

Automaton development kit

Animation Station

American Automata Academy

Price: \$49 (\$59 with extended deck) + post

Website: <https://www.AutomataAcademy.com>

The American Automata Academy has developed Animation Station to help automatists plan new projects. The kit contains 85 pieces, most of which are laser-cut plywood. Pieces include the box, cams, followers, a dozen $\frac{1}{8}$ " (3mm) shafts, crank parts, spacers, 16 plastic gears, and a small, round diamond file. Also supplied are a parts list, assembly instructions for the box, gear-ratio charts, and a component guide that describes the different pieces.

The box slots together quickly. When together, it measures $6\frac{1}{4}$ " wide x 6" tall x $3\frac{1}{8}$ " deep (159 x 152 x 79mm, respectively). It could be glued but holds together well without it. Each end of the box has nine holes through which the $\frac{1}{8}$ " shafts fit. The top has 15 similar holes. The holes in the top and sides are placed in line with one another: i.e. a horizontal shaft will align with a vertical cam follower. A secondary larger upper deck is available as an extra. This must have the holes drilled into it as needed.

The company states that this kit is not intended for beginners. The target audience is those who have already acquired some experience with simple automata but who want to gain a better understanding of cam types and their effects, gear placement, and gear reductions. The idea here is to experiment with the gears, cams, and followers to see what can be done.



The gear-ratio charts illustrate a variety of gear placements to achieve 1:1, 1:2, 1:2.5, 1:5, and, through a double-reduction gear train, 1:25. One pair of special gears were supplied that enables the user to change the direction of rotation, as with bevel or pinwheel gears. The gears can be placed on their shafts inside the box or outside. The holes in the ends of the box are placed so that appropriately sized gears on adjacent shafts will mesh.

Cams include round eccentric (two diameters), elliptical (three styles), snail (two sizes), and triangular. Also included are arms

for followers, round follower pads (two sizes), spacers, wooden bearings, a ratchet and pawl, and a small piece of sandpaper.

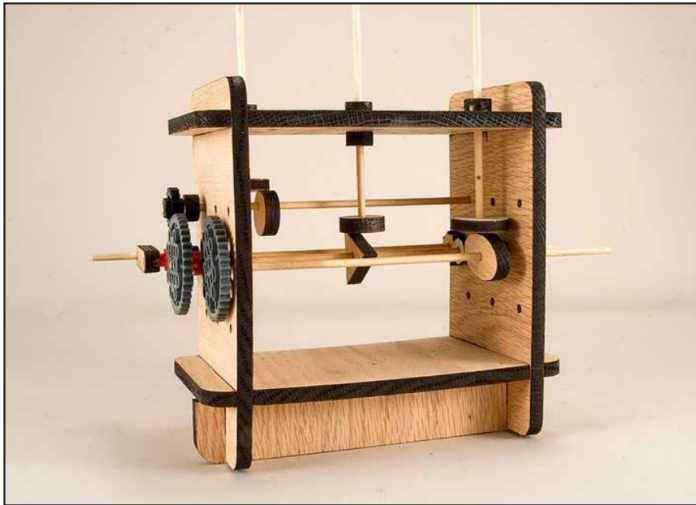
I found all of the holes in the box to be a relatively tight fit with the shafts. The little file provided came in handy for opening them out.

I built up the crank as instructed, then started playing around with the different components in the kit. I found that all of the cam holes were too tight and had to be opened up. The plastic gears, especially the smaller ones, were tight fits on the $\frac{1}{8}$ " shafts. Once on, however, they stayed in place.

Experimenting with the gears was fun. The gear-ratio chart supplied with the kit offers several combinations of gears for the experimenter. Many more are possible. I ended up with three different gear speeds involving four shafts and a double-reduction for one very slow-turning shaft. I also used a variety of different cams for different actions as well as the ratchet and pawl for one-way turning.

The thickness of the top plate of the box did not provide enough bearing surface on the vertical shafts for stability of the shafts. Consequently, there was a fair amount of lateral slop. However, the provided little wooden bearing pieces could be glued above or below the holes to provide more bearing surface for the shafts. This solved that problem.

There were some other minor difficulties. If you are playing with multiple shafts in adjacent holes, as I was, you may find that some of the cams are too big and will foul the next shaft over. The edges of the cams are somewhat rough, too, and can cause binding against the follower pieces. Smoothing with the



supplied sandpaper can help with that. Also, once the cams have been put on and taken off the shafts a few times, the shafts become slightly compressed, making a loose fit with the cams. When this happens, a little piece of thin tape on the shaft can help.

Figures for the tops of the vertical shafts are not provided. The instruction sheets show simple paper cutouts. You'll need to have something atop those sticks so that you can tell what the sticks are doing and at what speeds.

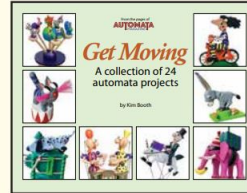
The combinations of gears coupled with the different cams provided are nearly infinite. The selection of cams in the kit will give a variety of different movements. That, along with the many gear reductions that can be achieved, make this kit a potentially valuable tool for the experimenter. The laser-cut box, with its carefully spaced predrilled holes make gear placement easy. This kit will be used in conjunction with classes offered by the American Automaton Academy. For more information about the kit and the Academy, visit the manufacturer's website.

—M. Horovitz

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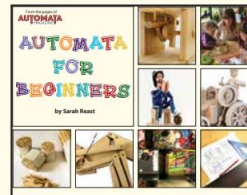
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