with two new pieces.

STEP 6: REPEAT STEP 4 AND 5

1) Press and hold the Up arrow key on the control panel until the gantry stops all the way at the extreme rear of the machine.

2) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

3) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.

4) Now press and hold the Down arrow key on the control panel until the gantry stops all the way at the extreme front of the machine.

5) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

6) If the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is finally traveling parallel to the gantry rail.

7) If the second burn mark is still not quite over the first burn mark, continue making adjustments to Mirror 1 until you are satisfied. **NOTE: It's not uncommon to repeat this sequence several times, especially if you have a heavy trigger finger.**

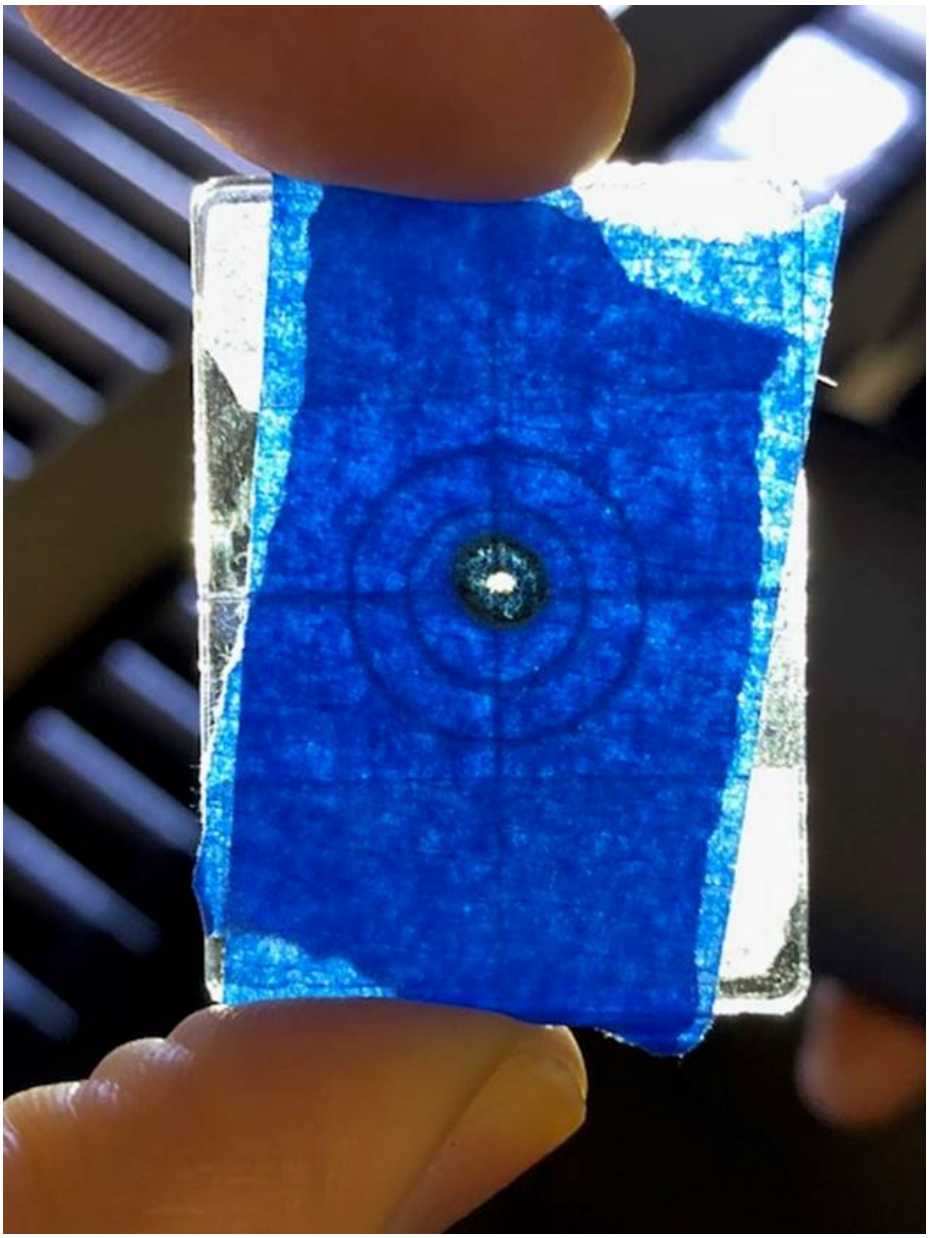
STEP 7: MIRROR 2 ENTRY POINT

1) Once you are satisfied with the way the second burn mark overlaps the first burn mark, remove the target from the black Mirror 2 housing making sure not to remove the blue painters tape.

2) Hold the acrylic target up to a light or use the light on your cell phone to illuminate the blue painters tape so that you can see the cross hairs of the acrylic target through the tape.

3) The laser beam does not have to be entering Mirror 2 dead center. Anywhere within the second ring of the target is fine.

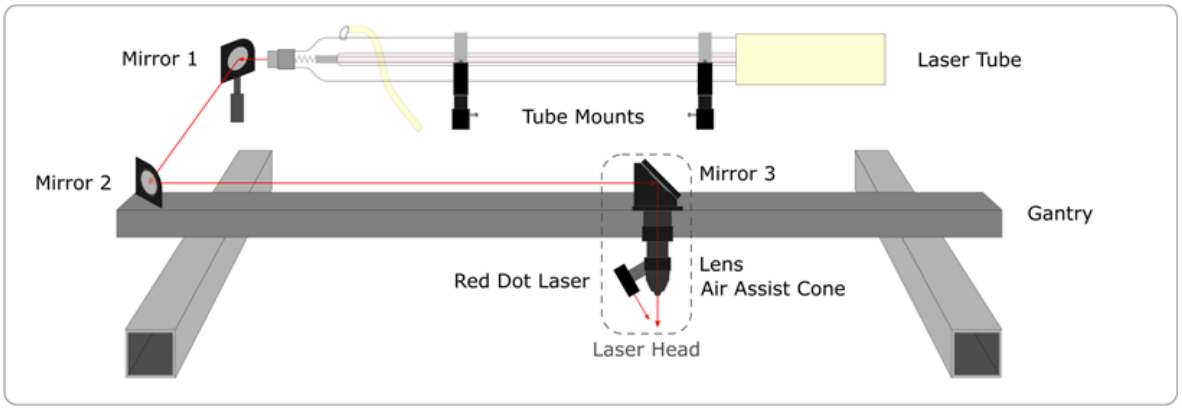
NOTE: This step is simply an observation to ensure the full width of the laser beam is making its way on to Mirror 2. If an adjustment needs to me made, it <u>will NOT</u> be via the adjustment knobs on Mirror 1. The adjustment knobs on Mirror 1 are only used to make sure the beam is shooting parallel with the left gantry rail. If the laser beam is not within the second ring of the target, take a picture of your results and email it to Rob on our tech support team. He will guide you through the proper adjustments.



STEP 8: MIRROR 2 PARALLEL CHECK

1) Open the front lid to the laser cabinet.

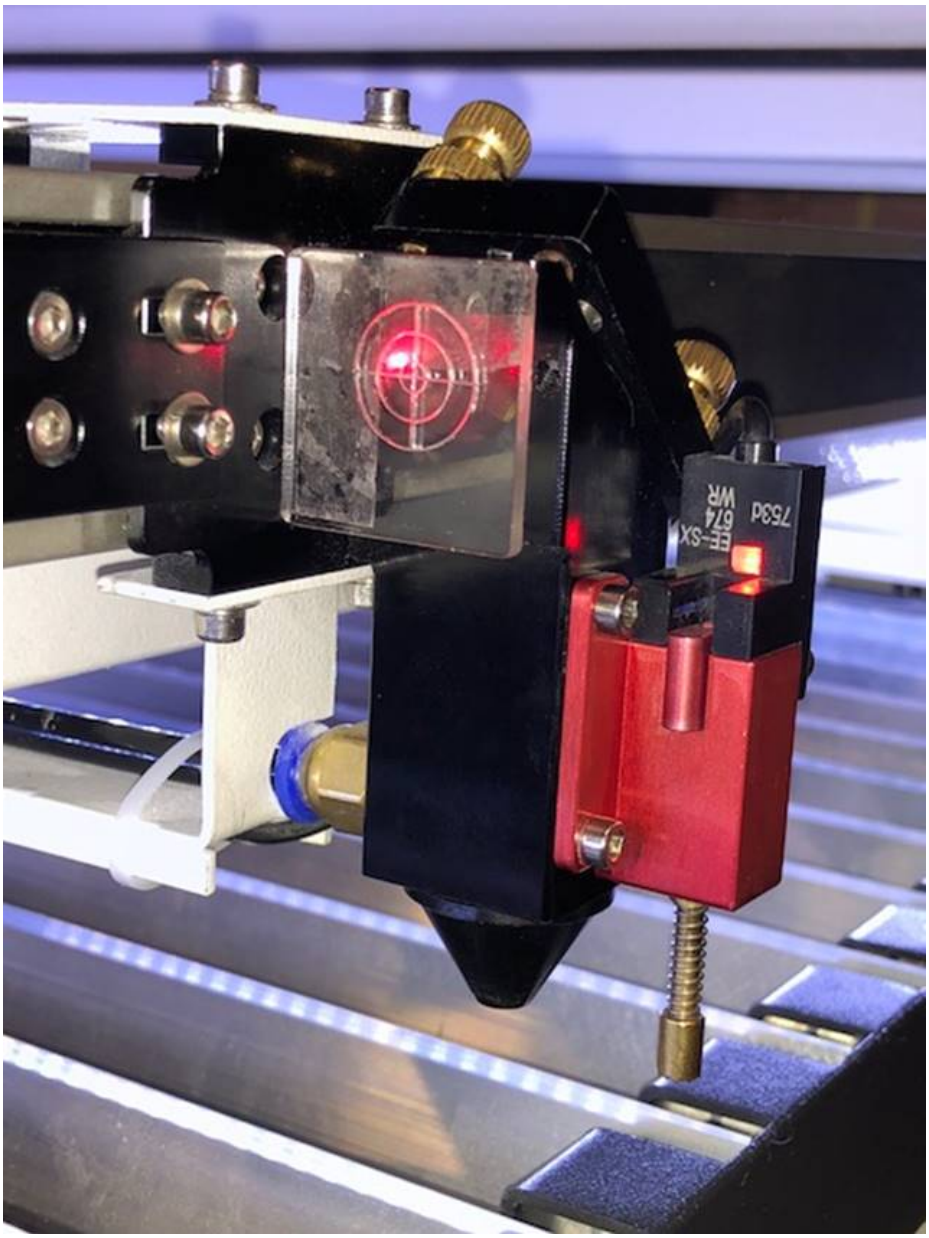
2) Locate Mirror 2, the laser head, Mirror 3 and the gantry. The goal here is to ensure that the laser beam runs parallel to the gantry as it travels left to right from Mirror 2 to Mirror 3.



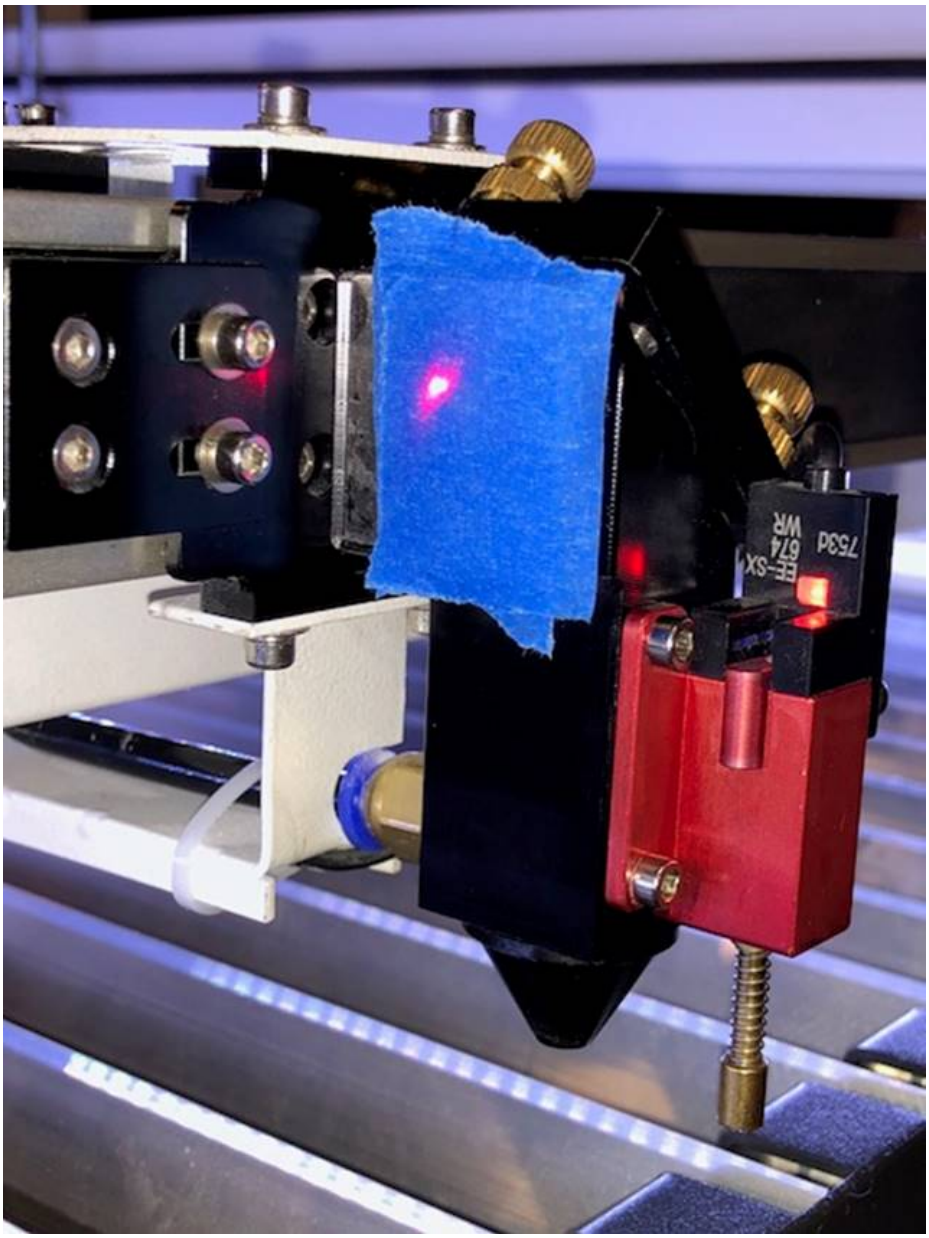
3) Locate the larger of the two square clear acrylic targets from within the clear tote and peel off the paper backing to expose the adhesive.

4) Place the target over the entrance to the laser head so that it faces Mirror 2. **NOTE: The tape on the target should follow the L shape on the laser head.**

5) Make sure the target is evenly flushed with the top of the black laser head housing and that it is pushed up against the back of the housing as well.



6) Tear a small piece of blue painters tape in half and then place them both (one on top of the other) over the acrylic target.



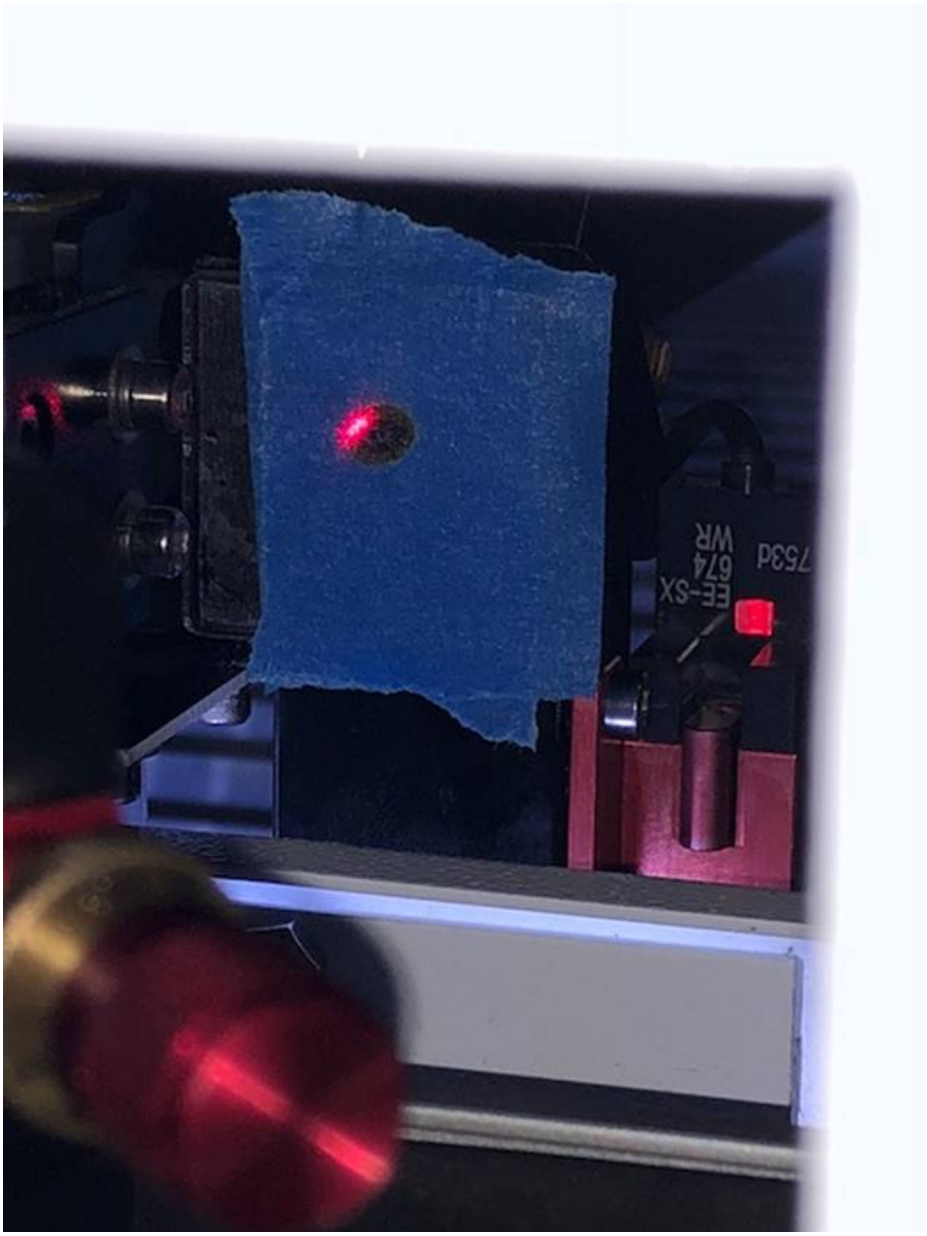
7) Press and hold the Up or Down arrow key on the control panel until the gantry stops midway between the back and front of the work table. **NOTE: You can check the Y coordinate on the control panel to ensure you stopped midway. (Mira5 = 150mm, Mira7 = 225mm, and Mira9 = 300mm)**

8) Next, press and hold the Left arrow key on the control panel until the laser head stops at the extreme left of the gantry. The goal is to bring the target as close to Mirror 2 as possible.

CAUTION: when pulsing, ensure your hands, face, head, hair, etc. are not in the machine or near the openings where the access panels were removed. When you pulse, an invisible laser beam shoots out the laser tube and towards Mirror 1, which then redirects the beam 90 degrees toward Mirror 2, which then redirects the beam 90 degrees toward Mirror 3 and so on. Also, take note not to hold down the Pulse button or it will incinerate the blue painters tape and burn the acrylic target below.

9) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

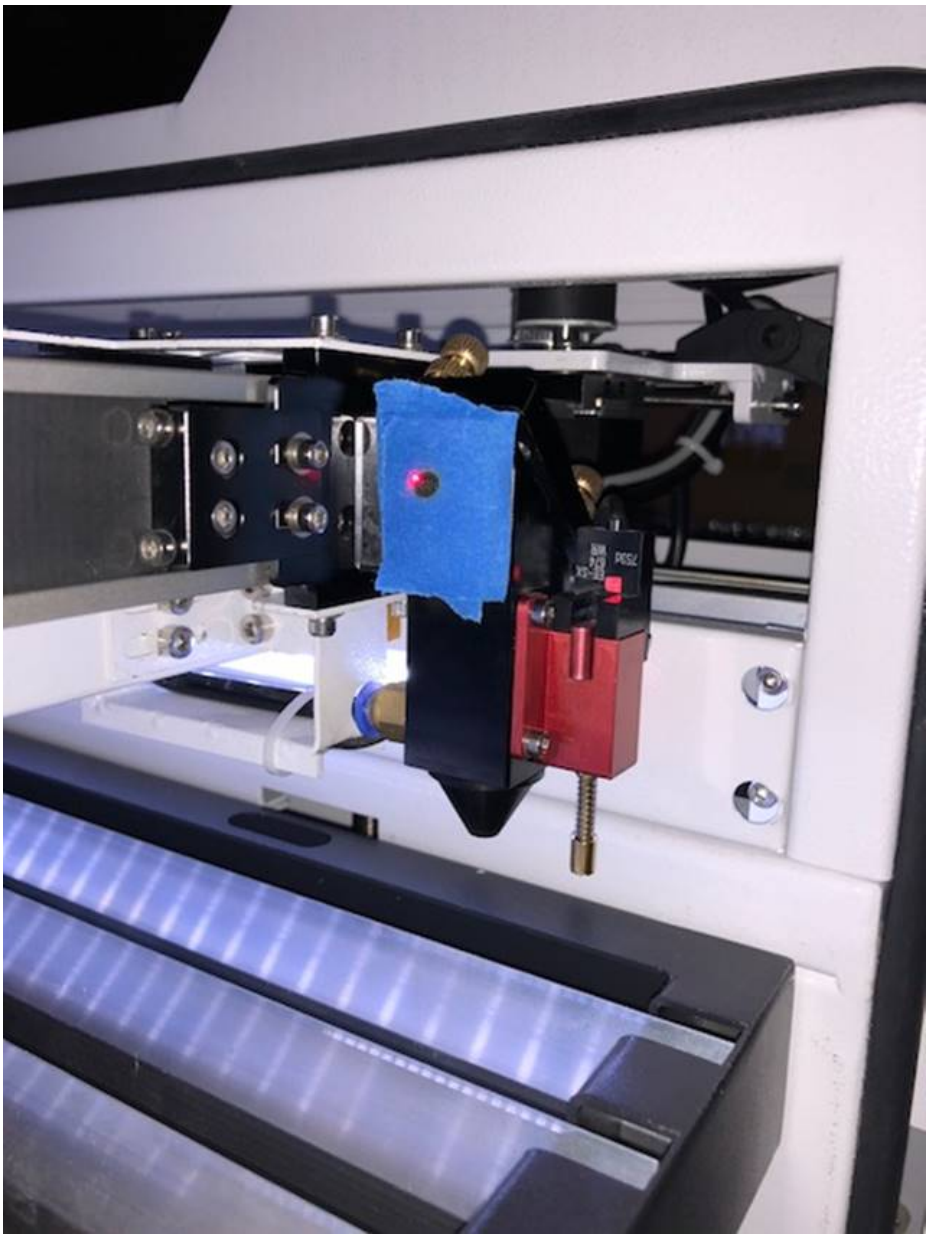
10) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.



11) Now press and hold the Right arrow key on the control panel until the laser head stops all the way at the extreme right of the gantry.

12) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

13) Once the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling parallel to the gantry and you can skip steps 9 and 10 and move on to Step 11: Mirror 3 Entry Point.



STEP 9: MIRROR 2 ADJUSTMENT

12) Assuming the second burn mark did not overlap the first burn mark, then this means you will need to adjust Mirror 2 and then repeat the Mirror 2 Parallel Check until both burn marks overlap.

13) Leave the laser head where it is sitting at the extreme right of the machine.

14) Locate the red adjustment knobs on Mirror 2 at the far left of the gantry.

15) Loosen the bronze locking nuts while making sure to hold the red adjustment knobs in place. **NOTE: You will want to be**

very careful not to accidentally turn either of the red adjustment knobs while loosening the bronze locking nuts.

16) Before making an adjustment, first study the two burn marks and identify which direction the second burn mark needs to move in order to overlap the first burn mark.

17) Then take a second to familiarize yourself with the adjustment knobs.

NOTE: The knob located at the bottom will move the beam downwards when turned clockwise and upwards when turned counterclockwise. The adjustment knob on the right will move the beam towards the right when turned clockwise and towards the left when turned counterclockwise. If your machine has the adjustment knobs in a different location, for example, the bottom knob is located at the top of the Mirror 2 bracket, then the opposite is true. Rotating the top adjustment knob clockwise will move the beam upward and counterclockwise will move the beam downwards.

18) Make a small adjustment in the direction(s) you see fit.

19) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape. If you turned the knob(s) the right way, this burn should be closer to your first burn mark.

20) Continue to adjust the knobs and pulse as needed until the second burn mark is shooting directly over the first burn mark.

21) Once the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling parallel to the gantry and you can skip Step 10 and move on to Step 11: Mirror 3 Entry Point.

22) If the painters tape gets too burnt and it becomes difficult to see where the laser is shooting any longer, then remove the blue painters tape from the acrylic target and replace it with two new pieces.

STEP 10: REPEAT STEP 8 AND 9

1) Press and hold the Left arrow key on the control panel until the laser head stops at the extreme left of the gantry.

2) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

3) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.

4) Now press and hold the Right arrow key on the control panel until the laser head stops all the way at the extreme right of the gantry

5) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

6) If the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is finally traveling parallel to the gantry.

7) If the second burn mark is still not quite over the first burn mark, continue making adjustments to Mirror 2 until you are satisfied. **NOTE: It's not uncommon to repeat this sequence several times, especially if you have a heavy trigger finger.**

STEP 11: MIRROR 3 ENTRY POINT

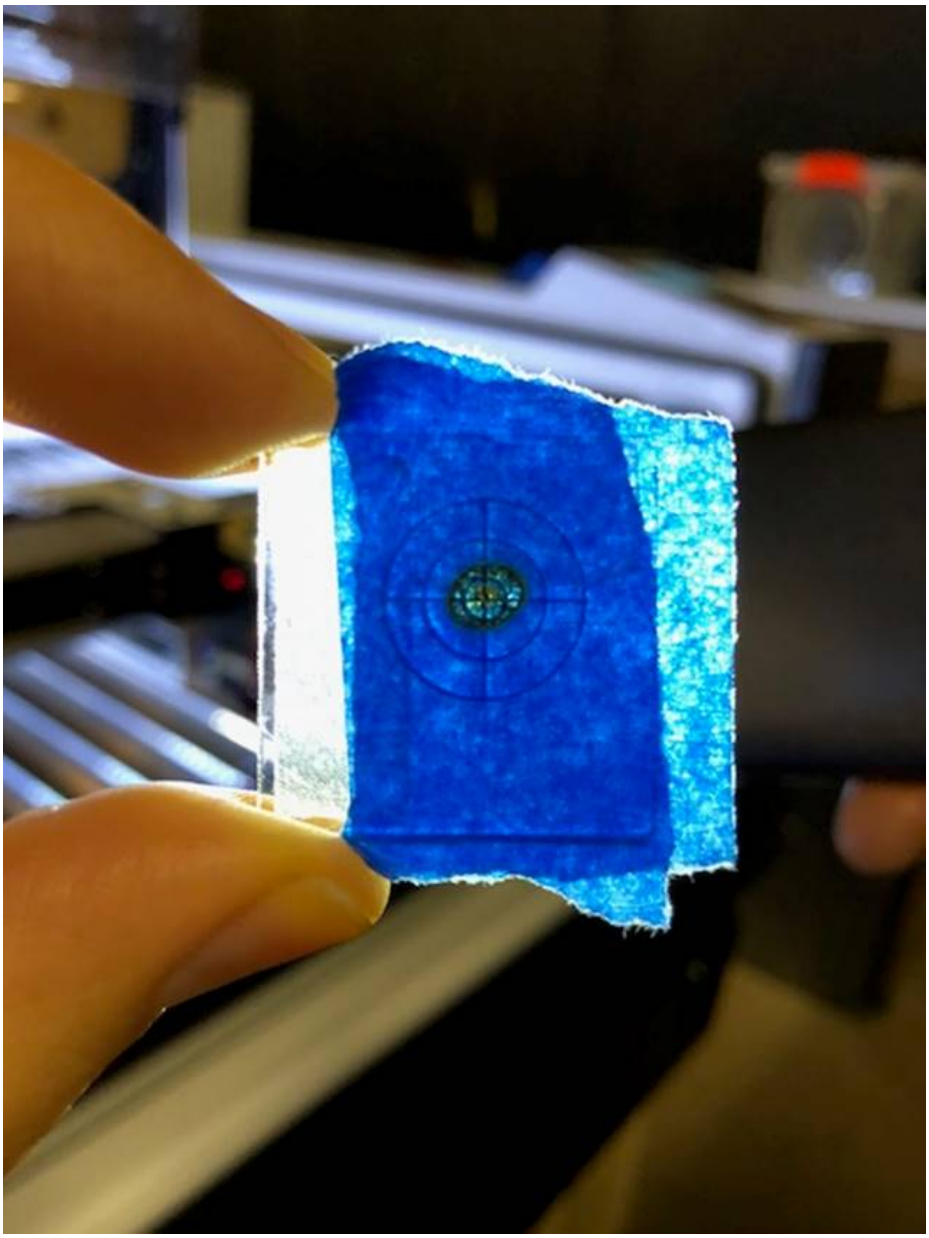
1) Once you are satisfied with the way the second burn mark overlaps the first burn mark, remove the target from the black laser head housing making sure not to remove the blue painters tape.

2) Hold the acrylic target up to a light or use the light on your cell phone to illuminate the blue painters tape so that you can see the cross hairs of the acrylic target through the tape.

3) The laser beam does not have to be entering Mirror 3 dead center, but it should be at least touching both of the cross hairs.

4) Keep the blue tape on for the next step.

NOTE: This step is simply an observation to ensure the full width of the laser beam is entering the laser head and making its way on to Mirror 3. If an adjustment needs to me made, it will NOT be via the adjustment knobs on Mirror 2. The adjustment knobs on Mirror 2 are only used to make sure the beam is shooting parallel with the gantry. If the laser beam is not touching both of the cross hairs, take a picture of your results and email it to Rob on our tech support team. He will guide you through the proper adjustments.



STEP 12: RED POINTER TO LASER BEAM PARALLEL CHECK

1) Now that the laser beam is running parallel in both X and Y directions, we can now adjust the red pointer to match the path of the laser beam. **NOTE: The red pointer does not need to perfectly overlap the path of the laser beam. The goal here is just to have it run parallel to the laser's path so that it can serve as a visual reference for the rest of the alignment process and future alignments.**

2) With the tape still on, place the square target over the entrance to the laser head again so that it faces Mirror 2.

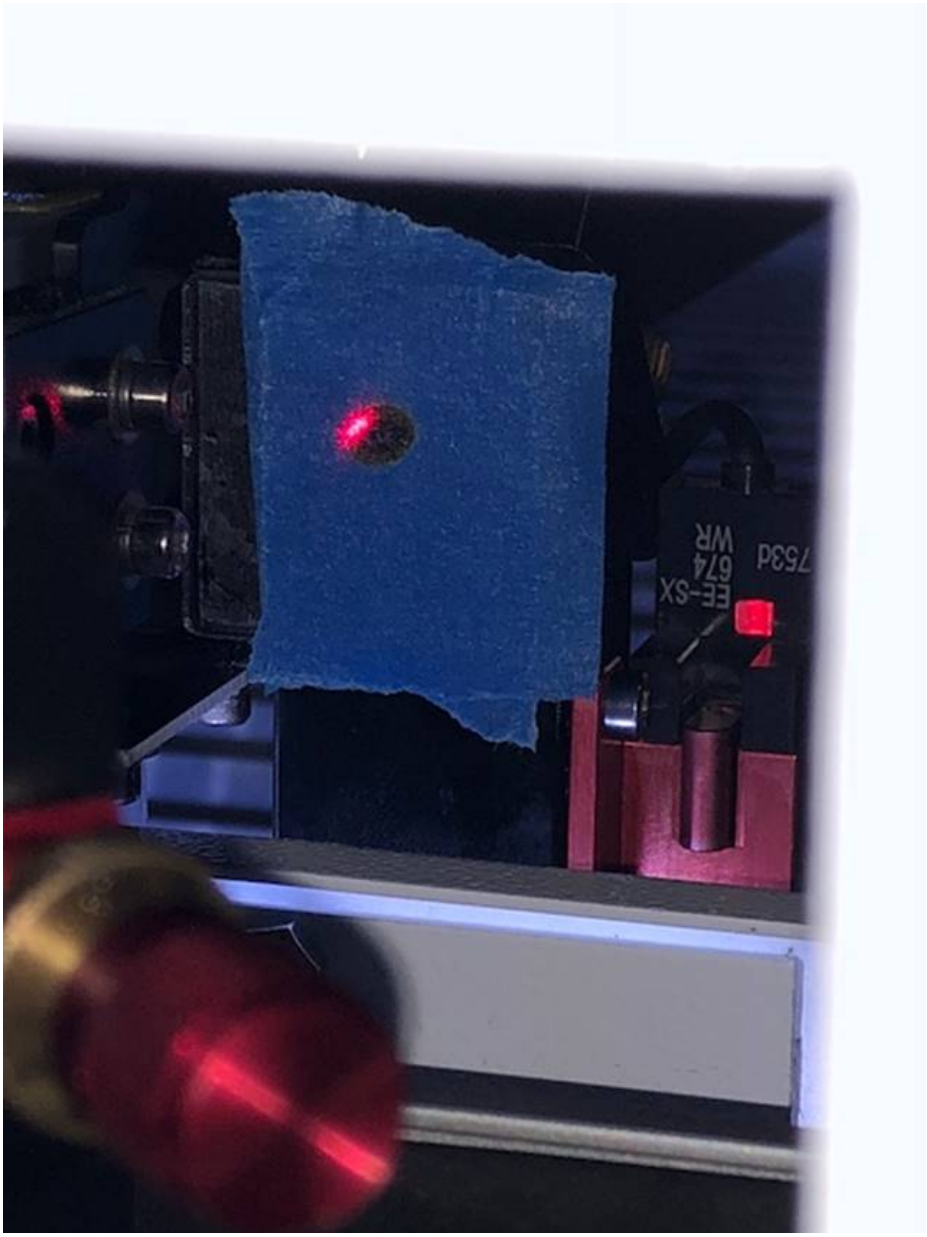
3) Make sure the target is evenly flushed with the top of the black laser head housing and that it is pushed up against the back

of the housing as well.

4) The gantry should still be located midway between the front and back pf the machine. **(Mira5 = 150mm, Mira7 = 225mm, and Mira9 = 300mm)**

5) Press and hold the Left arrow key and jog the laser head all the way to the left.

6) Now, take note of where the red laser pointer is in relation to the burn mark.

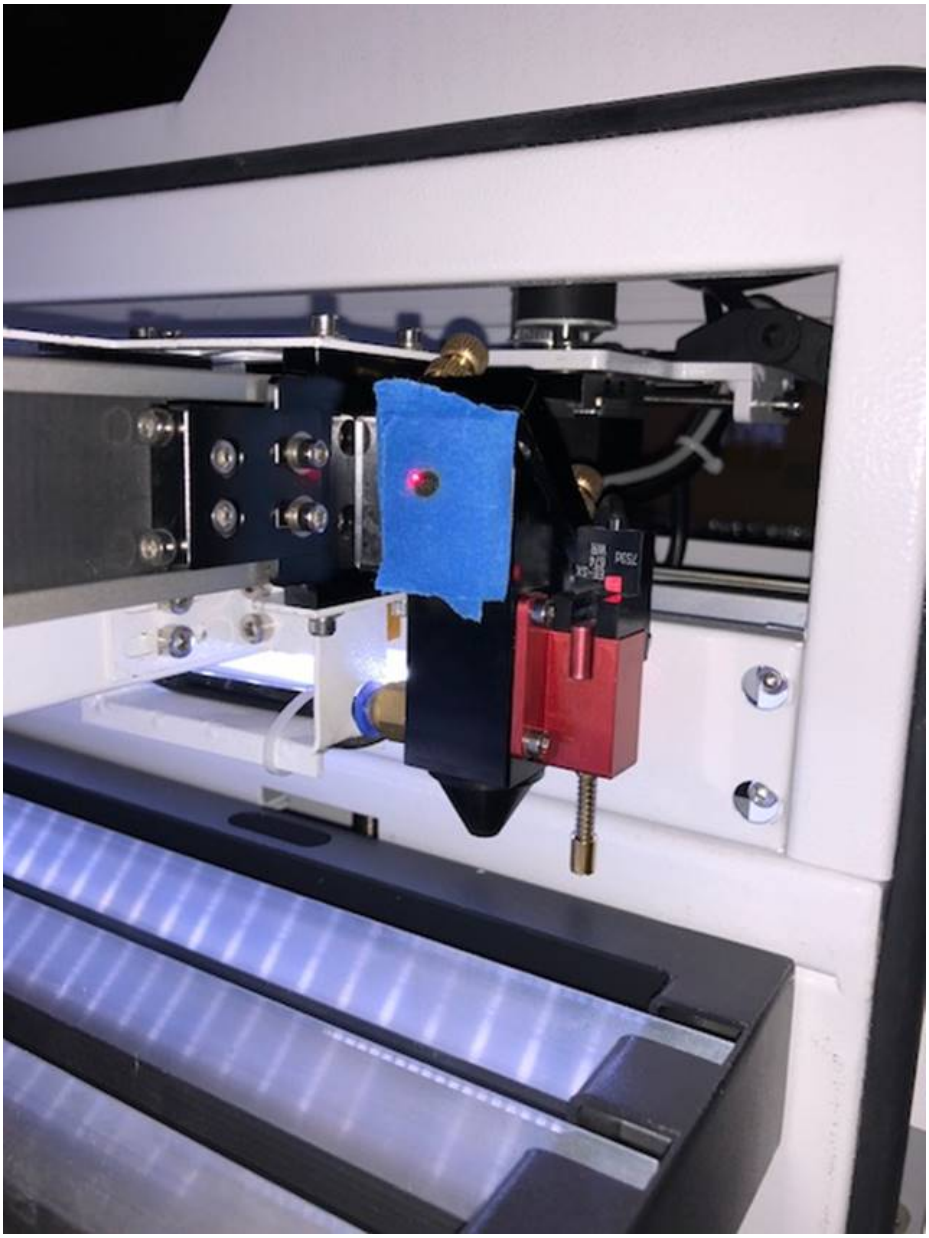


7) While maintaining a visual on the red pointer, press and hold the Right arrow key on the control panel so that the laser head begins to move to the extreme right of the gantry.

8) Continue to observe the red pointer and its relationship to the burn mark as the laser head travels to the extreme right of the gantry.

9) The goal is for the red pointer to remain in the same location as the laser head travels from the extreme left to the extreme right of the gantry. **NOTE: As the laser head moves further away, the red pointer will grow in size a bit, so it's important to maintain focus on the center of the red dot and not its fuzzy outer edges.**

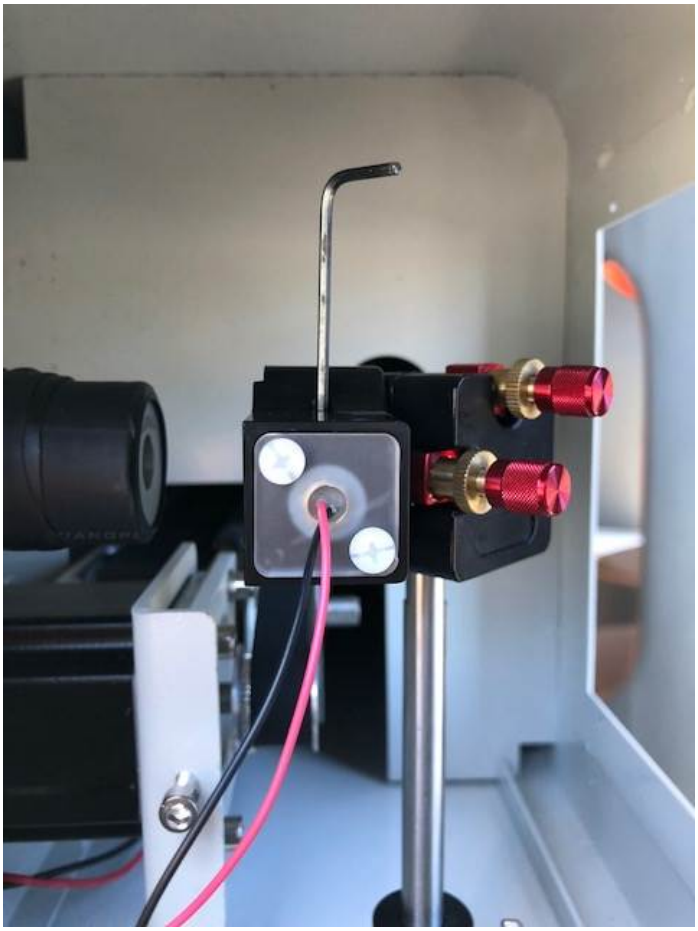
10) If there is **no** movement in the red pointer from the extreme left to the extreme right, then that means the red pointer is indeed traveling parallel to the laser beam and you can skip steps 13 and move on to Step 14: Mirror 3 Parallel Check.



STEP 13: RED POINTER ADJUSTMENT

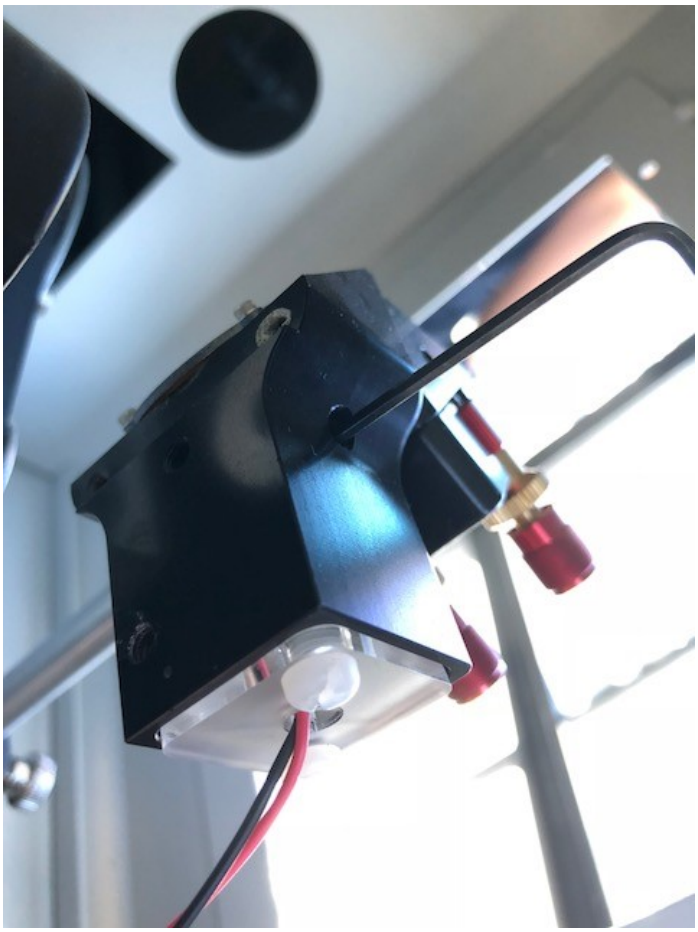
1) If there **is** movement in the red pointer from the extreme left to the extreme right, then it is an indication that the red pointer is not running parallel to the path of the laser beam and needs to be adjusted.

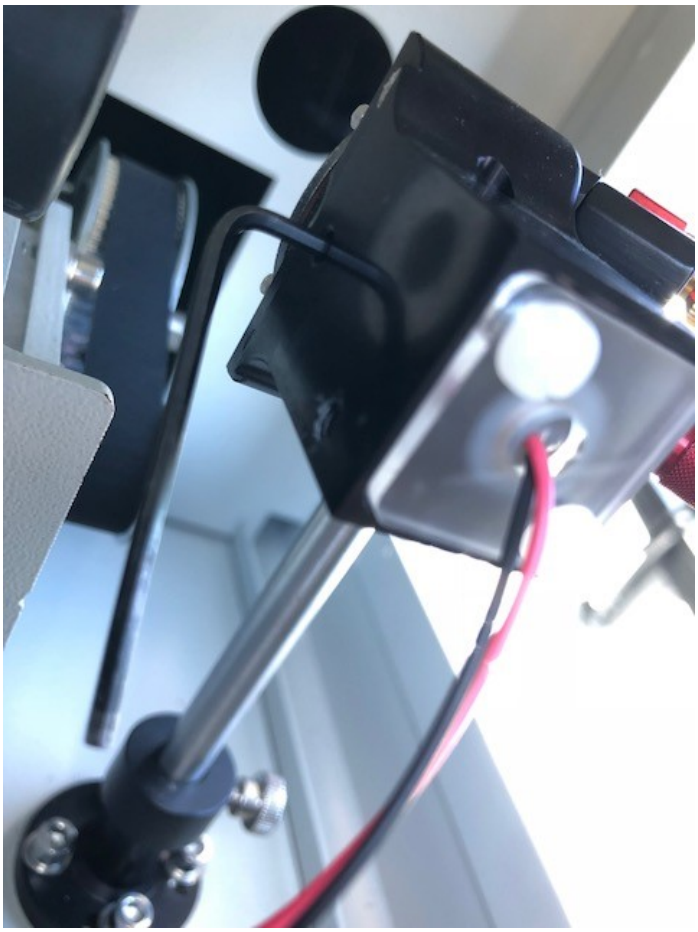
2) Locate Mirror 1 at the rear left corner of the machine. The red pointer bracket is in between the laser tube and Mirror 1.



3) Just like with the previous burn tests, the goal is to get the second burn mark or in this case, the red pointer location at the far right of the gantry to overlap the first burn mark or in this case, the red pointer location at the far left of the gantry.

NOTE: The setscrew located at the top of the red pointer bracket will move the beam downwards when turned clockwise and upwards when turned counterclockwise. The setscrew on the left will move the beam towards the right when turned clockwise and towards the left when turned counterclockwise. However, the opposite might be true for the left to right adjustment as it may change after it reflects of Mirror 1 and Mirror 2. I'm not in front of a machine right now to where I can confirm, but it will become obvious once you begin to adjust it.





4) Continue to make small adjustments as needed. It is not uncommon to have to jog the laser head from left to right and right to left many times as you intensely stare at it.

5) Once the red pointer maintains its position in relation to the burn mark in both extreme left and extreme right positions, then that means the red point pointer is indeed traveling parallel to the laser beam.

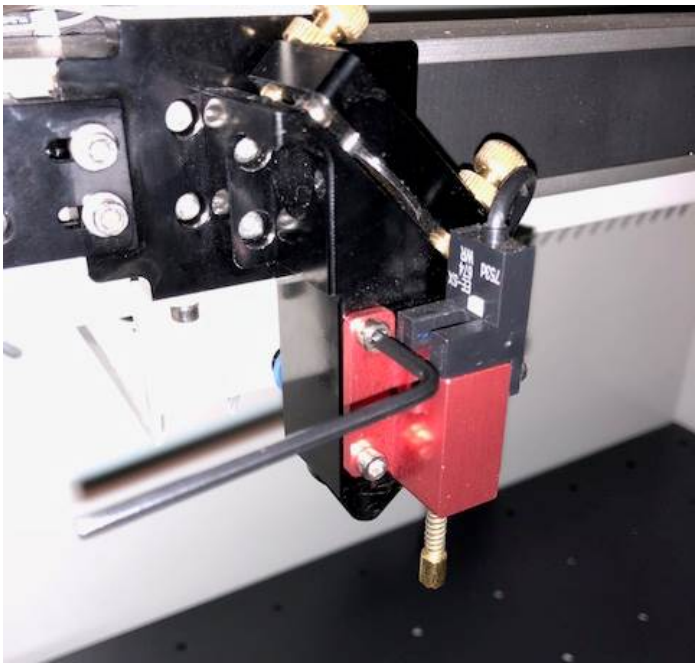
STEP 14: MIRROR 3 PERPENDICULAR CHECK

1) Press and hold the Up or Down arrow key on the control panel until the gantry stops midway between the back and front of the work table. **NOTE: You can check the Y coordinate on the control panel to ensure you stopped midway. (Mira5 = 150mm, Mira7 = 225mm, and Mira9 = 300mm)**

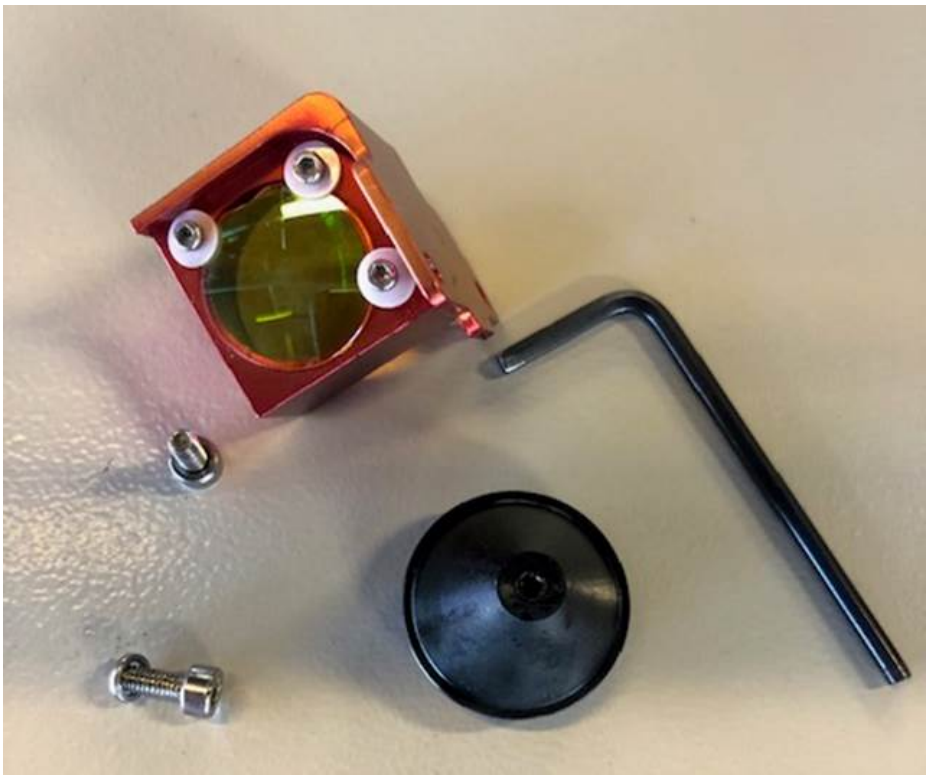
2) Next, press and hold the Left or Right arrow key on the control panel until the laser head stops midway between the left and right of the work table. **NOTE: You can check the X coordinate on the control panel to ensure you stopped midway. (Mira5 = 250mm, Mira7 = 350mm, and Mira9 = 450mm)**

3) Remove the nozzle from the bottom of the laser head by turning it clockwise.

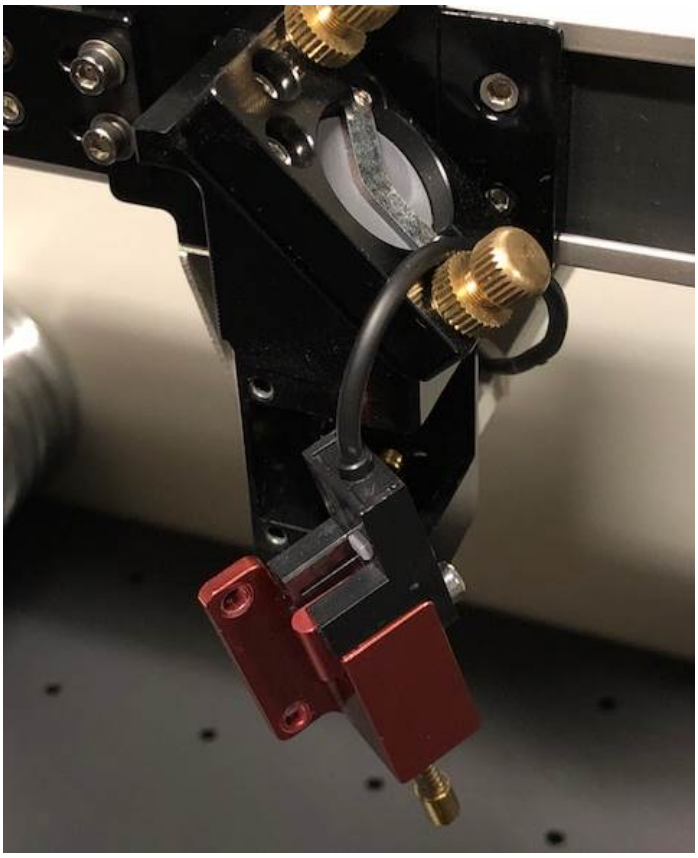
4) Using the 3mm Allen wrench, remove the two screws holding the Auto Focus sensor to the laser head.



5) Remove the lens cartridge as well being careful not to drop it. Place the lens cartridge, nozzle and the two screws in the clear tote for safe keeping.



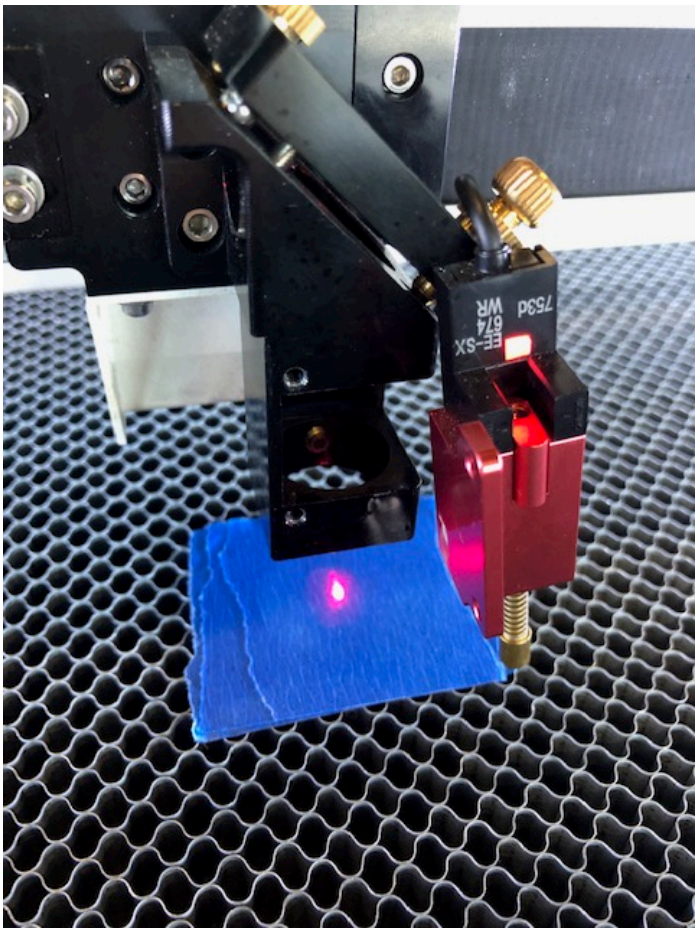
6) Loop the cable of the Auto Focus sensor over the lower adjustment knob on the laser head so that it simply hangs out of the way.



7) Press the Z/U button on the control panel and then press and hold the Left arrow key so that the table begins to rise.

8) Continue to raise the table until there is roughly a 1” (25mm) gap between the table and the bottom of the laser head.
NOTE: Make certain you don’t go too high, as this can result in a collision between the table and the laser head. NOT GOOD!

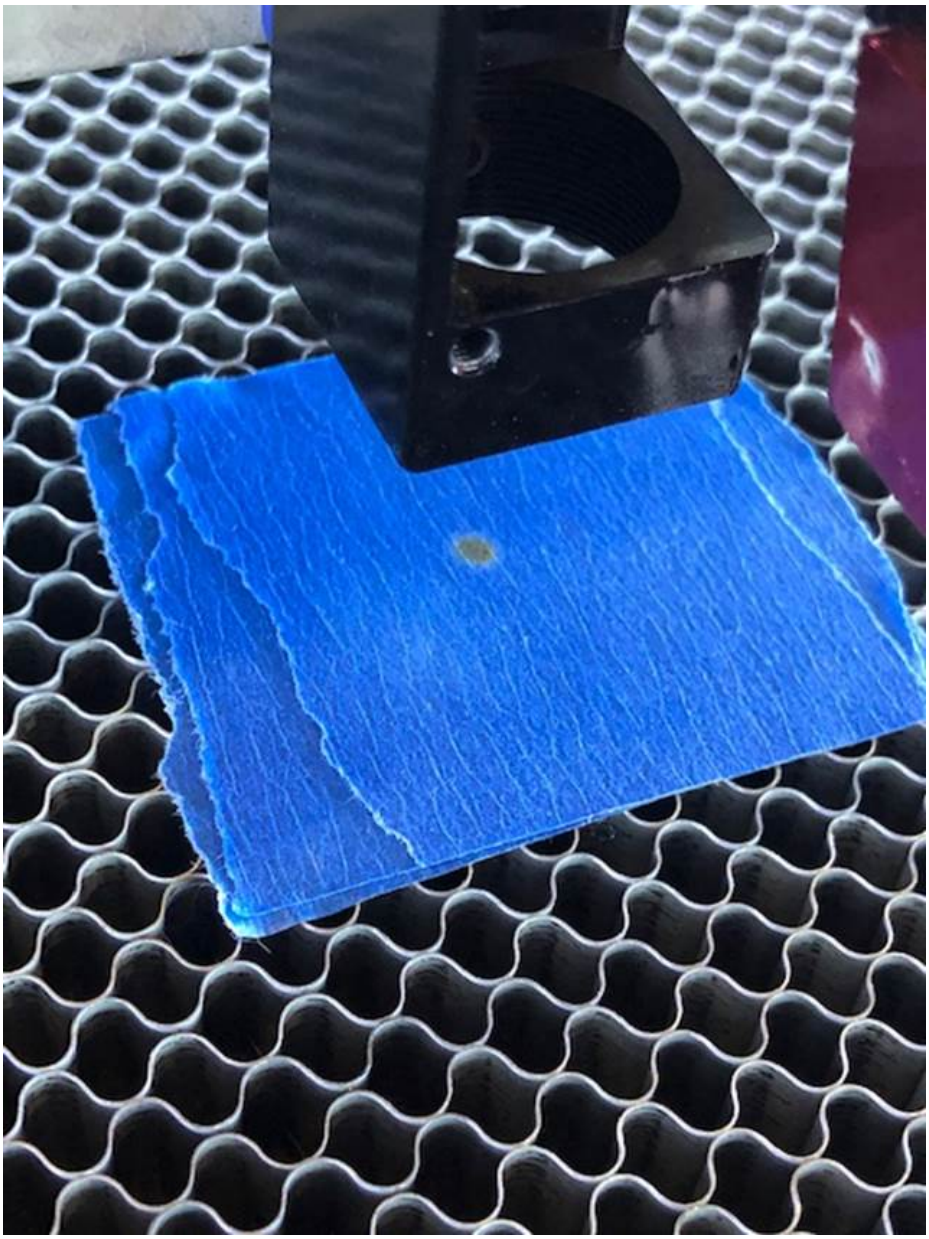
9) Tear a small piece of blue painters tape in half and then place them both (one on top of the other) beneath the laser head so that the red pointer is roughly in the middle of the tape.



CAUTION: when pulsing, ensure your hands, face, head, hair, etc. are not in the machine or near the openings where the access panels were removed. When you pulse, an invisible laser beam shoots out the laser tube and towards Mirror 1, which then redirects the beam 90 degrees toward Mirror 2, which then redirects the beam 90 degrees toward Mirror 3 and so on. Also, take note not to hold down the Pulse button or it will incinerate the blue painters tape and burn the acrylic target below.

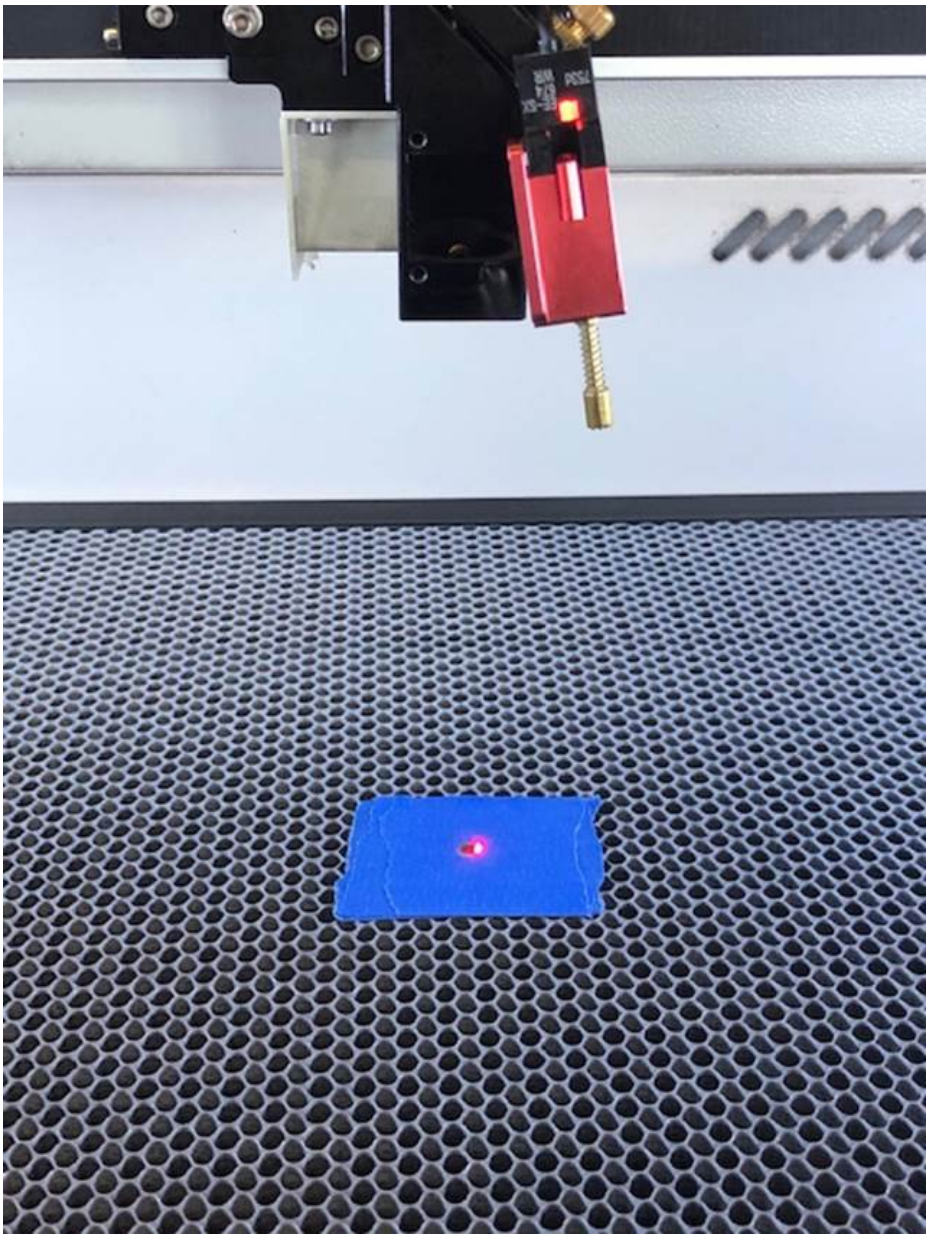
10) Press Esc on the keypad and then lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

11) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.



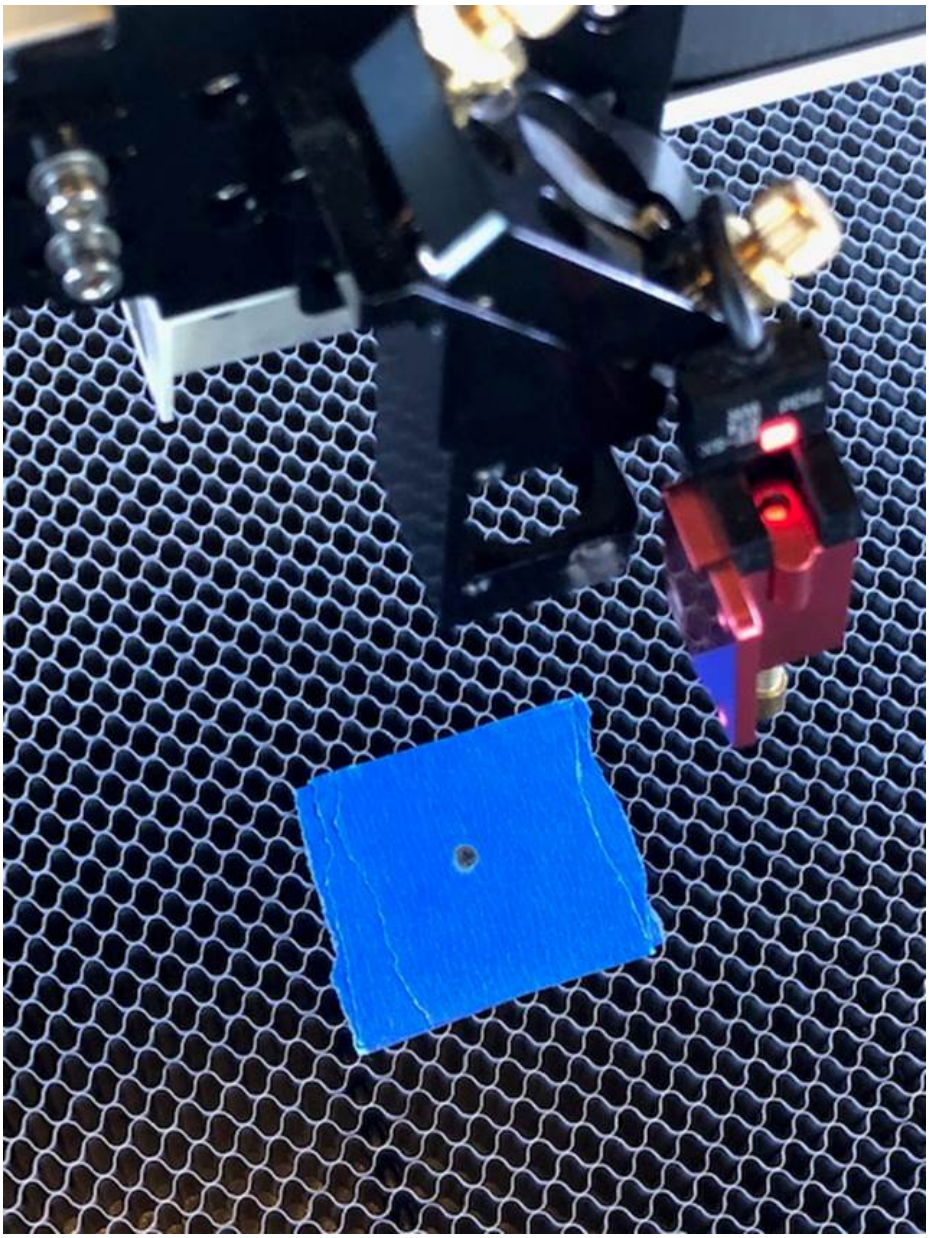
12) Press the Z/U button on the control panel and then press and hold the Right arrow key so that the table begins to drop.
NOTE: Make certain the table is not accidentally moving upwards as this will quickly result in a collision between the table and the laser head nozzle. NOT GOOD!

13) Continue to lower the table until there is roughly a good 4” (100mm) gap between the table and the bottom of the laser head.



14) Press Esc on the keypad and then lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

15) If the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling perpendicular to the work table and you can skip Step 15 and 16 and move on to Step 17: Laser Nozzle Entry Point.



STEP 15: MIRROR 3 ADJUSTMENT

1) Assuming the second burn mark did not overlap the first burn mark, then this means you will need to adjust Mirror 3 and then repeat the Mirror 3 Perpendicular Check until both burn marks overlap.

2) Leave the work table where it is sitting, 4” (100mm) away from the nozzle on the laser head.

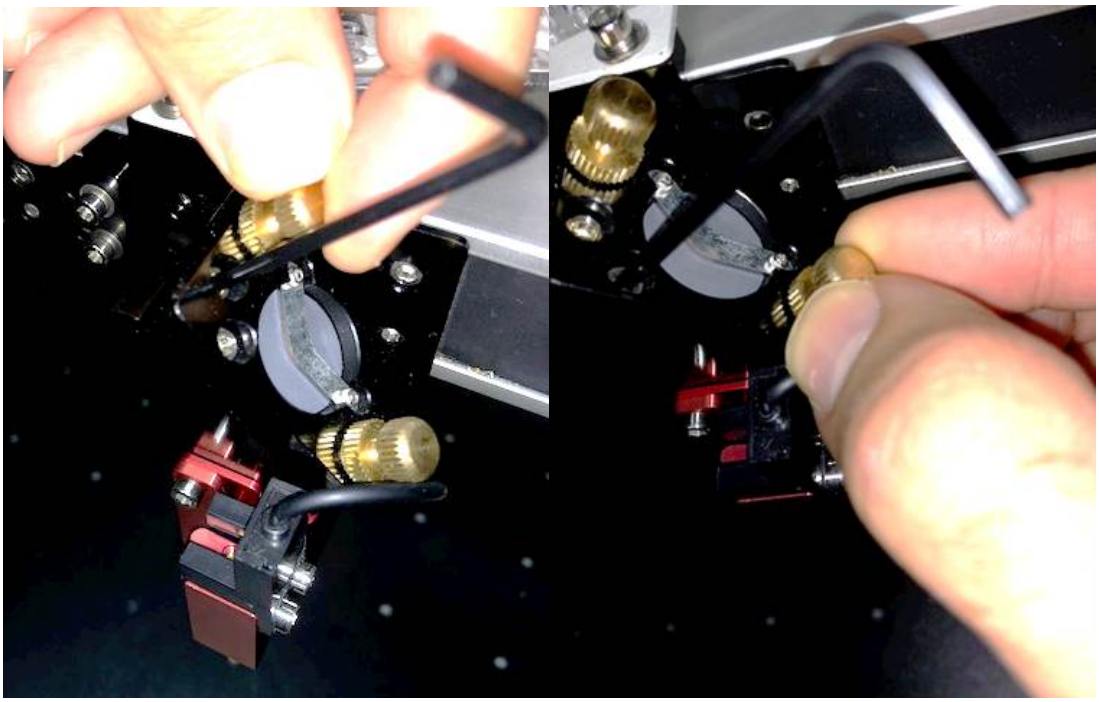
3) Locate Mirror 3 at the top of the laser head.

4) Loosen the bronze locking nuts while making sure to hold the adjustment knobs in place. **NOTE: You will want to be very careful not to accidentally turn either of the adjustment knobs while loosening the bronze locking nuts.**

5) Before making an adjustment, first study the two burn marks and identify which direction the second burn mark needs to move in order to overlap the first burn mark.

6) Then take a second to familiarize yourself with the adjustment knobs. They are a bit different from the first two mirrors and take a little getting used to.

NOTE: The knob located at the top of the laser head will move the laser towards the back of the machine when turned clockwise and towards the front of the machine when turned counterclockwise. The adjustment knob on the bottom will move the laser towards the right when turned clockwise and towards the left when turned counterclockwise. Before making any adjustments, you will need the 2.5mm Allen wrench in order to loosen the corresponding locking bolt at the top corner of the Mirror 3 bracket. These bolts are used to lock the final position of the Mirror 3 bracket in place and will prevent you from making any adjustments until they have been loosened slightly. The best way to go about making the Mirror 3 adjustment is to simultaneously loosen one of the bolts while using your other hand to turn the corresponding adjustment knob until the desired adjustment is achieved. The bolt at the very top of the Mirror 3 bracket corresponds to the front and back adjustment knob located right next to it. The bolt diagonally across that sits a bit further down corresponds to the left and right adjustment knob located at the bottom of the Mirror 3 bracket.



7) Continue to adjust the knobs and pulse as needed until the second burn mark is shooting directly over the first burn mark.

8) Once the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is indeed traveling perpendicular to the work table and you can skip Step 16 and move on to Step 17: Laser Nozzle Entry Point.

9) If the painters tape gets too burnt and it becomes difficult to see where the laser is shooting any longer, then remove the blue painters tape from the table and replace it with two new pieces.

STEP 16: REPEAT MIRROR 3 PERPENDICULAR CHECK

1) Press the Z/U button on the control panel and then press and hold the Left arrow key so that the table begins to rise.

2) Continue to raise the table until there is roughly a 1" (25mm) gap between the table and the bottom of the laser head. **NOTE: Make certain you don't go too high, as this can result in a collision between the table and the laser head. NOT GOOD!**

3) Tear a small piece of blue painters tape in half and then place them both (one on top of the other) beneath the laser head so that the red pointer is roughly in the middle of the tape.

4) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

5) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.

6) Press the Z/U button on the control panel and then press and hold the Right arrow key so that the table begins to drop. **NOTE: Make certain the table is not accidentally moving upwards as this will quickly result in a collision between the table and the laser head nozzle. NOT GOOD!**

7) Continue to lower the table until there is roughly a good 4" (100mm) gap between the table and the bottom of the laser head.

8) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver another very small burn mark on to the surface of the blue painters tape.

9) If the second burn mark perfectly overlaps the first burn mark, then that means the laser beam is finally traveling perpendicular to the work table.

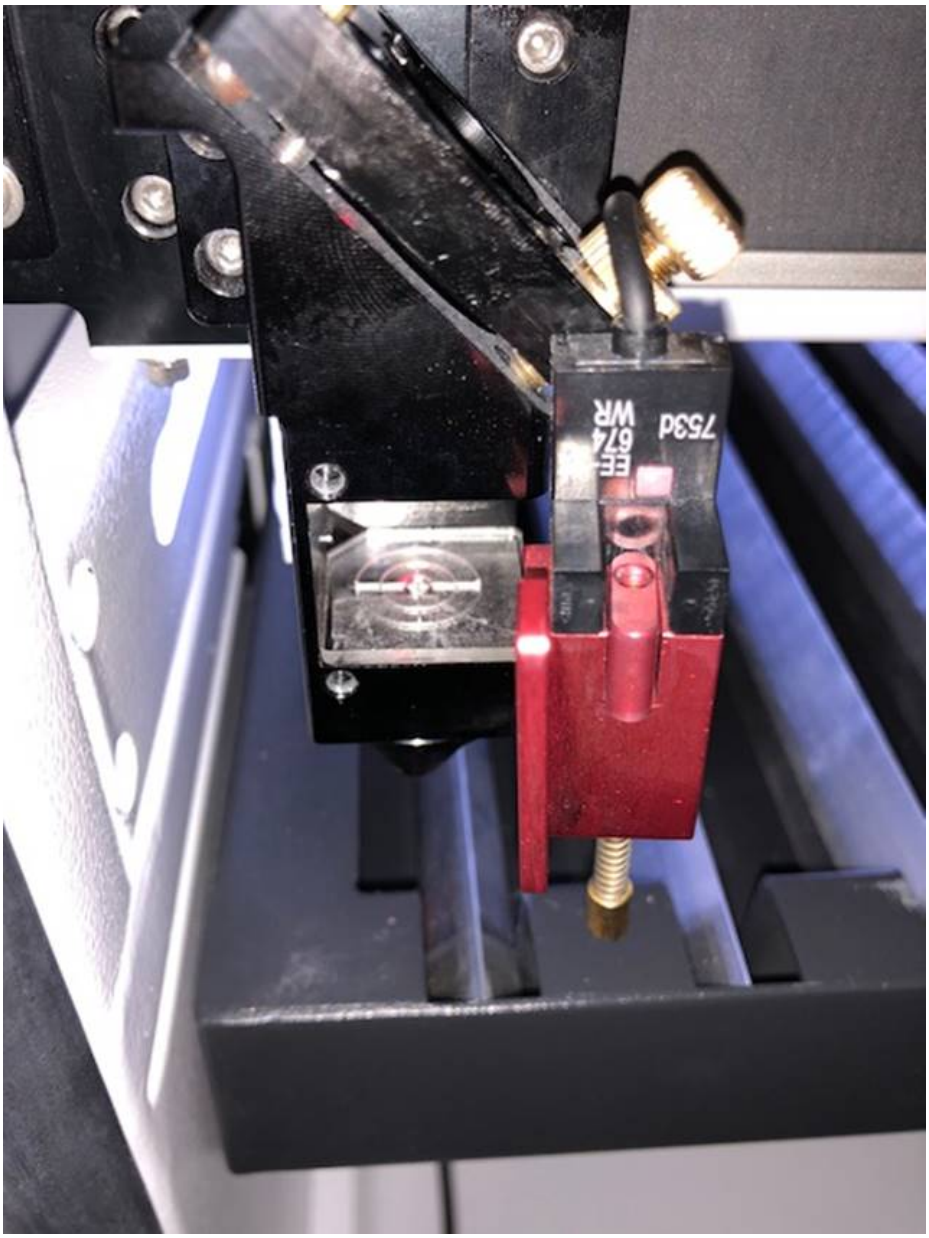
10) If the second burn mark is still not quite over the first burn mark, continue making adjustments to Mirror 3 until you are satisfied. **NOTE: It's not uncommon to repeat this sequence several times, especially if you have a heavy trigger finger.**

STEP 17: LASER NOZZLE ENTRY POINT

1) Locate the smaller of the two square clear acrylic targets from within the clear tote and peel off the paper backing to expose the adhesive.

2) Place the target inside the laser head so that side with the missing corner is facing towards the rear left of the inside of the laser head.

3) Make sure the target is evenly flushed with the left and rear walls of the laser head.



4) Tear a small piece of blue painters tape in half and then place them both (one on top of the other) over the acrylic target.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STOP

CAUTION: when pulsing, ensure your hands, face, head, hair, etc. are not in the machine or near the openings where the access panels were removed. When you pulse, an invisible laser beam shoots out the laser tube and towards Mirror 1, which then redirects the beam 90 degrees toward Mirror 2, which then redirects the beam 90 degrees toward Mirror 3 and so on. Also, take note not to hold down the Pulse button or it will incinerate the blue painters tape and burn the acrylic target below.

5) Lightly press the Pulse button **(DO NOT HOLD PULSE DOWN)** to deliver a very small burn mark on to the surface of the blue painters tape.

6) If the burn is not fully pronounced, lightly press the Pulse button again until there is a well-defined circular burn mark. The ideal mark is small and visible, not too big and not too dark.

7) Remover the acrylic target and hold it up to a light or use the light on your cell phone to illuminate the blue painters tape so that you can see the cross hairs of the acrylic target through the tape.

8) The laser beam does not have to be entering the laser nozzle dead center, but it should be at least touching both of the cross hairs.

9) Lastly, don't forget to install the nozzle, focal lens and auto focus sensor.

NOTE: This step is simply an observation to ensure the full width of the laser beam is entering the focal lens relatively center so that the magnified beam exits through the nozzle in its entirety. If an adjustment needs to me made, it will NOT be via the adjustment knobs on Mirror 3. The adjustment knobs are only used to make sure the beam is shooting perpendicular with the work table. If the laser beam is not touching both of the cross hairs, take a picture of your results and email it to Rob on our tech support team. He will guide you through the proper adjustments.

LIGHTBURN INSTALLATION AND RESOURCES

Lightburn Download https://lightburnsoftware.com/pages/trial-version-try-before-you-buy

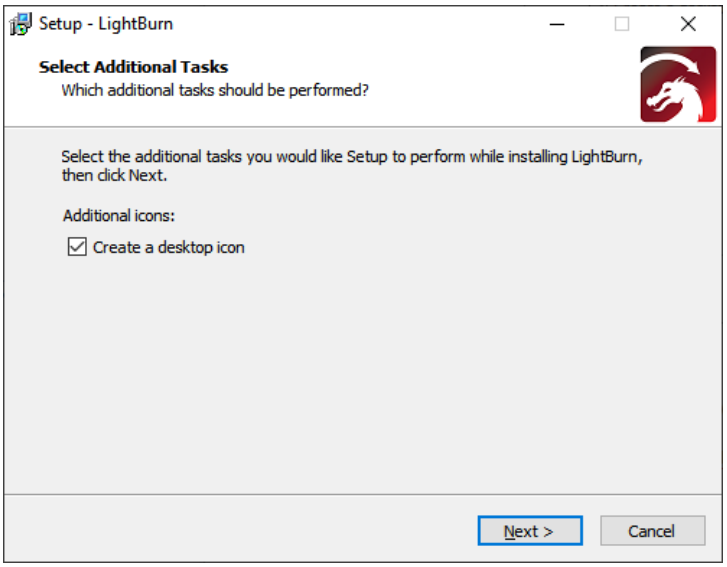
Lightburn Installation https://lightburnsoftware.github.io/NewDocs/Installation.html#windows-installation

Lightburn Software Docs https://lightburnsoftware.github.io/NewDocs/index.html

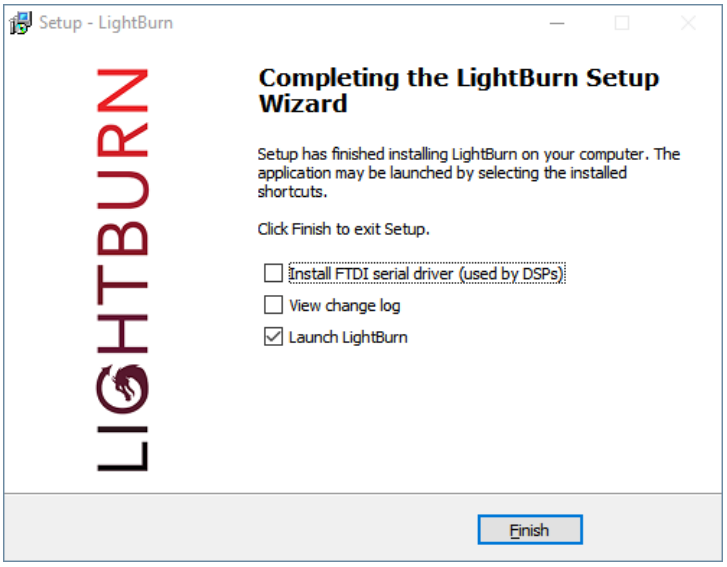
Lightburn YouTube Channel https://www.youtube.com/channel/UC-TdV9ThMD6E4MZztA6eZsQ/videos

INSTALLING LIGHTBURN AND CONNECTING YOUR LASER

1. Launch the installer by double-clicking it. Windows may ask if you trust us first. We sure hope so by now. =)

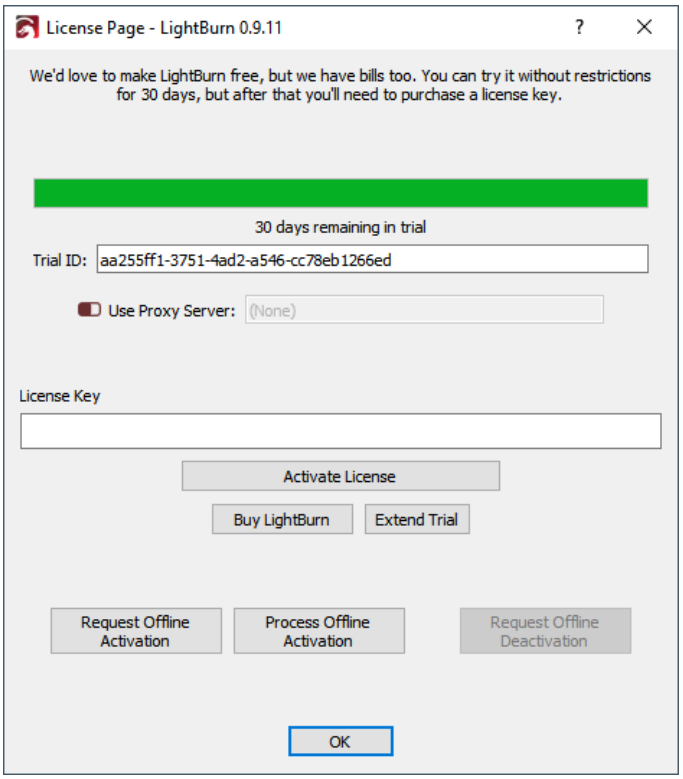


2. Click Next, then click 'Install'. The installation will proceed. When it completes, you'll see this:



3. Check the 'Install FTDI driver' box, check the “Launch Lightburn” box and click Finish.

4. If you've never used LightBurn before, you'll be shown the License and Trial page first. Note: You can get back to this screen in LightBurn at any time by going to the menu and clicking Help > License Management.



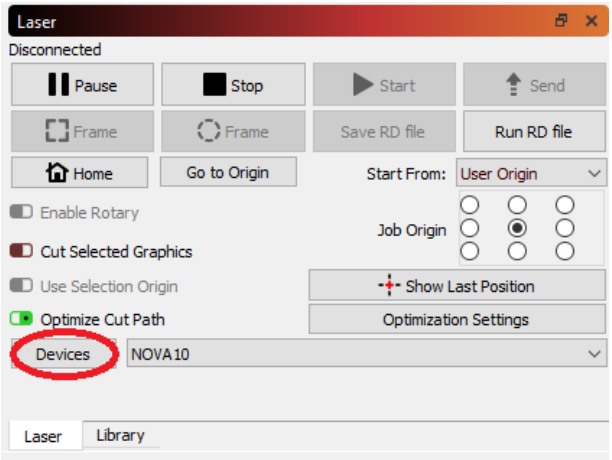
5. Be sure to enter your License Key exactly, including the dashes, then click the 'Activate License' button. We recommend just copying the key (scroll to top) and pasting it into the License Key box.

6. Now click on the “Activate License” and then click 'OK'.

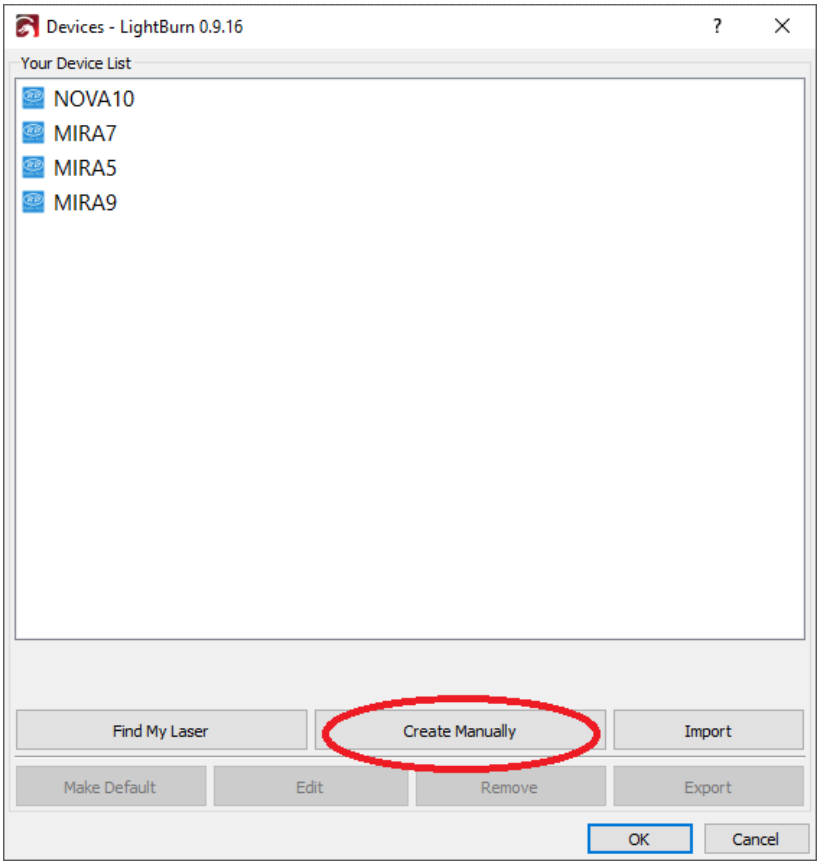
7. The next thing you'll see is the 'General Usage Notes' page - this is a brief help page just to get you going. You can get back to it any time in the Help menu, under Help > Quick Help and Notes. Click OK.

8. If you've never configured a device in LightBurn, you'll be brought here automatically when you run the software. NOTE: It is important that you pick something because the interface in LightBurn will change depending on the capabilities of the laser you choose.

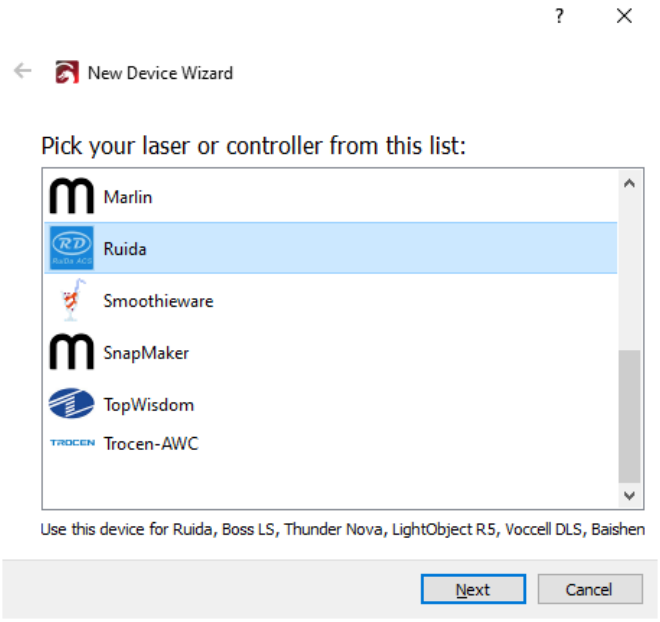
9. If you've done this before, but want to change your laser, or add a new one, click the 'Devices' button in the Laser Window to bring up the devices list.



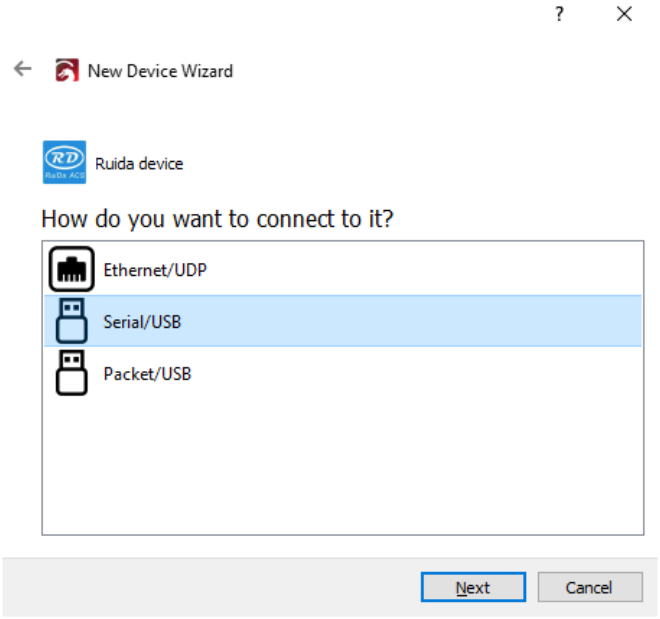
10. Next, click on Create Manually.



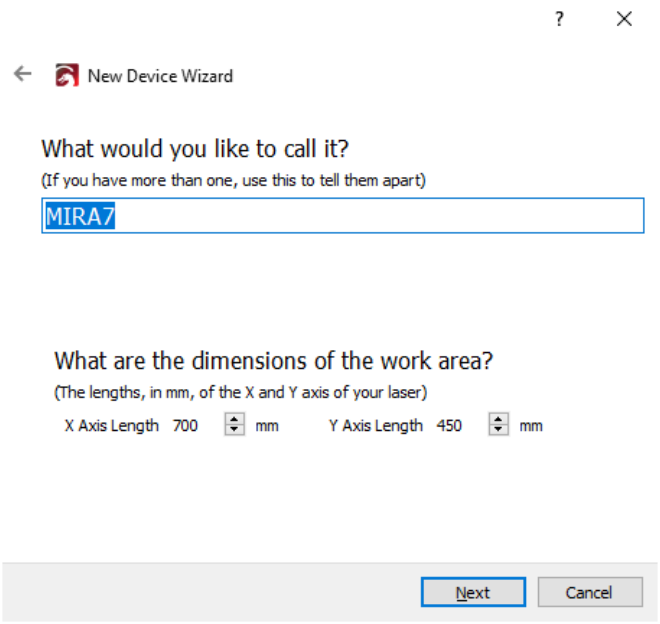
11. Choose the Ruida option from the list of controllers.



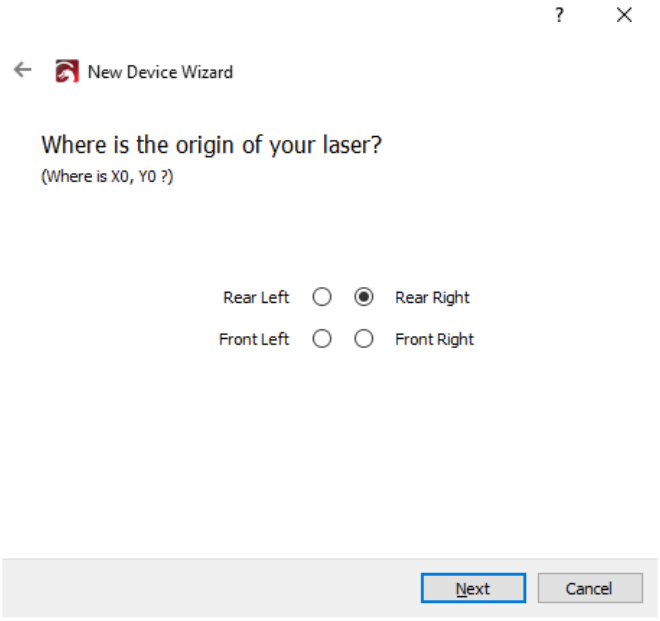
12. Select Serial/USB.



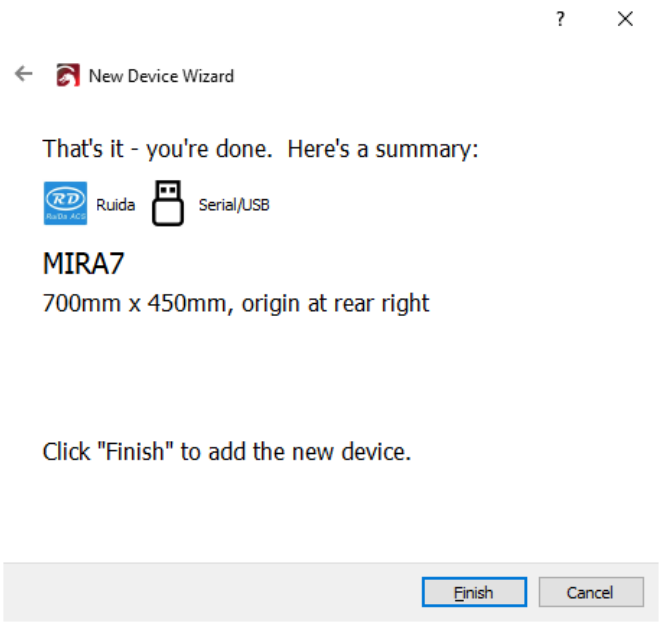
13. Name your device MIRA7 and input 700 for the X Axis Length and 450 for the Y Axis Length.



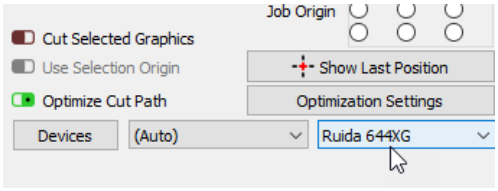
14. Set the Machine Origin to the Rear Right.



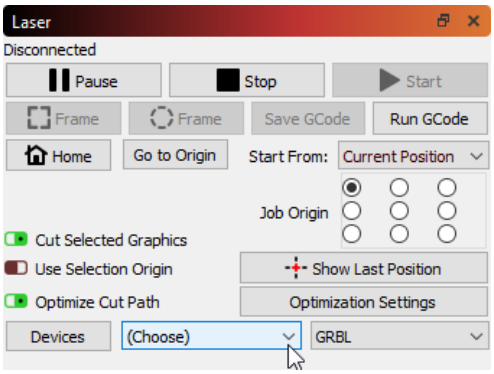
15. Review that everything matches and click Finish.



16. Once you have added your laser to LightBurn, it should appear in the list of devices to the right of the 'Devices' button in the Laser Window. If you only have a single laser, it will be automatically chosen for you. Note: If you have more than one laser set up, you might need to select the one to connect to by clicking here:



17. As long as your laser is connected to the same communication port, LightBurn will reconnect when you re-start. If you reboot your computer, or plug the controller into a different USB port, you might need to re-select it.



18. If you see the '(Choose)' as shown above, you need to select the port. If no ports are listed in the drop-down, it means that no devices were found, which could mean that it is not plugged in correctly, isn't powered, or you're missing a driver.

19. If your laser disconnects for some reason, or enters an alarm state and needs to be reset, you can quickly re-connect byright-clicking the 'Devices' button in the Laser Window.