Machining - Pantograph

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Drive Belt

The drive belt is a 4mm polyurethane cut at 60". The ends are joined by heating with a heat knife and melting slightly. Then push the ends together. Finish by grinding the bulging material off to make a smooth transition from one end to the other.

Manuals

Operating Instructions: Phanograph Operating Instructions.pdf

Spare Parts: Phanograph Spare Parts Catalog.pdf

Resources For Pantograph

60 degree engraving bits are a great place to start.

These are the ones used in the class: Amazon Engraving Bits

15 degree bits can be very fragile and 45 degree bits can cut a wide path. Feel free to experiment.

Chronova Engineering has great pantograph content: Chronova Engineering

Inheritance Engineering has pantograph content: Pantograph Video

Tool Tutorial

The pantograph is a tool that's especially useful for engraving - maker's marks etc. It uses a template and a 1.5x-10x reduction linkage to achieve very precise motion over a very small space without the aid of a CNC machine.

Basic Info

- This machine has two tables: Pattern table (which holds the pattern) and work table (which holds the piece being engraved).
- All user adjustments require the 3/4" wrench, or the two small collet wrenches for changing end mill bits, located in the drawer of the adjacent desk.
- 3/8" collet is holding a reducer collet that usually contains a collet for 1/8" end mills and engraving bits. A 1/4" collet is in the drawer, if needed. 1/8" bits with a 60º grind are recommended.

Approved Materials

- Aluminum
- Copper
- Brass
- Bronze
- Steel
- Plastic/Delrin
- Please seek advice on any other materials

Safety

- There are spinning elements on this machine and entanglement is a risk
- Glasses are mandatory when operating
- Short sleeve shirt or long sleeves that can be securely rolled up
- No dangling hoodie ties, necklaces, wrist watches, etc.
- Long hair needs to be tied back and secure

2D Mode

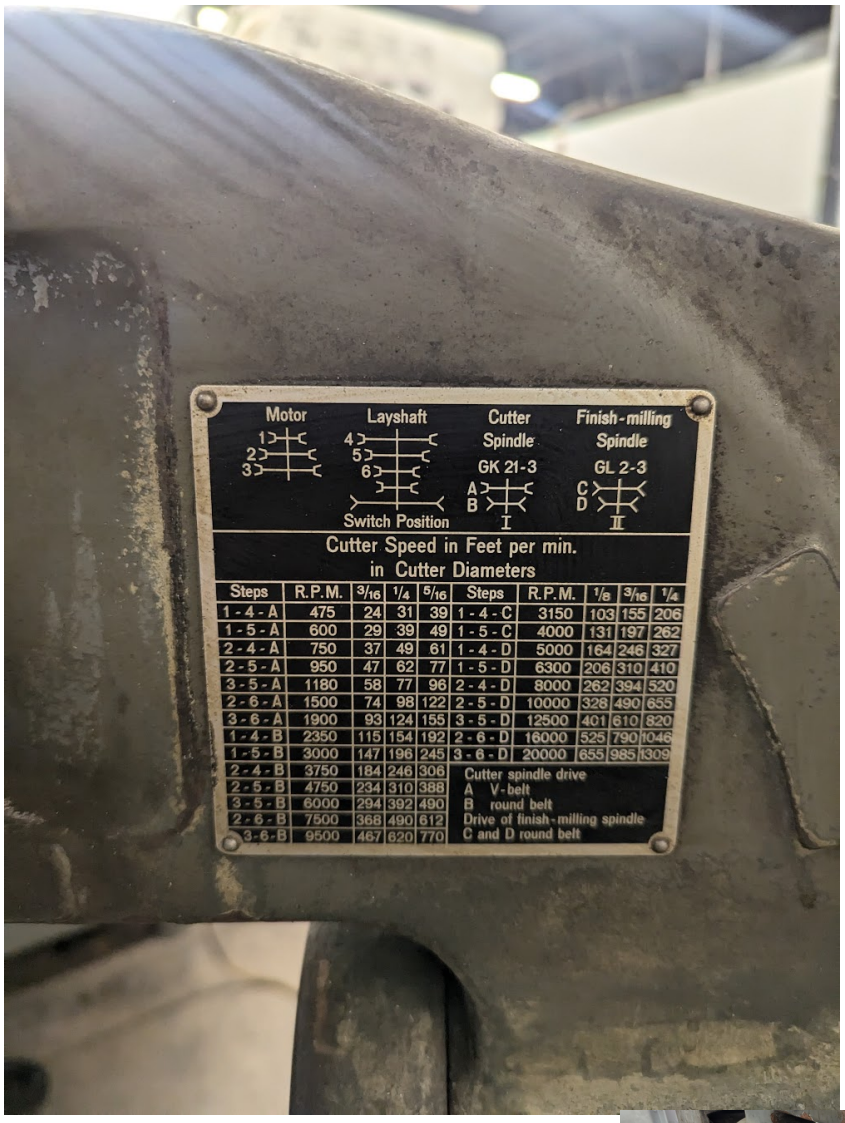
Warning: 2D mode only works on FLAT surfaces - make sure your stock material is flat where you are about to engrave.

1. Decide on the reduction ratio - how small the result is. All three segments of the arm should be set to the same value indicated on the top of the segment. All 5's for 5:1, all 3's for 3:1 etc.

    - To change reductions, make sure the stylus is **NOT** loaded; changing while the stylus is loaded risks breaking the stylus
    - Use the 3/4" wrench to loosen the nuts on the back of each of the arm segments, then slide the gauge to the correct number and re-tighten - only a little tightness is needed, don't crank these down.
    - Crank the pattern table hand wheel out so that the end of the arm is appropriately

be farther apart for a

1. Ensure it's at the highest speed if engraving (20k RPM); for larger bits consult the table on the plaque on the side of the machine



2. Ensure all the axes are unlocked as you typ  ving - X lock is underside of the machine below t e wheel, Y is on the left side of the worktable.