April 2014
Newsletter

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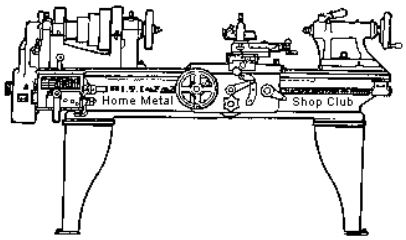


http://www.homemetalshopclub.org/

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	*Norm Berls*	*Joe Sybille*	*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 an electronic subscription from the front page of our website. We currently have over 608 subscribers located all over the world.

About the Upcoming 10 May Meeting

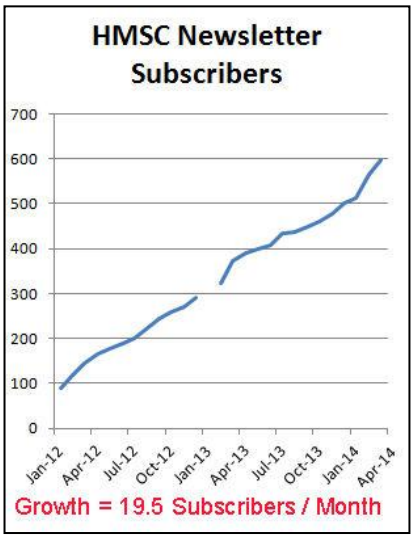
The next general meeting will be held on 10 May at noon at the Spring Branch Memorial Library in Houston, TX. Tom Moore will give a presentation on "Sharpening Lathe Cutters". Visit our website for up-to-the-minute details, date, location, and presentation topic for the next meeting.

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! Think about your last project. Was it a success, with perhaps a few 'ugh ohs' along the way? If so, others would like to read about it.
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 that 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 Librarian, Dan Harper.

The monthly Newsletter subscriber list has grown to about 600 (right graph). You can sign up or discontinue receiving emails via the orange newsletter sign up box on most HMSC web pages.

Recap of the 12 April General Meeting

By *Joe Sybille*, with photos by *Jan Rowland*

Twenty two (22) members attended the noon meeting at the Young Library, 5260 Griggs Road, Houston, Texas 77021. There were two guests present, Jim Williams and Harold Waters. Vice-President *Norm Berls* led the meeting. Club president Vance Burns was unavailable for today's meeting. Norm requested volunteers to serve on the novice SIG committee. The current SIG leader, Rich Pichler, is stepping down. Gene Rowan has volunteered to serve on the committee, but other volunteers are needed. A proposal offered for later consideration is to have the SIG group meet once every third meeting. This proposal is still pending. Rich Pichler thinks this proposal is ill advised, for novices want access to information monthly as opposed to every three months.

Presentation

George Carlson (right photo) gave a presentation on 'Machining Your Own Telescope Parts Avoids Astronomical Prices'. George is an avid photographer of celestial bodies, aka astrophotographer. His talk today dealt with making two parts: a mounting rail for his 8-inch reflector telescope and a focuser mounting flange.

George's telescope came with a mounting rail, but he felt it lacked sufficient stiffness for taking accurate pictures. He described how he made the rail saddles to fit the contour of the telescope's Optical Tube Assembly (OTA). This was done by cutting an arc on both sides of a rectangular piece of 6061 aluminum. Mounting holes were then drilled before cutting the rectangular piece in half lengthwise. Two pieces were now available to attach to each end of the OTA and to receive the mounting rail. George then made the rail, also of 6061 aluminum. It is a rectangular piece the width of the saddles and nearly the length of the OTA. Holes at each end of the rail were drilled to match mating holes on the saddles for mounting the rail. Both long sides of the rail received a dovetail edge cut at 60 degrees. The dovetail edges facilitated mounting of the OTA on the equatorial mount shown in photo above.

Next, George made the focuser mounting flange from a solid blank of aluminum (left photo). After truing one side, he used successively larger drill bits to make a 1 3/8-inch diameter hole in the blank. Since his largest bit is 1 3/8-inch, George used a boring bar to make the required 2.6-inch finish diameter. The use of a six jaw chuck facilitated holding the now thin walled mounting flange for internal threading.

There is no video of today's presentation.

Safety Moment

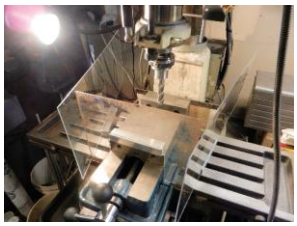
Norm Berls cautioned those present to avoid wearing welding gloves when operating rotary power tools. The loose fit of the glove can easily become entangled in the rotating mechanism and could cause injury to the wearer.

Rich Pichler offered another viewpoint on the wearing of welding gloves around rotary power tools. He opined that welding gloves gave better hand protection from the heat created when grinding items with a motorized grinder.

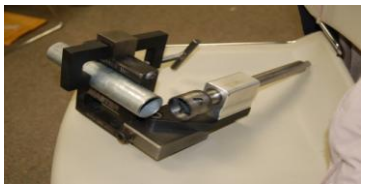
Show and Tell

Joe Williams displayed a dovetail cutter with which he has had much success (photo at right). He passed around a tubular assembly used

for circulating cooling fluid for his mill. The assembly is a tube within a tube and the inner one had begun to leak. Repair of the tube with the leak appeared difficult, and he asked for suggestions on a solution.



Martin Kennedy showed a rectangular plexiglass shield with a strong magnet attached to the bottom. The shield protects one from flying metal fragments. Given a steel surface for attachment, the magnet allows placement of the shield where required for the job at hand (left photo).



Dick Kostelnicek displayed a jig for making birds-mouth cuts in tubing using a hole saw (right photo).

Warren Gloss showed a marine coolant manifold he designed and made. The manifold is used in conjunction with a keel cooler to provide engine cooling for a marine engine. It houses 3 regular automotive thermostats (left photo).

Tom Darragh displayed an improved version of a shell casing annealer used for resizing spent rifle brass casings for reloading. He then showed a lazy susan type tool holder that revealed Tom's skill as a wood-crafter, too (right photo). Lastly, Tom shared with the group his recent acquisition of a DRO (Dgital Readout) made by Ditron Digital. We look forward to a follow-up report on the utility of the DRO by this manufacturer.

Norm Berls displayed high speed steel tool bits that he ground using a belt sander and rotary grinder. He then passed around a catalog of tool parts made by Arthur W. Warner.

Problems and Solutions - *Ask the Blacksmith*

One member wanted to know when the tailgate sale will take place. A date has not been set.

Another member solicited suggestions on how to remove rust from vices bought at a garage sale. Bead blasting was one response.

Novice SIG Activities

The novice group, led by Rich Pichler (right photo), met to discuss some of the basics of marking the center of holes and drilling them.

Articles

About Drill Rods

By *Dick Kostelnicek*

Drill rods are round, unhardened bars of tool steel. They're call *Drill Rods* because their diameters exactly match those of common twist drill bits; including Fractional (1/16 – 2 inches), Letter (A – Z), Number (1 – 52), and Metric (2 – 25 mm) sizes. They usually come in 3-foot lengths, but I've seen them sold as cut 1-foot pieces on Ebay and by special order in 12 foot lengths. They're extraordinarily straight and at least 1/8-inch longer than specified. They have a highly uniform internal consistency and are ground to a fine surface finish: 10 microns RMS for 1/8-inch and 30 for 2-inch diameter. These bars have excellent dimensional tolerance: +/- 0.0005 for 1/2-inch and +/- 0.001 for 2-inch diameter.

Drill rods are guaranteed free from *decarb* or the burning out of surface carbon. This high carbon content and fine surface finish inhibits rusting. But, you should still apply a light oil film if you intend to store them for an extended period. Drill rods come fully annealed, and therefore, are easily machined. They can be used *as is* or subsequently heat treated and hardened throughout. There are at least 7 readily available grades of drill rod, varying in alloy composition. However, the ones most often used in a home shop are designated as **W1** - **W**ater hardening, **O1** - **O**il hardening, and **A2** - **A**ir hardening. They can be obtained from most tool suppliers with prices increasing in the following order: W1, O1, and A2.

W1 - Water hardening is the most popular and least expensive type of drill rod. Its high carbon content allows its use without heat treatment. It's an electric furnace tool steel that is extremely uniform in consistency. Heat treat by raising the metal's temperature to a red glow where it becomes completely non magnetic at about 1450°F. Then, plunge the red hot metal into water or salt brine. Swish it around to prevent steam from insulating the hot metal from the chilling water bath.

For heat, I use the carburizing flame of an oxy-acetylene torch. A MAPP gas or propane torch will suffice if the flame envelopes the entire piece being heated. Stack a few fire bricks to make a temporary enclosure in which to heat and shield your parts from atmospheric oxygen (left photo). For a temperature indicator, I use a telescoping shaft pickup magnet (right photo). Caution! Prolonged heat can destroy a magnet's pull.

O1 – Oil hardening is a non-shrinking grade of tool steel having good abrasion resistance, toughness, and machinability. Heat treat by raising its temperature to the point where it becomes completely non

magnetic, about 1450°F, and plunge or quench in hot oil around 150°F. Use new non-detergent oil such as transmission or hydraulic fluid. Have adequate ventilation since smoke can be profuse.

A2 – Air hardening is the most expensive type of common drill rod. It is a 5% chrome tool steel that provides good wear and mild corrosion resistance. Heat treat by raising the temperature to 1750°F and quench by blasting with room air.

Parts to be heat treated can be wrapped in stainless steel foil envelopes and placed in a furnace to prevent scale and surface decarb. Caution! It's a real challenge to cut open the foil envelope containing a red hot part in order to quench it.

For all grades of drill rod, temper immediately after heat treatment by reheating your parts to 450°F for about 15 minutes. I cover my parts with lime powder or dry sand and place them in an electric toaster oven on its highest heat setting (right photo). Keep the powder cover to prevent atmospheric oxygen from decarburizing the surface as the parts cool slowly in room air. If I'm doing just a few parts at the same time, I leave them inside the oven, turn it off, and let it slowly cool on its own.

If you store several grades of drill rod in your shop, paint the ends with a distinctive color so that you can identify them later. I use artist's acrylic paint tubes and spread the paint with a paper tissue or cotton swab. Paint both ends of the rod and always saw off pieces form the same end. Choose distinctive colors and make a wall chart with a smidge of color next to the name of the rod type (left photo). I don't know of any standard color codes for drill rod, so I use W1 – red and O1 – yellow. I don't stock A2, but if I did, I'd probably paint it white.

Special Collet

By J. R. Williams

The photo shows a special modified collet that I made many years ago to cut off 11/2-inch OD acrylic tube into one inch long lengths. The stock is cut to length and then with a special radius tool, the ends are rounded over.

The plastic machines quite well with sharp tools and the cut is not crowded. I had acquired an old well-worn 5-C soft face collet and added the aluminum extension sections which were bored out to hold the plastic tube. Over the years there has been enough wear to prevent the collet closing on the work to be tight enough to prevent slipping. Sections of adhesive backed paper material for file markers were added

to the interior to prevent slippage.

The collet will bottom out on the face of the collet adaptor preventing further tightening. The plastic sections start out at six feet in length and are supported by the ball bearing tipped steady rest members. Only two are used for support and the unit is moved along the ways as the stock gets shorter.

This has been an annual project for my wife and her decorated Easter eggs for over 30 years.