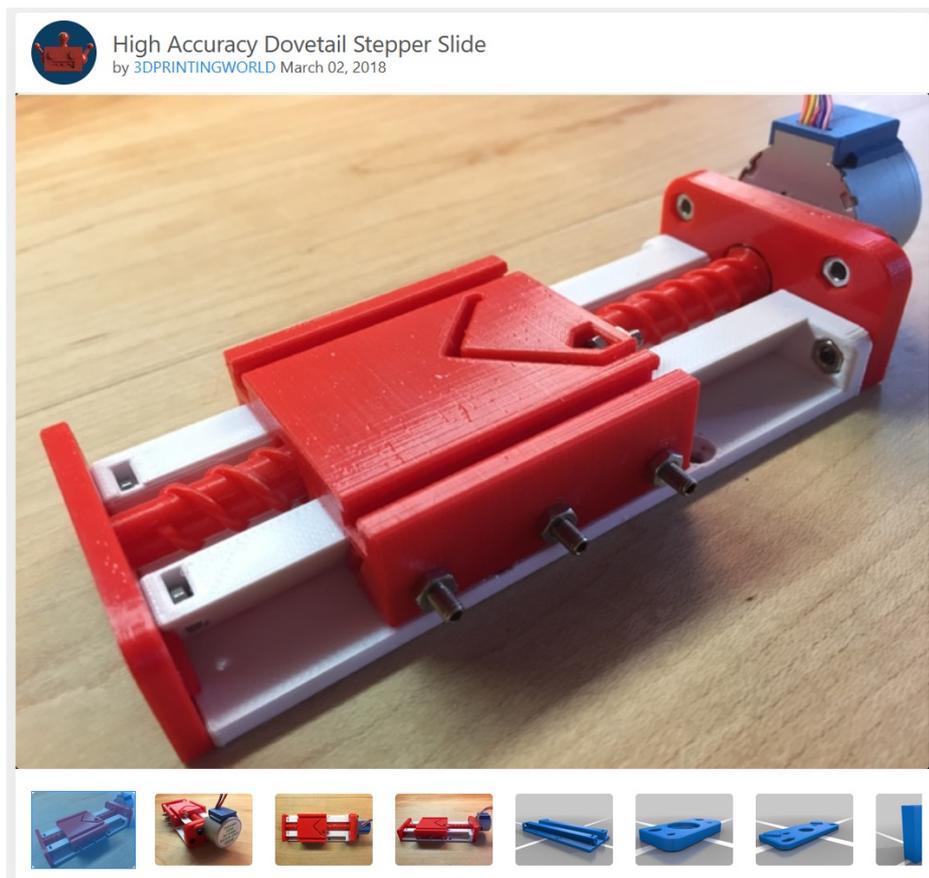


High accuracy dovetail stepper slides

There have been a couple of really interesting modelling demos on the WoSAG Sunday Zoom sessions with respect to wagon turntables, and lifts. Traversing mechanisms and other ‘behind the scene’ mechanisms also move rolling stock away from the track.

These mechanisms differ slightly from the ‘run of the mill’ animations in that fairly high precision is needed to get track to ‘register’ sufficiently to allow rolling stock to get back on to the main track without derailing. Over the years we and others have proposed, developed and demonstrated many techniques to do this. Most of these rely upon an ‘Acme’ screw and trapezoidal nut, the same mechanism that is used in 3D printer axes and flatbed scanners. In industry the same effect will typically use trap section screws and anti-backlash nuts. Salvaging a scanner is cost effective, but there are ever fewer of them about. Specifying such hardware to buy is not for the faint of heart, and actually buying it can be expensive and involve long delays.

So I was interested to stumble across this design on Thingiverse ¹

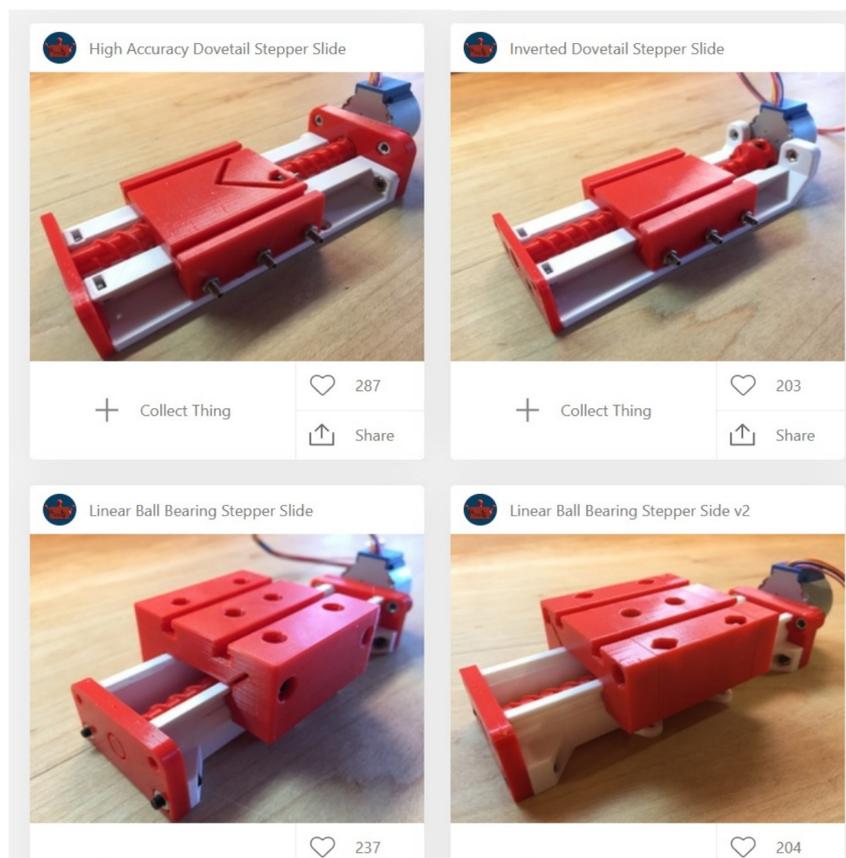


/more

Everything is 3D printed, except for a few nuts and machine screws. The motor is the very common (and cheap \$2!) one that is supplied with nearly all Arduino starter kits. Being a STL it can be scaled up or down to suit our needs.

The strange diagonal ‘slash’ along the top of the carriage is to allow flex in the plastic to be used to compensate for backlash. Backlash is that phenomenon where a mechanism moves in one direction and is stopped or reversed, the motor needs to move a tiny amount before the mechanism does. It’s because of the gap between the screw and the nut. If the gap is too big it gets ‘sloppy’ with lots of backlash, if it’s too small then the gear ‘binds’ or is hard to turn. The adjustment screw on the side of the carriage lets the user adjust out the backlash to suit their needs.

The design is now at least four years old and there have been many modifications, improvements, remixes and mashups. Search “dovetail stepper slide” on thingiverse to see some of the variations



[/more](#)



As ever, if you have ideas or questions on this or any other relevant 3DP topic, please get in touch, either directly via email or at one of the Sunday Zoom sessions

Stay safe and well, and keep in touch

Chic

`chic@computer.org`

1.Original Thingiverse URL

<https://www.thingiverse.com/search?q=dovetail+stepper+slide&type=things&sort=relevant>