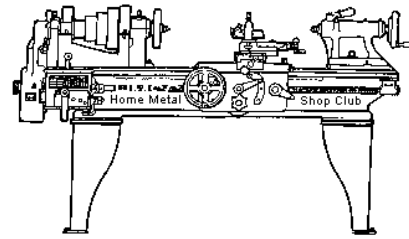




## November 2012 Newsletter

Volume 17 - Number 11



<http://www.homemetalsclub.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>John Hoff</i>	Secretary <i>Martin Kennedy</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 281 subscribers located all over the world.

## About the Upcoming December 8 Meeting

General meetings are usually held on the second Saturday of each month at 12:00 noon in the meeting rooms of the Parker Williams County Library, 10851 Scarsdale Boulevard, Houston, TX 77089. Visit our [website](#) for up-to-the-minute details and for the main presentation topic.

## 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 and curated 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 [John Hoff](#).

## Recap of the November 10 General Meeting

By Martin Kennedy, with photos by Jan Rowland

Twenty-one members attended the 12:00 noon meeting at the Parker Williams County Library. President *Vance Burns* led the meeting.

Vance Burns and Martin Kennedy are looking for a new, centralized location for meetings and will report back with a recommendation. If you know of a central location that could provide free facilities for our monthly meetings, please contact [Vance Burns](#).



## Safety Moment

John Hoff uses a diamond cutter to make profiles in grinding wheels. Sometimes the profiles are relatively thin. He said it's possible for the wheel to break, and it's important to stand to the side when cutting the wheel.

A giant lathe was being offloaded from a truck at a university. One of the timbers being used in offloading broke, and the lathe tipped right to the edge of a ventilation shaft. Fortunately, it didn't fall in. Later, the lathe was being rolling on pipes, and a guy got his tie caught in the pipe. The pipe started rolling over his tie, pulling his neck towards the ground. Others stopped the lathe from moving, but by that time, he was almost out of tie! The moral of these stories is to plan your work, take it slowly, and be extra careful when moving heavy machinery.

## Presentation



*John Hoff*, club Vice President, made the presentation this month.

Several months ago, John was talking to fellow club member *Joe Scott*. Joe makes parts for 1940's [Johnson Rifles](#). Only about 1500 Johnson rifles were built. Joe mentioned that there was a market for the magazine holder for the rifle. The holder was built up from stamped metal parts, required close tolerances, and was no longer produced. John had built metal stamping dies in the past, and wondered if he could build the magazine holder, just for a challenge.

John decided to build the holder from 18 gauge, or 0.0475" steel, to closely match the 0.050-inch thick original. Making the part would involve making several dies. For reference, he uses a book from [Lindsay's Technical Books](#)

on how to make dies. John started with the top profile on the holder. The die was based on a die shoe he bought on eBay for \$25. It works in conjunction with his 12-ton hydraulic press.

The die shoe precisely lines up the two halves of the die. To get a good edge on the stamped part, you want a clearance of 5% of the thickness of the metal between the dies. Too small of a clearance results in a high force being required to use the die, and can break edges of the dies. Too large of a clearance makes burrs on the edge of the stamped part, but makes the dies last longer. This is why you sometimes see rough edges on normally hidden edges on commercially made items.



John makes the dies from 01 tool steel. After rough machining, he heat treats, quenches and normalizes the steel. The final 0.01-inch cut are made on the hardened metal with one or multiple profiled grinding wheels.



Side bends on the magazine holder were not straight, but were slightly curved to match the curved magazine. John made a die to make the 25.2-inch radius bend. It was necessary to over bend by 1.75 degrees to account for spring back.

Another set of dies was made to cut tabs on the part. The tabs are bent over to connect the front and back-sides of the holder.

John showed how he made radius cuts on a grinding wheel. He uses a radius cutter, which is a precision device that can cut to 0.001-inch accuracy. After cutting the desired profile, the wheel can be used to make the final cuts on hardened dies.

John showed



John plans to make about 25 holders. Although it takes a long time to make the first part, subsequent parts can be made in minutes. Ten operations and dies will be required to make the completed magazine holder.

## Show and Tell



*Dick Kostelnicek* found that he spent a lot of time cranking his vice jaws in and out. To speed this up, he made a heat treated vice chuck key on a socket that fits into an electric screwdriver.

*Martin Kennedy* made a [presentation](#) on moving a Monarch 10EE lathe from a trailer to his garage, without the use of a fork lift (left photo).

*Joe Williams* broke the return spring on his drill press. He bent the end of the spring to repair it, but after a short time it broke again. Eventually, there was not enough spring left. He found that replacement return springs were readily available on eBay in three standard sizes.

On another project, Joe was requested to make a special knurl to make a rounded rope pattern on brass. First, he had to make a tool to make the knurl. Both tool and knurl were hardened 01 steel. Making the knurl required indexing 72 times. Refer to the article at the end of this newsletter for details on rope knurling.

*Mike Winkler* bought a plasma cutter for his new welder. He made a holder for the torch that lets him cut circles (right photo).



## Problems and Solutions / Ask the Blacksmith

A member acquired a Logan lathe. The lathe had some problems. It would not cut straight. It had a collet closer lever that looked like it had been hit by something. There was a problem with the spindle. The back of the spindle was eccentric, and may be bent. He was referred to the [Logan group on Yahoo](#).

A member asked about the right setting on a plasma cutter to reduce dross on the back of the cut. The reply was that you can minimize it, but you should always expect to get some dross. In general, a good resource for welding is [Welding Tips and Tricks](#).

## Novice SIG Activities

*Rich Pichler* and the Novice group discussed and demonstrated knurling.

## Articles



## Rope Knurling

By J. R. Williams



This project came to life when a friend wanted a small part rope knurled. A check of various catalogs indicated no source for such tooling. So, the next step was to make my own knurling wheel. I did not have a small tool to mill the wheel, so off to the lathe to start the process of making a special cutter after a little design work. The cutter has a sharp edge with a 90 deg. angle and is 4 mm OD. Using a 90 deg point tool, the form was made and the same tool used to cut the shank from O-1 drill rod material (right photo).



Next I used a mill to cut four flutes using a 1/8-inch diameter end mill. After the flutes were cut the work was rotated about 3 or 4 degrees and another pass made to remove excess material from the back-side of the cutter tooth. The cutter was hardened and drawn and ready for work after a light pass with a small abrasive stone.

A trial part was made on an aluminum bar stock. The first trial run was cutting with a radius tool in an area that had a relief area. Straight passes with the cutter set to be parallel with the axis of the work was satisfactory. Then, the big test: change the angle of the work to 30 degrees. This resulted in problems getting the tool to the center of the shallow groove and to cut uniformly for the full cutter width and not have the shank drag. After two attempts I decided the cut had to be made without a preliminary groove. That was easier to set up. That was the end of the first full day on this project.



As per the usual – there was not any 3/4-inch diameter O-1 tool steel rod in my stock so a section of 1-1/8" material was cut down to the required diameter and drilled and reamed for the mounting shaft. The work was installed in a spin indexing unit to perform the indexing. In this case 72 divisions was the number employed. The mill was programmed to move the cutter to the work and then slowly feed in for the cut and back out after the cutting (left photo). The problem was to keep your mind straight for the many moves of the index, and not make any mistakes in the process. An "A" axis would have been great for this project.

After the cuts were made, the part was removed from the index unit and then moved on to the lathe to cut off the part and get it ready for heat treat and drawing using an oil bath. A quick pass with the surface grinder finished the sides of the wheel.

The wheel was mounted on a section of key stock with a 1/4-inch diameter shoulder bolt and was ready to knurl. The test part was mounted on a simple mandrel where my home made knurling wheel worked very well rolling the pattern into the perimeter of the brass disk (right photo).



The finished part is shown in the left photo. This was a simple sounding project that required careful attention to details. After machining a concave knurling wheel, one can see why they are not a normal stock item.

