SECTION 4
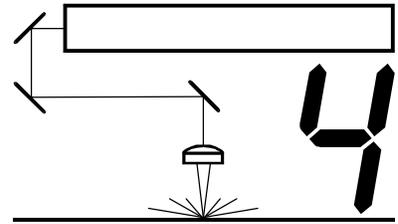
Running the System Step by Step

In this section we will cover how to completely use the laser system to create a product from start to finish. From powering on everything to removing the finished product from the system, we will cover the entire process step by step. As an example, let's engrave and cut out a key chain from a 2 by 4 inch, 1/8 inch thick piece of hardwood.

WARNING

Before continuing, please ensure that you have completely read and understood the entire manual up to this point. It is essential that you know how to safely operate the laser system before you actually engrave or cut any material.
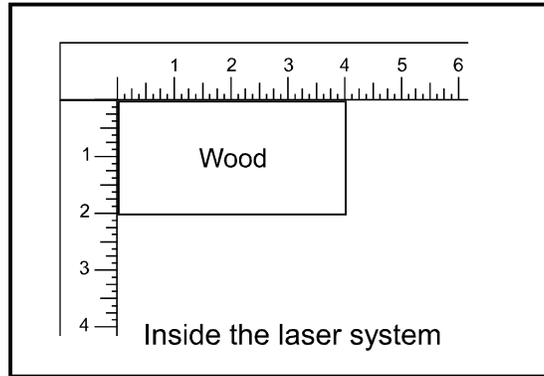
Powering Up

We recommend that you turn on your computer first and let it boot up completely before powering up the laser system. This will prevent any garbage information that might have traveled out the printer port from entering the laser system during power up. This common practice should be utilized for all output devices whether it is a laser printer or a laser engraver. If you happen to power up the laser system first and then power up your computer afterwards, there is a possibility that some garbage information gets transmitted to the laser system. If you then send down a file to print, that garbage may confuse the laser system and cause it to engrave erroneously which could damage your material. This is why we recommend turning on your computer first before the laser system as a safe practice.

Loading and Positioning the Material

The next step is to load and position the wood on top of the engraving table inside the laser system. Open the top door and position the piece of wood into the upper left hand corner of the table against the rulers as the diagram below indicates.

```
        1   2   3   4   5   6
     |.|.|.|.|.|.|.|.|.|.|.|.|
  1 —|
  2 —|         Wood
  3 —|
  4 —|     Inside the laser system
```

Focusing

Before attempting to adjust the focal height, visually check to make sure that the table is down low enough to prevent the focus carriage from hitting into the piece of wood.

With the top door still open, press the "Z" button on the control panel of the laser system. You will see the focus carriage move to the (1,1) position directly over the piece of wood. Using the focus tool, material thickness, or the Autofocus method, adjust the table until the proper focal height is achieved.

SIDE VIEW	SIDE VIEW
CORRECT	**INCORRECT**
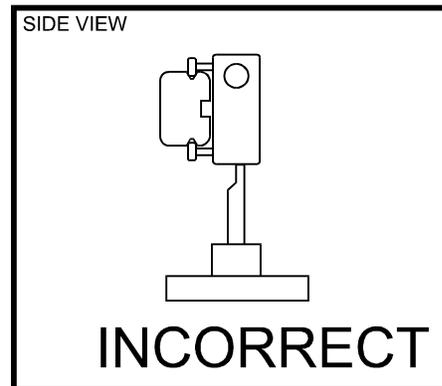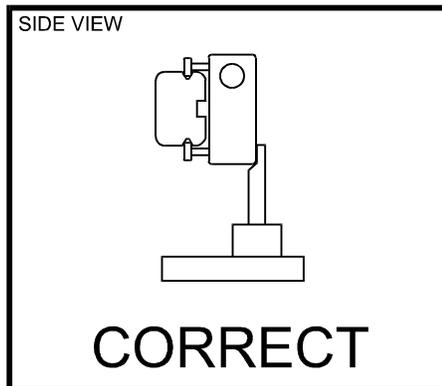
WARNING: Be careful not to position the tool underneath the focus lens as this can damage the lens if the table is driven up into it.

Sometimes it is desirable to be slightly out of focus when engraving or cutting. It widens the beam at the surface of the material to soften the image or create a wider cut line.

⚠️ WARNING

WARNING: DO NOT engrave or cut too far out of focus, as this can be a potential fire hazard. A maximum of .1 inches above or below precise focus should be the limit.

It does not matter whether you bring the table up to go out of focus, or down, the effect is the same. You should experiment on some scrap material at another time and note the difference. In this example, we will engrave in precise focus. Once you have established focus, store your focus tool and close the top door.

Creating the Graphic

In your graphics program set your page size to the maximum size of the engraving area, 24 inches wide by 18 inches tall in the Landscape mode. Create some text with a **BLACK** colored fill and **NO** outline. For example, type in the word "Keychain". Draw an outline box around the text, color the outline **RED**, give the outline a thickness of .00005 inches (or the smallest possible line width), remove the fill color (if any), and round the edges if desired. Now add a circle with the same **RED** outline .00005 inches (or the smallest possible line width) and **NO** fill, for the key ring. Place the graphic into the upper left corner of the page, on screen, relative to how the piece of wood is positioned in the engraving area as the following diagram illustrates:

On your computer screen
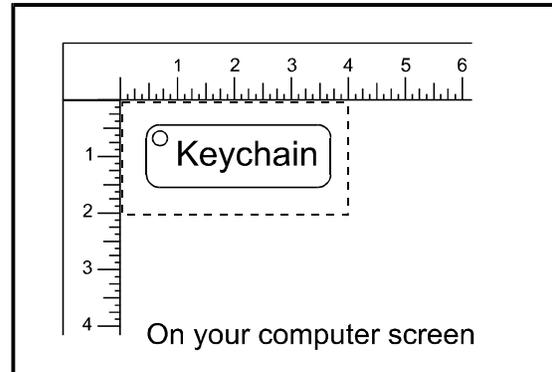
Setting the Drivers Properties

The next step is to set the drivers properties. From within your graphics program, get to where you can see the driver parameter screen. Usually, there is a menu item called "Print Setup" or "Print Options" that allows access to the printer driver screen from your graphics software. For specific instructions on how to access the printer driver from your graphics software, please refer to your graphics software instruction manual or online help screens.

Once the printer driver is visible, click on the appropriate tabs and set the drivers parameters to the appropriate settings. For an example of power settings for a particular material, please refer to Section 8 of this manual.

Downloading the File

You are now ready to print to the laser system. Make sure the laser system is powered on and the display reads " READY".

Find the "PRINT" command within your graphics program and click on it. Depending on which graphics program you are using, the menu command "PRINT" may be in various locations within your program. Usually after clicking on "PRINT", you will then need to click on "OK".

A status screen may now appear showing a percentage of completion. Once this status screen disappears, it does not mean that the file is totally in the laser systems memory. If you have the Windows 95/98 print spooler turned on, it can take several seconds to even minutes, depending on your file size and the speed of your computer, before the entire file loads into the laser systems memory. Once the entire file is completely loaded, the display on the laser system will automatically update and will display the file's name and the power settings that you assigned to the first color. One this appears, file download is now complete.

Starting the Engraving Process

Before pressing the "START" button on the control panel:

• Turn on your exhaust system.

• Make sure your material is positioned correctly within the engraving area.

• Make sure that you are properly focused.

• Make sure that the doors are closed and the RED light on the control panel is not flashing.

• Make sure the display shows the name of the file that you are going to run.

If all of the above has been verified, press the "START" button on the laser systems control panel to begin the engraving process.

WARNING

Observe that the laser system is functioning as desired. If any abnormalities are present, including but not limited to, flaming, sparking, melting, or excessive smoking of the material you are engraving, **STOP THE ENGRAVING PROCESS IMMEDIATELY BY EITHER PRESSING THE "PAUSE" BUTTON OR OPENING THE TOP DOOR!** Re-check your settings in the printer driver as well as the laser system. If everything seems to be correct, the material is not suitable for laser engraving or cutting and you **MUST DISCONTINUE** processing this material or any material that shows impending signs of damage to the equipment.

We will also remind you again to please comply with the warning label below.

WARNING
NEVER OPERATE THE LASER SYSTEM
WITHOUT CONSTANT SUPERVISION

EXPOSURE TO THE LASER BEAM MAY
CAUSE IGNITION OF COMBUSTIBLE
MATERIALS WHICH CAN CAUSE SEVERE
DAMAGE TO THE EQUIPMENT

Material Removing and Reloading

Once the laser system has completed processing you material, the laser beam will turn off, the motion system will move to its home position in the upper right hand corner, the system will beep twice, and the green light on the control panel will glow continuously.

Before opening the top door, wait a few seconds to let any remaining fumes that are leftover from the engraving or cutting process, evacuate through the exhaust system.

Open the top door and remove your material. Some materials will continue to out gas for several minutes to sometimes hours after the engraving or cutting process is completed. We recommend that you move these materials to a well-ventilated and unoccupied area.

WARNING

Some materials, when engraved or cut with a laser, can produce toxic and caustic fumes. We suggest that you obtain the Material Safety Data Sheet (MSDS) from the materials manufacturer. The MSDS discloses all of the hazards when handling or processing that material. The law requires all manufacturers to provide this information to anyone who requests it. DISCONTINUE processing any material that shows signs of chemical deterioration of the laser system. Systems damaged from this abuse will NOT be covered under warranty.

While the top door is still open, load in your next piece of material. If it is the same as the previous one and you want to run the file again, simply close the top door and press the "START" button again to start the process from the beginning.

For further information on running the laser system in a different manner other than what has been described in this section, please refer to the previous section on "System Operation".