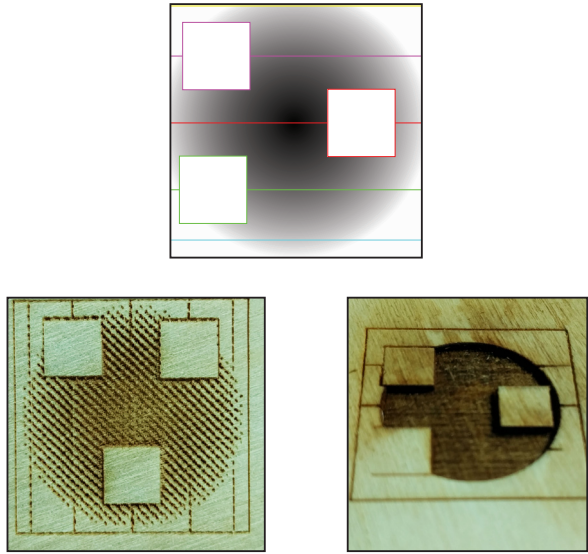


MATERIALS TEST

We provide a free materials test template with suggested starting points in power and speed settings. From here, you can experiment with your own materials testing by using this template for each project.

DOWNLOAD MATERIALS TESTING TEMPLATE: [www.laser101.fslaser.com](http://www.laser101.fslaser.com)



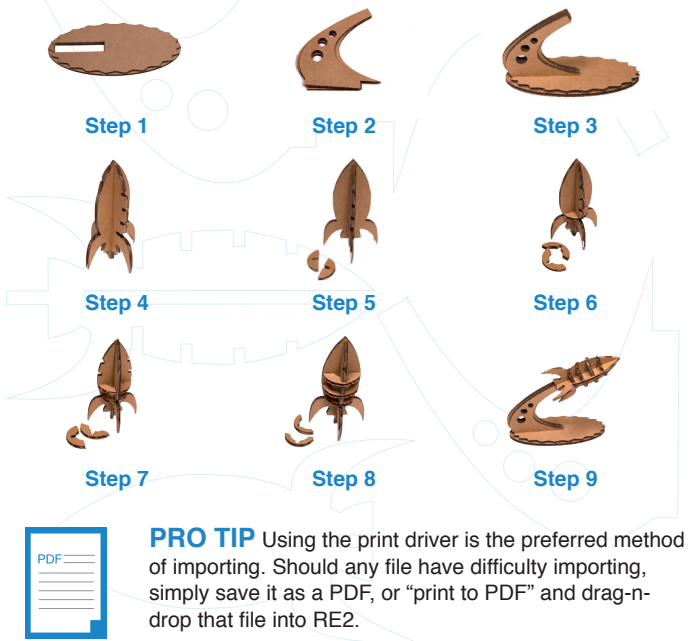
Free Materials Log

It is recommended that once you do a materials test, you record the setting information in a material's log. We offer a free material log template you can access at: [www.laser101.fslaser.com](http://www.laser101.fslaser.com)

“INITIATE BLAST OFF” LASER PROJECT

This free design project is perfect for new operators to learn how to use their Muse laser system. We supply the design file, the step-by-step instructions and utilize cardboard from the box your Muse arrived in as material.

To access the project, go to:  
<http://laser101.fslaser.com/materialtest>



RETINA ENGRAVE 2.0 REFERENCE GUIDE V1.0

WORKFLOW

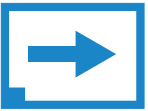
Before you start any job, it is operator's responsibility to be aware off all assembly requirements and safety issues outlined in your user manual.



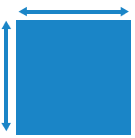
**1. Create Design:**  
Create your design in the program of your choice. **Note:** Files should be created with laser cutting considered.



**2. Connect to Software:**  
Link your Muse to the software by typing the IP address found on the Touch Screen (Settings>Network>Copy IP) into your browser (Google Chrome Suggested).



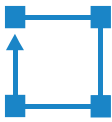
**3. Import Design:**  
Using direct print from your design program, or by drag-n-dropping the file into the RetinaEngrave 2.0 workspace, import your design to the software.



**4. Place Material:**  
Place your material into the laser bed workspace.



**5. Focus:**  
Using the included focus billet, focus the laser to the material (consult your user manual).



**6. Align Laser to Material:**  
Using either the perimeter tool, or camera function (see camera features), align your design on the appropriate area of your material.



**7. Adjust Object Properties:**  
Using the Properties Manager Window, adjust your Vector or Raster settings for your cut, mark or engraving.



**8. Run Job:**  
Double check your safety precautions and accessories, and press the “play” button to start the job.



CAMERA: CAPTURE WORKSPACE

Use the onboard camera to capture your workspace to align your design.

1. Place material in center of laser bed.
2. Position the laser head above the material and use the focus billet to focus the cone above the material surface. Ensure your material does not impede the movement of the laser head.
3. Initiate Camera Sequence - Press the Camera Icon on your RE2 software, or on the LCD touch screen (for touch screen controls, see user manual) - Note that you 1) use the camera button, 2) position the head, and 3) press the camera button again (this initiates sequence with no indication on software).

Follow the steps on the screen. The camera diode is now on, this is different than the position diode indicating the laser position, this is used for calibration. Ensure this diode hits the surface of your object.

4. After 9 photos are taken and stitched, your workspace should now represent your laser bed. Position your design as needed (for help importing, see the Work-Flow Section), and adjust setting.
5. You are now ready to run your job! To double check a position on your workspace, CTRL-Click anywhere on the work space to position the laser head there.



CAMERA: VECTOR TRACE

1. Choose your material, and prep. Flat objects work best, and we suggest you place masking tape (paper tape) on the surface before marking with a pen (sharpie). Don't allow the masking to tape to overlay on the material when applying more than one strip.
2. Using a thick black marker or pen, draw on your material. Thick solid lines will be read the best. If coloring in a space, ensure completely filled in.
3. Capture the workspace as shown in steps 3 & 4 in the “Capture Workspace” instructions.
4. Click on the “Vectorize” icon in the top menu bar (show with label). This will bring up a sub-menu. Using your mouse, select the section you want to vectorize and press ok. You can repeat this step as many times as you like. Place a white piece of paper behind your self-drawn design to help aid if having trouble capturing the area you want to vectorize.
5. You now have Bitmap and Vector data for your object available. They should appear in the Object Manager box. Delete data not needed. If just engraving, delete vector data, if just cutting or marking, delete bitmap data.
6. You are now ready to run your job!

Maximize Your Muse  
with Free Lessons, Projects & Certifications

The arrival of your Muse Laser System is just the beginning. We want operators to become experts in all aspects of design, cutting and finishing amazing projects. To do this, we offer our free Laser 101 curriculum which will visually guide you, step-by-step, from beginner to expert maker. Once you have confidence with your laser cutter, access our free library of project files for new ideas and designs. Finally, take your skills to the market with our Laser Cutting Certificate program.



[WWW.LASER101.FSLASER.COM](http://WWW.LASER101.FSLASER.COM)



Technical Support is available from 8am to 5pm (PST) M - F at [support@fslaser.com](mailto:support@fslaser.com).



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TOP LINE MENUS

- A. PROJECTS LIST**  
Lists past project files for easy access. Simply “drag ‘n drop” into the workspace.

**B. TITLE PROJECT**  
Click window to rename.

**C. NEW PROJECT**  
Start a new project.
- D. OPEN FILE**  
Open an existing project.

**E. CAMERA**  
Initiates camera operation (see camera features).

**F. JOG PERIMETER**  
Laser continuously outlines the border of current project until stopped.

- G. VECTORIZE**  
Used with camera to apply vectors to selected area of image.

**H. TEST FIRE**  
Test fire the laser.

**I. ESTIMATE TIME**  
Click for estimation of time to complete current job.
- J. GLOBAL SETTINGS**  
Should only be used after reading user manual, control all object properties in properties manager.

**K. START JOB**  
Run your project. When job is running, “play” button is replaced with “pause” and “stop” buttons.

JOG MENU

- A. HOME**  
Homes laser to 0, 0 (X, Y), then returns to previous position.

**B. JOG (DIRECTION)**  
The four arrows will jog the gantry **UP, DOWN, LEFT** and **RIGHT**.
- C. LOCK/UNLOCK MANUAL CONTROL**  
Locks the gantry for JOG button control or Unlocks the gantry for manual control.

**D. JOG**  
Button has three states: **FAST** (Green figure), **SLOW** (White figure) and **STOP** (Red figure).

VECTOR PROPERTIES

- A. REORDER LAYERS**  
Click and drag up or down to change order of vector layers.

**B. TAG**  
Identifies different vector colors in each object, allowing to adjust setting independently.

**C. SPEED**  
Adjust the speed the laser head passes along vector lines when marking or cutting.
- D. POWER**  
Adjust the amount of power received by the laser tube.

**E. CURRENT**  
Adjust the amount of current received by the laser tube.

**F. PASSES**  
Apply multiple passes of same color vector line. Set pass to 0 before deleting a vector layer.
- G. PLUS (+)**  
Add a vector layer.

**H. MINUS (-)**  
Remove a vector layer.

WORKSPACE CONTROLS

- A. UNDUE LAST OPERATION**  
Removes the last operation.

**B. REDO LAST OPERATION**  
Repeats last operation.

**C. FLIP OBJECT ALONG X-AXIS**  
Reverse image the object.

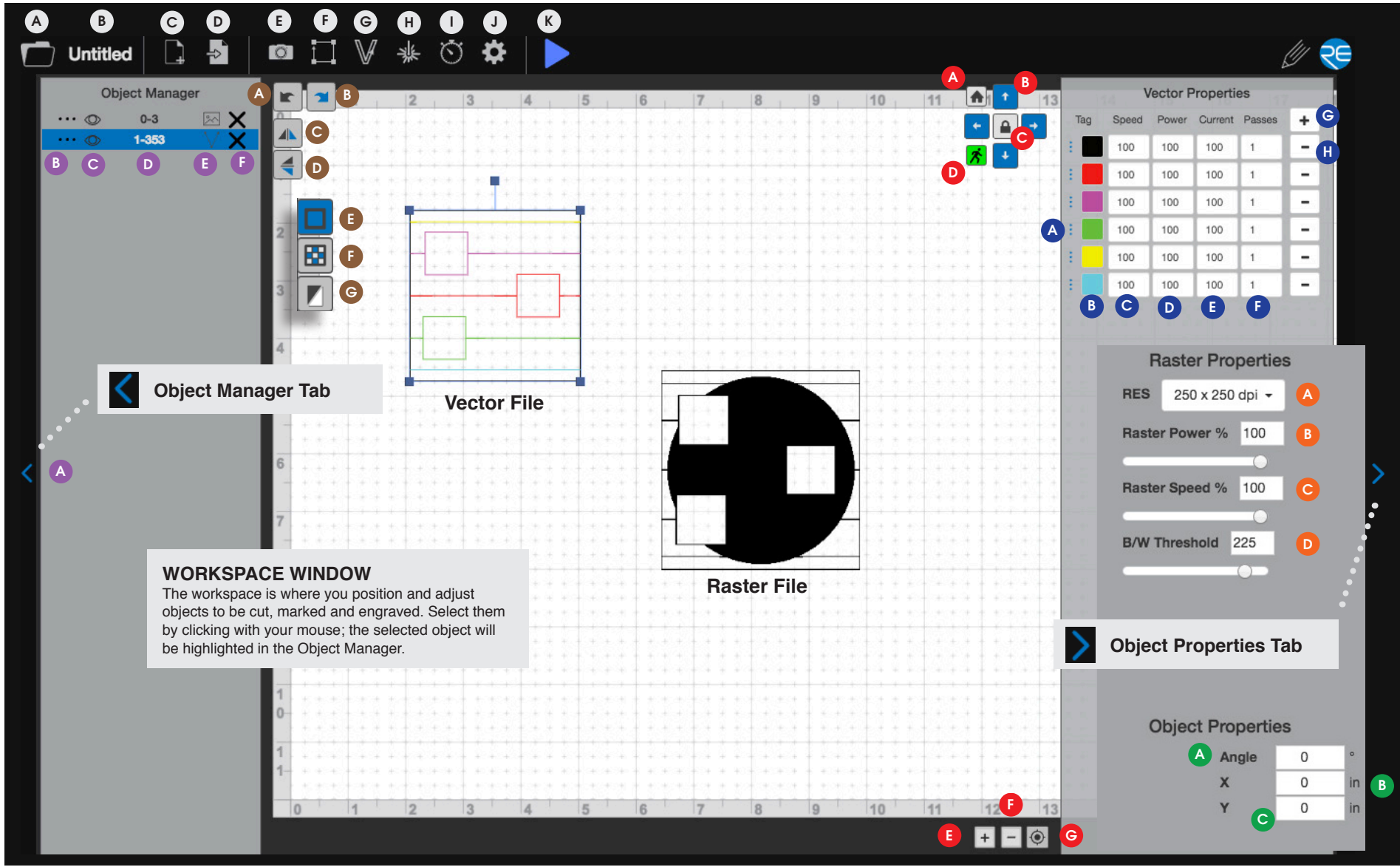
**D. FLIP OBJECT ALONG Y-AXIS**  
Reverse image the object.
- E. NO DITHER**  
Turn dither off.

**F. DITHER**  
Create gradients for photo engraving.

**G. THRESHOLD**  
Adjusts range of color that adjust to either black or white.

STOPPING THE LASER

- Once a project has begun, the laser will continue until the project is complete. If for any reason an operator needs to stop the laser, choose one of these options:
- 1. Open the lid.** Cuts off the laser if it is opened. This should be your first method of stopping the laser during an emergency.
  - 2. Push On/Off Button.** Push button on top of Muse once to pause. Push again to continue. Push and hold to stop.
  - 3. E-Stop.** On the touch screen, the top red bar is an “Emergency” stop button (E-Stop).
  - 4. Software Stop.** In the software, click the Pause Button to halt the laser. Clicking again will continue the job. Clicking “Stop” will end the job.



RASTER PROPERTIES

- A. RESOLUTION (RES)**  
Resolution is controlled by the DPI (Dots Per Inch) settings. DPI options include 250 (default), 500 and 1000. The more dots per inch, the higher precision and quality of your images, while a lower DPI will process and engrave faster.

**B. RASTER POWER %**  
When engraving, adjust the amount of power applied to the material.
- C. RASTER SPEED %**  
Adjust the speed the laser head passes over the material when engraving.

**D. B/W THRESHOLD**  
Used independent of dithering, this adjust which range of colors will be engraved as “black”.

DESIGN VIEW

Access Design View Features (see User Manual for details)

PRO TIP

“Current” and “Power” both affect the power output of the laser. “Power” controls the frequency of laser pulses during cutting. So, higher laser “Power” means more frequently energy will be deposited into the material. “Current” controls the actual laser output each time laser pulses.

So, high laser “Current” means more energy will be deposited into the material every time laser pulses. One thing to note, “Current” only applies to vector jobs.

The combination of the different “Current” and “Vector” settings can create a wide range of effects on different materials, use these and “Speed” to perfectly adjust for your material.

OBJECT MANAGER

- A. OBJECT MANAGER TAB**  
Keep track of the various objects in the main work-screen. By clicking and dragging these layers, we can rearrange the cut order of the project. Objects on the top will cut first.

**B. REORDER OBJECTS**  
Click and drag up or down to change order of operation.

**C. HIDE/UNHIDE OBJECT**  
Clicking the “eye” icon either hides or makes the object visible. Hidden objects will be skipped in the cutting process.
- D. ID CODE**  
This is a random designation to your object layer. You can custom name your object layers as well.

**E. OBJECT TYPE**  
This icon tells you what type of operation the object layer is. The “V” icon indicates a vector file, while the “photo” icon represents a raster.

- F. REMOVE**  
Click the X to remove an object layer.
- V** Vector

**Photo** Raster

OBJECT PROPERTIES

- A. ANGLE**  
Set a custom number or use the bars on the right of the box to increase or decrease the angle in increments of one.

**B. X - AXIS**  
Input a number directly into the window, use the increase/decrease bar, or manually click and drag the object to any place in the work area.
- C. Y - AXIS**  
Input a number directly into the window, use the increase/decrease bar, or manually click and drag the object to any place in the work area.

MOUSE CONTROLS

- A. DRAG ‘N DROP**  
Click and hold a design file and then drag it into the workspace. You will be invited to “Drop anywhere!”. Once uploaded, click and hold the left mouse button and drag the mouse to move the object in the workspace.

**B. RESIZE/ROTATE**  
Clicking on the object with your mouse will highlight the square adjusters for size and orientation. Use mouse to manipulate the object’s size by expanding or constricting the square adjusters or turning the rotation node to rotate object.
- C. ALT + LEFT CLICK TO ROTATE**  
Hold the Alt button on your keyboard, then left click and hold your mouse over the

- D. ALT + LEFT CLICK TO RESIZE**  
Hold the Alt button on your keyboard, then left click and hold your mouse over one of the four corner “resizing” nodes. By moving the mouse, you can to rotate the object from the opposing node.
- E. HOME TO LOCATION**  
Instantly home the laser to any location in the work bed by simultaneously holding the Ctrl key and left-clicking the mouse. This allows you to choose where the laser starts the job.