Laser Job Checklist

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Help is available!

First, check on the web site http://colaser.org for news and tips. Email Paul paul@mustbeart.com for questions that can wait for a response. If you need help right now, ask around the building and see if anybody there can help. If you still need help, you may text Paul or call his cell phone (the number is posted on the wall).

The following list is supposed to remind you about the steps you already know how to do (from taking the laser training class). If you don't understand any steps, please ask. If you haven't taken the training, please do before trying to use the laser. The training is mandatory even if you're already a laser expert.

Checklist

Preparation

If possible, prepare your files at home. See [TBD] for more help on preparing your files.

Check on the web site http://colaser.org for announcements about the laser. There might be problems, or there might be improvements, or there might be scheduling constraints you need to be aware of.

Schedule your time on the laser. On http://colaser.org click on Schedule to see the calendar of existing reservations. On the same page you'll find a link to the form you can submit to request time on the laser. You can only schedule time if you've taken the laser training and are on the approved list.

Check the last few entries in the Log Book, to make sure there isn't some known problem with the laser. Also, look around for posted notes.

Fire It Up

Turn on the monitor, if it's off. Hit a key to wake up the computer. If the computer doesn't wake up, push its power button on the right rear corner. It should boot into Windows by default.

Turn on the water chiller (black rocker switch on the chiller). There will be several alarming beeps. The green "NORMAL" light should come on. If the green light doesn't come on, stop and do not turn on the laser. The chiller should ALWAYS be on before the laser is powered up, and stay on until after the laser is shut down.

If the key isn't already in the laser, fetch it from the orange toolbox.

Turn the key switch on the laser to the right. Nothing visible will happen.

Twist the big red button on the laser clockwise. It will pop up, and the laser will make a clunk noise and power up. Wait until it no longer says "Booting" on the keypad display.

At the computer, if the RetinaEngrave3D window is not already visible, click on the RetinaEngrave3D icon in the taskbar at the bottom of the screen. It's a blue triangle with lighter blue diagonal stripes. The RetinaEngrave3D software will launch or come to the front.

Connect and Home

Look at the lower left corner of the window. After a few seconds, it should say "Connected". If it keeps saying "No Connection", try clicking on the retry button next to the "No Connection" message. If that doesn't work, read the IP address from the laser's display and enter it on the ProLF 48x36->Specify IP Address for Connection menu item.

Look just to the right. If it says "Not Homed" then go to the laser control panel. Hit the F/S-Z button until the display says "FX" and then hit the button with a picture of a house. The LCD will say "Homing" and the head will move toward the upper right. When it has reached the upper right corner and stopped, hit the cancel button (green checkmark and red NO symbol). The computer should now be showing "Homed". (Sometimes this doesn't work, for reasons we haven't figured out. If the head doesn't go all the way home, you can turn off the laser and manually move the head to the upper right corner. Then power back up, reconnect, and try the homing operation again.)

Preliminary Checks

Inspect the work table in the laser. Does it appear to be pretty level with the chassis? If not, the table may need to be realigned. A misaligned table is not usually a big problem for small jobs, as long as you focus in the same place on the table. For larger jobs the differences in focus created by table misalignment can be a problem.

Inspect the mirror at the left end of the gantry and the mirror at the top of the laser head. Use a flashlight and look for any crud on the surface. If it looks dirty, take a clean Kimwipe and a little bit of isopropyl alcohol and wipe it off very gently with a single swipe. Don't re-use the tissue.

Shine the flashlight straight up into the laser nozzle and look sideways into the diagonal mirror. You should see a clean illuminated yellow circle. If you see dark spots or a lot of dust on the yellow circle, the lens needs to be cleaned before you activate the laser.

Load the Job

You can now load your file into the computer. If you have a thumb drive, the USB slots are on the back of the computer. The computer is also on the Internet so you can fetch your files that way. If you're a Dropbox user and want to share the "Colaser Shared" folder, ask Paul. Regardless, the "Dropbox/Colaser Shared" folder is the recommended place to store your files on the computer. Create a folder named for you and put all your stuff there. Stuff left on the desktop is likely to be moved or deleted.

Check your file. Tips: in CorelDraw, vectors need to be "hairline" rather than any number of pixels wide, and it's a good idea to make them a primary color (other than black). Raster data (including text you want to be solid and not outlined) should be black. If you have any raster

data, the file must be scaled to the right size in the drawing program, before sending it to RetinaEngrave3D.

Now bring your file into RetinaEngrave3D, usually by printing it to the Full Spectrum Engineering Driver printer. Don't forget that you might need to change the "paper" size to a big enough size to hold your drawing (from the print dialog hit Properties, then Advanced). If you're loading an XPS file you previously saved, you'll load it directly from RetinaEngrave3D's screen. If you have trouble getting your file to import correctly, it sometimes helps to print it to PDF, open the PDF file in Adobe Reader, and print from there. Check the import settings in RetinaEngrave3D, to the right of the raster power and speed settings.

Set all the settings to their desired values. For raster operation, you'll need to set overall power and speed. For vector operation, you'll need to set power and speed for each vector color, plus overall vector current. If you don't know the best values, you may need to run some tests. If you have multiple colors of vectors, you'll need to check the settings on each color and possibly pay attention to the order. If you have a color showing on the vector screen that you don't want to cut, set the passes to zero.

Placement and Focus

If your material is thicker than the current spacing between the honeycomb grid table and the laser head, you'll need to lower the table. Hit the F/S-Z button until the LCD says FZ, then hold the down arrow button until the table is low enough.

Place your material on the table. Make sure its top surface is flat and level. You can use tape or the provided weights to hold your material down. Make sure there's no way the laser head will strike your material or anything else on the table. Make sure that the edges of the honeycomb grid and the edges of your material are clear of the edges of the chassis, so they won't hang up on the lip when the table is raised to focus.

If the gold autofocus probe is not installed, do not try the autofocus procedure!

If using autofocus, position the gold autofocus probe over your material.(Move the head by using the jog buttons on the computer screen or (in FX or SX mode) the arrow buttons on the keypad. The laser head cannot be moved by hand when the machine is on, despite what it says in some of the documentation.) Check that the autofocus probe isn't loose. On the keypad, set the mode to FZ and tap the button marked AF. The table will slowly rise until it pushes the button on the end of the autofocus probe, then drop to the focused height.

If focusing manually, locate one of the acrylic focus tools. Position the laser head over your material. Hang the autofocus tool from the ledge on the laser head (there's a photo of this on the web site). Carefully move the table up until it just touches the focus tool, by selecting SZ mode and using the up arrow button.

Reposition the laser head over the upper left corner of the rectangular area you wish to cut or engrave.

Final Checks

If you wish to confirm that the job will fit on your material as desired, hit the J key on the computer keyboard and watch the head. It will run around a rectangle that just encloses your job. You can do this as many times as you need to. Adjust the material position and/or head position until you're satisfied.

If you need the head to move more slowly to confirm the rectangle, you can use the keypad key with a square of four arrows in SX mode. In FZ or SZ mode, that key will run just one side at a time. In FX mode it acts just like the J key, but you must run it once from the computer before the laser knows what rectangle to run.

Recheck the power and speed settings.

Now, AFTER you're done with the J key check, check the mode setting on the computer screen. Set it to Raster, Vector, or Raster then Vector as desired. This setting can get reset by accident quite easily, so check it last.

Close the lid. The laser won't fire unless the lid is closed. Also, make sure all the access doors on the laser are closed and locked.

Now, BEFORE ANY LASER OPERATION, turn on the exhaust blower (plug in the cord in the wall near the air conditioner) and the air assist (turn on the plug strip it's plugged into). Someday this will be a switch on the wall. You should hear both blowers come on. Both blowers MUST be working before you cut or engrave anything.

Run the Job

On the computer, hit the triangular Play button or hit the G key on the keyboard. The laser should start working. If it doesn't, check the computer screen for an error.

You must stay in the Loft and pay attention to the laser while it's working. We don't want to burn down the building. You don't need to watch it every second, but you do need to be in the room and aware of what it's doing. If you must step out of the room, pause the job and make sure it stops (and nothing is on fire) before you go.

When it's done, wait a good 10 or 15 seconds, until all the smoke is cleared out of the work area.

Open the lid. Move the laser head (using the jog buttons or (in FX mode) the arrow buttons) out of the way if you need to, and remove your material (or reposition it for next job).

After the Job

You can turn off the blower and air assist now. Be sure to turn them back on before running another job. Be sure they're off before you leave.

Write about your results in the log book. It's really useful if you write down what settings you used on what material, so others can use your settings as a starting point. If you observe any problems or learn any new lessons about how to use the laser, write them down.

If you ran into anything that needs fixing, email Paul.

Before shutting down the laser, move the head to the upper right corner, for the convenience of the next user. Then push the big red emergency switch to power off the laser, and only then switch off the water chiller.

If you generated much smoke, or if the room smells of smoke, turn on the air cleaner and set its timer to run for 8 hours.

Clean up your mess. If you filled up the trash can or put food waste or any other smelly things into it, take the trash out to the dumpster near the outside gate and put a new plastic liner into the trash can.

Don't forget to remove your USB thumb drive from the computer and take it with you.

If there is no other authorized user waiting, turn off the AC, fan, lights, etc., close the window, and get the keyholder to lock the door. Leave the computer powered on.

If you made something really cool, consider writing it up for posting on the web site.

If you noticed anything missing from this list, please tell Paul so he can fix it.