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Newsletter

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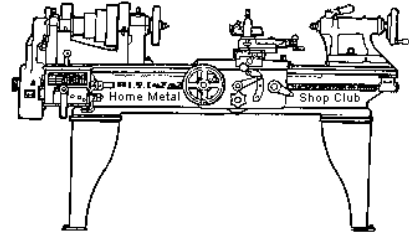
The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area since its founding by John Korman in 1996.

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
Brian Alley	*Ray Thompson*	*Joe Sybille*	*Emmett Carstens*	*Ray Thompson*
Webmaster/Editor	Photographer	CNC SIG	Casting SIG	Novice SIG
Dick Kostelnicek	*Jan Rowland*	*Martin Kennedy*	*Tom Moore*	*John Cooper*

This newsletter is available as an electronic subscription from the front page of our website. We currently have over 1027 subscribers located all over the world.

About the Upcoming 14 January 2017 Meeting

The next general meeting will be held on 14 January at 12:00 P.M. (Noon) at the Parker Williams Branch Library located at 10851 Scarsdale Blvd., Houston TX. There will be two presentations:

Martin Kennedy & Vance Burns	Martin Kennedy & Vance Burns
CNC Build - A Router From Scratch	CNC Build - A Lathe Conversion

Visit our website 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 Ray Thompson*.

Martin Kennedy has compiled a new map showing the location of our active members.
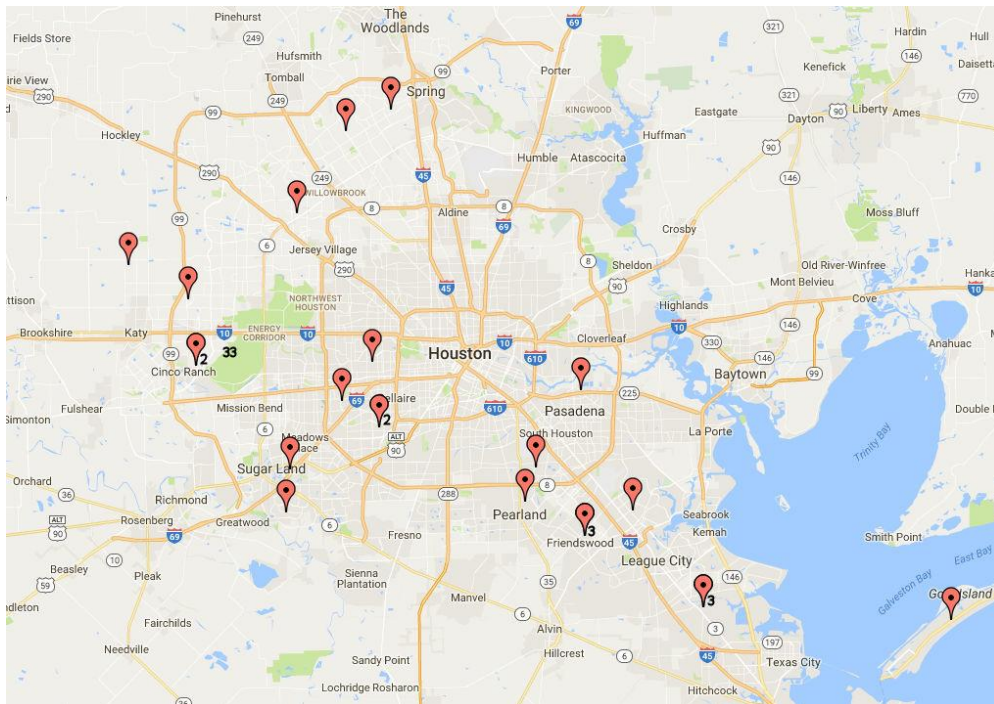
Recap of the 10 December 2016 General Meeting

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

Twenty-three (23) members attended the 12:00 P.M. (Noon) meeting at the South Houston Library located at 607 Avenue A, South Houston, TX 77587. There was one visitor, Tina Alley. There are twenty-six (26) members in good standing with the club.

President *Brian Alley* led the meeting.

Presentation

Club member Norm Berls began the second part of his presentation on Sketchup - 3D Modeling Software with a recap of last month's presentation. He then discussed organizing a complex project. First, take a look at the entire model by selecting 'expand all' after right clicking on the file of interest. Here one can view nested components. Norm then demonstrated how one may edit one part of the nested components. The parts may be grouped according to function. Each group may then be hidden to reveal only the group containing the part to edit. Once the part of interest is revealed, one may edit it as required.

Norm then demonstrated how to export a picture, using JPG format, into a file. Following this demonstration, he enumerated the best practices for grouping and visibility. He recommended taking the following steps:

    Completely draw every part.
    Include all lines.
    Include all faces.
    Set color by selecting whole group.
    Set texture by selecting whole group.
    Control visibility by group.

Next, Norm discussed and gave a demonstration of standard views, scenes, and fly-by animation. Standard views included the typical top, bottom, front, back, left and right sides. Scenes are several views saved as one. Fly-by animation is viewed as a sequence of scenes in a single video file.

Intersecting objects were next demonstrated by Norm. A cube with a cylinder, oriented horizontally, intersected the cube from front to back. The goal in the demonstration was to erase unneeded intersecting lines and faces.

Norm followed up with a demonstration of smooth lines and smooth objects. In this demonstration, he showed how one may erase vertical lines on a cylinder and then soften and smooth the edges. Next, he discussed importing projects into projects. He demonstrated how to place a socket head cap screw (SHCS) into a hole in a metal plate. Afterwards, Norm showed how to add dimensions to a part and then edit those dimensions.

Lastly, Norm demonstrated the use of the 'follow me' tool. This tool allows one to easily create complex drawings of pipelines and springs.

Trouble with circles and other SketchUp resources will be the focus of part three of the presentation.

Norm's slide presentation may be viewed at this link.

Show and Tell

John Cooper showed a catalog of aluminum extruded parts made by 80/20 Inc., a manufacturer of modular framing systems.

Rich Pichler demonstrated a do-nothing busy box he received as a gift. Contained within the box is a switch and set of meshed gears that automatically flips the switch back when it is acutated (left photo).

Norm Berls exhibited lathe accessories such as a tool height gage, compound angle setting tool, and a four jaw chuck centering tool (right photo).

Brian Alley displayed examples of parts made using 3D printing techniques. Parts were made of carbon fiber or nylon. The parts are used in the manufacture of both sport and racing cars (right photo).

Dick Kostelnicek create*d* video of a Geneva Mechanism in operation using the drafting program *Sketchup* and animation program called *Anamation Shop.*

Richard Douglas showed a 5C collet chuck that he acquired recently (left photo).

Problems and Solutions

A member sought recommendations on local sources of cast iron round stock. Another member recommended Metal Supermarket, a local metal distributor.

Articles

CNC Blindness
By Vance Burns

I was determined *not* to get into CNC (**C**omputer **N**umerical **C**ontrol). Too much, too expensive, too time consuming, too complicated, too difficult, etc…. Then someone gifted me a basket case CNC project that was more parts than plan. Set the hook, reel me in.

Getting past my presuppositions, I decided to do some research and possibly get past my druthers: I really enjoy a challenge but I draw the line; by analogy I would not jump out of airplanes without a parachute; too much of a challenge. To the uninitiated CNC looked like a trip to Intimidation Texas, and I really wanted to focus on things inside my comfort zone. Nevertheless, the mental distraction that CNC research provided was alluring… CNC can be any price beginning with virtual/simulations, budget shoestring/found items and anything beyond. Prototypical CNC is within the reach of anyone. If you think outside the box, CNC hardware is common and readily available. Just about every printer you've ever owned has demonstrated a form of CNC. Every scanner you have ever owned likewise has demonstrated a form of CNC. Many of the early CNC hobby devices were cobbled together from old printer parts. I am oversimplifying it, of course, but in a basic CNC environment you have a real or virtualized controller and likewise a "mechanism" which is being controlled. In the printer example, you have a dedicated internal controller and the paper advance and print head positioning system, which are typically mechanized by stepper motors. Hook up a computer and you now have an enhanced controller, an internal (motion) controller and positioning stepper motors waiting for your command. Enter the home PC. The PC has become ubiquitous in most homes and though pricy, the appeal has negated the cost and made ownership a matter of course. The parallel port on the PC predated the home PC by 10 years and was a standard in the industry. Forgetting the port for a moment, consider that the PC doesn't interface well with anything, and those items with which it does connect are dedicated and constrained to that one device, keyboard, monitor, etc. The serial port was made for IO, but if you grew up in this industry you know how unpredictable serial communications could be. The parallel port just worked flawlessly and had a lot going for it. Eight pins to use for output, five for input and four for bidirectional. Being able to manipulate seventeen pins at a whim offers real possibilities for controlling a printer or a CNC device, as Jan Rowland has demonstrated for decades programming the parallel port though the Basic programming language.

The ubiquity of the PC gives the illusion that the most recognizable component in CNC is the front end software. We will return to the importance of the PC in a bit, but let's survey the software tools available to the hobby CNC'r and understand why settling on one is just part of the fun. There are many to chose from and they are improving (as a class) all the time.

You might not know about CNC yet but you understand value. Let me say now that value perception is a little tricky in this arena. For instance, free is not free and expensive is not a guarantee. Some of the old CNC warhorses have been around long enough to garner a rabid following and thereby some decent unofficial support. Some are so new they don't get a lot of the spotlight and some are standards overseas but largely overlooked in the States.

At first blush one will tend to focus on an application's price and for that reason the low dollar control software items garner a lot of attention. As I said, in the CNC control world, free isn't turnkey, and you invest either through dollars or sweat equity.

Some of the old warhorse applications that have been around for years have the better support and recognition. Of those you might consider affordable, the older applications still sell but the support is minimal and you have to be a web maven to mine the advice of a lot of Johnny-come-Lately opinions on the forums.

The low dollar applications have their defined niche and the warhorse apps are old and not keeping up with current tech. If you have the bigger is better disease (speaking as a bigoholic) the old warhorse applications may not support your goals. If you are drawn to the niche apps, stay with the niche hardware.

CNC hobby software and hardware can be inexpensive. There are some cutting edge applications that are available and at a reasonable cost. Part of the decision path is staying focused, don't take a rabbit trail that is too complicated with uncomplicated software in your plans. Match the app to the application. Dusting off my soapbox for a second; remember the parallel port on the PC – that interface is dismissed by many CNC pundits who are not worth hearing. The Parallel port was revolutionary and continues to be so. The loss of the quintessential port on the retail PC is more economic and less a matter of obsolescence.

If you have a PC with a parallel port you are still in business – the parallel port works and works well. Alternatives to the parallel port are (wait for it) parallel ports! They are readily available for insertion into the PC bus. Parallel port alternatives come in many hardware flavors, and each is a compromise, USB, MODBUS, Ethernet, etc; nothing comes close to having 17 signal pins at your beck and call. The compromise comes in control and complexity. I don't want to scare you from using "other than" the parallel port, but they have cons. They are more expensive. They are more complex to implement (the vendor may have done this for you). Some generic interface implementations are not designed to control things that, if ignored for a nanosecond or two, will go off and ruin your workpiece or machine. There is one company that has built a "port" that looks like a parallel port but allows redefinition of any pin to any purpose; not as easy to implement but certainly doable.

Ok let's name names, in no particular order:

www.edingcnc.com is an interesting company that provides PC software and interfacing with motion control products. The point of entry into this hardware/software product is +$200 and provides a respected product. This is a product made outside the States and is more obscure than other products. If this were a US based company I could see them stepping into the Mach3 world easily. I have no hands on experience with this product but have read extensively about it.

www.cncdrive.com is an up and comer that offers PC software and motion control interfaces. The point of entry into this hardware/software product is +$160 US and is offered by a company outside the States. The offerings are really interesting and some are very vertical, ie they fit a very specific niche but do it well. I have no hands on experience with this product but considered it for a long time.

www.flashcutcnc.com is also popular. The point of entry into this hardware/software product is +$1200 US. While I have no experience with this product my research tells me they have ardent supporters and hyperbolic critics. It appears that a $1200 price tag brings them both out of the woodwork. A lot of folks are somehow comforted that the price is that high and that infuriates the critics.

www.dynomotion.com The point of entry into this hardware/software product is +$550 US. While this is really a very interesting product, the owner of the company does about as much as he can to discourage your purchase unless you are a C programmer. I interfaced with the company and was really confused by their approach. Needless to say this business model worked – I did not buy it.

www.machsupport.com is a company that has provided PC software for over a decade. The point of entry into this ~~hardware~~/software (only software) product is +$175 and provides a well respected product. Mach3 has its detractors and the much promised upgrade path to Mach4 has proven difficult. Mach3 is used extensively in hobby and light industry. It is showing its age.

www.linuxcnc.org is different from others in the bunch. It is one of the most powerful and extensible applications on the CNC planet and yet it is provided without cost. The point of entry into this ~~hardware~~/software (only software) product is +$0.00. It is provided without cost but not implemented without cost – google "sweat equity".

My first foray into CNC was with Mach3 and a servo based system. Since servos use feedback communication to the controller, as a total 'nubie' I flogged myself silly trying to get Mach3 to work with Servos. Guess what – Mach3 doesn't support feedback from servo devices. I found that LinuxCNC does and I had movement within an hour of downloading the software – using the parallel port.

As I mentioned previously, interfaces that utilize the parallel port get a lot of negative spin but really, if you are not machining faster than the parallel port can support, what is the advantage to using something else? LinuxCNC not only supports a plethora of interfaces, it has an existing library of parallel port setups that will fit the hobby CNC setup. If you are an unrepentant 'bigoholic' (we meet the second Saturday of every month, check the webpage)

LinuxCNC can be tailored to your latest world-domination fantasy. Can be tailored – by you (that's the hidden expense). Not to discourage creativity, but the further you move from the parallel port standards, the more equity you need to invest in the application configuration. Support for LinuxCNC is priced the same as the product, free. If you ask for support you must ask politely. These guys are volunteers and if you come with attitude it will be all you have when you leave. If you ask a question that has been answered a thousand times they may ignore you. That being said, they demonstrate remarkable patience and seem unflappable to the most inane questions if the supplicant is polite.

What do I recommend? Pick the hardware platform you are interested in and use the same software everyone else is using. Official support from these small companies is dwarfed by the unofficial support and if your configuration is too obscure you will have few support options from the beginning, unless you like a challenge.