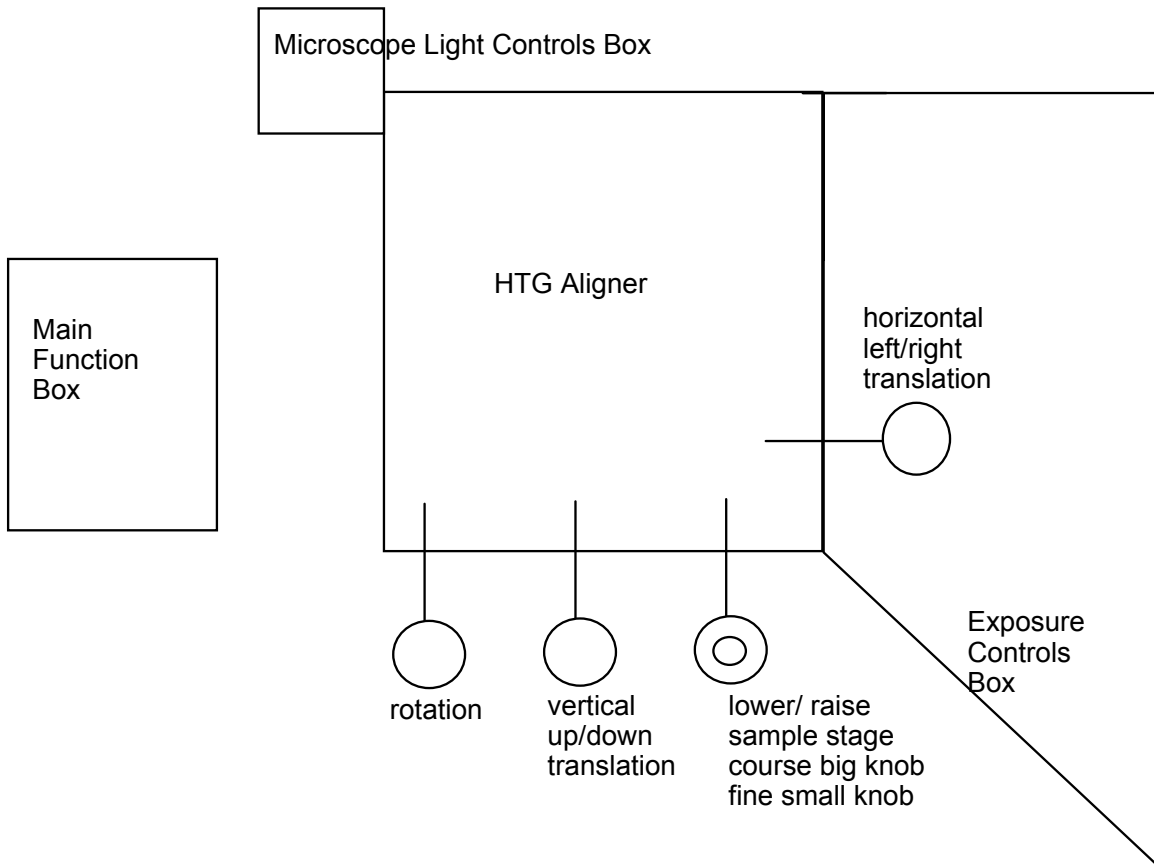
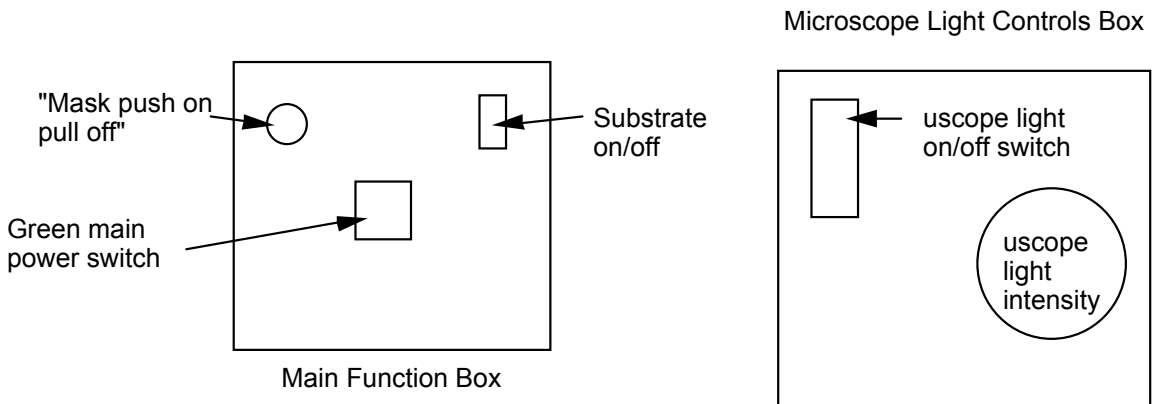
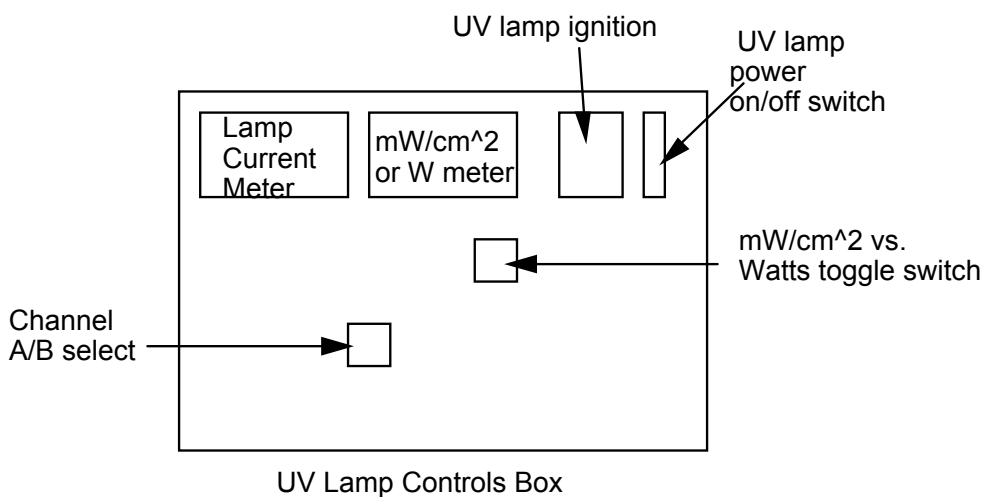
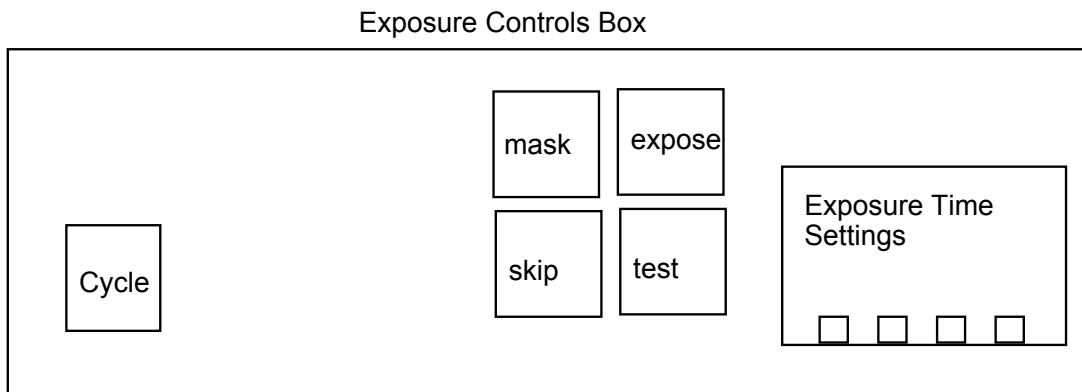


**HTG Mask Aligner**  
Revised 08/18/2001



UV Lamp Controls Box is located under right side of table  
Pressure Guages are under table to left





**\*\*Start Up\*\***

- (1) Check if somebody has already signed in, and if the machine is warming up. If not, you can go ahead and sign in!
- (2) Push the green “main power switch” on the Main Function Box.
- (3) Turn on the UV lamp power switch, on the UV Lamp Controls Box.
- (4) Push the UV ignition button on the UV Lamp Controls Box. This should ignite the UV lamp, which requires 1/2 an hour to warm up!
- (5) Turn on the valve with the red “air” label.
- (6) Turn on the valve with the yellow “vacuum” label.
- (7) Turn on the N2 in the corner.
- (8) Turn on the microscope light, and adjust the intensity on the Microscope Light Controls Box.
- (9) Check the pressures in the gauges under the table (to the left). They should all be at or above the lines that are drawn on the gauge surfaces.
- (10) You can test the lamp, and find out (a) What power the bulb is producing, and (b) what intensity (power / cm<sup>2</sup>) it’s emitting. To do (a), just flip the switch to the “Watts”

position. Read the bulb power off the top scale of the meter. To do (b), flip the switch to “mW/cm<sup>2</sup>”. Then push the “test” button. This will open the shutter on the aligner, and allow the UV light to shine through. Read the bottom scale on the meter to see what the mW/cm<sup>2</sup> intensity is.

(11) Wait half an hour for the UV lamp to warm up.

### **\*\*Operation\*\***

(1) Hit the “mask” button on the Exposure Controls Box to raise the mask holder up so you can put your mask in.

(2) Put your mask in, and push in the button marked “mask push on/ pull off”, on the Main Function Box. This will affix your mask to the mask holder. If there is a hissing noise, your mask has not been sucked up to the mask holder! Try again!

(3) Put your sample down on the substrate holder

(4) Move the “sub on/off” lever on the Main Function Box up to affix the sample to the substrate holder (it sucks a vacuum).

(5) Lower the sample stage, by turning the knob #1 on the aligner CW. You want to be sure that when you bring the mask down, it will not hit your sample! So lower it until you’re sure that the mask won’t hit it when you bring it down!

(6) Push the “mask” button on the Exposure Controls Box. The mask holder will come down and sit above your sample.

(7) Raise the sample up towards the mask by turning knob #1 on the aligner CCW. Bring the sample close to the mask, but don’t contact it yet.

(8) When the sample gets close to the mask, push the little button in that’s next to the substrate holder. The button somehow causes an air jet to push the substrate up, such that it is flat and flush with the mask. As you push the button in, turn knob #1 CCW to bring the substrate into contact with the mask the final step.

(9) Make sure that the microscope is above the height of the mask holder! Raise up the microscope so that the objectives will not ram into the substrate holder when you move the microscope over above the holder!

(10) Hit “cycle” on the “Exposure Controls”. This will move the microscope above the mask holder and substrate so that you can align if you want.

(11) If you need to do alignment, do it now! There is no “separation” lever on the HTG, so if you want to move things around, you should first turn knob #1 CW to get the substrate out of contact with the mask. Then do the alignment, and bring the substrate into contact with the mask again. Repeat as necessary.

(12) After alignment is finished, make sure that the mask is in contact with the substrate.

(13) Set the exposure time on the Exposure Controls Box

(14) Hit “cycle” on the Exposure Controls Box. This will now move to the next stage of the cycle, which is the exposure. The microscope will move out of the way, and the UV-lamp will move above the sample, and the exposure will start. Don’t look at the UV light! There is no eye protection on this machine!

NOTE: If the “skip” button on the Exposure Controls Box is pushed in, the UV exposure stage is skipped. This is useful if you have aligned your substrate, and then decide that you don’t want to expose. You can push the “skip” button in, and then push “cycle”, and

the UV exposure step is skipped. But of course, if you want it to expose, you must make sure that the “skip” button is NOT pushed in!

- (15) When the exposure is finished, the UV lamp will shut off, and the UV lamp house will move away from the sample.
- (16) Bring your sample out of contact with the mask by turning knob #1 CW to lower the substrate holder.
- (17) Hit “mask” on the Exposure Controls” Box. This raises up your mask holder and allows you to remove your mask and your sample.
- (18) Hit the “substrate on off” button on the Main Function Box. This will stop the vacuum from sucking on your substrate, and allow you to remove your substrate.
- (19) Hold on to your mask, and pull out the “mask push on/pull off” button on the Main Function Box. Your mask will fall off (hopefully into your hands!)
- (20) Hit “mask” on the Exposure Controls” Box to lower your mask holder down again.

**\*\*\*Shut Down\*\*\***

- (1) Turn the microscope light intensity down, and the microscope light off.
- (2) Push the green Power Button on the Main Function Box.
- (3) Turn off the UV lamp power switch on the UV Lamp Controls Box, in order to turn the lamp off.
- (4) Turn the UV lamp power switch back on, so that the fan keeps going (don’t hit the ignition button, though, because that will re-light the lamp!)
- (5) Turn off the air
- (6) Turn off the vacuum
- (7) Turn off the N2
- (8) Half an hour later, you can come back and turn off the UV lamp fan.