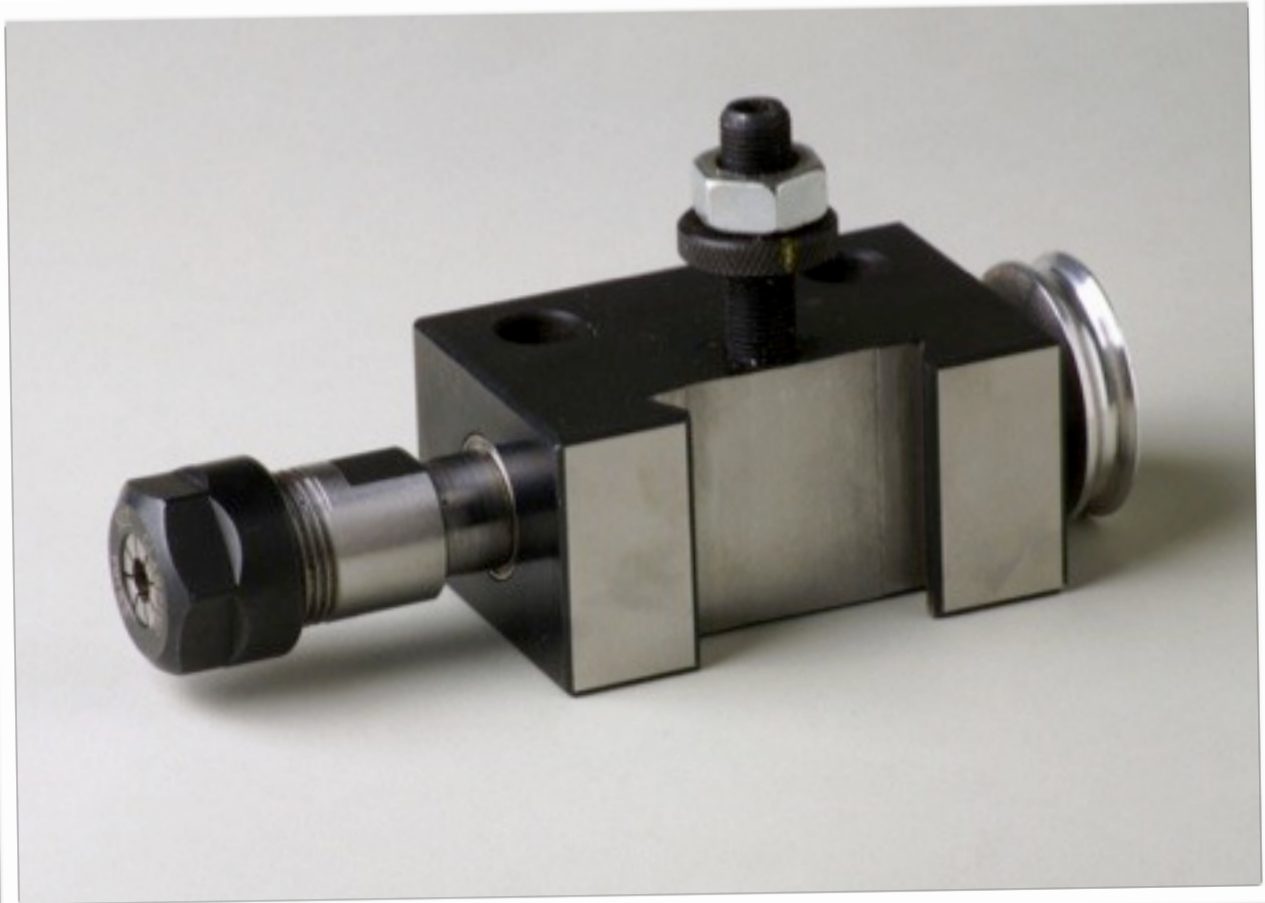


Precision Drill Frame Construction



This article describes the construction of a precision drill frame (which can be used for drills, mills, or an eccentric cutter) made from an ER16 extension chuck. This is the 3rd generation drill frame I've made based on suggestions from John Alexander.

It starts with a boring tool holder (I used littlemachineshop.com #2283) and bored each end for a bearing. The bearings I used are McMasterCarr #5972K154 which are 21mm OD, 12mm shaft, 5mm width. Mount the tool holder in a metal lathe with a 4-jaw chuck,

center the work, and bore the hole to fit the bearing. Repeat for the other end.

The ER16 chuck was purchased on eBay and was listed as “C12-ER16-100 Collet Chuck Holder”. You can find them for about \$10. They ship from China, but delivery is actually pretty quick.

Then make a spacer from tubing for both ends of the shank of the ER16 collet chuck. The spacer should only contact on the center of the bearing. Make a pulley for the end drill/tap the end of the ER16 collet chuck shank.

The photo below shows all the pieces that I made to put this together:



The screw on the end of the ER16 collet chuck shank is used to adjust the preload on the bearings. Tighten it until you feel some slight increase in the rotational resistance, then back off a bit. Secure it with Loctite.

This is the best drill frame I've made so far. It's extremely rigid and I get no chatter at all when doing deep cuts with an eccentric cutter.