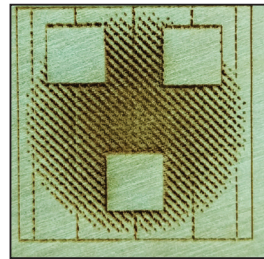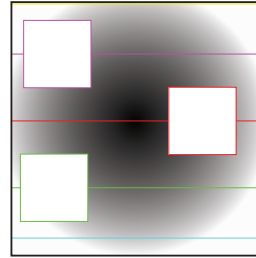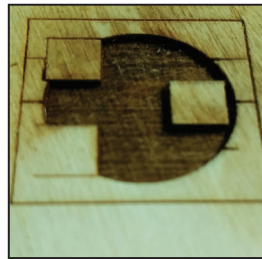## MATERIALS TEST

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:
http://laser101.fslaser.com/materialtest

Dithered Example   **Solid Fill Example**
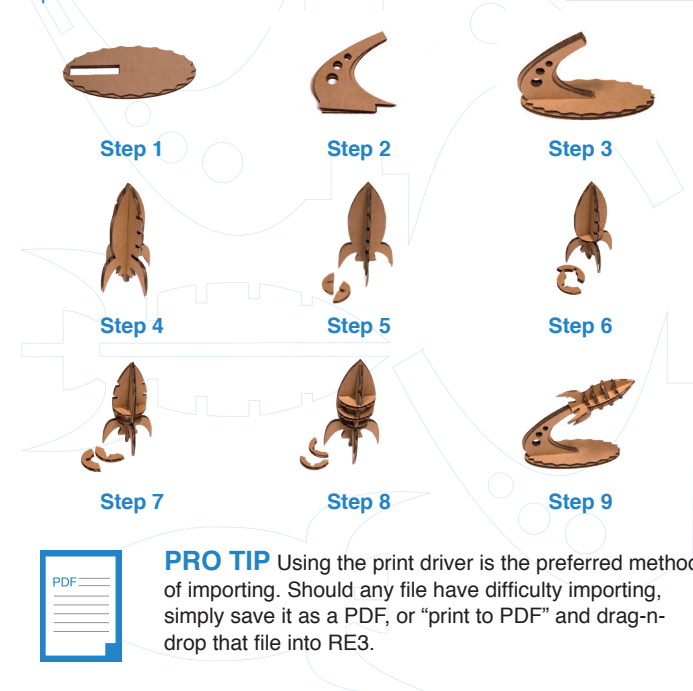
Free Materials Log

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: http://laser101.fslaser.com/materialtest

"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

Step 1   **Step 2**   **Step 3**

Step 4   **Step 5**   **Step 6**

Step 7   **Step 8**   **Step 9**

PRO TIP Using the print driver is the preferred method of importing. Should any file have difficulty importing, simply save it as a PDF, or "print to PDF" and drag-n-drop that file into RE3.

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.

LASER 101
CUT.MARK.ENGRAVE
FULL SPECTRUM LASER . LASER 101 COURSE . LAS VEGAS, NV . WOOD . FABRIC . LEATHER . GLASS . ACRYLIC . PAPER .

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RETINA*ENGRAVE* 3.0 *REFERENCE GUIDE V 3.0*

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.
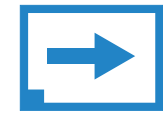
1. Create Design:
Create your design in the program of your choice. **Note:** Files should be created with laser cutting considered.
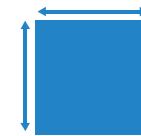
2. Connect to Software:
Link your Muse to the software by typing the IP address found on the Touch Screen (Settings>Network>Copy IP) into your browser (Google Chrome Suggested).

3. Import Design:
Using direct print from your design program, or by drag-n-dropping the file into the RetinaEngrave 3.0 workspace, import your design to the software.
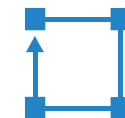
4. Place Material:
Place your material into the laser bed workspace.

5. Focus:
Using the included focus billet, focus the laser to the material (consult your user manual). Note that if your Muse has the autofocus feature, focusing is automatic when the job is run.

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 RetinaEngrave 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. Click "New Height Measurement". The laser head will shift back and measure the height of your material using the secondary red beam laser. You can repeat this step several times for more accurate results. If results don't improve, it may be that your material is an uneven surface. Click Continue when focused.

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!

ICON MENUS

SETTING CONTROLS

A. SETTING
Goto settings options.

B. UNDO
Reverse your last action.

C. REDO
Reverse your last undo.

(E) 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.

INDICATORS (BOTTOM ROW)

A. POSITION INDICATOR
Displays current position of the laser on the grid.

B. TIME REMAINING
Displays the time remaining to complete current job.

C. STATUS INDICATOR
Displays whether laser is ready to initiate a job or is currently executing a job.

D. SYNC INDICATOR
Displays information on connected devices.

E. DEVICE CONNECTION
Lid indicator and waterflow indicator.

MUSE CONTROLS

A. CAPTURE
Initiates camera functions (see using camera functions).

B. VECTORIZE
Apply vector/engraving to selected area of image.

C. JOB TIME ESTIMATE
Time for job to be completed.

D. RUN PERIMETER
Outlines the border of current job.

E. RUN JOB
Run your project. When running "Play" button will be replaced with "Pause" and "Cancel."

PROJECTS MENU

Displays information about current projects.

A. PROJECT
Click on a project to view and display properties in properties window.

B. LAYERS
Click on a layer to view Information on projects with multiple layers in properties window.

C. SUBLAYERS
Vector portion can be expanded to show each element of the vector job as each one can be manipulated / deleted individually.

D. CREATE / DELETER LAYERS
Begin or Delete a project.

VIEW/SNAP CONTROLS

A. ZOOM
Enlarges/reduces workspace screen detail and size.

B. FIT ALL
Rests view to default, fitting entire project in workspace screen.

C. VIEW
Pan and zoom using your mouse.

D. SNAP
Enable or disable various snapping features.

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 rotation node. By moving the mouse, you can resize the object from center rather than the corner.

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.

DRAW CONTROLS

A. SELECT
Initiates pointer.

B. PATH
Creates custom paths.

C. SHAPE
Darw tool to create shapes.

D. TEXT
Creates object made of text.

POSITION MENU

A. FLIP HORIZONTAL
Flip object along horizontal axis.

B. FLIP VERTICALLY
Flip object along vertically axis.

C. ROTATE 90 LEFT
Rotate object to left.

D. ROTATE 90 RIGHT
Rotate object to right.

GROUP MENU

A. GROUP
Group objects.

B. MERGE
Combine layers.

C. SPLIT
Split up a compound shape or object.

ARRANGE MENU

A. BRING FORWARD
Send an object one layer forward.

B. SEND BACKWARDS
Send an object one layer backwards.

RASTER (ENGRAVE) PROPERTIES

A. HALFTONE DITHER/ THRESHOLD
Appy threshold or halftone dither to a raster.

B. INVERT
Reverse Black and White elements.

C. RESOLUTION
Set Resolution to 250, 500 or 1000 dpi.

D. RASTER POWER %
When engraving, adjust the amount of power applied to the material.

E. RASTER SPEED %
Adjust the speed the laser head passes over the material when engraving.

F. 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)

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
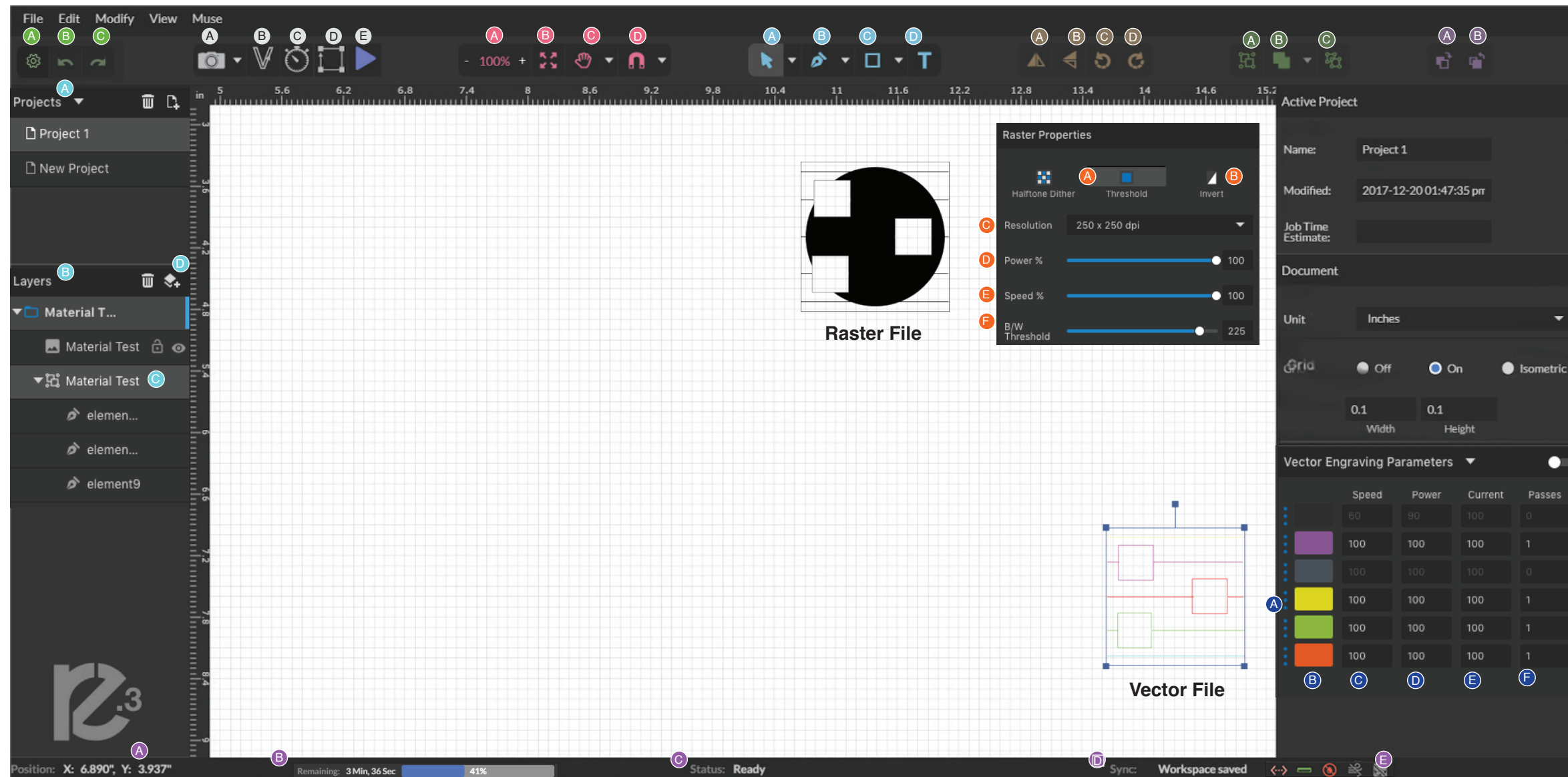Adjust the amount of current received by the laser tube.

F. PASSES
Apply multiple passes of same color vector line. Set pass to 0 skip a color from vector color.

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.

Workspace panel

Projects
- Project 1
- New Project

Layers
- Material T...
- Material Test
- Material Test
  - elemen...
  - elemen...
  - element9

Raster Properties

Halftone Dither | Threshold | Invert

Resolution: 250 x 250 dpi
Power %: 100
Speed %: 100
B/W Threshold: 225

Raster File

Active Project

Name: Project 1
Modified: 2017-12-20 01:47:35 pm
Job Time Estimate:

Document

Unit: Inches

Grid: Off / On / Isometric

Width 0.1 | Height 0.1

Vector Engraving Parameters

	Speed	Power	Current	Passes
	60	90	100	0
	100	100	100	1
	100	100	100	0
	100	100	100	1
	100	100	100	1
	100	100	100	1

Vector File

Position: X: 6.890", Y: 3.937"
Remaining: 3 Min, 36 Sec — 41%
Status: Ready
Sync: Workspace saved

Remaining: 3 Min, 36 Sec