

# **A Low Cost Cross Slide DRO**

*By R. G. Sparber*

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I have a low cost longitudinal DRO on my lathe and use it every time I run this machine. Until now, I have not had a similar readout on my cross slide. It was not a major problem because my cross slide dial is very accurate. A 0.005" in feed using the dial typically causes a change in cut radius of 0.005 +/- 0.0005".

My goal in developing this DRO was to use a Harbor Freight® 6" digital caliper. Additionally, I wanted the display to be parallel to the lathe's ways and read out in diameter, not radius.

The solution, shown below, is almost completely finished. I just need to screw down the diagonal bar.

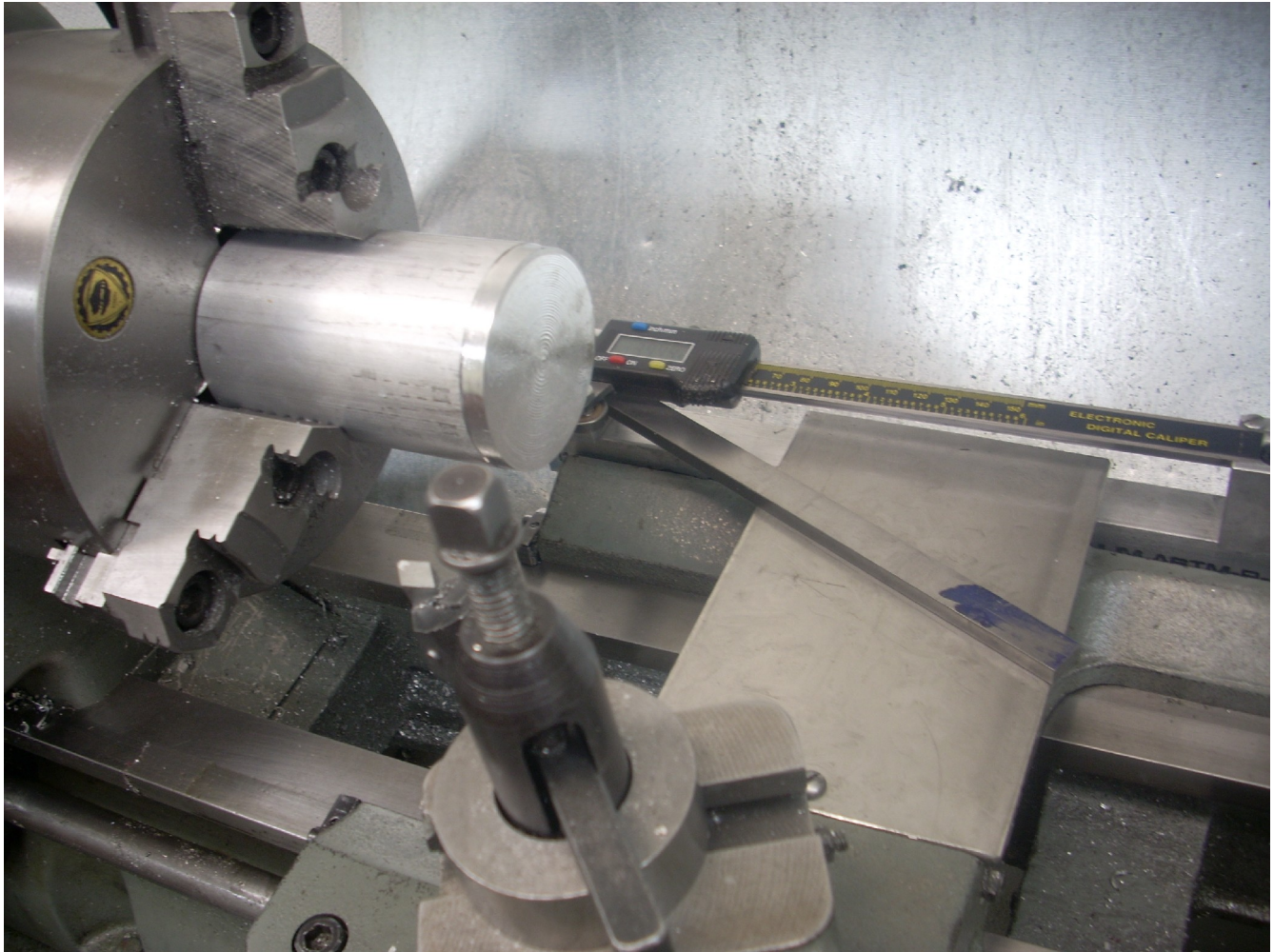


In the foreground you can see my cutter set at the center of the spindle. In the background you can see my DRO with the slider all the way to the right. The slider has a small, high quality ball bearing attached to it. The ball bearing rides on the diagonal bar.

The body of the caliper has been modified so it can be supported by a set of blocks. These blocks are screwed to a horizontal bar that is in turn screwed into the back of the apron.

The diagonal bar is at an angle equal to the arctangent of 2 which equals  $63.43^\circ$ . The “2” comes from the fact that for each inch the cross slides moves in, I want the slider to move 2” to the right. This geometry forms a 1-2-5 right triangle. I can measure radii up to 3” with this set up because the DRO can read up to 6”.

I may permit this diagonal bar to lock into a second angle of  $45^\circ$ . The DRO will then read up to a 6” radius.



Here we have the cutter all the way out. The slider has moved to the extreme left.

Missing from this picture is a mechanism for keeping tension on the slider so the wheel is in constant contact with the diagonal bar. I plan to use a constant force spring and a ball chain which will attach to the slider. In initial accuracy test I used a rubber band and it worked well over a large range but not the full range.

I must also fashion a chip guard to protect the diagonal bar and wheel.

Once I set the angle to give me that 2:1 slope and temporarily clamped it, I was able to dial in 0.100" on my cross feed dial and read 0.200"  $\pm$  0.0005" on my caliper. I repeated this test over the full 6.000" range with consistent results. When the project is finished, I will go back and test the accuracy of the attachment every 0.010".

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