

Laser Engravers Big and Small

Presented by
Bruce Meissner and Robert Love



An Introduction to Using a



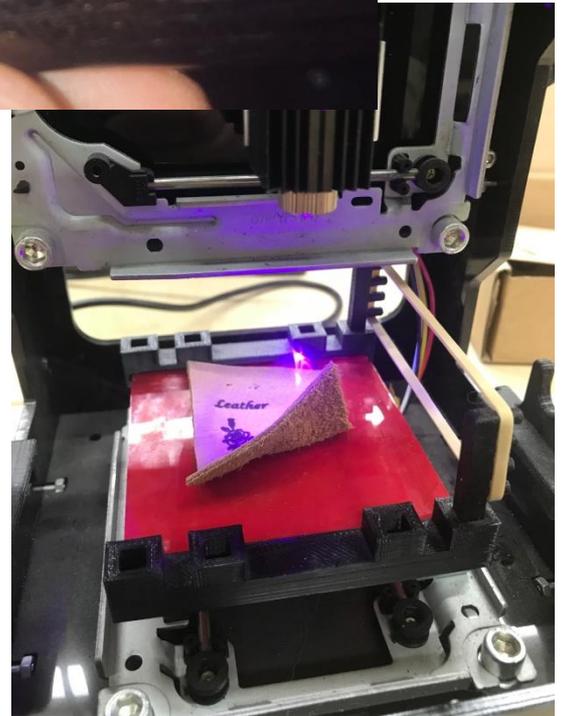
Lasers are for More than Ninjas on Segways



And Robotic overlords



They Can Be Used for Woodworking



They Can be Used for Woodworking





Light

Amplification

by

Stimulated

Emission

of

Radiation

Types of Lasers

Most woodworking lasers may be either solid state or gas tube.

Solid state lasers are made from semiconductor material (Diodes), Such as found in CD/DVD players. Typically lower power than gas lasers. Systems starting around \$90 can be found on Amazon.com (search for NEJE laser)

Gas lasers typically use carbon dioxide (CO₂) as lasing medium.

- Lower cost 'hobbyist' CO₂ lasers (\$2000-5000) are typically water cooled and use high voltage to excite the laser tube similar to a neon sign. Laser tube cannot be refilled.
- More expensive lasers (\$5000+) are air cooled and use radio frequency waves to excite the laser. Laser can be refilled at factory.

Types of Laser Equipment

- ❖ Hobby – Often imported and cheap
- ❖ DIY – Kits that you assemble or buy the components and build your own
- ❖ Pro-Consumer – Very easy to use and expensive
- ❖ Professional – Easy to use, long life, powerful, continuous use, and expensive

Laser systems operate by either raster mode (like a TV screen) or by vector mode (point to point lines) or a combination of both.

Laser times will vary with all the settings required, orientation of object relative to x-axis (direction of laser beam) and amount of detail.

For Example:

- ❖ Spiral bowl, cut from 1/8" birch plywood, took 12.5 minutes start to finish.
- ❖ Coaster, cut from 1/4" maple, took 4.5 minutes per piece to engrave & cut.
- ❖ Glass tile, raster image only, took 6.75 minutes.

Small Hobby Lasers Can Be Used To

- ❖ Engrave wood, plastics, paper stock
- ❖ Cut thin stock
- ❖ They are not suitable for metal or glass or reflective stock

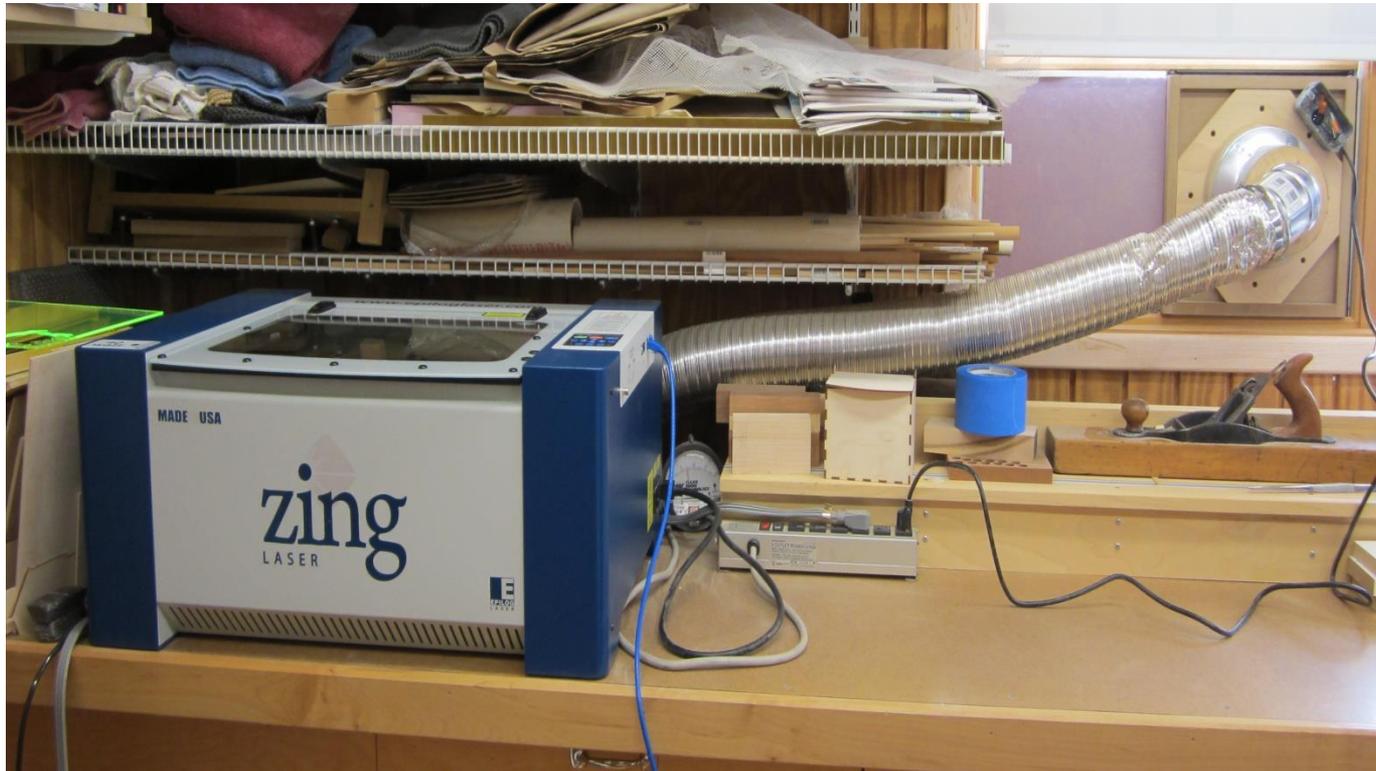
Semi and Professional Lasers Can Be Used To

- ❖ Engrave wood, plastics, leather, paper, glass, and painted/power coated metal stock
- ❖ Cut wood, plastics, leather, paper stock. Cut thickness depends on the laser power
- ❖ Not suitable for reflective stock

Safety

- ❖ Protect your eyes! Don't point the laser at your eyes and use eye protection!
- ❖ Smoke will be generated. Use proper ventilation or filtration. Professional lasers offer filtration options.
- ❖ Keep fingers clear of the laser when in operation. It will burn you.
- ❖ Avoid using the laser on material that create dangerous fumes, like PVC.

Any larger laser system, other than the small laser diode units, usually have exhaust ports for smoke and debris. These systems also require a small air compressor to blow smoke away from lens. Dirty lens can reduce cutting ability or even crack from heat of laser beam.

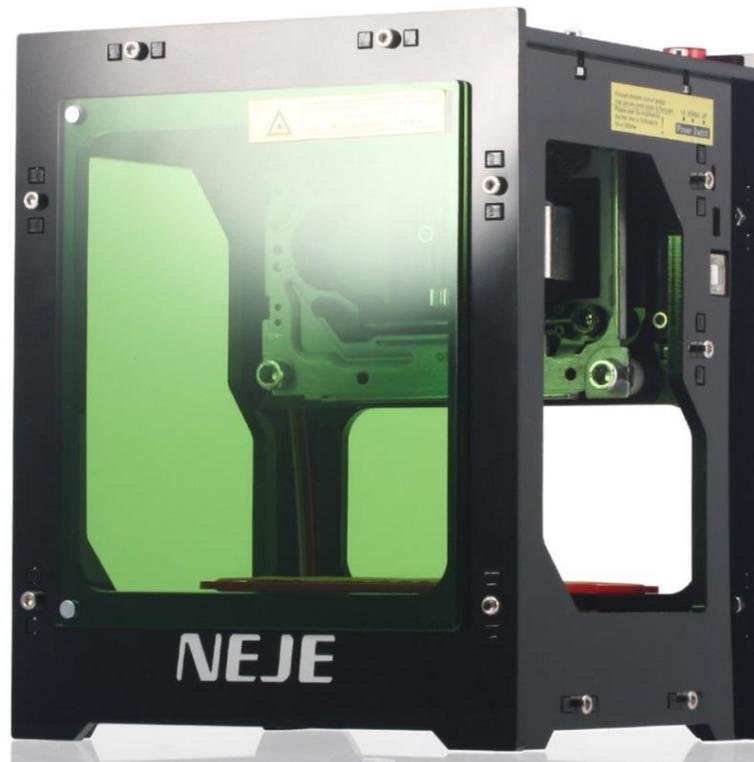


Epilog laser with window mounted exhaust fan using metal flex duct

In life and With Lasers

- ❖ You get what you pay for.
- ❖ Typically more expensive laser systems are
 - ❖ More powerful lasers
 - ❖ Faster
 - ❖ Higher print resolution
 - ❖ Better software and easier to use
 - ❖ Have larger print areas
 - ❖ Engrave/cut more materials

Small Lasers



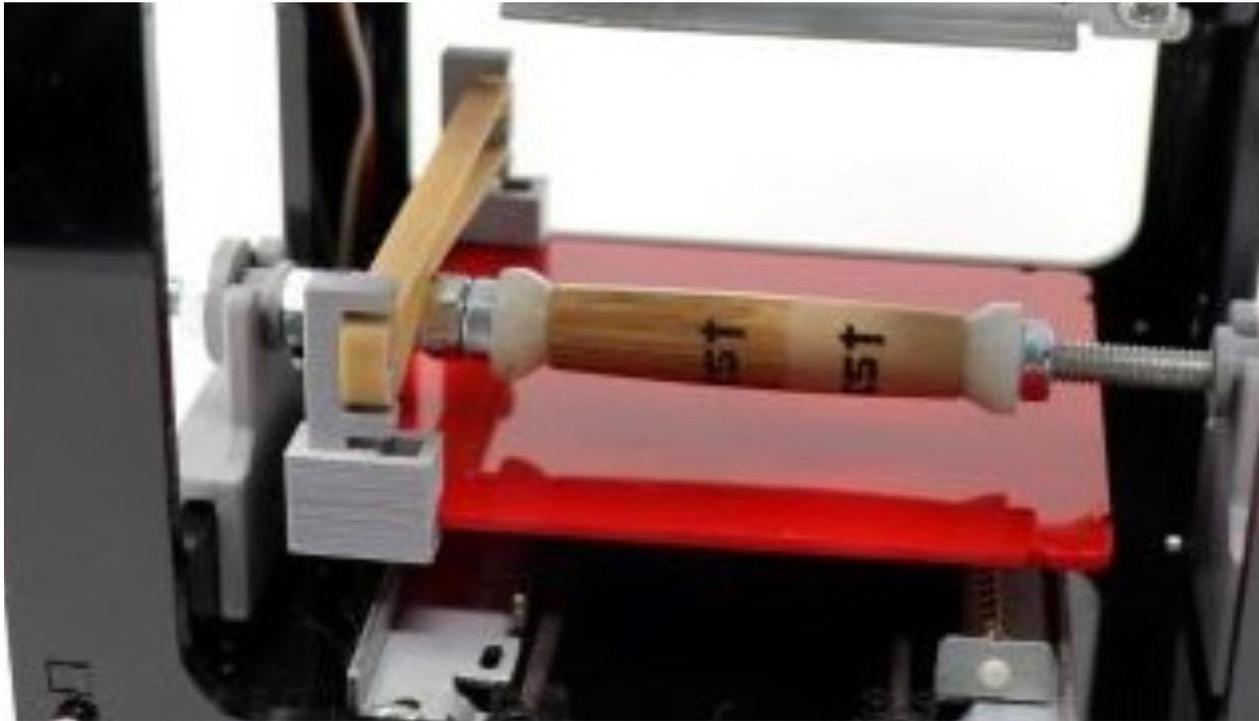
Small Lasers

- ❖ Imported lasers
- ❖ Various names include Neje, Qiilu, Meterk, MWPowder
- ❖ Uses CD/DVD laser positioners for motion
- ❖ Software is very basic
- ❖ Laser Power ranges from 500mW to 1500mW
- ❖ Print area about 1.5" square
- ❖ Prices around \$90-150
- ❖ Readily available on Amazon

Small Lasers

- ❖ Aftermarket rotary attachment devices available
- ❖ One Source is TSHADOW.COM for \$45-50. It is a 3D printed add on that uses a rubber band to transfer the table motion into rotary motion
- ❖ Good for engraving pens and other small items that can be fitted to a mandrel.

Small Laser Rotary Attachment

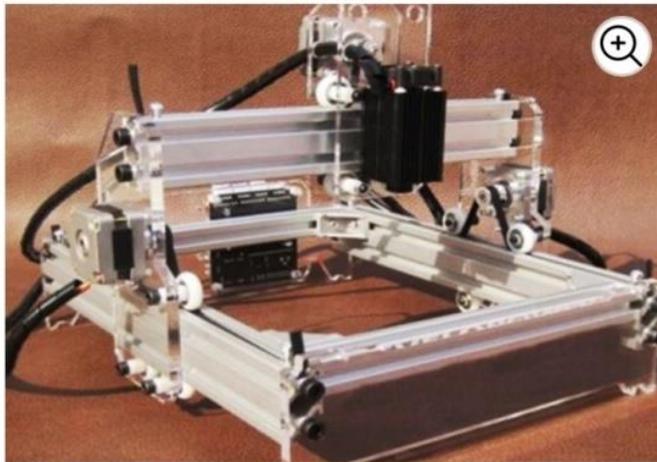


DIY Kit Lasers

Arts, Crafts & Sewing / Crafting / Wood Crafting / Wood Burning & Engraving Supplies



CLEARANCE



2000mw Mini Desktop Laser Engraving Machine Laser Engraver Laser Cutter Printer DIY Logo Mark Self-assembly 17x20cm

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DIY Kit Lasers

- ❖ All the components needed assemble an open bed laser engraver
- ❖ Software is basic to advanced (at an additional cost)
- ❖ Laser Power Ranges from 500mW to 5W
- ❖ Uses cheap stepper motors or more expensive servo motors
- ❖ Prices from \$150 to \$2500
- ❖ Print area vary by manufacturer and size of the rails, but typical sizes are 7"x8" up to 18"x24"
- ❖ Can be found on Amazon and through CNC/Laser groups and even Walmart.com

Pro-Consumer Lasers



Pro-Consumer Lasers

- ❖ One Common brand is Glowforge. Glowforge.com
- ❖ Extremely easy to use (computer not required, but can be used)
- ❖ Has scanning capability along with the laser engraving and cutting
- ❖ Camera view shows engraving on work piece before engraving to allow for adjustments
- ❖ Laser power is 40 or 45 W
- ❖ Print area 11"x 19.5"
- ❖ Prices range from \$2500-6000

Multi-Function Machines



Multi-Function Machines

- ❖ Machines like the CNC Shark and CNC Piranha, available from Rockler, are sold as CNC Router, but there is a Laser Accessory.
- ❖ Print area ranges from 12"x18" up to 25"x50"
- ❖ Prices range from \$1600 to \$4500
- ❖ A 7W Laser option is available for an additional \$999.99 and attaches to the router spindle

Multi-Function Machines CNC Shark Laser Accessory



Multi-Function Machines

- ❖ There are several machines that have CNC router, 3D printer, and laser capabilities (many are imported)
- ❖ A web search comes up with brands:
 - ❖ Zmorp3d VX
 - ❖ Snapmaker
 - ❖ Flux Delta
 - ❖ Atom
 - ❖ BoXZY
 - ❖ And many more

Professional Lasers



Professional Lasers

- ❖ Common brand is Epilog
- ❖ Prices are based on speed, print area, laser power, and filtration options. Ranges from \$8000 to over \$60,000!
- ❖ Software is easy to use
- ❖ Laser power ranges from 30W to 120W
- ❖ Use high quality servo motors
- ❖ Print area ranges from 16"X12" to 40"x28"
- ❖ Has a Rotary attachment option

Better Known Laser Suppliers

- Rockler (Rockler.com): chilled water systems starting at \$3600
- Thunder Laser (Thunderlaser.com): chilled water systems
- Boss Laser (Boss laser.com): chilled water systems starting at \$4000
- Epilog Laser (Epiloglaser.com): air cooled, starting @ \$8000
- Full Spectrum Laser (Fslaser.com): chilled water systems starting at \$3500
- Trotec Laser (Trotec.com): chilled water systems, some air cooled
- NEJE solid state laser, Amazon.com, starting \$90
- Dremel (Dremel.com): chilled water systems starting at \$6000

Many of the above listed websites have free sample artwork files available.

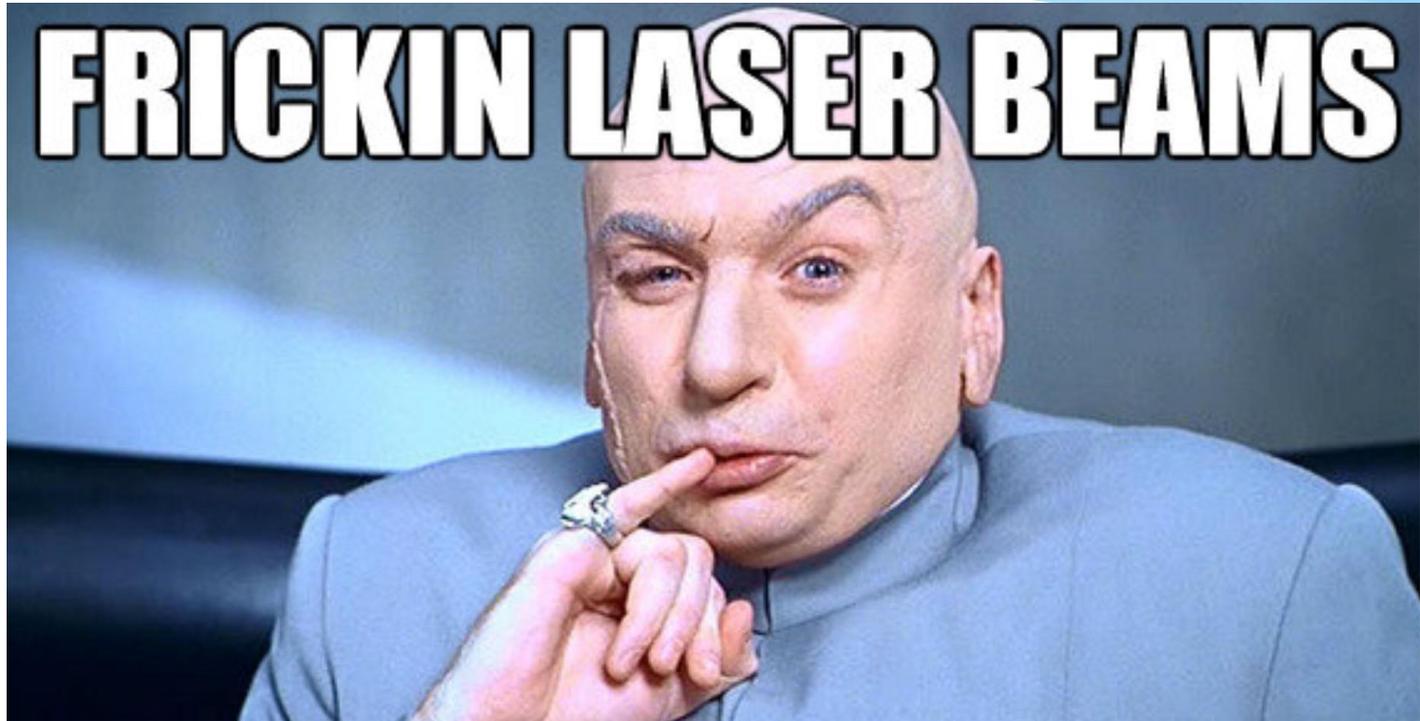
Cheaper systems can be had from China but quality may be poor and documentation/support may not be available.

Locally there are several trophy/engraving shops that have lasers. Memphis Lumber is another source.

Maker Spaces

- ❖ Some Maker Spaces have Lasers available
- ❖ Fayetteville Library has an Epilog Laser
 - You need to be certified by the staff before use
 - Good idea to reserve the laser ahead of time

Now Can I Get Some



Demonstrate the Lasers

- ❖ Neje Laser demo
- ❖ Epilog Videos

Questions

