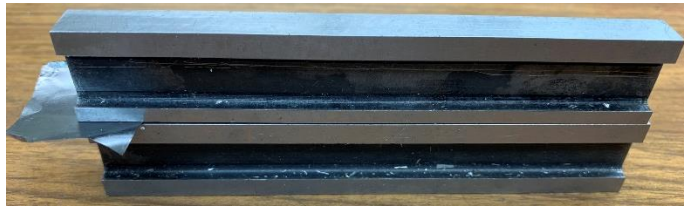


How Small A Gap Can you See?, Version 1.1

By R. G. Sparber

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Looking through a gap with a bright light on the back side is amazingly sensitive. The technique is hundreds of years old yet still used today. But how sensitive is it for me, with eyesight that is far worse than when I started my machining hobby?

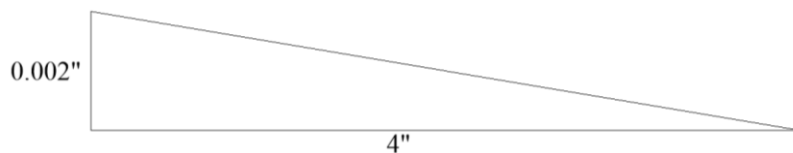
When I clean the surfaces and place these two parallels together, I see no light between them.



Then I found a scrap of 0.002 inch shim.

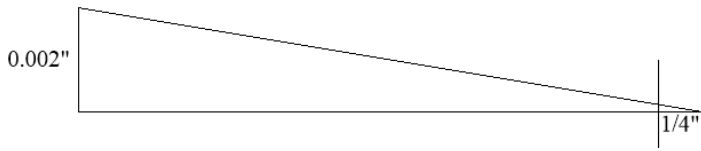


I placed the shim between the parallels leaving 4 inches to the other end.



This gives me a variable width gap that starts at 0.002 inches on the left and goes to 0 on the right over a span of 4 inches.

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Holding the parallels takes some care. I put two fingers around the shim area and two at the point. Pressing anywhere else will bend the parallels and close the gap.

I held up the parallels and shim to a strong light and slowly rotated the assembly back and forth. When my eye was in perfect alignment with the gap, I saw a triangle of light. Looking along this triangle, the gap vanishes at about $\frac{1}{4}$ of an inch from the point.

Four inches from the point I know the gap is 0.002 inches. This gives me a ratio for this right triangle that tells me the gap at $\frac{1}{4}$ of an inch:

$$\frac{0.002''}{4''} = \frac{X}{\left(\frac{1}{4}\right)''}$$

Solving for X gives me $\frac{0.002'' \times \left(\frac{1}{4}\right)''}{4''} = 0.0001$ inches.

Therefore, I can detect a gap down to a tenth. In my younger days it was even better.

I welcome your comments and questions.

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Rick Sparber
Rgsparber.ha@gmail.com
 Rick.Sparber.org