Laser Cutting Info Sheet

Get a vector graphics program and learn how to use it! *Use Google or any other search engine and search for "free 2D CAD software" to find software to download.*

Ensure that the software can create or export Corel Draw (.cdr), Adobe Illustrator (.ai), or Drawing Exchange Format (.dxf) files.

Getting a file cut:

- Some of the makers of laser cut kits also do custom cutting. Fees usually included a set up fee and a charge for linear inch of cutting. Some will supply material.
- Automated Artists - automatedartists.com
- Check local area for companies that do custom laser cutting. Many will be geared for industrial work and may not want to do small orders or may be unfamiliar with the materials you want to cut.
- Check for a "maker space" or "tech space" as they will often have a laser cutter. They usually require a membership fee, but may have other useful tools such as 3D printer, machine tools, welder, etc.
- Check local community colleges for classes that use a laser cutter.
- Award and trophy shops often have lasers that are under-utilized.
- Pool the resources of several modelers or a club to buy a laser.

Materials that can be cut with a hobby laser:

Paper	Basswood & Balsa	Acrylic
Cardstock	Plywood	
Polyback(Laserboard)	Styrene sheet	

Manufacturers of laser cut kits and details. Check out their websites for ideas or inspiration.

- **American Model Builders** www.laserkit.com
- **Branchline Trains** www.branchline-trains.com
- **Blair Line** www.blairline.com
- **Bar Mills** www.barmillsmodels.com
- **B.T.S.** - www.btsrr.com
- **Builders in Scale** www.builders-in-scale.com
- **RS Laser** www.rslaserkits.com
- **GC Laser** www.gclaser.com
- **Monster Model Works** monstermodelworks.com
- **Side Track Laser** www.sidetracklaser.com
- **Vector Cut Models** www.vectorcut.com

Things to consider if you really want to buy a laser:

1. Usage – Will you use a laser for enough projects to justify the expense and upkeep of the machine?
2. Budget - How much do you want to or can you afford to spend on a laser cutter? The lowest cost laser I feel comfortable recommending is $3500 (FS Laser Systems H-Series)
3. Laser power – For model building you cannot go below 25W and 40W would be better.
4. Max cut size - My laser has a cutting area of 12" X 16" which is big enough to do most of my parts as a single piece. Many inexpensive ones are less than 10" X 10".
5. Cooling - All laser tubes need to be cooled. Many of the lesser expensive ones require water cooling.
6. Exhaust – Fumes and smoke need to be vented outside by a fan or blower.
7. Tube life - Make sure you can get a replacement tube if needed and see if you can find out the cost.
8. Software that runs the laser/User control – Make sure the laser will do what you want it to do before buying.

3D Printing Info Sheet

Get a 3D CAD program and learn how to use it! *Use Google or any other search engine and search for "free 3D CAD software" to find software to download. There are free options available.*

Sketchup - www.sketchup.com
AutoCAD123D - www.123dapp.com
FreeCAD - www.freecadweb.org
OpenSCAD - www.openscad.org
OnShape - www.onshape.com

All 3D printers require a .stl file format to print.

Getting a file printed:
It is best to use a 3D printing service. They have better machines, more variety of materials, and larger build volumes than hobby machines. The most well known 3D print service is Shapeways at www.shapeways.com. There are several other 3D print services out there.

Most hobby 3D printers are Fused Filament Fabrication (FFF) or Fused Deposition Modeling (FDM) machines. These have a spool of plastic filament that is heated and extruded through a nozzle.

- Resolution (quality and detail) is less than satisfactory
- Ok for slab-sided objects that can be easily sanded smooth
- Material is inexpensive.
- Leaves very distinct layers that need to be sanded smooth.

Better detail is obtained with the stereo lithography machines. In this process a vat of liquid resin is selectively cured by a light source layer by layer. The part appears to be being pulled out of the vat of resin. Stereo lithography machines are more expensive to purchase and to get refills on resins.

Neither type of hobby machine will give acceptable results for most model railroad projects. Best hobby machine available is the stereo lithography Form 2 by Form Labs at formlabs.com for about $3500. Build volume is 5.7" X 5.7" X 6.9"