PRATT INSTITUTE

PI-FAB

PRODUCTION FACILITIES

LASER SHOP

X660 TUTORIAL

VLS660 Tutorial

Introduction

ABOUT THE LASER SHOP:

Laser cutting is a technology that uses a laser to cut materials, and is typically used for industrial manufacturing applications. Laser cutting works by directing the output of a high-power laser most commonly through optics. The laser optics and CNC (computer numerical control) are used to direct the material or the laser beam generated, which then either melts, burns, vaporizes away, or is blown away by a jet of gas, leaving an edge with a high-quality surface finish. The Laser Shop is available all students and faculty in the Architecture program. Please use the Laser Shop monitors as a resource for shop use.

PROTOCOLS:

- Valid Pratt ID + currently enrolled in an approved Pratt SOA course is required
- Students must sign up using the Digital Submission system in the Laser Shop
- Laser cutters are limited to academic work only, commercial work is prohibited
- Cutting time is limited to 45 minutes and is dictated by Priority Schedule
- Priority Schedule allows everyone to cut during studio-specific time slots
- Fire blankets are located by each machine in case of material flare ups
- Students who cause flare ups will be ejected from the Laser Shop for the day

GUIDELINES & RECOMMENDATIONS:

- NEVER leave the room while you are cutting
- It is not efficient use of the laser cutter to make squares, plan accordingly
- To expedite cutting download the driver for the plotter HERE
- Grasshopper scripts are available to maximize your material usage HERE
- Monitors are there to help & guide you- Use them!
- When making your laser file, ensure your lines are organized in specific layers
- Use scraps of the same material to test laser cutting settings

X660

I   Before Coming In:

a. Overkill, Flatten, and Purge your file on your personal/lab computers, **not in the laser room**.

b. Make sure your layers are assigned the appropriate colors- The colors determine the oder in which the laser will cut/score

c. Generally you will try to score first and then cut. For example: if you're using magenta and cyan, set your score layer to magenta, and cut layer to cyan

d. Below is the order of the colors: black will cut first, red second and so on

        BLACK
        RED
        GREEN
        YELLOW
        BLUE
        MAGENTA
        CYAN
        ORANGE

e. Save your file as an AutoCad 2017 or lower on your USB

f. Verify your material is sized to fit the laser cutter: VLS660/X660 = 18"x32"

g. The laser bed has a 1/4" offset border to which it won't cut to the edge of the sheet, so keep everything within the dashed border

II   Opening Your File:

a. Once you arrive to your station at the Laser Shop, plug in your USB and copy your file onto the desktop

b. Open your file using AutoCAD

III Z-Axis Calibration:

a. First, place your material on the laser bed. Make sure it's as flat as possible- tape down the edges if necessary.
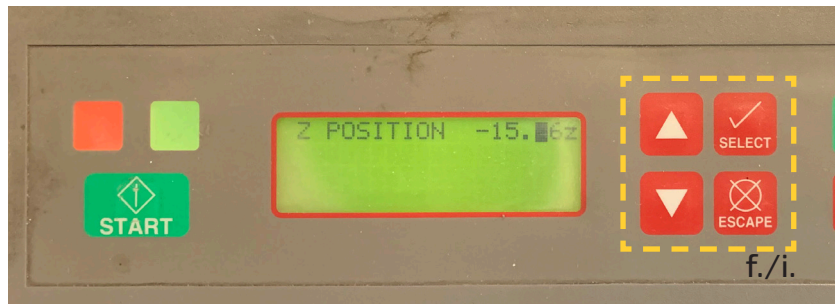
b. Now you must adjust the bed height of the machine. This focuses the laser, ensuring a clean and efficient cut. The control panel is located on the laser machine.
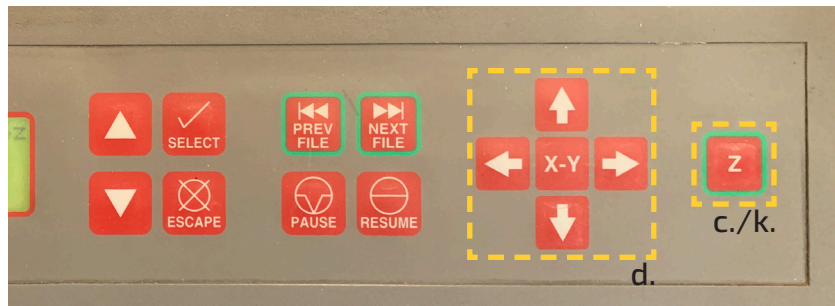
b.

c. Press Z. The laser should move to the upper left corner.

d. Use the X-Y arrows to center the laser head above your material. Once centered, use the calibration tool provided.

e. NEVER raise the bed while the calibration tool is below the laser head. Doing this will damage the machine.

f./i.

f. Press (DO NOT hold) the up/down arrows to adjust the height of bed.

g. AFTER adjusting, slide the tool beneath the lower-right corner. The top of the peg should be flush with the bottom of the corner.
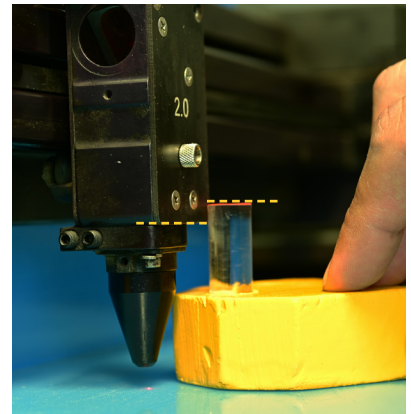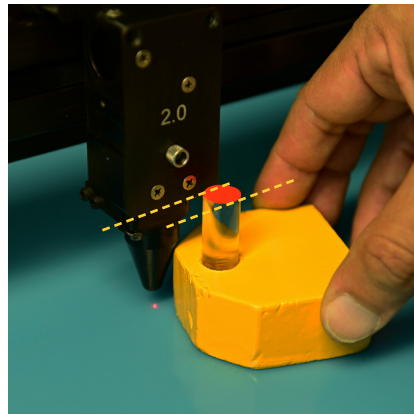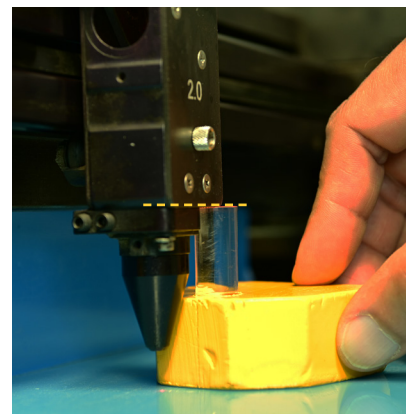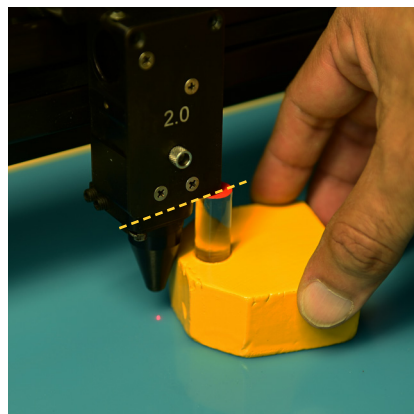
h. In this example, the calibration tool is higher than the bottom corner, this means the laser bed it too high and we must lower it.

h.

i. Use the SELECT button to adjust the bed in smaller increments

j. Adjust the bed until the peg of calibration tool is flush with the lower-right corner of the laser head housing.
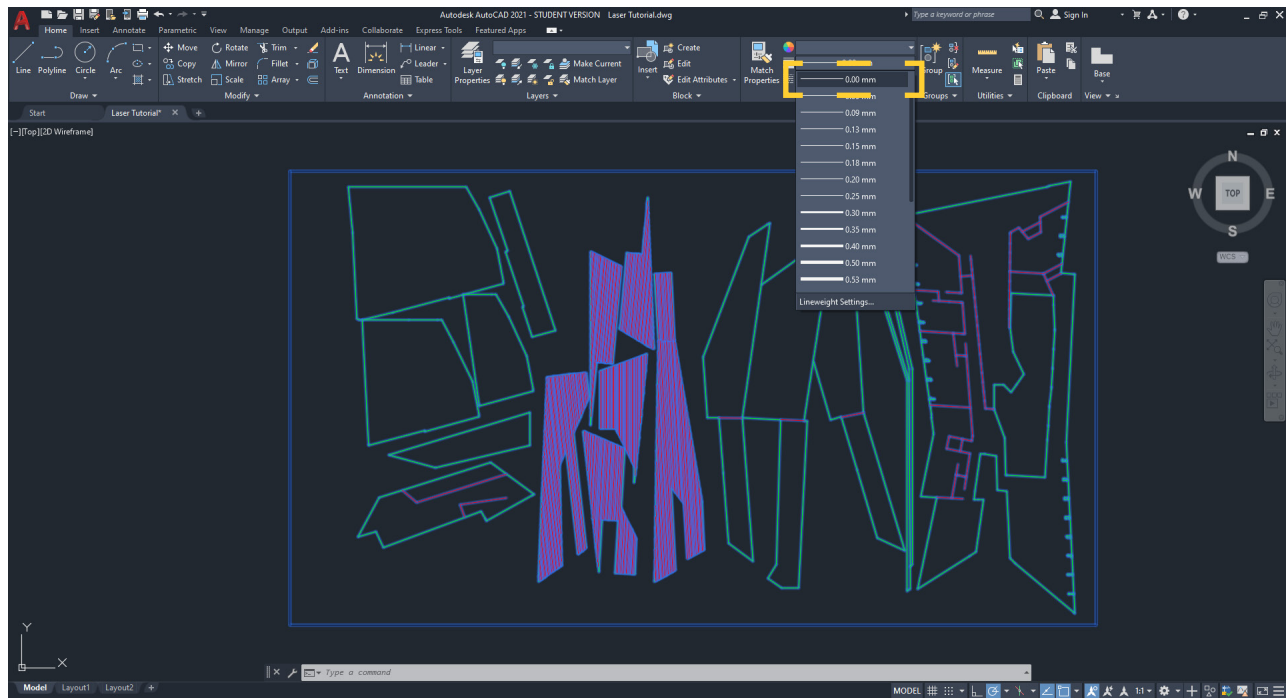

j.

k. Press Z to exit calibration mode. The laser head will move to the top right corner.

IV   Linework Configuration:

a. After opening your file, you must configure your linework. In order for the laser cutter to read your linework, **lineweights** and **index colors** must be set

b. Lineweights:
  - Select everything in your file
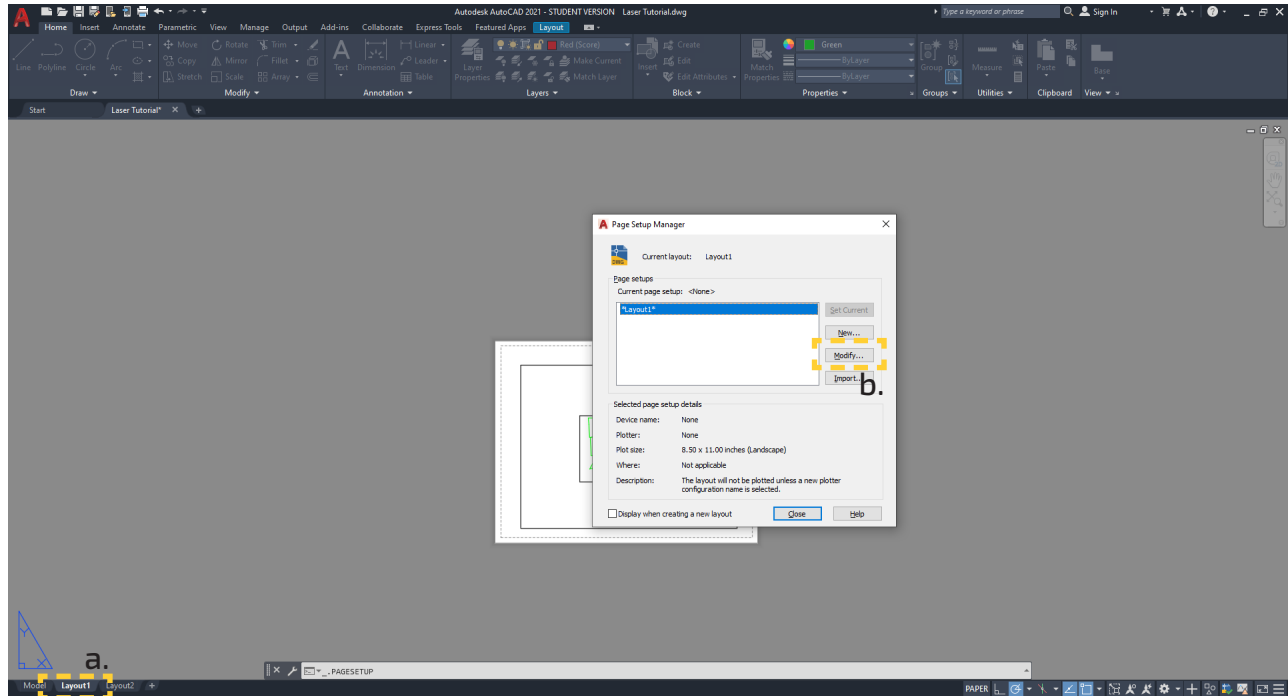 - Set all line weights to **0.00 mm**

c. Index Colors:
  - Use the **QSelect** command to select one layer (i.e. "Red (Cut)")
  - Click **OK**
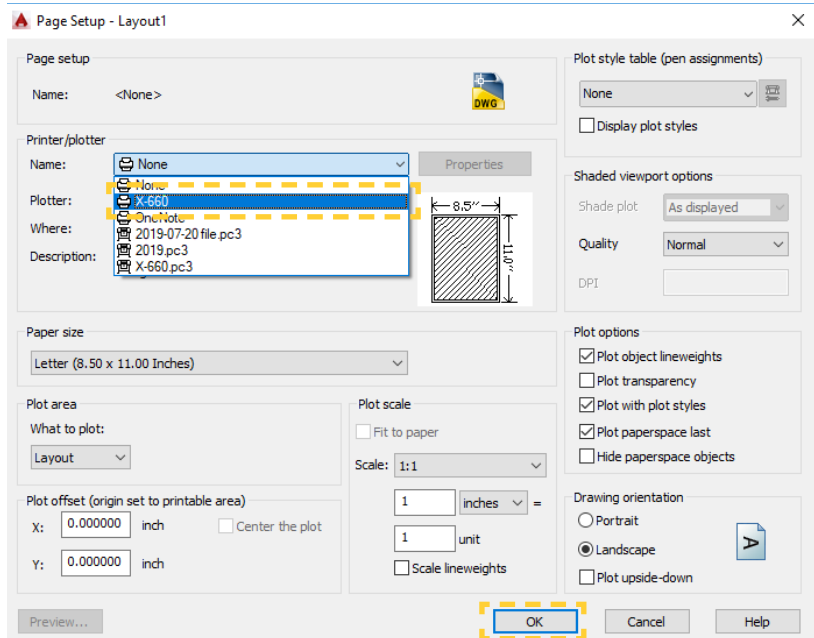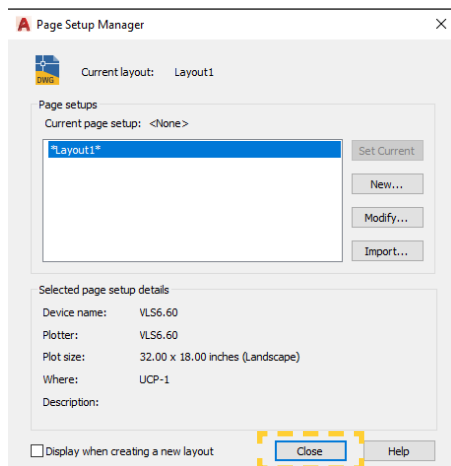 - Set that layer color to an **Index Color.** (i.e. Index Color "Red")
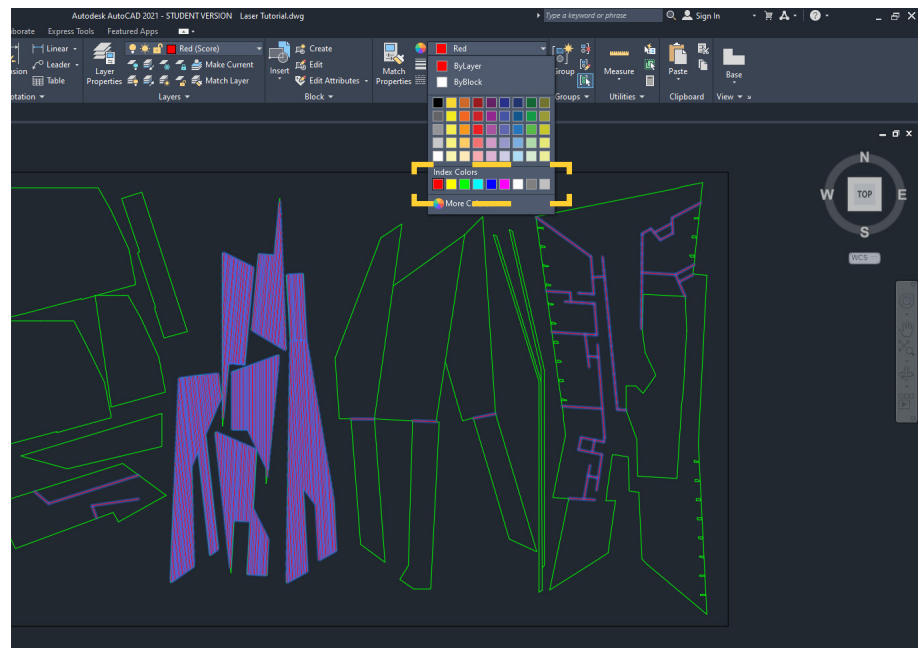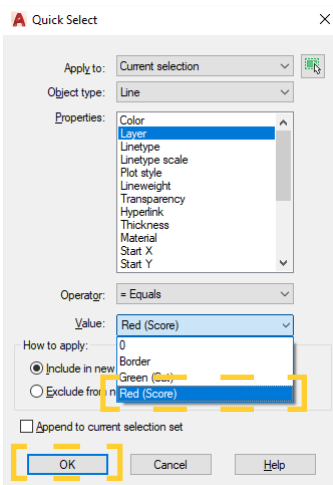
V Layout Setup [Paper Space]:

a. Now that your lines are configured, set up your layout. Click on the **Layout1** tab at the bottom left (If a menu does not pop up right click Layout1>Page Setup Manager)

b. click **Modify**

c. Open the Name dropdown menu and select **X660>OK**

d. Click **Close**. The paper space is now the correct size

VI   Layout Setup [Model Space]:

a. Next, you must adjust your viewport to fit the paper space. Click on the **viewport border-line** (it should turn blue and bold)

b. Click on a **corner** and place it outside of the paper space (the paper space should be completely inside of the viewport)
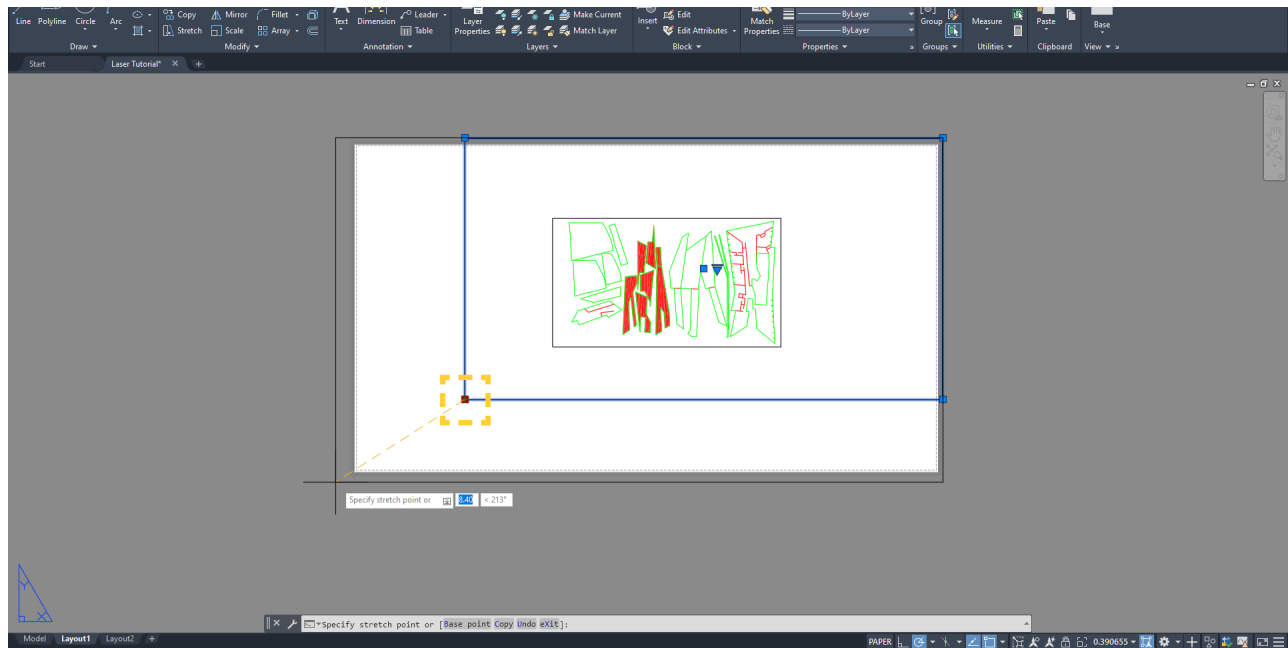

c. Next, adjust the model space to fit the paper space. Double click **inside of the viewport** (the border will be black and bold). You are now in model space

d. Choose the appropriate **scale** for your file at the bottom right (usually 1:1)

e. Use the mouse wheel to pan your file to fit the paper space. Double click in the gray area to go back into paper space.
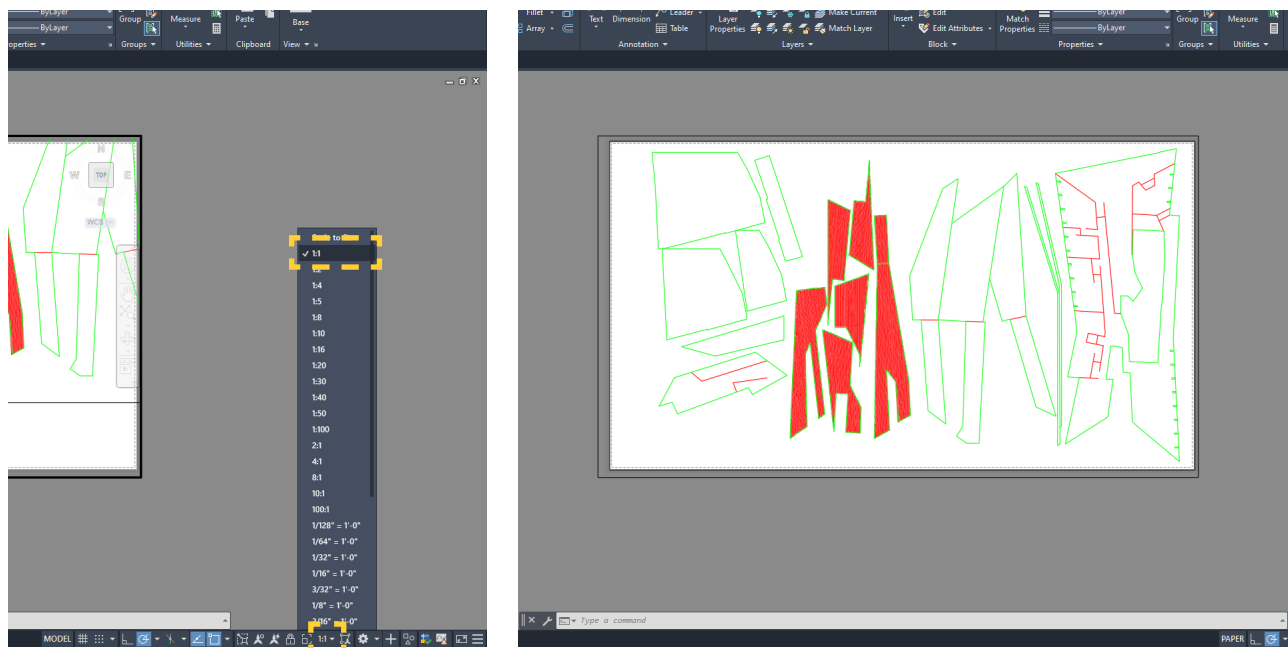
VII Laser Mode & Settings:

a. Now that your lines and layout are configured, you must input your laser machine settings. Use **ctrl + P** to plot

b. Click **Properties** > **Custom Properties**. The Laser Settings menu will open.
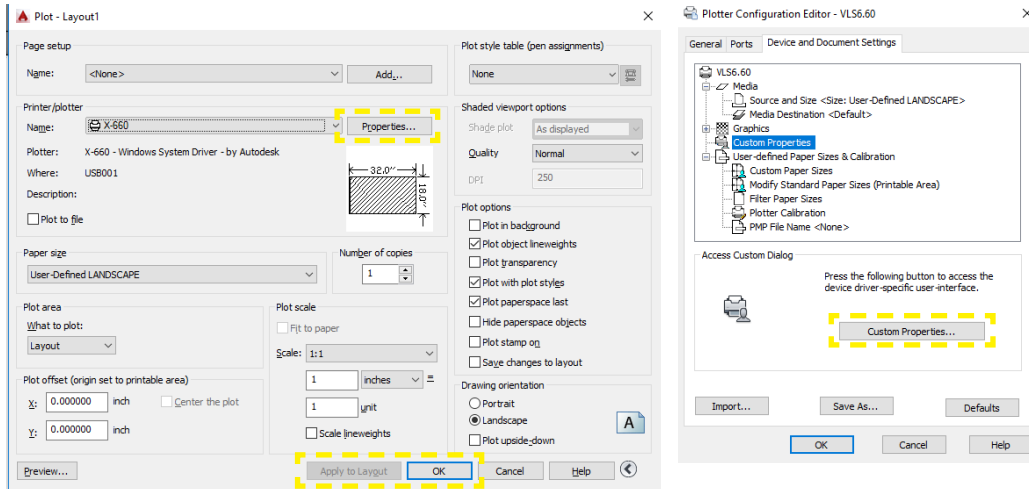
c. In this menu, you will need to adjust the layer **pen mode** (VECT/SKIP) and **settings** (Power/Speed/PPI).

d. Mode:
- In this example, we are using Red and Green so we will skip the rest.

- Click on the Pen Mode gray square next to each layer that you **will not** use until it says **SKIP** then click **Set**

- Now click on the Pen Mode gray square next to each layer that you **will** use until it says **VECT** then lick **Set**
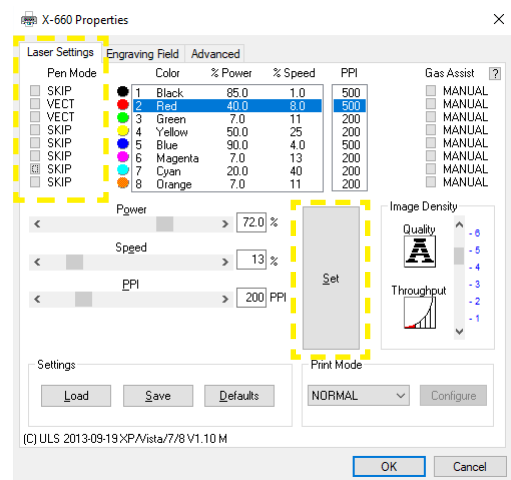
d. Settings:
- Power, Speed, and PPI settings are specific to each laser cutter. Refer to the setting guides attached to the monitor at your station.

- In this example, we are scoring with Red and cutting with Green so we will adjust those settings.

- Click on a layer that you **will** use and input the value for each category:
    Power
    Speed
    PPI

- Click **Set > OK**
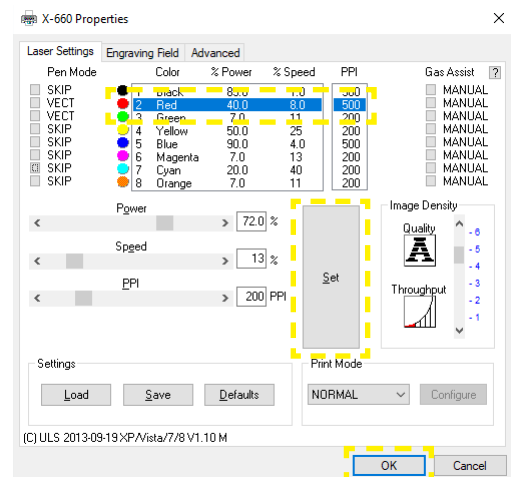
e. Save your settings, Click **Apply to Layout** > **OK**

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VIII Verify & Start:

a. After you configure your lines, layout, and settings, verify that your file Name, PWR, SPD, and PPI are read correctly on the laser machine screen

b. After verifying, you are ready to start cutting. Press the green START button.