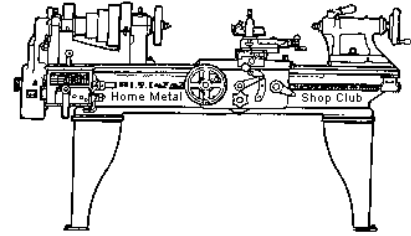




## January 2019 Newsletter

Volume 24 - Number 01



<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 <i>Brian Alley</i>	Vice President <i>Ray Thompson</i>	Secretary <i>Joe Sybille</i>	Treasurer <i>Emmett Carstens</i>	Librarian <i>Ray Thompson</i>
Webmaster/Editor <i>Dick Kostelnicek</i>	Photographer <i>Jan Rowland</i>	CNC SIG <i>Martin Kennedy</i>	Casting SIG <i>Tom Moore</i>	Novice SIG <i>John Cooper</i>

This newsletter is available as an electronic subscription from the front page of our [website](#). We currently have over 1166 subscribers located all over the world.

### About the Upcoming 09 February 2019 Meeting

The next general meeting will be held on 09 February at 1:30 P. M. at South Houston Branch, Harris County Library, 607 Avenue A, South Houston, Texas 77587. Dick Kostelnicek will give a short presentation on "Active Tailstock Tooling."

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.

By majority vote, the new meeting start time will be at 1:30 P. M.

## Recap of the 12 January 2019 General Meeting

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



meeting (right photo).

Fourteen members attended the 12:00 P.M. meeting at the Galena Park County Library, 1500 Keene St., Galena Park, TX 77547. There were three guests in attendance, Mrs. Tom Moore, Dave Bodart, and Jon LeGrand. There are twenty-nine members in good standing with the club.

President Brian Alley led the



## Presentation



Instead of a formal presentation, club members Joe Sybille (left photo) and Brian Alley (right photo) led a discussion on the results of the member survey. The survey questionnaire included the following items:

1. How did you find out about the club?
2. Which part of the monthly meeting is the most important to you?
3. List areas of interest you would like to see in future presentations.



Rank the categories 4 through 7 below from 1 to 5 with 5 being the most likely.

4. Importance of getting new members into the club.
5. Club participation in activities with other local groups.
6. Members going as a club on field trips to local businesses.
7. Presentations from speakers not in the club.
8. Would members be interested in collaborating on a club project similar to how some clubs take part in robotics competitions or the like?

Lastly, are there any other thoughts or comments?

In general, the survey results revealed most members discovered the club via an internet search. Internet searches frequently find articles written by club members. There are several sections of the monthly meeting, namely, Meeting Opening, Monthly Presentation, Safety Video, Show and Tell, and Problems and Solutions. Among the different sections of the meeting, the Monthly Presentation is the most important section, with Show and Tell and the problems and Solutions sections tied for the next most important. Areas of interest for future presentations included, among others, more machining tips and tricks, proper use of milling machines, metal working without assistance of digital gadgets, and forgotten skills.

Increase in membership and presentations by non-club members ranked the highest among survey questions pertaining to membership, activities with other clubs, field trips, and non-club member presentations. There was general agreement that the collective experience of the members is the most important benefit of membership. Members learn from each other. There is interest in collaboration on a club project, but the coordination to commence a project has yet to be worked out. One commenter suggested it would take several members with the same set of plans with each deciding which part of the project they were interested in completing.

Other comments included a request for more show and tell videos made by the presenter, a demonstration on the use of thread measuring wires, the acquisition of a centralized meeting location, and a new start time for the meetings, among other comments. A centralized meeting location has been difficult to find because the club cannot afford to pay for rental space for about thirty persons on the second Saturday of the month. The room required must have climate control and sufficient electrical outlets for a projector and access to the internet. So far, county libraries have been a reliable meeting resource. Unfortunately, the county libraries that have been most accessible have been on one side of town, the southeast. Members are encouraged to offer suggestions for new meeting locations to the vice-president, Ray Thompson. By majority vote, a new start time was accepted. It is now 1:30 P.M.

A pdf file copy of the survey summary may be found at [this link](#).

## Safety Moment

The safety video emphasized the importance of maintaining a clean work area, safe use of racks and shelving, safe and proper lifting techniques, and use of proper personal protective equipment (PPE).

## Show and Tell

*John Cooper* shared a few pictures he took while attending the 2018 FABTECH convention in Atlanta, Georgia. There were over 1600 exhibitors demonstrating metal working machines. Also, he mentioned the upcoming HousTex Metal working Show to be held at the George R. Brown Convention Center on 26, 27, and 28 February, in Houston, Texas.

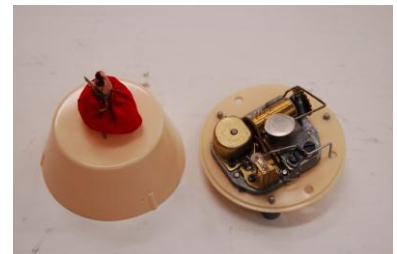
*Dick Kostelnicek* showed several gears, right and left hand helical and herringbone, and discussed the advantages and disadvantages of each. See photo at right.



*Brian Alley* exhibited a U. S.- made wrench of novel design. It is used to remove and install hex nuts of varying sizes. See photo at left.

*Visitor John LeGrand* showed an antique novelty item of a ballerina which twirls on a vertical support (right photo). A windup mechanism causes the twirling action.

He also showed pictures of tools he made at a former job to assist his co-workers and him perform their duties. Lastly, Jon showed a few



pictures of an antique tricycle he is restoring. The tricycle was manufactured by Gendron Iron Wheel Co, founded in 1872.

*Richard Thomas* mentioned the upcoming Cabin Fever Expo 2019 to be held at the Lebanon Valley Expo Center, 80 Rocherty Road, Lebanon, PA 17042, on 18, 19, and 20 January 2019. For more information on this event and future ones, visit [www.cabinfeverexpo.com](http://www.cabinfeverexpo.com).

## Problems and Solutions

A member wanted to know if it was possible to use his 7 ¼" circular saw to cut metal and should he consider saw blade tooth alignment. Yes, cutting metal with a circular saw is possible, provided one selects the proper saw blade. Several suggestions on saw blades were offered.

## Articles

### Calipers

By Martin Kennedy

I have several calipers around the shop. I have Vernier calipers, dial calipers, and digital calipers. Most of them are 6" digital, as this is the most useful length overall. I have other calipers for measuring longer distances.

Maybe you're in the market for a caliper or would like to add to your collection. So why would you pick one caliper over the other? Do you need a caliper that costs over \$150, or will a \$2 plastic caliper meet your needs? What type? What length? How accurate does it need to be? I'd like to address those questions in this article.



#### LENGTH

The most common and readily available caliper will measure a length of 0 - 6". For general use around the shop, this will probably meet 99% of your needs. The majority of measurements you'll make where you need accurate measurements will likely be 0-2".

I noticed that I occasionally needed to make a measurement right over 6", so I purchased an 8" caliper. Unfortunately, these are not very common, and the price reflects that. Since I bought it, I've only used it a few times.



There have been occasions where I needed to measure something even longer to high accuracy. For these measurements, I have a 12" dial and a 24" Vernier caliper. I don't use them that often, but when I do need them, there's nothing else that will suffice.

## TYPE

Calipers come with one of three mechanisms – Vernier, Dial and Digital.

Vernier – These calipers have graduated markings that allow reading through interpolation. Some have both inch and metric markings. They can be a bit tricky to use, and until you get used to them it's easy to get a digit wrong. They are, however, the least expensive type of caliper. They are also robust, since they don't have a lot of mechanical and/or electronic parts. As you can see in the above picture, I have a cheap plastic one. I keep it in my car. It's surprisingly accurate for something made of plastic. A disadvantage of this plastic caliper is that the zero cannot be set – it is what it is.

Dial – These calipers have a dial indicator that shows the reading. They're usually either metric or inch. They don't require batteries, so they work fine if they sit for an extended period. There is a rack and pinion arrangement in the caliper that moves the dial pointer, and it's been my experience that it's easy to get a piece of swarf in the mechanism which makes the dial slip a gear tooth and read incorrectly. If you get a dial indicator, you'll need to learn how to slip a tooth on the indicator gear back to the original position and get the reading back on track. I used to have a 6" Starrett dial caliper, but I dropped it and broke it. I have not felt the need to replace it.

Digital – Very common today due to the extremely low price of Chinese calipers. In fact, the Chinese models cost somewhat less than Vernier or Dial calipers. Name brand digital calipers cost quite a bit more. This type of caliper is very easy to read and requires no interpolation. They can display in one of two or three modes – inches, millimeters, or fractional. They're easy to set to give relative distances instead of absolute, which can be handy when measuring something like bolt hole separation. Neither Vernier nor dial calipers have an incremental mode. If you're in the market for a caliper, this is the type that I'd recommend.

## COST

In general, more costly calipers will give better service and accuracy. I prefer the Mitutoyo Absolute Digimatic calipers, of which I own three. However, depending on your needs, another type or brand may work great for you.

Here are the differences between the Mitutoyo and Chinese calipers:

- A Mitutoyo caliper costs 16x as much as a Chinese caliper. Said another way, you can buy 16 Chinese calipers for the cost of one Mitutoyo caliper. If you tend to drop, damage the jaws or lose calipers, buy the Chinese!
- The Chinese calipers eat batteries. Both types retain information (like the zero point) when the caliper is turned off. For whatever reason, the battery drain on the Chinese calipers is much higher, and you won't get but a month or two of service out of a battery. Also, if you forget and leave it on, it'll go through a battery in a day or so. I get about a year out of a Mitutoyo battery

and about two months out of a Chinese battery. One thing I do now is that I remove the battery from the Chinese caliper when I'm not using it, so the batteries last a lot longer now.

- When moving the caliper jaws, the display update is faster on the Mitutoyo and moves smoothly. The Chinese reading is jumpy as it updates only 2-3 times per second.
- The Mitutoyo button to set absolute zero is separate from the button to set relative zero
- The accuracy of the Chinese caliper is almost the same as the Mitutoyo, although I only have one to compare.
- I have to check and reset the zero on the Chinese calipers more often during use, as it gets off by 0.0005 or 0.001- inch fairly easily. On the Mitutoyo, it keeps a good zero. Of course, removing the battery from the Chinese caliper for storages requires a zero reset when it is reinserted.

## ACCURACY

There are four ways to make measurements with a caliper. The most common is by using the lower, or external jaws. These are the largest jaws on the caliper. Second, the height or offset from a surface can be measured using the backside of the caliper. I didn't test this specifically, since it has a zero point when the jaws are touching, and thus has similar accuracy to the OD measurement. Next, the internal or upper jaws are used to measure ID. These are the smaller jaws opposite of the lower jaws. The last measurement method is to use the depth probe, which is a metal rod that comes out of the end of the caliper. For each of these methods, I checked the caliper readings against some standards I have. Here are the variances from my actual measurements. The further the number shown is away from zero, the less accurate the caliper is:

	Cost	OD	ID	Depth
Plastic	\$ 2.00	0.002	0.007	0.003
TackLife	\$ 10.00	0.001	0.013	0.010
Chinese	\$ 15.00	0.000	0.006	0.002
Mitutoyo	\$ 160.00	0.000	0.000	0.001

Due to the way I tested the calipers, I don't think a difference of 0.001" is significant. To get an accurate test, I'd need several of each type of caliper, and would need to make and average multiple measurements. There's an art to making accurate measurements, and it requires more practice than I likely have. Slightly more pressure on the adjustment wheel can easily move the measurement by 0.001". As you can see, even the Plastic caliper may be accurate enough for you. The biggest problem I see on the first two calipers is that the ID and Depth measurements are off. This is a quality control problem, and there is likely little quality control of cheap calipers. And while it's easy to set the zero on OD measurements – just wipe the jaws clean, close the jaws, and hit the zero button, it's difficult to set it differently for ID and depth measurements.

## CALIPERS AND eBAY

I've bought all my Mitutoyo calipers off of eBay. Whether you buy new or used calipers, it's easy to get counterfeits. The counterfeits look like the Mitutoyos, and even come with the same case, paperwork and certifications. How can you tell if they're counterfeit?

- New counterfeit "Mitutoyo" calipers are very inexpensive compared to the real thing. I just pulled up an eBay listing for one for \$14.00 shipped. If you see a listing with a low price, it's almost certainly fake.
- The majority of listings for new Mitutoyo calipers are fake
- I also looked at Starrett digital calipers. They don't seem to be counterfeited
- Most, but not all, used calipers are real. Expect to pay \$30 - \$40. Check out [completed items](#) to see what they're currently going for
- If you look at the inch display, the Mitutoyo has four full height decimal numbers, while the fake caliper has a half-height number in the last position. See photo above
- There are [several web pages](#) that show differences between real and counterfeit calipers to help you make an informed purchase

