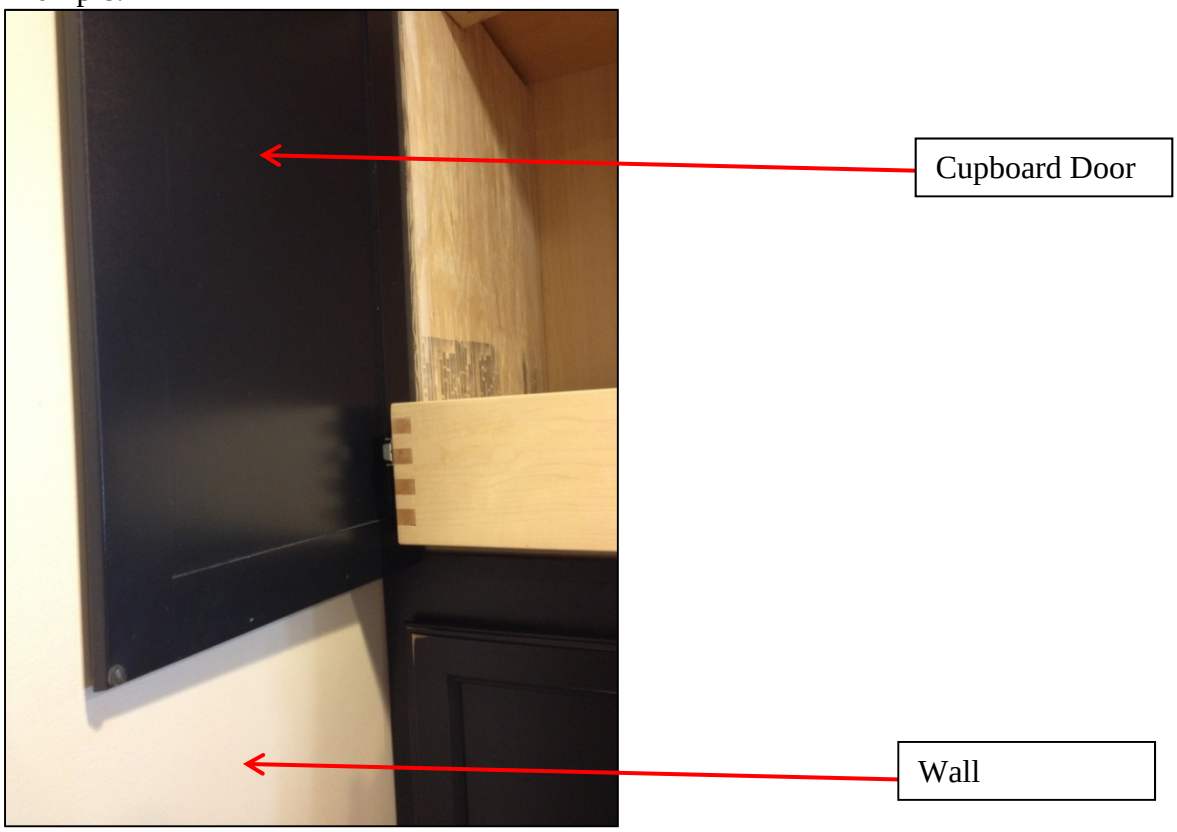
Introduction to Close Quarters Marking Tool

Part 1: Necessity is the mother of invention

I found it necessary to mark the location for pilot holes in very close quarters when installing pull out drawers in my kitchen. In the case below the wall would have been in the way, even if I had removed the cupboard drawer. I believe there are applications outside of drawer installation.

Example:



Part 2: Prototype development

I experimented with a few different approaches and prototyped several, eventually resulting in the following:

Design Considerations included:

- Heavier lead resists breaking (lead for a mechanical pencil worked, but I found it to be generally too fragile) My best prototype utilizes the point from a "push point pencil"
- The lead should mark the surface you are writing on at an angle. An earlier prototype had the lead at a 90 degree angle to both the length of the handle, and the marking surface which was sub-optimal

Example of a prototype in action. This view is looking down into the space between the drawer and the open cupboard door:

Part 3: Manufacturing Considerations and additional features

Material:

One obvious choice for material choice for mass production would be plastic as it is light, strong, and could easily be formed into an appropriate shape.

I would suggest that machined aluminum could be a better choice as it offers many of the same benefits as plastic while having a more desirable feel, and would be more durable in a shop environment. Machined aluminum would likely allow a higher retail price due to consumer perception. Machined aluminum would allow for adding additional features. I think benchmarking an X-ACTO knife would be a great place to start.

Additional features:

One feature that I would have liked, but lacked the ability to prototype, is an articulated head. Adding an articulated head would allow the product to have a wider range of applications.

Example similar to what I thought of:

I would consider using recessed hex head (Allen key) screws for adjustment as this will retain a low profile and keep the tool from getting too bulky to fit into the small areas it is intended for`.