

Application of 3-D Carving Pantograph

by Bill Russell

Based on successful (I think) application of the pantograph described in the December, 1995 issue of the newsletter, the following recommendations are offered for your consideration. The carvings produced are very small at 1:96 scale. Here, it is assumed that the pantograph is set up for a 2:1 reduction.

The Pattern

The pattern used consists of double sized wood carvings mounted on a wood substrate. However, the pattern can be any material so long as the size and shape are correct.

System Errors

The stylus diameter is slightly more than twice the cutter diameter to account for the following types of errors.

- Pantograph fabrication errors
- Pantograph alignment errors
- Dremel bearing errors
- Looseness in pantograph joints
- Deflection of pantograph arms

Stylus

1. The stylus must have the same shape as the cutter. For example, if the cutter is cylindrical, the stylus must be cylindrical.

2. Theoretically, the dimensions of the stylus must be twice the diameter of the cutter.

3. The actual size of the stylus must be twice the size of the cutter plus a small amount to account for the errors listed above. For the author's system, 0.004" has proven adequate.

Example: Cutter Dia is 0.015
Stylus Dia. = 2 X 0.015 + .004
= 0.034"

Cutters

1. Dental burrs work well as cutters.
2. For small carvings, use the smallest burrs available. (0.4 mm available)
3. Cross cut burrs work particularly well.
4. For cutting outline, cylindrical cutters are best.
5. For cutting 3-D details, pointed or round cutters work well.
6. Cutters must be rotated at very high speed.
7. When changing cutters, locate new cutter and stylus at two reference points marked on pantograph base.

Alignment

See drawing in this newsletter for alignment requirements.

Removing Carvings from Substrate

1. When cementing workpiece to wood substrate, use an adhesive that is not waterproof, such as Elmers School Glue.
2. To release after carving:
 - Put a small amount of acetone in a wide mouthed glass jar.
 - Submerge workpiece in the acetone for approximately 1.3 hours. (Keep lid on jar.)
 - Remove workpiece from jar and use a blade to lift the carvings from the workpiece.

Warning: Do not breath the fumes of the acetone.

1996 Membership List

The SMA membership list included in this newsletter was produced by our treasurer, Gary O'Donnell. His phone number is (714)968-0323. If any changes are needed, please let Gary know, and they will be printed in a future edition of the newsletter