Guide for Laser Cutter Monitor's Responsibilities

From The Student Contract for Laser Cutter Use:

"Monitors will be granted card access in exchange for offering a minimum of three monitor supported hours per week. These hours must be coordinated with the TA(s) at the beginning of each semester and should be posted on the Laser Cutter Signup Calendar. Card access hours of operation are still limited to the general hours of operation for the machines.

Monitors assume responsibility for supervising the equipment and the operation of the lab during their monitor shift, and should be able to provide additional troubleshooting and software support for the students using the equipment. Additional training in trouble shooting and some basic service tasks will be included in monitor training sessions. Monitors are also there to help mediate access disputes between students. Monitors are responsible for the general state of the room at the end of their shift and should clean up scraps, trash, and abandoned materials, and other debris before handing the room off to the next shift. If the monitor does not directly meet with the individual hosting the next shift, they should turn off all equipment and the lights in the room before leaving.

Maintenance of the equipment is the responsibility of the Fabrication Lab TA(s) or the Shop manager and not the monitors. Monitors should not be assigned to conduct these tasks, nor should they take it upon themselves to do so."

Monitor Hours

Monitor hours are three hours a week of the student's time where they are agreeing to be in the lab in support of **other** students using the laser cutter. If the equipment is unoccupied they may use it to laser cut their own work, but the priority is to allow non-monitors to access the machines during those times. The occupants in the room should remain limited to students using the laser cutter or preparing to do so plus the monitor. Try to avoid leaving the room any time that the machine is operating, especially with inexperienced users. Remember that the machine must always be supervised when it is operating, so you and the students can never both leave the room when the machine is cutting.

For students using the laser, access during monitor hours can be scheduled using the laser sign-up spreadsheet, or can operate on a walk-in basis. However, any student with a reservation should be given priority so long as their files are ready when they arrive. The monitor can also use best judgement on this if a walk-in is also fully prepared and is performing a cut of a much shorter duration than the scheduled student, so long as the students agree to the adjustment. During COVID restrictions this can also be limited to remote support or students can drop of materials and pick them up after you cut them. If this is the case it should be coordinated on the Laser Cutter Sign-up Schedule.

If another student is still cutting at the start of a prepared student's reservation the monitor is asked to use best judgement and negotiate between the two students. If the cut is nearly complete try and allow the student to complete the file. If the file has a considerable duration remaining you can try and negotiate with the student with the reservation, perhaps suggesting they prep their next file(s) during that time, or you can politely ask the student cutting to stop their cut. Please also consider the implications and complexity of the cuts when deciding on the course of action. It may difficult for a student with a partially cut file to finish their cut later, so the material in the machine can be wasted.

Monitors should always prioritize safety. Make sure that everyone in the room is wearing safety glasses when the machine(s) are firing. Make sure that students are not using restricted materials. If a student insists on a specific material that is listed as restricted, have them reach out the Shop Manager to discuss the use and if there is an alternative material or fabrication method. Remember that the emergency power off (EPO) button on the wall only works on the older machine. If a student is using the Epilog fusion they should hit the EPO on the machine instead.

Make sure that the air compressor is turned on before **every** cut.

Refer to the Student contract for emergency procedures in case of either a fire or an injury.

Software Support

Monitors should have a good working knowledge of at least Rhinoceros and Adobe Illustrator, as well as the laser cutter operating software. If you do not know those pieces of software well it is recommended that you review the tutorials and look up additional tutorials online. Even if you do have an excellent working knowledge of the software you can always learn something new. Doing this can also introduce you to other ways of thinking or using the software which can be useful because other students will not necessarily do things the same way that you do.   Your priority is the safety of the students and managing/supervising the equipment; software support should be provided if feasible in addition to your other responsibilities.

Room/Laser Cutter Cleaning

If there are scraps or abandoned materials please dispose of them before the next shift or add them to the scrap bin if they are usable. If there are little dropped bits from the laser cutter on the floor please sweep them up at the end of your shift. If there is a significant amount of material bits collecting under the grid in the laser cutter, please remove the grid and empty it into the trash. This is a fire safety consideration and it will also affect how much soot is on the underside of a piece after it is cut. This can be done at any point during the shift that you happen to notice the issue **as long as the debris is not hot**.

Please turn all of the equipment and the lights off at the end of your shift if another monitor is not present.

Troubleshooting the Laser

Troubleshooting the laser generally involves examining both the results (the actual cut or lack thereof) in concert with the settings in the software. It can be difficult to accurately troubleshoot an issue if the file that caused it has already been closed.

Some of the most common issues and their causes are:

Nothing shows up in the job queue = the laser cutter is not connected to the computer. Check that the red USB cable that connects to the laser cutter is connected to the computer. Also, make sure that the laser cutter is turned on.

The job says it will take no time or <10 sec. = the line weights or colors are not correctly set up and they are being culled from the print. Also check that the lines are set to center alignment on the path not inside or outside which can cause a thicker line. Not having the correct section of the page set up on the first print window can also cause this.

The cut did not go all the way through at all = the settings were not appropriate or were not programmed correctly. One common source of this is a student forgetting to click the update button on the color mapping page. The machine may also be defaulting to settings on the first page of the print driver due to a color issue.

The cut did not go all the way through and the lines are unusually broad = the broad lines usually indicate an error regarding the focus of the machine.

The laser cutter did not cut all the way through in some places = this usually indicates a change in focus. There is also a loss in efficiency as the machine moves closer to the user side of the machine. If it is close to cutting all the way through then making the cut slightly more intense may help. If it is not close check the focus or the material settings, or the optics may need cleaning/adjustment.

Do not attempt to clean or adjust the optics yourself. Contact the TA's or the Shop Manager. If you notice, or suspect, that the optics are particularly dirty do not keep cutting; that can damage the lens.

Do not run the cut over the same area repeatedly. The CO_2 Laser will not cut the carbon left coating the cut path, and repeated cutting in the same location will not be effective. It will also alter the appearance of the cut and make identifying the source of the issue more difficult.