



# SCHSM

Southern California Home Shop Machinists

September 7, 2019

## OFFICERS

President	Charlie Angelis
Vice President	Michael Vulpillat
Secretary	Ron Gerlach
Treasurer	Jim Endsley

## COMING EVENTS

Sep Meeting  
 Sat, Oct 5, 2019, 2:00 p.m.  
 El Camino College

WESTEC  
 Sep 24 -26, 2019  
 Long Beach Convention Center

Little Machine Shop Opne HouseOct  
 Oct 12th, 2019 11am to 3pm  
 396 W Washington Blvd #500  
 Pasadena

## PREFACE -

The September meeting of the Southern California Home Shop Machinists was called to order at 2:00 p.m. on Saturday, September 7, 2019. We met in classroom AJ115 on the first floor of the Industry and Technology Building at El Camino College in Torrance, California. There were 26 members in attendance.

## CLUB BUSINESS –

Charlie called the meeting to order and checked for new members. There was one visitor and potential new member that arrived a little later and thus missed Charlie's initial call for new members. The visitor was Bill Heather. He lives in Norwalk and has a nice collection of machine tools. We welcome Bill and hope he returns.

Eldon reminded us of the upcoming Westec show. It is September 24th through the 26th, and encouraged members to attend. Each year some members meet on the first morning of the conference and walk around together (more or less).

Willie mentioned the Little Machine Shop event on Oct 12 from 11am to 3 pm. Members are encouraged to attend this annual event and bring some of their favorite projects to display. This is good for the club and can be a lot of fun for the attendees. LMS provides food and drinks for the attendees.

## PRESENTATIONS –

Norm Wells –Inexpensive PID Temperature Controllers–  
 Norm showed a small and inexpensive PID temperature controller. It came with a Solid State Switch and K type thermocouple. The standard thermocouple has Nomex insulation and is not intended to be used above about 400degrees. He also showed a ceramic insulated thermocouple which was good for much higher temperatures.

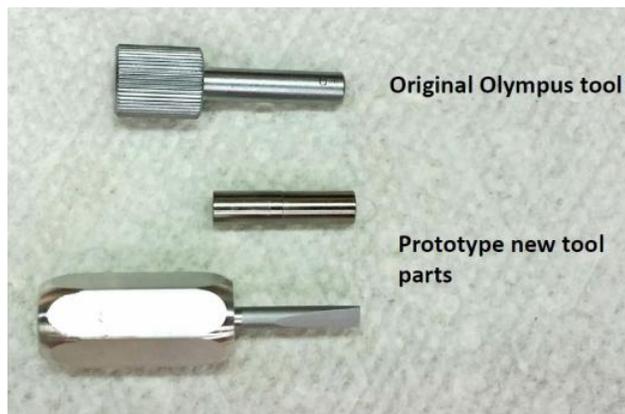


Larry McDavid –Objective Centering Tool for an Olympus Polarized Light Microscope–

Larry uses an Olympus Polarized Light Microscope. In use, the objective lens needs to be centered, as well as possible, over the optical axis of the microscope.



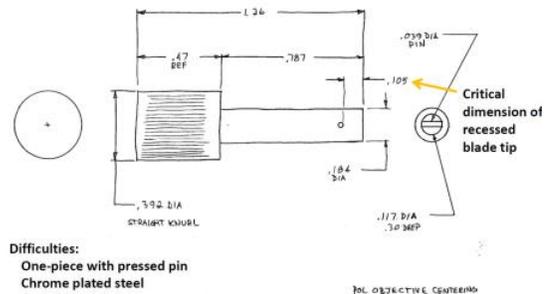
This is achieved by two adjustment screws and a spring, each separated by 120 degrees around the axis. The adjustment screws are a bit unique in that they allow the temporary mounting of adjustment screw drivers so that the two screws can be simultaneously adjusted without the need for a third hand. These special screw drivers are either no longer available or are prohibitively expensive, so Larry needed to come up with a replacement.



To compound matters he committed to providing two sets to a friend/instructor in exchange for some special slides which the instructor makes for his class presentation. The number needed grew to a total of six sets or twelve of these small and precise screwdrivers. The original design (see image above) involved a pin pressed through the side walls of a short length of tubing which was then transitioned into a knurled knob. This might be easy to punch out with some setup tooling or CNC but for Larry's home shop it was way too labor intensive, so he

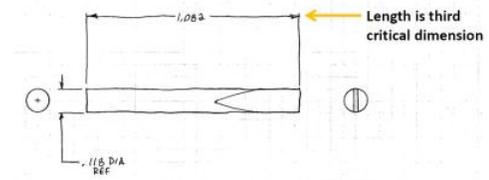
opted for a different approach. The driver construction technique he presented for the meeting started with a flat head Wiha screwdriver to which he precisely sawed off the handle leaving a portion of the shaft. This was then pressed into a new handle formed out of 7/16 aluminum hex stock. A custom formed SS sleeve was then pressed over the screwdriver blade resulting in the desired effect of a shrouded screwdriver tip.

The sketch below shows the layout and dimensions of the original Olympus screwdriver.



The difference between the original and the new drivers can be seen in the image to the left. The top one is obviously the original driver and the bottom, along with the sleeve in the middle, are the partially completed new McDavid driver.

The next step was to cut down the new Wiha screwdriver blades. The sketch below shows what Larry needed to achieve in terms of length and accuracy for this process.



After that he used his RaliCut mini crosscut abrasive saw with the normal vise removed. In place of the normal vise he clamped down a square 5C collet block with a special collet stop

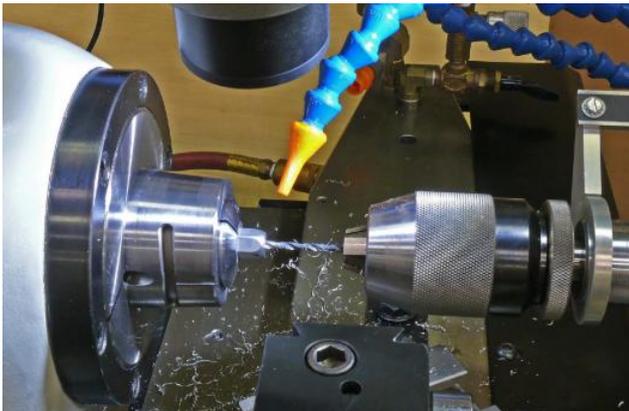


installed. The collet stop provided the repeatability from one cut to the next for the 12 screw drive blades he cut. This setup resulted in a total variation of length for all twelve blades of 0.0013". Not bad at all.

The image below shows the Wiha screw driver before and after the blade tip removal. Also included in the shot are some of the partially completed new McDavid drivers.



Making the knobs consisted of cutting sections of the 7/16" aluminum rod and then mounting them in a newly acquired 7/16" 5C collet for drilling and reaming to accept the screwdriver shafts. Also rounding sharp edges off using a form tool with a fixed radii.



The sleeves for shrouding the screwdriver blade were made from stainless steel tubing with an OD of 3/16". The entire length was drilled out to a 0.120" ID to fit over the screwdriver blade and a section of the OD was turned down to 0.184" to fit into the microscope adjustment screw

openings. The following photo shows one section being parted off after all previous operations were complete.



Assembly was completed by use of several Loctite Anaerobic adhesive products. He used 609 Retaining Compound for the blade to handle bonding and 242 Threadlocker to secure the sleeve in place. He used SF 7649 Primer on both locations since the bonds were between steel and aluminum and steel and stainless steel. Primer is not needed when bonding steel to steel.

#### LOCTITE ELIMINATES ASSEMBLY FASTENERS



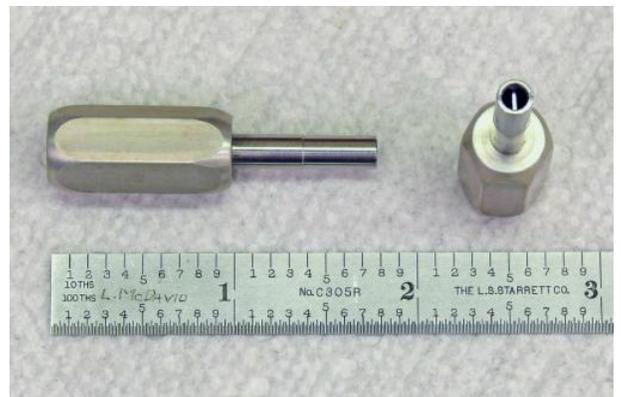
Final assembly by Loctite anaerobic: Aluminum & stainless need Loctite 7649 primer to cure adhesive.

Use Loctite 609 Retaining Compound for high-strength bond of screwdriver blade in handle.

Use Loctite 242 Threadlocker for sleeve-to-blade bond.

Tools ready for final assembly

The last image shows two of the final products. It should be noted that the hex stock handle was a deliberate design feature to eliminate the propensity for these little screw drivers to roll off tables and benches if conditions are not ideal.



## SHOW and TELL

Charlie Angelis showed the group an Edge Technologies lathe tool height setting gadget. As seen in the photo it has a built-in precision ball bearing, spirit level and flat surface.



The rod, which comes with the gadget, would be mounted in the headstock. The flat would rest on the top of the cutting tool's cutting surface and then the tool height would be adjusted until the spirit level indicates a level position. This works since the bearing axis and flat are in the same plane. This, of course, presumes that your lathe has been leveled.

Charlies also passed around a nice shiny new aluminum step pulley with a nicely drilled center hole with integral keyway for securely mounting to a shaft.



The only problem was there was no provision for a set screw(s) to keep the pulley in position on the shaft. Examining the pulley made it obvious why there was no screw. The only location where a set screw could be placed had a

sparse amount of meat left over for drilling and tapping. Maybe this explained why it was so cheap on eBay.

Larry McDavid did his periodic give away of little eyedrop bottles that are excellent for light lubricants. He also showed off his unique 5C collet stop set from Edge Technology which had a variety of center pin sizes.



The KBC collet stop he had been using was too big to fit up into the smaller collet sizes and the end was hardened so it was not easily turned down. Loaded with more new goodies, Larry then showed his new Milwaukee M12 Fuel Surge 12V Lithium Ion Brushless Impact Driver. It is small and light weight. According to Larry it is just as powerful as the ones with the bigger 18V batteries.



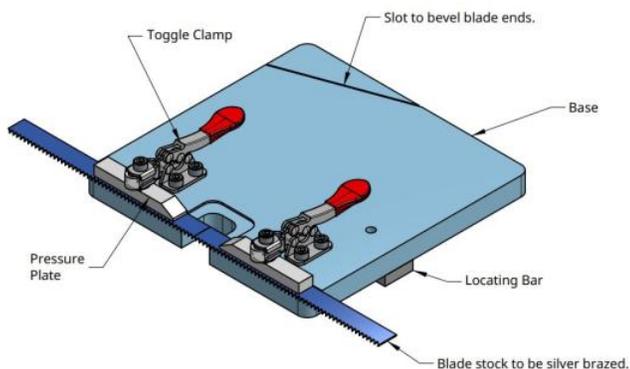
Last but not least was his mention of US Shop Tools which he is enamored with because they have no minimum purchase requirements and is close enough to his home to be convenient.

Ken Rector showed us his new (for him) Planimeter, which is an old school instrument for measuring the area under a random shape curve. This old but well preserved instrument, made by Builders Iron Foundry, is a polar Planimeter and was designed for measuring circular recorder graphs.

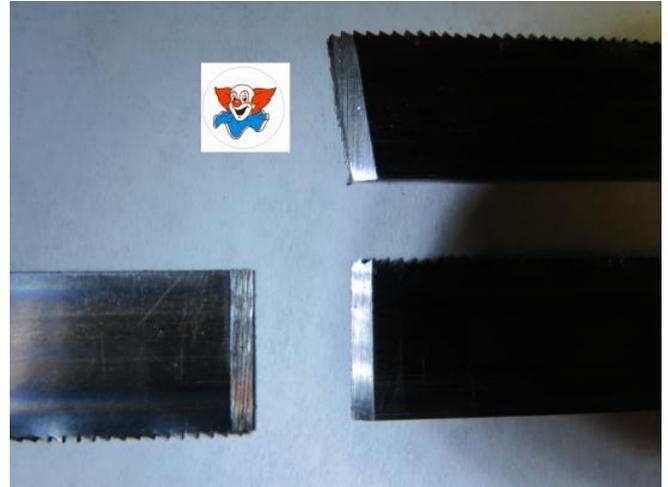


Millar Farwell sought some advice on locating some motor mount holes and seemed to get the info he need.

Dan Snyder discussed some issues he was having with grinding his saw blades his new blade brazing fixture he had shared previously. His fixture has an angled slot that is used to hold the blade for grinding. The intent is to grind both sides in such a manner as they form an abbreviated lap joint which is more sound than a simple butt joint. When he first used the fixture he discovered that the slot was not perpendicular to the plane of plate. So the bevels came out in a sort of 3D slope as shown



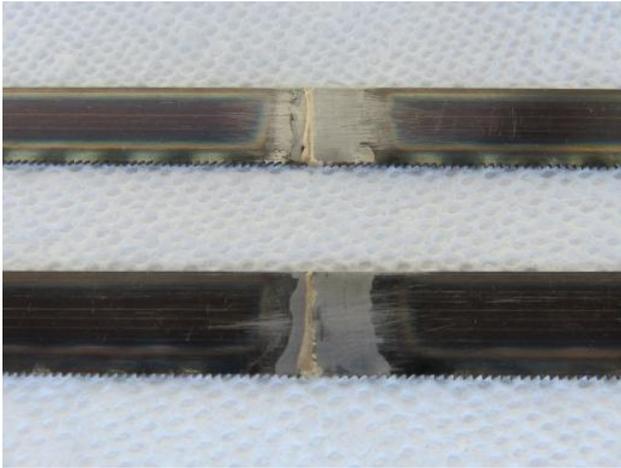
in the picture below.



He figured that the thin (0.028") slitting saw blade he had used to make the fixture had been pushed at a small angle when it entered the work. Therefore, he recut the slot with a thick 0.125" saw and then added a shim to make the slot the right size opening to hold the blade perpendicular to the plate.



Then the bevels came out square. This is shown above in the bottom half of the image. The clown face in the top part of the picture is next to the bad grind he was getting before his upgrade. He also showed a quick video of his bandsaw in operation with a newly brazed blade...and all was well. The image on the next page shows a couple of blades he brazed with his new and improved fixture. The rest of the talk was about making and using the fixture. He showed a video of some sawing with a blade made using the fixture. He got the original design idea for this fixture from Tom's Techniques, a Youtube video contributor.



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SCHSM welcomes presentations by members or guest speakers on any subject related to metal working activities. If you have some knowledge or experience you feel may be of interest to our members, or if you know someone that may have something interesting to relate, please consider making a presentation at a meeting. Presentations may be a little longer and more detailed than a show and tell, and may be accompanied by slides, video, or physical displays. Probably every member has some experience they can share, and this is the purpose of SCHSM. Please contact President Charlie Angelis to make arrangements to give a presentation.

SCHSM meets in Classroom AJ115 on the first floor of the Industry and Technology building of El Camino College, 16007 Crenshaw Blvd. Torrance, California, at 2:00 p.m. on the first Saturday of every month. The building is near Parking Lot B. Enter the campus from Manhattan Beach Blvd.

If you would like to contribute an article to this newsletter, or make a comment, contact the editor, Fred Bertsche. He can be reached via the SCHSM Yahoo Group, or at [fbschsm@yahoo.com](mailto:fbschsm@yahoo.com).

Find us on the web at [www.schsm.org](http://www.schsm.org).

