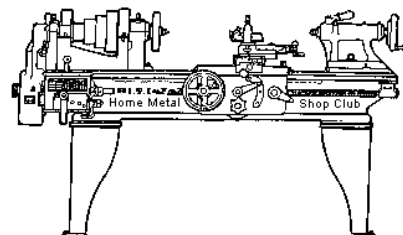




June 2016
Newsletter

Volume 21 - Number 6



<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
Vance Burns

Vice President
Norm Berls

Secretary
Joe Sybille

Treasurer
Emmett Carstens

Librarian
Ray Thompson

Webmaster/Editor
Dick Kostelnicek

Photographer
Jan Rowland

CNC SIG
Martin Kennedy

Casting SIG
Tom Moore

Novice SIG
Unfilled

This newsletter is available as an electronic subscription from the front page of our [website](http://www.homemetalshopclub.org/). We currently have over 900 subscribers located all over the world.

About the Upcoming 09 July 2016 Meeting

The next general meeting will be held on 09 July at 12:00 PM (Noon) in the meeting rooms of the Parker Williams County Library, 10851 Scarsdale Boulevard, Houston, TX 77089-5714. Brian Alley will give a presentation on Anodizing.

Visit our [website](http://www.homemetalshopclub.org/) for up-to-the-minute details, date, location maps, 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. These books can be quite costly and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership. The club has funds to purchase new books for the library. If you have suggestions, contact the [Librarian Ray Thompson](#).

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](#). Think about your last project. Was it a success, with perhaps a few 'uh ohs' along the way? If so, others would like to read about it. And, as a reward for providing an article, you'll receive a free year's membership the next renewal cycle!

Ideas for programs at our monthly meeting are always welcomed. 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](#).

Recap of the 11 June 2016 General Meeting

By Joe Sybille, with photos by Jan Rowland

Fifteen members attended the 12:00 PM (noon) meeting at the Barbara Bush County Library, 6817 Cypresswood Drive, Spring, TX. One visitor attended. There are forty-six members in good standing with the club.

Vice-President *Norm Berls* led the meeting.

Thanks are in order for member Richard Pichler for a donation of fifty dollars to the club. Richard sold several machine vises during the meeting and gave the proceeds to the club.



Annual club officer elections are usually held during the June meeting. With the exception of President and Vice-President, all current office holders agreed to serve another term in their respective positions. Due to the smaller than usual turnout for this month's meeting, elections for President and Vice-president were postponed until next month's meeting.

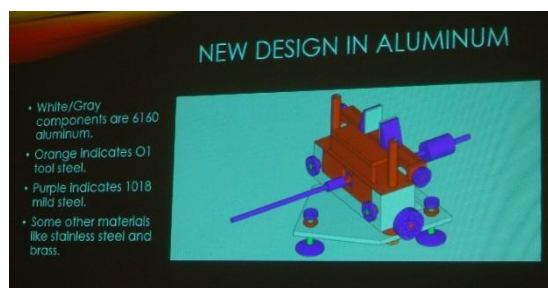
Presentation

Club member, *Norm Berls*, gave a presentation on 'The Redesign of a Rifle Rest'. This design is one for a front rifle rest for bench rest target shooting. The purpose for the design and build of the bench rest is more of an exercise to experiment with new technology than a tool that would see extensive use. Using the software product Sketch-up, Norm was able to see the evolution of his design before heading to the shop to cut metal.

There are three main sections to his bench rest; namely, base assembly, middle assembly, and top assembly. Incorporated into his design are the following features:



Left hand threads
Universal joints
Rack and pinion gears
Teflon friction limiting plates
Compression springs
Complicated balancing mechanism
Welding of dissimilar metals

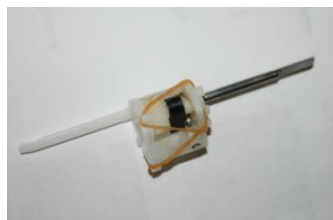
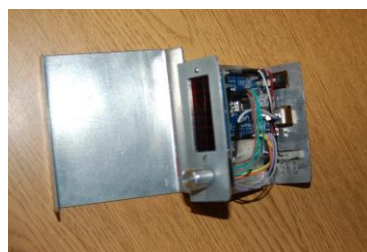


- White/Gray components are 6160 aluminum.
- Orange indicates O1 tool steel.
- Purple indicates 1018 mild steel.
- Some other materials like stainless steel and brass.

Earlier design considerations involved the extensive use of carbon steel. Motivated to reduce weight to make the bench rest easy to carry, Norm eliminated some steel parts in favor of aluminum. Fine threads are used throughout the bench rest. To facilitate assembly and disassembly of the bench rest, bronze bushings will be press fitted into aluminum parts. The bushings provide more durable threads for steel fasteners. Suggestions offered to improve the design included the use of screws with brass tips, and the use of the combination of washers and locknuts to prevent the loosening of screwed together assemblies. Norm's concept of the bench rest is shown in the above photo.

Show and Tell

Dick Kostelnicek demonstrated the use of a RPM and surface speed meter that he designed and built to measure the speed of his drill press and lathe. The meter uses a Hall-effect probe and a button magnet attached to the machine's Spindle (Right photo). The diameter of lathe work or drill diameter in a drill press is entered into the device to calculate surface feet per minute. The electronic design uses an Arduino microcontroller and a rotary controller to select menu items and enter numerical data. It also keeps track of the number of revolutions between starts and stops of the machine tool.



Jan Rowland showed the gearing of a disassembled electric toothbrush. (Left photo).



Brian Alley exhibited two circular designs cut in wood and made in connection with his introduction to the use of the software Fusion 360. He used the software to control a CNC (Computer Numerical Control) mill. (Right photo).



Dan Harper showed several cushioned floor mats he obtained free from 'Curb-Mart' (aka curbside rubbish). (Left photo).

Articles

Fossil Rock Splitting Chisel

By Richard Pichler

Chisels used for splitting rocks while hunting fossils tend to get beat up, dulled, nicked, and lost. The splitting edge needs to be strong, thin, and about 15-25° to get a good split (Right picture).



The chisel's hard metal can be obtained from an auto leaf spring that is available at an automotive parts recycling center or junkyard (Above right photo). A leaf spring usually costs about \$10 to \$20. About 20 to 30 chisels can be made from one spring which often has multiple leafs. The leafs can be cut up with an abrasive metal cutting blade in a hand power saw guide (Right photo) or with a abrasive chop saw (Left photo). Make the chisels long enough to avoid hitting your hand (8-10 inches).



I have a guide for making a 90° cut across a leaf spring (Above right picture). A similar guide can be easily made from small angle iron. If you use a hand or Skill saw, buy an extra abrasive blade for they are easily damaged when hand guided. The 15°-25° edge can be fashioned using a coarse grinding wheel. Be careful not to draw the temper from the chisel. I spray paint the finished chisel with a bright colored primer in order to help locate it when dropped in the rock debris field. I do my abrasive saw cutting outdoors to avoid contaminating my metal shop's working machines. My outdoor workbench has a cement sheet rock top surface which has held up well in humid weather for 3 years.

Delrin – A useful product for prototyping

By Joe Sybille

Recently, I had the opportunity to make a cover for the housing of a RFID (Radio Frequency Identification) controller. The controller is used to restrict unauthorized access to machinery in a shop.

Aside from the electronics within, the housing is comprised of a single gang junction box, a cover, and a shield. The shield, in conjunction with the cover, serves to form a pocket in which a RFID card is placed to control access to a machine.

Developed by DuPont, Delrin (acetal homopolymer) is a crystalline plastic which has properties that fall between metals and plastics. Delrin is purported to have high tensile strength, creep resistance and toughness. Additionally, it exhibits low moisture absorption, is chemically resistant to hydrocarbons, solvents and neutral chemicals, and it has high fatigue endurance.

Delrin is available in plates and rods. The material can be turned on a lathe, shaped on a mill, and cut with a router bit. Since it is cheaper than steel, Delrin is useful for prototyping parts.

In the photos below, one can see the results of cutting Delrin blanks with a router to form slots for the RFID controller cover. In the left photo, the blank on the left is the front of the cover depicting the card slot; the blank on the right is the back of the cover depicting a slot for an antenna. The right photo shows the assembled controller with RFID card in the pocket.

