## Revision Table

<table>
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<tr>
<th>Version</th>
<th>Dated</th>
<th>Description</th>
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<tr>
<td>1.00</td>
<td>9/4/2012</td>
<td>Original DRAFT</td>
<td>Dpeeples</td>
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<tr>
<td>1.01</td>
<td>9/7/2012</td>
<td>Added sections on lowering table to Tips &amp; Troubleshooting</td>
<td>Dpeeples</td>
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<tr>
<td>1.1</td>
<td>10/10/2013</td>
<td>Removed content about computer / laser communications issues</td>
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<td>Foam Core removed from approved materials list</td>
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<td>Updates for online reservations, foam core references removed, update reference to materials table removed from this document</td>
<td>DPeeples</td>
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<td>08/22/14</td>
<td>Updates on banned Polycarbonate and penalties for running carbon generating materials</td>
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Student NOTICES

- **DO NOT CUT MATERIALS THAT HAVE NOT BEEN APPROVED.** This will cost you your laser use for a period much longer than you, your parents, and professor will be happy about.
  - Approved Materials
    - Basswood –(1/8 thru 3/8)
    - Chipboard - single
    - Chipboard – Double
    - Matte Board
    - Paper
    - Plywood 1/8 inch *(REQUIRES APPROVAL before starting)*
    - Solid Wood 1/32 – 3/8 cutting
    - Solid Wood over 3/8 scoring only
    - Sand ply ¼ & ½
    - White Museum Board
    - White Poster Board
    - Certain plywood materials (ask)

- **Do NOT laser cut or score polycarbonates.** Polycarbonates give off very toxic fumes and excessive amounts of flames and soot / smoke. Polycarbonates are sold under the trade names of Lexan, Makrolon, Makroclear, Arcoplus and others. If you are not sure, try cutting a small piece of it at 100% speed and 50% power, 5000 Frequency. If you see black smoke and/or large flames, **STOP immediately**. The carbon attaches to the laser lens and causes it to crack as well as gums up the laser drives, mirrors, gears and other components. Contact shop staff
so that the lens can be cleaned. Do not try to get around this rule by changing the settings. No excuses.

- **Students who continue to use the laser when their material is generating black sooty carbon** will be charged for the cleanup and replacement lens. **Students may also face additional charges as it will be considered deliberate destruction and abuse of university property.**

- **ALWAYS turn on the fans before sending a file to the laser.** The switch is located on the left side just inside the door.

- **If you are the last one out, please TURN OFF THE FANS** The switch is located on the left side just inside the door.
Reservations

Reservations are limited to 2 hours per day per student.

- **The reservation system is on-line.** Can be found at http://www.supersaas.com/schedule/woodshop/equipment

- The scheduling system is available via any browser including your smartphone, android, iPhone, or tablet computer.

- For more info, please download the “Reservation System Guide” at http://spsu.edu/architecture/facilities/woodshop.htm

- **Failure to appear for reservation time.** Reservations will be audited and can cost you:
  
  o First offense - warning
  
  o Second Offense - one week loss of use
  
  o Third offense – balance of the semester

- **Reservations are only valid for the first 10 minutes of the hour.** Lasers unclaimed by 10 minutes after will be “free” for others to use. The two hour rule will not apply to the use of unclaimed laser time.
Safety and Conduct

You must wear shop approved shoes. NO OPEN TOE SHOES. Your shoes must cover the top of your foot and your heel and toes.

Clean-up!!

- You must clean up your scraps after you finish
- Clean all dribbles/detritus/debris/scrapscut parts from inside the machine
- Clean the floor area around the laser and dispose of all garbage cutouts etc.

Workspace

- Space is limited in the laser room. We have designated drawers (listed by Laser number) in a drawing file outside the laser room to store your materials while using the laser. This is to help you keep track of all the small parts and provide a place to keep your materials clean prior to using them.
- Please remove everything from the drawers when you are finished.

Donations

- Donated materials should be placed in the correctly labeled drawing file drawer located outside the laser room.
  - Please feel free to put “usable” left over materials in the appropriate drawer.
  - Please ask before taking anything from the donation drawers.
Login and Printing Procedure

- Login using your SPSU network login
  - **TECHIE NOTE:** The login script will make a user directory and copy all of the laser cut files (*.PC3 files) to that directory. Every time you login the cut files will be copied from the main archive to your cut file directory. Any new cut files you make will reside in that directory. If you change a setting on an original cut file, it will be overwritten the next time you log in, so always change the name if you want to keep it.
  - **TECHIE NOTE:** All of the student user files will be removed after the end of the semester.

- Open AutoCAD 2014

  - **TECHIE NOTE:** When you log in the first time, AutoCAD will go through its basic startup and copy files etc., which may take a few minutes. It will load much faster after the first login.
o Select OPEN > Drawing

- Search Commands
  - Open
    - Open a file
      - Drawing
        - Open an existing drawing file.
      - Sheet Set
        - Open a sheet set data file in the Sheet Set Manager.
      - DGN
        - Import the data from a DGN file into a new DWG file.
      - Sample Files
        - Open Sample Files from local or online locations.

- Options
- Exit AutoCAD 2013

o Select “Desktop”

- Select File
  - Look in: Desktop
  - History
  - Documents
  - Favorites
  - FTP
  - Desktop
  - Buzzsaw

- File name:
  - Files of type: Drawing (.dwg)
Select the file “LASER 24x36”

**NOTE:** You can download the “LASER 24x36” file from the Website [http://spsu.edu/architecture/facilities/woodshop.htm](http://spsu.edu/architecture/facilities/woodshop.htm) and save your data to it prior to coming to the shop. **Be sure to rename it to another filename.**

**Answer “Yes” to the notice that it is “currently in use or is Read Only”**
o Select and erase any contents inside the white box.

o Open your drawing file on your thumb drive or Z: Drive

○ TECHIE NOTE: Students can retrieve their drawings from the Z Drive (no Thumb drives needed).
  ▪ From your workstation, save your drawing files to a folder on your Z drive desktop. You will be able to retrieve them from there on the laser PC’s.
  ▪ Remember that the space on Z: is limited so don’t load really big files.

○ NOTE: If you get the message that your drawing is going to be stamped with the Autodesk message “PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT”. Select “Continue...” on that screen and the next. Then go to the troubleshooting section and follow the instructions to remove the stamp.
If you did not get the above Autodesk Educational Product plot stamp messages...

- Cut and paste your items from your DWG file into the white box on the “LASER 24x36” file.
- Make sure **ALL LINE WIDTHS ARE 0.00mm**.
- Make sure your **score lines are on the yellow layer and your cut lines are on the red layer**.

- Place your material in the laser
- Select PLOT

![Plot window](image)

- Select the material from the Printer/plotter Name list or choose <previous plot> on the page setup “name” dropdown.
Click “OK” if you get this message

*** NEVER click on anything in the PLOT AREA or PLOT OFFSET sections.
- Correct the “Paper Size” back to “Arch E 36 x 48 in”.

- Click “OK” to send it to the laser.
The Laser will show your plot file name in the blue LED window.

- If it doesn’t show up, check to see if the line widths are all 0.00 mm and the lines are all on either the Red or Yellow layers. Otherwise contact shop staff for help.

- Press the Green start button on the laser to start the job.

**OBSERVATION!!**

- **You must watch the laser the entire time it is cutting your materials.**
  - Leaving the machine running unattended will cost you your use privileges for the SEMESTER. No exceptions.
  - You are watching to make sure it does not catch the material on fire, which can happen in just a few seconds!

**In case of FIRE!!**

- If the fire is very small,
  - open the lid and quickly remove the material from the laser
  - Take the burning material it outside to extinguish it.
  - Have the Shop staff check out the machine before restarting.

- If the fire is larger or you can’t grab the material to remove it,
  - grab the fire extinguisher from the wall mount,
  - remove the pin and apply just enough to put out the fire.
  - Have the Shop staff check out the machine before restarting.

- There is no excuse for a fire on the laser if you are watching the laser, therefore you will be charged for any damages done to the laser or to the honeycomb back board. Costs could exceed $800 for repairs.
TIPS!!!

Making multiple passes

If you need to make another pass using the same settings, just press the green start button on the laser when it finishes and it will restart using the same file.

Frequency settings.

There are a lot of misconceptions about the Frequency setting. The Frequency setting is for the density of the materials. Changing the “properly set” frequency setting will not affect the quality or speed of your cut.

- 5000 - Plastic/Acrylic
- 1000-1600 Chipboard/Museum board
- 500-1000 – Paper, Wood, sandply
CHANGING Speed / Power / Frequency SETTINGS

- From Autocad 2014, Select “PLOT”
- Select the material file you wish to modify
- Press “Properties”
o Then press “Custom Properties” in the center lower section of the window.
- On the Blue Epilog driver screen

- Make sure the <AutoFocus> box is checked (left hand side under “Options”)
- Select the Color Mapping function
• Make sure the “Color Mapping” checkbox in the upper left hand corner is checked

• Select either the red or yellow layer by clicking anywhere on the row in the right-hand window.

• Modify the settings as needed. See recommended laser materials settings posted on the wall in the laser room or available at http://spsu.edu/architecture/facilities/woodshop.htm

• Press the “Triple Arrow” button to save the changes

• Click “OK” when finished. It will return you to the configuration editor screen
Click “OK” to return to the plot screen
- *** NEVER click on anything in the PLOT AREA or PLOT OFFSET sections.
- Correct the “Paper Size” back to “Arch E 36 x 48 in”.

o Keeping your changes. When you exit the setting screen the following alert box will appear.
To save your changes select the “Save changes to the Following file” radio button.

- Scroll to the end of the text string and change the name of the file to something else.
  - Note: Your changes will be saved and will be available later when you are logged on that machine.

- Press OK and the file will be sent to the Laser.
Lowering the table for thick materials

- On lasers 1, 3, 4 & 5. (LEGEND EXT)
  - Open the lid
  - Use the switch on the front left side to lower the table so that the material is at least two inches below the laser plunger
  - Close the lid and press the green start button
- On laser 2 (HELIX), on the machine keypad
  - Press the “Disable X/Y” button
  - Press the green “go” button
  - Press the up or down arrow buttons
  - When finished press the “Reset” button
- Contact staff person, for assistance if needed.

Troubleshooting

Plotter says “DONE” after you press the green button

- Check the following:
  - All line widths are set to 0.00mm
  - Your lines are all on either the Red or Yellow layers
  - Did you check the paper size before pressing OK?
    - It should be “Arch E 36 x 48 in” for all lasers, including laser #2 (the HELIX)
  - If none of these were wrong,
    - select PLOT,
    - then select “Preview” in the lower left corner
    - Does your drawing show up?
Laser doesn’t receive your file

- Nothing shows up on the laser readout.
  - You are on either asleep and having nightmares of the network hub in the wall behind laser 5 is having “issues”
    - Make sure no one in the laser room is in the process of sending a file to their laser.
    - Unplug the power cable from the back of the hub.
    - Count to 10 very loudly while standing on your right foot.
    - Plug the power cable back in
    - Resend your data to the laser
  - This problem should not occur since we switched the lasers to a network port from the USB port. Contact staff if you are still having a problem

Laser starts printing back and forth really fast on the top or far left or right side.

The laser is trying to print the Autodesk message “PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT” in RASTER MODE. The “Produced by an AUTODESK EDUCATIONAL PRODUCT” was stamped on your file. See below section: “Determining if your drawing has been stamped by AUTOCAD”.

Laser decided to hit the left/right or front limits and stop

The laser is trying to print the Autodesk message “PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT” in RASTER MODE. The Produced by an AUTODESK EDUCATIONAL PRODUCT” was stamped
on your file. See below section: “Determining if your drawing has been stamped by AUTOCAD”.

**Determining if your drawing has been stamped by AUTOCAD**

- To check to see if the stamp has been embedded in your drawing:
  - From AutoCAD 2014 - Go to Plot
  - Pick <previous plot> from the “name” dropdown
  - Click on “preview” in the lower left corner.

- If the small black bars appear on all four sides...
- Zoom in on one and your will see:
• Follow the steps below to remove the stamp from your file

Removing the “PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT” message.

• From the command line in Autocad 2014 type
• DXFOUT
  ![DXFOUT Command](image)
• Save your drawing file
• Exit AutoCAD 2014
• Restart AutoCAD 2014
• Go to the command line and type DXFIN
• Find the file you just exported and open it.
• It will not have the message embedded.

Fat Lines – If your items start off with a nice thin cut/score line and then start getting noticeably “fatter” or not cutting through, it is because the material is not flat on the table. Ask for assistance from staff to deal with this issue.
Table is too high to complete the focus process

- On lasers 1, 3, 4 & 5, (LEGEND EXT)
  - Open the lid
  - Use the switch on the front left side to lower the table so that the material is at least two inches below the laser plunger
  - Close the lid and press the green start button
- On laser 2, (HELIX), on the machine keypad
  - Press the “Disable X/Y” button
  - Press the green “go” button
  - Press the up or down arrow buttons
  - When finished press the “Reset” button
- Contact staff person, for assistance if needed.

Table drops way below normal and stops without cutting

- Typically means the plunger is stuck in the up position
- Check to make sure the plunger is moving freely.<<photo>>
- If not contact a staff person to clean it.
- If it was stuck in the up position but now moves freely, restart your laser job. (On Laser 2 HELIX resend the job to the laser.)