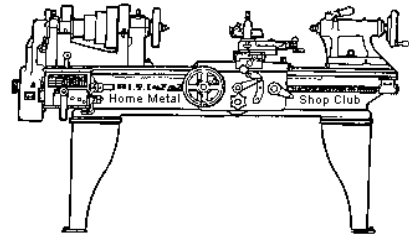




January 2014
Newsletter

Volume 19 - Number 1



<http://www.homemetalshopclub.org/>

The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area since its founding by John Korman in 1996.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members enjoy getting together and talking about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings generally consist of **general announcements**, an **extended presentation** with Q&A, a **safety moment**, **show and tell** where attendees share their work and experiences, and **problems and solutions** where attendees can get answers to their questions or describe how they approached a problem. The meeting ends with **free discussion** and a **novice group** activity, where metal working techniques are demonstrated on a small lathe, grinders, and other metal shop equipment.

President <i>Vance Burns</i>	Vice President <i>Norm Berls</i>	Secretary <i>Joe Sybille</i>	Treasurer <i>Emmett Carstens</i>	Librarian <i>Dan Harper</i>
Webmaster/Editor <i>Dick Kostelnicek</i>	Photographer <i>Jan Rowland</i>	CNC SIG <i>Dennis Cranston</i>	Casting SIG <i>Tom Moore</i>	Novice SIG <i>Rich Pichler</i>

This newsletter is available as an electronic subscription from the front page of our [website](#). We currently have over 500 subscribers located all over the world.

About the Upcoming 8 February Meeting

The next general meeting will be held on 8 February at noon at the Jungman Library, located at 5830 Westheimer Road in Houston, Texas. This location is near the intersection of Westheimer Road and Augusta Drive (west of the Galleria). HMSC member, John Hoff will give a presentation on "Moving Machinery – My Personal experience." Please bring your moving experience for discussion.

Visit our [website](#) for up-to-the-minute details, date, location, and presentation topic for the next meeting.

General Announcements

[Videos of recent meetings](#) can be viewed on the HMSC website.

The HMSC has a large library of metal shop related books and videos available for members to check out at each meeting. The library is maintained by the [club librarian, Dan Harper](#). These books can be quite expensive, and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership.

We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the [webmaster Dick Kostelnicek](#). In the September, 2012 HMSC board meeting, the board elected to waive membership fees during the next membership renewal cycle for those providing newsletter articles.

Ideas for programs at our monthly meeting are always welcome. If you have an idea for a meeting topic, or if you know someone who could make a presentation, please contact [vice president Norm Berls](#).

The club has funds to purchase new books for the library. If you have suggestions, contact the club [librarian, Dan Harper](#).

Recap of the 11 January General Meeting

By *Dick Kostelnicek*, with photos by *Jan Rowland*

Twenty five members attended the noon meeting at the Collier Library. There was one guest: Darrell McCurly. President *Vance Burns* led the meeting.

Joe Williams gave several books to the library donated by former club member the late Art Volz.

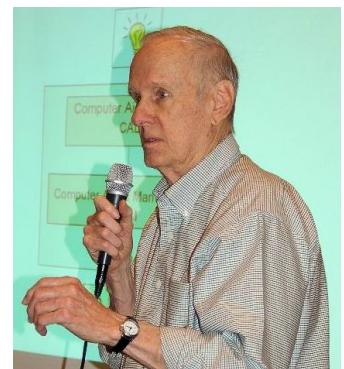


Presentation



Mike Hancock presented his experience using the integrated **CAD / CAM**, **Computer Aided Design / Computer Aided Manufacturing**, software package [CAMBAM](#). It can be [downloaded](#) and used free for 40 sessions. A unlimited license cost \$150.

CAMBAM is used to design a part in 2.5D. Most other CAD packages design in 3D. However, as you create the design it is producing CAM G-code to run your mill. You must insert specific information such as the milling cutter size and the zero position location that you wish to declare. In order to drive your specific mill, which surely has quirks in implementing G-code, a postprocessor specific to your machine must be used. The CAM software



automatically determines the bit's center path given the CAD design profile to be cut. The software generates 2.5D milling code in that vertical or Z-axis does not move at the same time as both X- and Y-axes are changing.

Mike illustrated how to use the CAD/CAM software to produce nameplates using both engraving (sunken letters) and embossing (raised letters) using a TrueType font. He designed a part while giving his presentation and then proceeded to make it on a small milling machine that he brought with him.

Here is the link to [Mike's presentation slides](#).

Safety Moment

Rich Pichler brought a number of new safety glasses that he got at a garage sale and distributed them for a fee of course!

Show and Tell



Joe Scott showed a fixture for automatically centering a gun part that he makes on a mill. This is useful since he can't see as well as he did when he was younger.

Martin Kennedy showed his latest version of a dial indicator holder for an Aloris style tool holder. See his article at the end of this newsletter (left photo).



Norm Berls showed his homemade draw bar for his mill/drill (right photo). He also presented an update of his [DRO presentation](#) given last month by answering questions on the [accuracy and repeatability](#) of the installed DRO.



Tom Darragh showed his Lazy Susan Tool Holder with four sides and asked for suggestions how to hold Aloris style tool holders on it (left photo).



Ray Ethridge showed clevis pins that he made with his drilling jig that he described in the [October newsletter](#) (right photo).

Problems and Solutions - Ask the Blacksmith

Norm Berls wanted to know whether to mount a back plate on a 4-jaw chuck with metric or imperial screws as either would fit close enough. Answer: Centering is not critical on a 4-jaw chuck.

John Elliott asked about how to tap a number $\frac{3}{4}$ - inch holes on a lathe. Suggestion: Use the tap driver described in [article in November newsletter](#).

Articles

Dial Indicator Holder

By *Martin Kennedy*

In the presentation on "[Ten Cheap and Useful Things for the Lathe](#)", one of the things I mentioned was a Dial Indicator Holder (right photo). I liked my Holder a lot, but it had some drawbacks as designed. I thought I could make a better holder.



This is my initial design. It had a few drawbacks:

- There's no adjustment screw to set the height at the centerline of the lathe automatically.
- The holder was at the very bottom of my tool post when it was at the correct height.
- The dovetail was a little loose.
- The dial indicator could swivel slightly on the holder, and tended to move while in use.
- While the knurled screw used to attach the indicator to the holder was convenient to grab, it tended to be in the way. because it frequently hit the lathe chuck.
- The tip of the indicator stuck out a long way from the tool post, and for large stock I could not crank the cross slide out far enough.



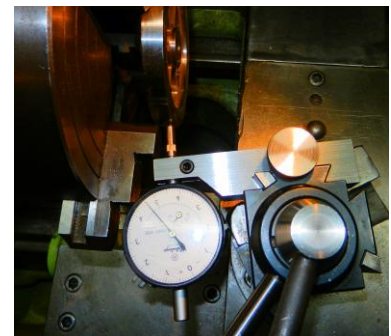
Here's the new design. The drawing is at the end of this article. I think that the new *design* (left photo) addresses the drawbacks of the first design (above right photo). It's easy to convert it to be used on the edge or the face of the stock in the lathe. The knurled screw was made such that a larger section of the shaft bottoms out on the top of the holder at the correct height to put the gauge at the center line of the lathe.

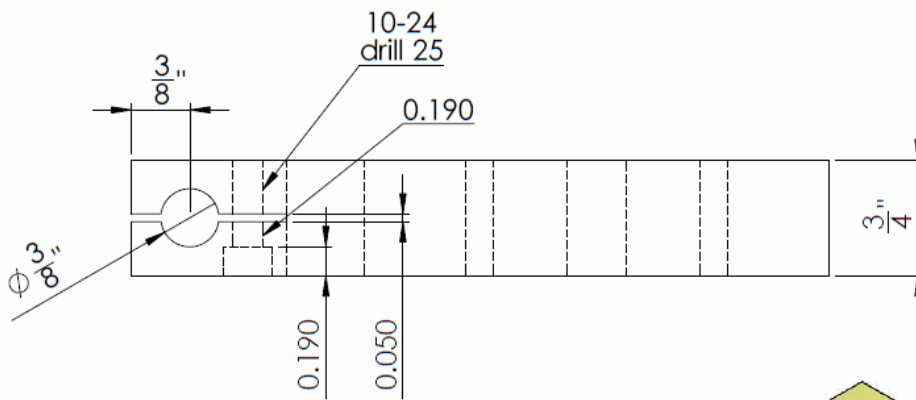
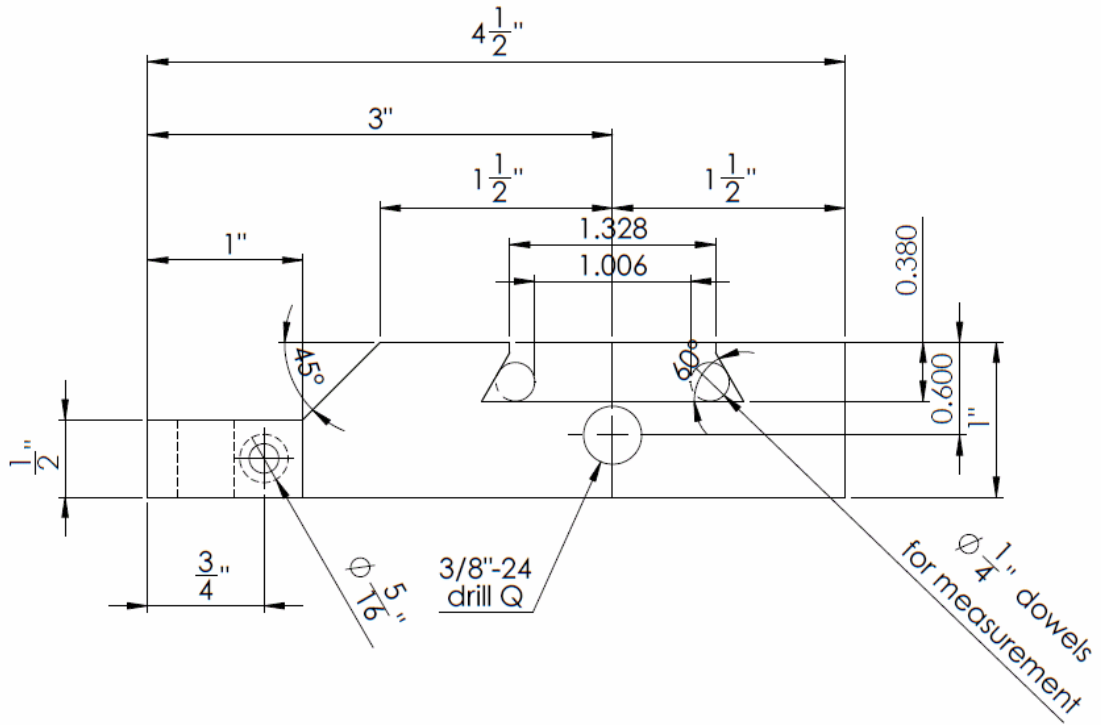
Note that I use a dial indicator that reads in 0.0001" increments. Total stroke of the indicator is only 0.050". This is great for getting stock exactly centered in a 4-jaw chuck.

This tool was made manually on my mill. I didn't use the CNC functions. The hardest part is getting the dovetail exactly right. If it's a few thousandths too wide or narrow, or too deep or shallow, it won't work correctly. The trick to accurately measuring a dovetail is to put dowels in the dovetails, and measure between the dowels. Note that the drawing shows what this measurement should be with 1/4" dowels.

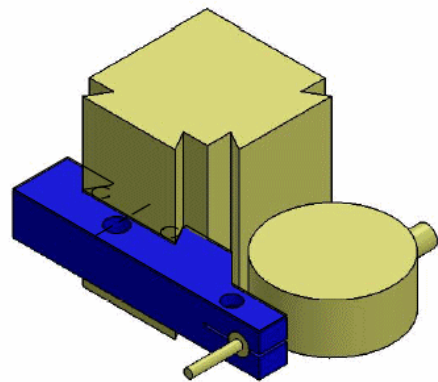
I designed this tool for an AXA tool post. Other sizes can be made, but you'll need to either measure an existing holder or look up the relevant dimensions of the dovetail on the internet.

The right photo shows the indicator being used on the edge of stock. Note how little clearance to chuck is needed.





Note: Design for AXA Toolpost

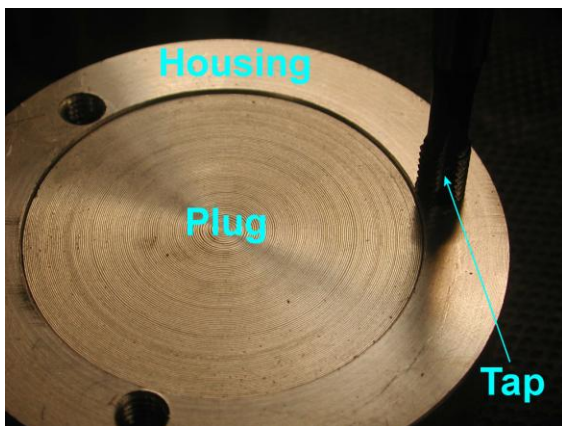
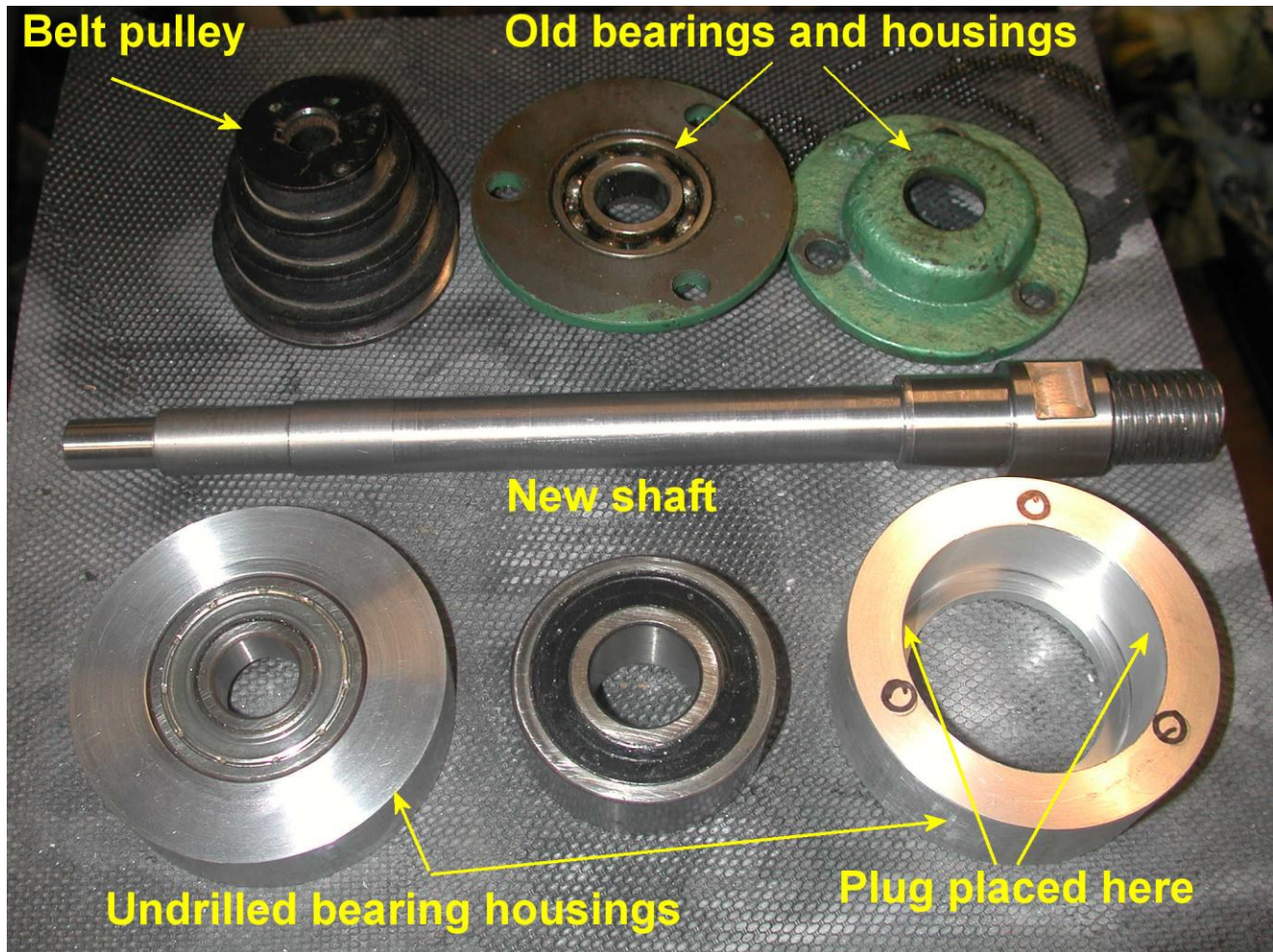


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SIZE	FILENAME	REV.
A	Dial Indicator Holder Drawing	A
SCALE 1:1	Sheet1	SHEET 1 OF 1

Tapping Close to the Edge

By J. R. Williams

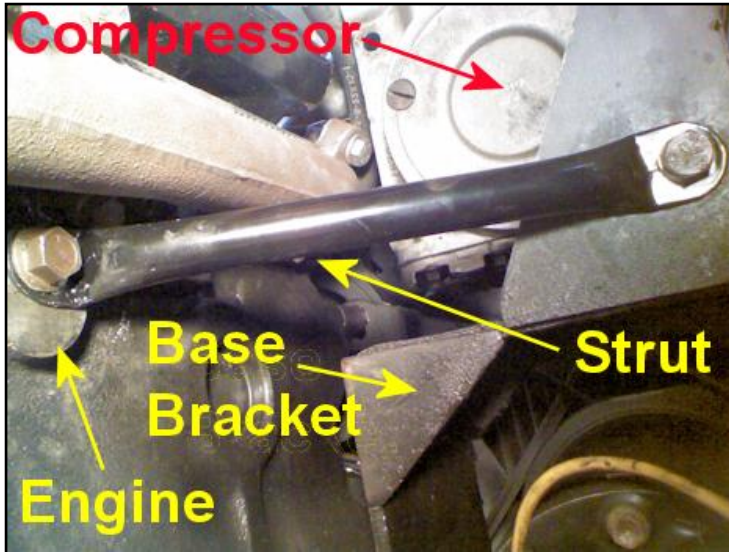


holes were tapped and plug removed.

My current shop project is to rework a small wood lathe. I machined a new spindle shaft with a larger threaded end and replace the old damaged bearings. The old spindle had open bearings (see above photo). The new shaft fits into larger bearings that were in my bearing collection. The mounting bolt holes in the new bearing housings have to match existing headstock holes, thus placing the holes close to the edge of the larger bearing's bore. Drilling close to the bore is no problem but I felt a tap might push cut material into the bore. A close fitting temporary aluminum plug was inserted into the bearing bore before tapping (left photo). A potential problem was avoided and the project was ready for assembly after the

Strutting Around

By Dick Kostelnicek



I have a reciprocating compressor that is belt driven by an IC engine. Under load, it shakes violently at around 1000 RPM. The compressor is cantilever mounted at its base by a bracket attached to the engine casting (left photo). This shaking or resonance at 1K RPM can be moved to a higher frequency by adding stiffness to the compressor mounting or alternatively to a lower speed by adding mass to the compressor. Resonant frequency is determined by the relationship $(K/M)^{1/2}$, where **K** is the mounting stiffness and **M** the compressor mass. I choose to move the resonance to a RMP that is well above the top engine speed by providing strut bracing to stiffen the mounting.

A strut must withstand both tension and compression forces. To prevent buckling under compression, it should be of substantial girth at its mid length. During tension, a strut must have sufficient sectional material to prevent elongation and subsequent yielding. To be light in weight, it can be made from tubing. Metal in the center of a solid strut would do little to prevent it from buckling, but rather just add to its cost and weight.



I made a strut from ½-inch **EMT** conduit (**E**lectrical **M**echanical **T**ubing) that is available at my local home improvement store. I squeezed the ends flat in a vise (left photo), and then, bent them to the proper angle. Subsequently, the ends were drilled for the proper bolt size and rounded by a pedestal grinder (right photo).

Now, when metal is bent at a severe angle it can work-harden and develop

stress cracks. These imperfections may eventually lead to failure of the strut, right where it was bent, under vibration loading. To relieve this stress, heat the areas around the sharp bends to cherry red and allow them to cool slowly. Alternatively, place a weld bead on the inside and along the length of the bend as this will both add reinforcement and provide the heat necessary to anneal the stressed metal.

