

Alignment Procedure for X2 dual laser tube systems:

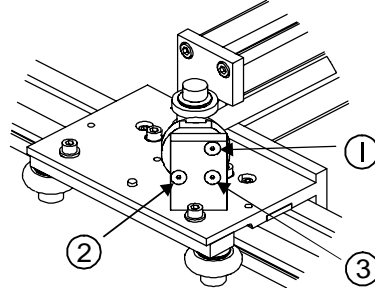
To test the alignment of laser tubes you'll use the Beam Alignment Menu. Please refer to the procedure below for testing system alignment. The procedure must be followed carefully. Please read through Section One, **ONLY PERFORM THE FOLLOWING STEPS FOR VERIFICATION, DON'T MAKE ANY ADJUSTMENTS UNTIL INSTRUCTED TO SO.**

1) Section 1: Alignment of the engraving system:

- a) Remove the X-axis carriage faceplate, which has the number 3 mirror and lens attached to it.
- b) On the left side of the carriage you'll find the beam entrance hole. Place a piece of masking tape over this hole.
- c) Turn the machine on. From the main menu of the laser system display, scroll to Preferences, press Select.
- d) Scroll to Configuration, press Select. In Configuration, scroll to Alignment Mode, press Select. You will see Power and KHZ, these settings are preset; you may need to adjust these settings. Power should be at 5% and KHZ will be at 2.
- e) You are now ready to check alignment. Make sure all doors are closed and you have a green LED on the display. With the Motion System control arrow keys, move the X-axis carriage to the upper left corner of the engraving table (0, 0).
- f) Push the XY button in the center of the motion control arrow keys. The laser will start firing in continuous mode, press again to stop laser firing. The object is to mark the tape so that you can see where it is hitting on the tape, try not burn only discolor the tape.
- g) Leaving the tape in place with the burn mark, move the X-axis carriage to the lower right corner of the engraving table. Push the XY button and burn another mark in the tape. Push the XY button to stop the laser firing.
- h) Look at the 2 burn marks on the tape. The burn marks should be 50% touching and in the center on the tape. If your lower right side burn mark doesn't match up with the left side burn mark, you will have to make an adjustment at the #2 mirror. Depending on the placement of the right side burn will determine how you adjust on the number 2 mirror.

- i) Below is a diagram showing mirror adjustment screws. If the right side burn mark is to the left or right of the left side burn mark, adjust the appropriate screw shown on diagram. Likewise, adjust for up and down as shown on the diagram.

- On the backside of the #2 mirror mount locate the three hex screws. The upper screw (1) is used to adjust the beam vertically (up and down), the lower-left screw (2) adjusts it horizontally (left and right), and the lower-right screw (3) is not normally adjusted and serves as the pivot point.



2) Section 2: Troubleshooting for a misaligned tube.

- a) Label the top Tube #1 with a piece of masking tape, remove the bottom tube and label it as Tube #2.
- b) Burn the tape as described in the Beam Alignment section, **make no adjustments**. Mark the burn as #1.
- c) Remove tube #1 and replace it with tube #2. **Use the wiring harness for the top tube**. Burn the tape again. Mark this burn as #2.
- d) If the burns do not center on the tape, but are close or are on top of each other, then the tubes are O.K. and the motion system needs to be aligned by following Section One using Tube #1.
- e) If one of the tubes burn marks is closer to the center of the tape, put that tube in the top location and burn a fresh piece of tape. Adjust the motion system to this laser tube. After adjusting the motion system, test the second tube (**the tube not used to align the motion system**) in the top tube location of the engraver.

If this tube is not aligning with the system,
please contact Technical support.

3) Section Three: Adjusting the beam combiner for system alignment, used to align tube #2 to match tube #1.

The beam combiner is located on the back of the engraver and has the beam tubes for the laser protruding from it. To adjust the alignment of the combiner, locate the small access panel.



- a) With motion system aligned and both tubes testing as aligned properly, place Tube #1 in the top position. Make a fresh set of burns on a new piece of tape.
- b) Remove Tube #1 and place Tube #2 in the bottom position of the engraver. **Using the power cable for the top tube**, burn a set of marks into the tape, one for the upper left and one for the lower right. These marks should be on top of the marks burned by the first tube. If the marks are not matched up, locate the cover for the adjustable mirror on the combiner and remove it.
- c) Adjust the mirror in the combiner so the two laser burns are on top of each other. The tube can be adjusted as well to allow for proper alignment. In this case, please call Service for assistance before proceeding.

****DO NOT ADJUST THE #2 MIRROR ON THE LEFT SIDE OF THE ARM FOR THE BOTTOM TUBE POSITION. ****

- d) After adjusting the optics and testing both tubes, there should only be one burn mark on the tape that is centered on the beam entrance to the carriage.