March 2013

Newsletter

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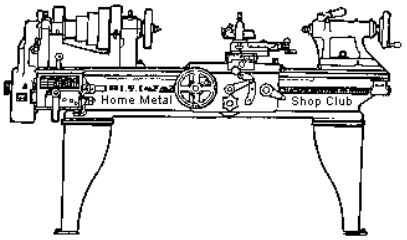


http://www.homemetalshopclub.org/

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	Vice President	Secretary	Treasurer	Librarian
Vance Burns	*John Hoff*	*Martin Kennedy*	*Emmett Carstens*	*Dan Harper*
Webmaster/Editor	Photographer	CNC SIG	Casting SIG	Novice SIG
Dick Kostelnicek	*Jan Rowland*	*Dennis Cranston*	*Tom Moore*	*Rich Pichler*

This newsletter is available as a free electronic subscription from the front page of our website. We currently have over 380 subscribers located all over the world.

About the Upcoming April 13 Meeting

General meetings are usually held on the second Saturday of each month at 12:00 noon. Visit our website for up-to-the-minute details including, date, time, location, and presentation topic.

The April meeting will be held at TxRx Labs. This will be the second time that we have meet at this location in order to allow our membership to mix and mingle in the TXRX environment and help them come to a consensus on their preferences concerning future meeting locations. TxRx Labs is located at 205 Roberts Street.

Our speaker will be Ron Eickelman who will describe how he built his CJ-7 Jeep from scratch.

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 articles for the monthly newsletter! If you would like to author one, or would like to discuss writing an article, please contact the Webmaster, *Dick Kostelnicek*. During the September HMSC board meeting, they 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 can make a presentation, please contact *John Hoff*.

Emmett Carstens, club treasurer, reports that currently we have 37 active club members.

Recap of the March 9 General Meeting

By Martin Kennedy, with photos by Jan Rowland and Martin Kennedy

Twenty nine members and five guests – George Edwards, John King, Vladimir Frumin, Charles Smith and Bill Kimbrough, attended the 12:00 noon meeting at the TxRx Labs facility. President *Vance Burns* led the meeting.

Safety Moment

When you are drilling or milling PVC, Poly Vinyl Chloride, use a vice and extra clamps. PVC is soft, and can pull up and out of a vice when machined. Extra restraints against vertical movement are warranted.

A cutting torch is not source of compressed air. Don't use it to dust things off, especially clothes. The oxygen can increase their flammability.

Presentation

Club member *Norm Berls* made a presentation on Tramming a Rong Fu Mill/Drill. Norm considers himself to be a novice machinist, and said that this project led him down many paths which increased his metal working knowledge.

Norm described his tabletop Rong Fu Mill/Drill. The mill uses a circular column that allows the head to rotate horizontally. During its use, he was having trouble keeping tolerances. After some measurements, he discovered that it was not in tram, and that he had received it that way from the factory. It was out of alignment by about 0.020” over 4", which is a lot. The mill needed tramming. Tramming is where you aligning the Z, or vertical axis, to be exactly perpendicular to the X and Y axis of the table.

Tramming this mill could be accomplished by installing shims under the circular column where it is mounted to the base. Tram was accomplished by using a dial indicator with and an adapter that he made to mount it to the chuck in the mill.

The steps used to tram were:

- Leveled the mill in both directions using a level on the work table.

- Remove the belt from spindle to prevent any influence from belt tension and to allow the spindle to be easily rotated.

- Put a dial indicator on an arm and mount the arm in the spindle with a collet. He could have also used the chuck instead of the collet.

- Measured the distance to the work table at +/- X and +/- Y by rotating the dial indicator arm.

- Add steel shims between the column and the base. Repeated the test. The goal was to make all the readings on the dial indicator the same.

Norm was unsuccessful in getting the mill into tram, even after multiple attempts. He was able to get all but the -X reading to match. He concluded that the work table itself was not flat, and the column was probably not perfectly straight. He also found that the tram was extremely sensitive to the torque on the bolts that affixed the column to the base.

HE tried a second method to tram the mill. He made a polished mandrel that he put into the collet. Then, with a machinist/s square on the table, he noted the gap between it and the mandrel. Again, he was unsuccessful in getting the mill in tram.

One of the problems he was having was that with shims and the variable torque on the mounting bolts, the measurements were not consistent or repeatable. The next thing he tried was to raise the column from the base using all-threads, with nuts above and below column mount (left photo). He found that this made the adjustments much easier than with shims. Again, he used the machinist's square and a commercially produced HSS rod that he bought, with a light behind them to illuminate the gap. He was able to get the mill in tram to within 0.0015".

He did some tests. He found that tightening one nut would change the tram. Norm ended up slowly torquing up the nuts below and above in rotation.

If he had to do it again, he'd make longer all-threads, and would use 18 tpi for the adjustment nuts instead of 11 tpi.

The next thing Norm talked about in his presentation was how he built a set of adjustable parallels. With these parallels, he could set his work piece exactly perpendicular to the spindle, and improve on the tram. He described the steps he used to make the adjustable parallels. While making the parallels, he found that the diameters of his cheap drills varied from what was marked. He went through the reasoning that led him to acquire a high quality set of 135 degree drills.

He then gave some tips on tapping, and talked about case hardening the parallels.

Show and Tell

Dick Kostelnicek attended the recent Houstex machine show. He passed around several samples of pieces that had been cut with a water-jet, a plasma-jet, a cold saw, and and various band saws. He brought in a radial metal bender that he built, plus some parts that were fabrocated using the bender.

He then demonstrated how to search for articles on the HMSC web site.

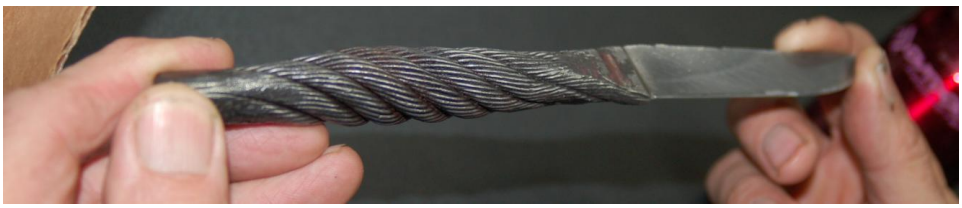
Martin Kennedy showed two things he made this month – a tapping alignment tool (left photo) and a milling vice speed handle (right photo). He described how he pressed in a deep socket for the hex hole in the speed handle.

Tom Moore found a place to buy small quantities of steel on the North West side of town. It's Steel Supply LP, located at 13140 West Road just off 290.

George Edwards showed how he uses a boring head adapted to mount in his lathe tailstock to offset centers without having to adjust (and re-align) the tailstock. He showed how he mounts a small lathe chuck inside of his big chuck when he is doing small work. He talked about a project where he needed to making several coils for ham radio use. He needed to make a lot of Lexan disks. To make this easy, he built a clamping holder to hold several Lexan squares on the lathe and allowed them all to be cut at once (above left photo). He passed around an adapter he made using two plates, thumb screws, and a leather square mounted to a tool post holder that holds back pressure on wire when he winds coils on his lathe (right photo).

George Carlson built a 14.5 x 22 x 3-inch vertical CNC router. He passed around the water cooled 2,400 RPM engraving motor used in the design. He uses the router to make circuit boards, among other things.

Chuck Rice acquired a Dunmore miniature precision drill from eBay. It had a pitted column and a bent spindle (photo left). He fixed it, straightened the spindle, replaced the chuck and painted it.



Bill Kimbrough showed a knife that he forged from an improved plough steel grade wire cable (photo above).

Problems and Solutions / Ask the Blacksmith

Vance Burns mentioned how story sticks can be used to find twists easily by placing them on opposite ends, sighting along them and comparing them visually.

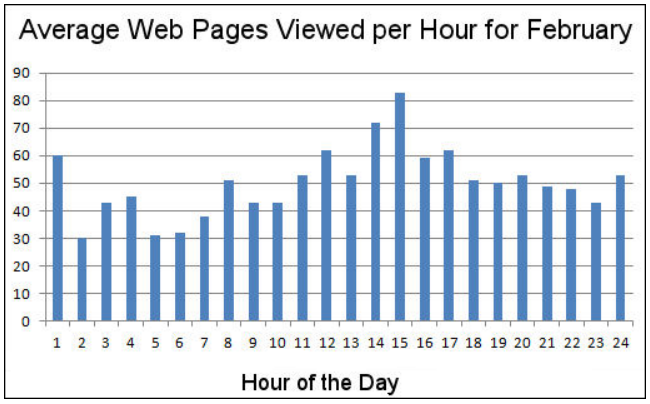
An attendee wanted to make drinking glasses out of champagne bottles. He described the way that he managed to cut them evenly. He built a jig with a class cutter that scored the bottles. Then, he wrapped a piece of nichrome wire around the scored groove. He applied around 6 volts using a Variac to the wire. The glass snapped on its own after about 40 seconds, and made a perfect cut. The last step wasto finish the drinking glass lips with a granite polishing pad.

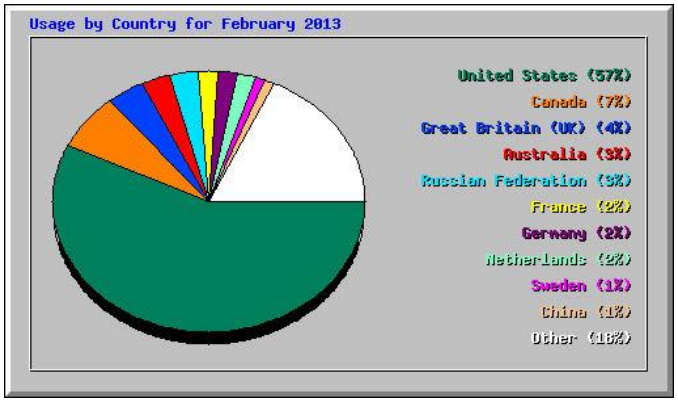
An attendee acquired a Hardinge lathe wired for 440 volts 3-phase that he wanted to run at home. Suggestions were to use a VFD or to replace the motor. He said that might not be possible, since the lathe has three motors of which two are three-phase and one is a D.C. The carriage drive is supplied by a variable transformer and a diode bridge. Other suggestions were to use a rotary converter or a transformer.

HMSC Website

The HMSC Website, maintained by *Dick Kostelnicek*, contains a wealth of information on machining. It receives visitors from all over the world. Site statistics can be viewed on the website. A few interesting statistics from February are:

Average Visits per Day	499
Average Web Pages per visit	2.4
Most Popular Page having 5144 monthly views	Powder Coating in the Home Shop
Most Popular Video with 131 monthly views	Lathe Centering Part 1
Top search string comprising 4.5% of searches	"metal lathe projects"
Number of Newsletter Subscribers	380





Novice SIG Activities

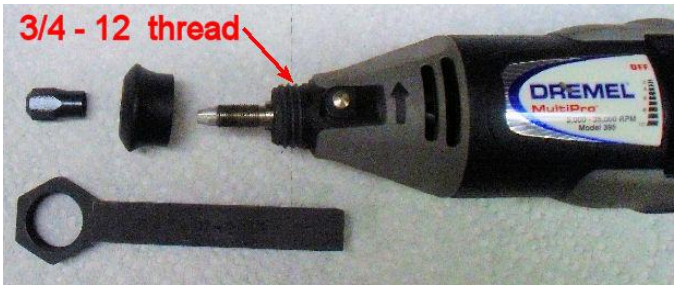
Rich Pichler and the novice group worked with a member who brought in his recently purchased mini lathe for instruction.

Articles

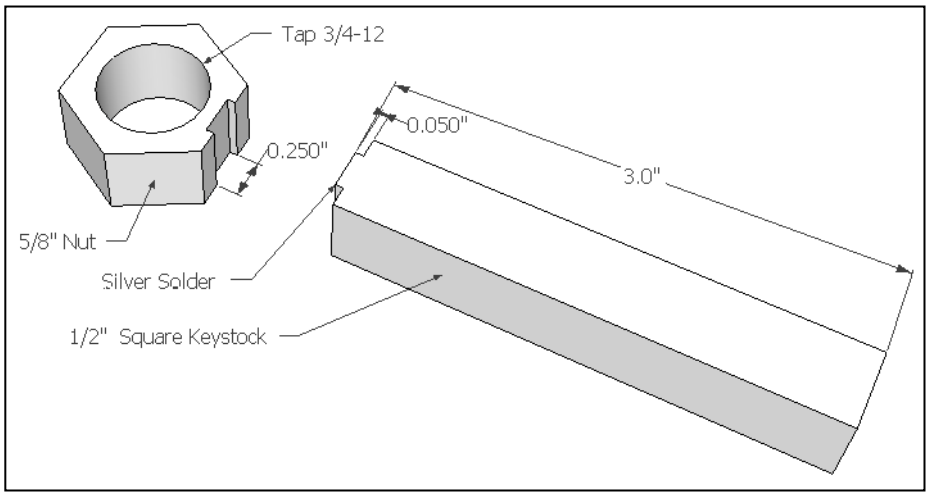
Dremel Toolpost Holder

By *Dick Kostelnicek*

Here's a simple fixture that holds a Dremel motor in a lathe's Aloris style toolpost. It's fashioned from a reworked 5/8-inch hex nut that's silver soldered on to the end of a length of ½-inch square key stock.



The 5/8-inch nut was bored and re-threaded as ¾-12 in order to fit the Dremel's spindle nose (above right photo). The over-all dimensions of a common 5/8-inch nut are 0.938–inch across the flats and 0.547–inch thick. So, there's enough material to rethread the nut for the Dremel's 3/4–inch spindle nose. Some older Dremel tools have a ¾-16 thread, which would allow the use of a standard ¾-16 nut. I turned the 12-pitch internal thread in my lathe rather than use a tap. Note: ¾-12 isn't a common thread size, at least not in my workshop.



When you first screw your holder on to the Dremel spindle and bottom the thread against the motor's shoulder, you may find that the on/off switch and the spindle lock button on the motor's body are not facing upward. In my case, I needed an additional ¼ turn. Now, each full turn advances a 12-pitch thread by 0.083–inch. So, that extra ¼ turn of rotation required milling down the entire side of the holder by ¼ x 0.083 = 0.021–inch. I could have used shim washers to accomplish a similar alignment but the holder wouldn't have been quite as adroit.

Here are Web links to two commercially available Dremel Tool Holders:

http://mechanicalphilosopher.com/kdh.html

http://alisam.com/page/14g9f/Metalworking.html

Raising and leveling a Lathe

By *Martin Kennedy*

I'm fairly tall, and I don't like leaning over to use a lathe. I find a lathe more comfortable if the controls are about the level of my elbow. My lathe was a bit lower than this. I wanted to raise it. I originally had it sitting on 4x4 lumber, but my garage floor is very uneven and there was no easy way to level the lathe. I wanted to be able to level it with something that looked a bit better than old lumber.

To accomplish these goals, I built these Leveling Bases shown in the left photo.

They're made of 4 x 4 x 3/8 - inch structural tubing. I welded caps on the ends. The bolts are ¾ -inch all-threads, with a ½ - inch hex machined on the end to allow adjustment. I drilled and tapped holes in the structural tubing after marking the locations with the lathe temporarily set on the structural tubing. I made 3/8 - inch threaded washers that I tack welded to the bolts to keep them from turning. For the two holes under the headstock end of the lathe, I had to make adapter pieces since the base of the lathe is very irregular. This is especially true for the back adapter.

After getting the lathe level by adjusting the all-threads, I put nuts on the tops for extra security.

Here's what they look like on the lathe: