



# SCHSM

Southern California Home Shop Machinists

September 2, 2017

## OFFICERS

President	Charlie Angelis
Vice President	Michael Vulpillat
Secretary	Fred Bertsche
Treasurer	Jim Endsley

## COMING EVENTS

### WESTEC

September 12-14, 2017

L.A. Convention Center

### October Meeting

Sat, October 7, 2017, 2:00 p.m.

El Camino College

### November Meeting

Sat, November 4, 2017, 2:00 p.m.

El Camino College

### December Meeting

Sat, December 2, 2017, 2:00 p.m.

El Camino College

## Preface

The September meeting of the Southern California Home Shop Machinists convened at 2:00 p.m. on Saturday, September 2, 2017. We met in classroom AJ115 on the first floor of the Industry and Technology Building at El Camino College in Torrance, California. There were approximately 30 members in attendance, and no visitors.

## Club Business

Millar Farewell said he continues to work on arrangements for an October tour of the Edelbrock Foundry, but they haven't gotten back to him. He'll press onward.

Willie Jordan said he will be the point man for the Little Machine Shop (LMS) Open House. He will contact LMS to find out if or when the open house will take place this year, and coordinate our attendance if appropriate.

Don Huseman volunteered to inquire about a tour of Jay's Garage for SCHSM members. One club member warned that he inquired earlier about taking a tour and was told that tours were not offered to the general public. Stay tuned.

## Presentations

### Western Engine and Model Exhibition (WEME)

Millar Farewell gave an overview of the 2017 Western Engine and Model Exhibition (WEME,) which was hosted by the Bay Area Engine Modelers (BAEM.) WEME is held in conjunction with the GoodGuys West Coast Nationals, a premier west coast hot rod and custom car show held at the Alameda County Fairgrounds in Pleasanton, CA.

Millar and Ken Rector represented SCHSM. They displayed our club's engines, as well as some of their own projects. BAEM members displayed several very nice model engines, including supercharged V8s. Paul Knapp



*Millar Farewell presenting an overview of WEME, 2017.*

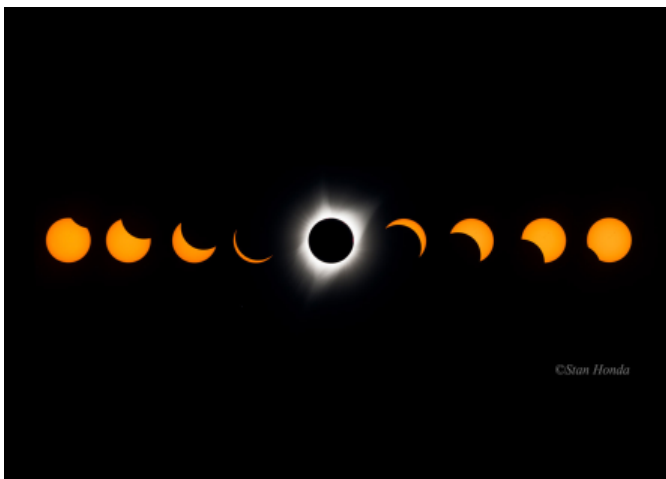
brought approximately sixty engines from his exquisite model engine collection. There were hundreds of custom hot rods and vintage cars, and an extensive showing of vintage scooters and motorized bicycles. One building housed an impressive model train layout, approximately sixty feet in length. Of particular interest to Millar was a tether car display and competition with cars reaching speeds in excess of 100 mph.



*A nice display of tether cars at WEME, 2017.*

## 2017 Total Solar Eclipse

Larry McDavid gave a very interesting presentation about his trip to Casper, Wyoming, where he viewed the August 21, 2017 Total Solar Eclipse. Larry was kind enough to write an article about his experience. It has been included in this newsletter and is well worth reading.



*Composite image of eclipse progression.*

## Show and Tell

Lewis Sullivan showed a specialized dial indicator base he made for setting the height of the four cutter blades in his 16" wood chipper. The indicator's base rests on the large drum in which the four blades are mounted. It straddles one blade at a time, with the tip of the dial indicator positioned over the edge of the blade. Lewis attached a thin, flat strip of metal to the underside of the indicator base. The strip of metal runs beneath the tip of the dial indicator and rides over the sharp edge of the chipper blade. It provides a wider contact area and a ramp for the tip of the indicator, and prevents the indicator from being damaged by the blade. Using this set up, Lewis was able to set all four blades to a high degree of accuracy.



*Lewis Sullivan's specialized dial indicator base.*

David Dik showed a Universal Thread Repair Tool he bought from McMaster-Carr. He used it to repair the internal threads in the large spindle nut of his Deckel FP1 milling machine. The tool is inserted into the bore of a nut or threaded cylinder and its fingers expanded. A single point cutter on one of the fingers is placed in an undamaged area of the internal threads and the tool is snugged up against the inside diameter of the nut or threaded cylinder. Once set, the tool is rotated, allowing the cutter to chase the threads and remove the damaged material.



*Universal Thread Repair Tool for internal threads.*

Ron Gerlach showed a combination tool height setting gauge and threading tool positioner that he made from plans he found on the Houston-based Home Metal Shop Club's website. The design is credited to HMSC member, Dick Kostelnicek, and can be found here:  
[http://homemetalshopclub.org/projects/tool\\_height\\_and\\_threading\\_positiner.pdf](http://homemetalshopclub.org/projects/tool_height_and_threading_positiner.pdf) .

The tool is made from a store-bought 2MT to JT3 adapter. All of the modifications are done to the JT3 end of the adapter. A 20 degree dihedral "hinge" is machined to center from the periphery of the JT3 taper. A 60 degree v-notch is machined around the periphery of the JT3 taper, inboard from the dihedral cuts. See photo.

In use as a tool height setting gauge, the 2MT taper is placed in the lathe's tailstock with the dihedral surfaces facing down. The tip of the lathe's cutting tool is adjusted upward until it just touches the "hinge," or edge joining the dihedral surfaces. At this point, the tool is at spindle center height. The tool holder is then locked in place. In order to set a thread cutting tool, the 2MT taper is again placed in the tailstock and the cutter adjusted to spindle center height. The tip of the threading tool is then aligned in the machined v-notch and locked in its tool holder.

HMSC has other very useful projects which can be found here:  
<http://homemetalshopclub.org/projects/project.html> .



*Height Setting Gauge / Threading Tool Alignment Gauge made by Ron Gerlach*

Matt Rulla showed an assortment of scalpels and blades he bought on eBay. He said that in addition to the typical hobby uses, scalpels are very useful for de-burring plastics and other composite materials. Scalpel blades are extremely sharp, and their superior heat treatment makes them less brittle than typical hobby knife blades.



*Assortment of scalpels, handy for hobby use and de-burring of plastic parts.*

Matt also showed a Mitutoyo disc micrometer he bought at the most recent Anderson Plywood Old Tool Swap Meet. He demonstrated how the disc micrometer can be used to measure slots and features that would be too small or narrow to permit the use of conventional micrometers.



*Mitutoyo Disc Micrometer*

***Safety Tip: If it's predictable, it's preventable!***



Matt shared a cutter used primarily for fabric and thin sheet material. It resembles a small circular pizza cutter. It has a sharp, round blade, about an inch and a half in diameter. It is best used with a cutting mat for ease in cutting and to protect the blade and bench top.



Roller cutter for fabric and thin sheet material.

Lastly, Matt shared an assortment of deck screws and driver bits that he found to be very effective for making sound home repairs to decking, fencing, and other heavy construction repairs. Besides coming in a variety of sizes, thread pitches, and driver types, they are also available in different colors and coating types. They are available at any of the big box hardware stores.



Deck screws come in a variety of sizes, driver types, thread pitches, colors, and coatings.

## Problems and Solutions

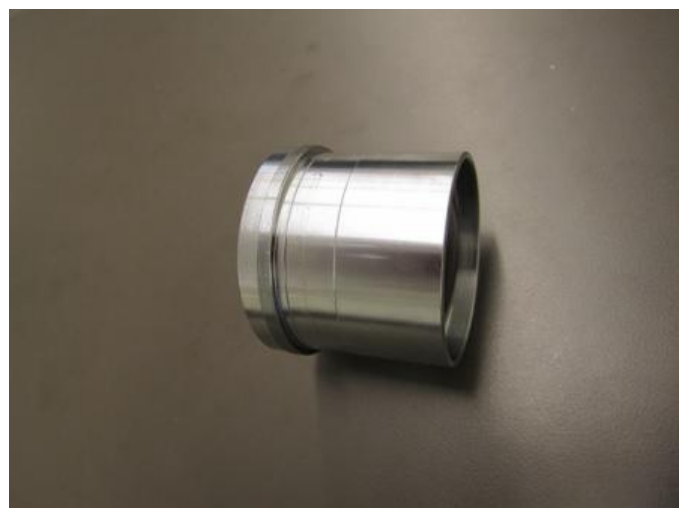
Bob Heil presented a slide show illustrating damage to the custom made rear step bumper of an ambulance used by the Redondo Beach Community Emergency Response Team (CERT.) The ambulance had been donated to the volunteer CERT program and there is no budget for repairs.

Bob asked for ideas on how to get the bumper repaired at little or no expense. Club members offered several ideas, giving Bob some promising avenues to explore.



Bob Heil requested input on how to repair the rear bumper of this CERT ambulance.

Leonard Vorhis showed an eyepiece for a large telescope. It is constructed of thin-wall stainless steel tubing. It has external threads on one end, and internal threads and a lens on the other. The eye piece has some light dimple marks around its periphery where its securing screws made contact. Leonard asked the group how to hold the eyepiece in a lathe without crushing it so he can take a skim cut and remove the dimple marks. One suggestion was to make a threaded arbor to match the internal threads of the eyepiece, thread the eyepiece securely onto the arbor, and take very light cuts with a sharp cutting tool.



Leonard Vorhis asked how to safely hold this delicate telescope eyepiece in the lathe.

## Articles

### The August 21, 2017 Total Solar Eclipse

By: Larry McDavid

I observed a glorious total solar eclipse from near Casper, Wyoming on Monday, August 21. No clouds were seen and the weather was cool and quite pleasant with strong sunlight. At eclipse totality, there were unexpected streamers and unexpected structural detail in the bright white solar corona, three red coronal prominences and a superb diamond ring at third contact. Simply Wow!



*2017 Total Solar Eclipse during "Totality." The photograph exposure covered up the three red solar prominences in this picture.*

There were 262 in our eclipse tour group; I've used this tour group for four solar eclipses and know many of the regulars. I was surprised at the pre-eclipse coordination meeting to find that the vast majority of tour members were "eclipse virgins," never before having seen a total solar eclipse. We set up at our primary viewing site at Glendo Airport, Wyoming within 100 meters of the eclipse path centerline, because it was clear weather there early Monday morning. The City of Glendo population is 1500 but had 90,000 visitors on August 21!

Glendo "Airport" is a bit of a stretch! In actuality, the airport is quite large but has only one grass runway, is unattended and is used primarily for ultralight aircraft. The proper name is Thomas Memorial Airport. However, the vast (remember, this is Wyoming!) grass fields were a great place to host the huge crowd of eclipse viewers. Fortunately, the entire field had been mowed in preparation for the visitors.

We left our hotel at 4:30 am to avoid traffic in the 1 hour drive from Casper to the Glendo airport; that worked well. We had the only reserved area at the

airport, a 40 x 120 foot awning for shade, 300 chairs and lots of snacks and drinks. All that was possible because our tour planning for this eclipse event began four years ago. The downside was that everyone at the airport left shortly after fourth contact and there was a monumental traffic jam. We were in five buses and drove northwest to Casper but the folks trying to drive southeast to Denver were projected to be in a traffic jam until the next morning! For miles and miles and miles there was no movement in that traffic after the eclipse!

One remaining tour event, a celebratory BBQ dinner, was Monday night. My bus for Denver left the Casper hotel at 8 am Tuesday. I'm bushed! But, I enjoyed an excellent, better than most (for sure), eclipse viewing and I got to watch it with my own eyes because this time I was not tied to a camera/telescope. I did take some cell phone video and got crowd sounds at totality! This was my seventh solar eclipse viewing.

Amazingly, my son Matthew and his family (ages 3+ and 5+) drove from Chino, California to Oregon on Saturday night (a 20 hour drive with traffic), stayed at a friend's home in Oregon, then drove 100 miles on Monday morning to park in a pullout area on Hwy 5 exactly on the eclipse centerline! He had no clouds and the whole family watched the eclipse. There were several other families there, including a German couple who shared wine after the eclipse. I took Matt to the 1991 total solar eclipse in Cabo San Lucas when he was age 9. Now it seems he is continuing that tradition!

This was one of the most enjoyable of all the eclipses I've viewed! The sky was dark at totality, the solar corona bright and full of detail, there were red solar prominences, a pinpoint, searchlight-bright white diamond ring at third contact and a spectacular 360 degree sunset during totality. The air temperature dropped sharply; that makes you appreciate how much energy we get from the Sun!

Some news pundits were saying that if you were already in a location that would get a 99% eclipse there was nothing to be gained by traveling to get to totality! That is absolutely false! If you have never seen a total solar eclipse it is difficult to appreciate or to describe how spectacular totality really is! But, you must go to where the eclipse happens and that has surly sent me to some strange, remote places over many years!

Solar eclipses are punctuated by four \*instants\* of time: First Contact, Second Contact, Third Contact and Fourth Contact. Think of two round disks of slightly different diameters approaching each other.

When one disk first touches the other disk, that is First Contact. Then, the disks cross each other (the Sun and moon centers are coincident for an instant if you are located on the eclipse centerline). When the two disks just cease to touch each other, that is Fourth Contact.

The interesting stuff happens at Second Contact and Third Contact! Totality is defined as the period between Second Contact and Third Contact. Remember the moon has mountains and valleys! So, the lunar disk edge is not a smooth circle. At Second Contact and at Third Contact the sun's chromosphere is visible through the valleys on the moon; that produces "Bailey's Beads," irregular bright spots on a very thin arc of the sun visible around the perimeter of the moon. At the final instant, a single bright spot of the sun is visible at the center of a thin arc of the sun; that is the famous "Diamond Ring." It literally looks like the bright reflection of a diamond on a wedding ring. The same sequence is repeated at Third Contact.



*Progression as totality ends; here you can see solar prominences. Left half of photo shows Bailey's Beads; Right half shows Diamond Ring forming.*

But, I specifically mentioned the Diamond Ring at Third Contact as being bright and spectacular. Why? Well, think about it! Between First Contact and Second Contact you are standing in some sunlight and your eyes are adapted for bright light. At Third Contact you have been standing in darkness for several minutes (2-1/2 minutes for this solar eclipse) of almost darkness and your eyes are night-adapted. So, the bright spot of the sun appears shockingly bright in the Diamond Ring! It is so bright and so localized to a tiny spot that it appears white in color.

Celestia mechanics rules eclipses! If the moon is farther away from Earth, it does not cover the sun and an "annular" eclipse happens. If you are not on the eclipse centerline, you get a "partial" eclipse as Los Angeles did on August 21. Both are Dullsville... Did I say only totality matters?



*Diamond Ring at Third Contact*

Between First Contact and Second Contact and between Third Contact and Fourth Contact, you *\*must\** use solar filters or use eclipse glasses. During totality you *\*must\** remove those or you will see *\*nothing\** at all! Totality is the only time you can look at the sun without any eye protection. There is an interval of several seconds (maybe up to ten seconds) near totality when you need to remove the eclipse filters in order to better see Bailey's Beads and the Diamond Ring. Every eclipse viewer must make that decision himself.

Every eclipse is different! Solar conditions driven by sunspots are different, the celestial geometry is different and often local weather is different. You never really know what totality will look like until it happens. But, it is spectacular!! A 99% solar eclipse is not even a *\*distant\** comparison; you gotta be on the path of totality or you see nothing special. Totality is EVERYTHING.

That's why I have traveled to eclipses in remote places to stand in the darkness (or shadow) of totality. You are in the umbra of the moon at totality. For example, I went to the Altiplano of Bolivia at 15,000 feet elevation for a total solar eclipse. We were in the Bolivian high desert with no people and no development for hundreds of square miles. No roads! We rented three all-wheel-drive buses for the trek from our hotel to the eclipse centerline; we needed two buses for the 60 in our tour group but rented three in case one broke down going across the desert lands. We forded a river. We had a Bolivian military escort (sixty obviously "wealthy" visitors!).

The maximum possible duration of totality is about 7-1/2 minutes long. Why the different lengths of totality? Celestial mechanics rules! Remember the Earth's orbit and the Moon's orbit are not circles but ellipses. That means that when the moon passes in



front of the sun and casts a shadow down on the Earth, its apparent diameter (driven by its closeness to Earth) determines how long the moon will cover the Sun.

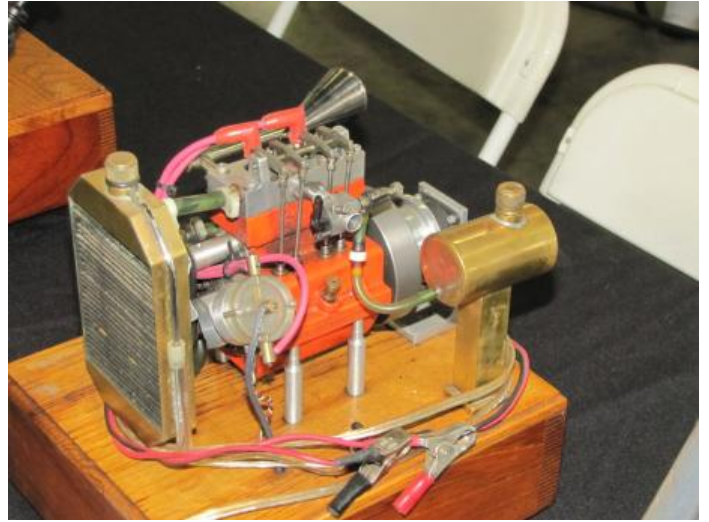
All the interesting stuff happens at Second Contact and Third Contact. People scream. People cry. People shout: "Bailey's Beads," "Diamond Ring" and then you hear, "Oooohh, "Wow!" At Second Contact you hear all this and then, usually, silence! People are so awestruck it just gets quiet. It surely did in Wyoming. A few folks planned to play music and brought guitars; none played. Totality was so

overwhelming they just forgot. If you are not in totality, none of this happens. It is an incredible experience and everyone should do what it takes to get to totality for a solar eclipse at least once in his lifetime.

## Western Engine and Model Exhibition

Photos Courtesy of Millar Farewell







# 2017 GoodGuys West Coast Nationals

Photos Courtesy of Millar Farewell







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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).

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