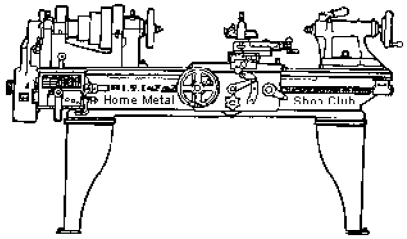
Home Metal Shop Club

September 2009
Newsletter

Volume 14 Number 9



http://www.homemetalshopclub.org/

Since its founding by John Korman in 1996, The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members always like to talk 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 a presentation with Q&A, followed by ***show and tell*** where the members can share their work and experiences.

President	Vice President	Treasurer	Secretary	Librarian
Vance Burns	*John Hoff*	*Emmett Carstens*	*Dick Kostelnicek*	*Dan Harper*
Webmaster	**Photographer**	**CNC SIG**	**Casting SIG**	**Novice SIG**
Dick Kostelnicek	*Jan Rowland*	*Dennis Cranston*	*Tom Moore*	*Rich Pichler*

About the Upcoming October 10 Meetings

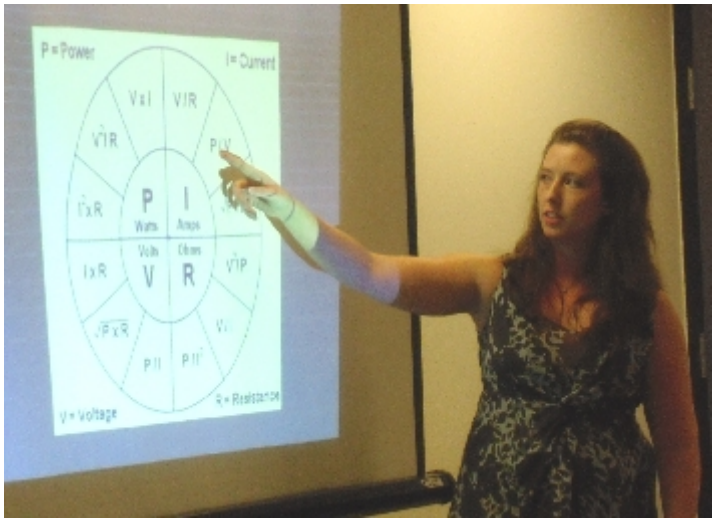
We're meeting at the Freed-Montrose library at 1:00 p.m. A business meeting will convene at the snack shop next to the Freed-Montrose Library entrance at 11:30 p.m. Bill Swann and Adam Hampton will be talking about the design and control of a tracking photovoltaic array. Visit http://www.homemetalshopclub.org/events.html for details about upcoming events.

Recap of the September 12 Regular Meeting

Thirty members attended the 2:00 p.m. meeting at the Looscan library. John Hoff reminded everyone to pay his or her $15 dues to Dennis Cranston, who was filling in for the club treasurer.

Recap of September 12 Business Meeting

Future business meetings will be held in the snack bar near the library entrance. The expense and group cover charge at the previous establishment was deemed prohibitive.



Presentation

Crystal Brock of Plante's Commercial Roofing LLC discussed the costs of installing photovoltaic panels and support equipment on Houston area roofs. The initial and operating cost together with the lack of tax and electric provider incentives makes it difficult to justify photovoltaic electric sourcing in our area at this time. For commercial establishments with other than bottom line financial interests, it appears that electricity from solar may still be viable.

Show & Tell

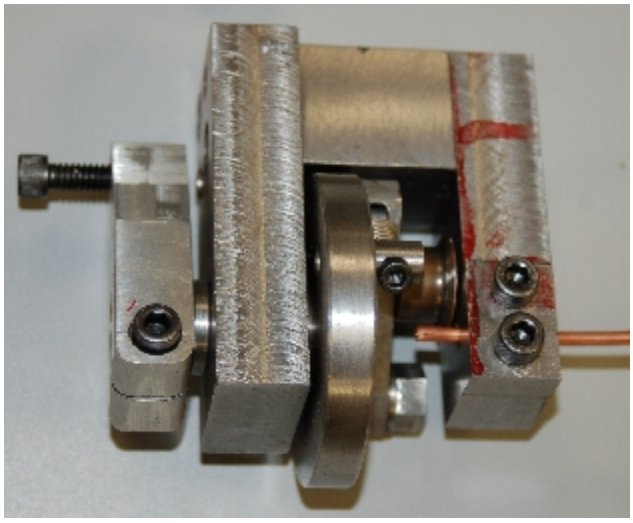
Alan May showed his version of Jerry Howell's "Miser" low temperature Stirling cycle engine. The raw metal for his engine was purchased by John Korman for a *Group Project* during the formative years of the HMSC club.

Jerry Howell died recently, but his web site still remains an inspiration to all model engine enthusiasts http://www.jerry-howell.com/Miser.html.

Alan May thought that it was *hi-time* to finish his model Stirling engine. He also showed his miniature nut driver made from an inverted cap head screw (above right photo).

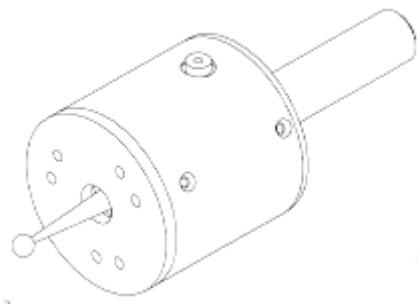
Alan then passed around his version of Rod Shampine's screw puzzle published in the December 2001 HMSC news letter. http://www.homemetalshopclub.org/news/dec01/dec01.html - sneaky puzzle

Joe Scott showed some old trade school training program manuals. Most secondary schools no longer provide *manual training* as it was called during the previous century. Joe also demonstrated the use of forming dies that he made to produce antique gun reproduction parts (right photo).



John Hoff showed his solution for cutting and dressing the end of 1/8 inch copper tubing. He was dissatisfied with commercial tube cutters, and made his own. The device has an axial guide hole that allows a drill bit to ream out the cut end of the tubing. Several club members mentioned that for small tubing, such as capillary copper tube, they are best cut by nicking with a 3-corner file and breaking by hand. This works when the tube's wall thickness is greater than its inner diameter. Breaking also prevents small particles from entering the tube as might happen during a reaming operation.

Martin Kennedy demonstrated his cam lock modification. It replaces the stock screw and nut used for clamping the tailstock to his Harbor Freight Lathe's bed (right photo).



J, R. Williams passed around copies of the summer issue of Digital Machinist magazine that published his article entitled "Touch-trigger Contact Probe" (left drawing).

Joe's article on a variable speed "Drill Press Motor Installation" appears below in this newsletter.

Dick Kostelnicek talked about "Duck" and "Duct" tape. Both are correct usage. Prior to the wide spread use of centralized HVAC, Duck Tape was developed to seal ammunition cased during WW2. Because it repelled water, it was named after the waterfowl. Central air condition and its attendant ducting and sealing needs referred to a sticky impermeable, usually gray colored, tape as Duct Tape. Today it comes in all colors and is used as a means for a "quick-fixer-up."

Another common reference to the DUCK is in the fabric world. Duck Canvas is a tight cotton weave that is naturally waterproof. During WW2, soldiers used the infamous Canvas Shelter Halves to get out from under inclement weather. Two soldiers snapped together their shelter half panels to form of an "A" shaped tent, each providing a single support pole and several stakes. They claimed that the rain rolled off the canvas like water off a Duck's back, at least till the surface tension was broken by touching it on the dry side, Campers who have used Duck Canvas Tarp Tents can attest to its ability to shed water and subsequently leak during a prolonged rain shower.

Duck canvas is specified by its weight in ounces per square yard. Tarps made from canvas duck are often called-out by a gauge number. Subtract the weight from 19 to get the tarp gage. A number-1 canvas tarp is made from 18-oz. canvas duck.

Articles

Drill Press Motor Installation

By *J. R. Williams*

The topic of installing a motor speed control system on a drill press was discussed at length the other day with a Club member. This prompted me to take a few photos of my variable speed bench top drill press.

The conversion was prompted when I obtained a surplus DC motor and controller from a junked treadmill. The motor is a high quality unit, by Baldor, and is rated at 1 hp. It has more than sufficient power for a drill press application. The press' original motor was rated at ¾ hp.

I tossed out the old light weight motor mount and construct a new one using a larger plate and new support shafts that extend into the main casting. In the above photo of the motor mount there is an additional ¼" thick plate supporting the motor, because I didn't make the mounting shafts long enough to accommodate the existing drive belt. The shafts are held to the plate with 3/8" flat head cap screws.

The control chassis for the motor was installed in a box fabricated from my scrap pile and includes a power switch and fuse. The box could have been made much larger, as it is crowded. The power for the system is plugged into a junction box mounted on the left side of the main casting.

The speed control is connected to two push buttons on the right side of the main On-Off push button housing (top right photo). The control chassis is designed for treadmill service and when the power is turned on, the button for increasing the speed must be held down till the desired spindle RPM is obtained. The button lowering the speed operates in similar fashion. This is a minor problem, as the unit has to be started from zero when the main is power turned on by the green push button. The control's manufacture, Minark, does not provide schematics. They claim that the unit and its documentation are the provenance of the company producing the treadmill.

I have another drill press with a smaller treadmill motor with a commercial power unit that has provided me with good service. My next shop tool modification is to come up with a larger motor and control for my 20" Clausing drill press. It has a variable pulley drive, but I would like to have a slower speed capability.

That's got nothing to do with it!

By *Dick Kostelnicek*

We converged on Tulsa. It was the eve of a four-day Thanksgiving holiday. Technicians came from surrounding regional field offices, while the logging truck was en route from a well-service company in Houston. I flew in a day earlier to get some needed rest before our arduous task. Over the next few days I would be *observing* and *advising* on the deployment of a new seismic listening instrument or *sonde* as it was lowered into an oil well. Now, *observing* and *advising* is where a consultant gets blamed when things go awry but applauds his client's achievements after a successful outcome. In either case, he submits both report and invoice, and *smiles silently* on his way to the bank. My story is not about oil wells per se, but rather the calamitous events that would befall that logging truck.

It's just a big box-like cab sitting atop the frame of a beefed-up 10-wheeled truck frame. A logging truck must travel over all sorts of terrain and operate its equipment continuously and independently of external power. Mounted at its rear is a large drum winch upon which tens of thousands of feet of wire line (armored multi-pair electrical cable) is wound. Inside the instrument cab is a plethora of computers. They record and decipher information that is gleaned form the logging tool, in this case a *sonde.* The tool is attached to the wire line, as it is spooled off into the depths of the earth. A logging truck is the essence of a mechanic's dream, fitted with pumps, motors, gears, levers, cables, and electronics of all kinds. Even the smell, roar, and heat from its diesel engine excited me.

At breakfast, I was told that the truck broke down upon arriving in Tulsa. It was serviced by a mobile truck repair outfit and would meet us at the well site. Now, we often did our work after an oil well was proven a dry hole and all economic interest had waned. This time was different. We were dealing with a deep test well, not an oil prospect. It was deemed safe, no produced gas, no high pressures, and not the slightest chance of blow out. Drilling had ceased with the rig's crew scattered to their homes to enjoy the long holiday weekend. We were left alone, without their support. Our success or failure wouldn't suffer the gaze of idle rig hands watching our spectacle.

The truck was positioned on a gravel covered pad with the wire line cable passing over a sheave placed atop the drill rig's derrick. Our *sonde* lay on the rig floor attached to the end of the cable. We were ready to *go down hole*. I usually stayed out of everyone's way. Let them do their job! If trouble came, I would be summoned. The *sonde* was inserted into the hole and the trip down to 20,000 feet went without incident. At TD (total depth) I watched with casual interest as the drum winch paused and then reversed for the slow journey back up to the surface. But, soon its movement became erratic. Back and forth, 20 feet up then 10 down. Now, as you watch a problem develop, sometimes an unrelated incident passes your gaze. One of the truck cab's running lights, left on both night and day, went out. Just one of those things, I thought. It has to happen some time and I was watching.

Soon, the technicians were hurriedly in then out of the truck. They opened several of its access panels while pointing inside and shouting to one another, "SMOKE!" Something was seriously wrong. Now, I was the technical observer-advisor and this was an operational problem. So, I observed. There goes another running light! Now, what's the probability of seeing two go out within a few minutes time?

Then it happened. The truck's engine quit. Never is the engine allowed to shut down with cable down hole. This had now become my problem. The tension on 20,000 feet of wire line cable, due to its own weight alone, is enormous. Fluid pressure at the bottom of the hole might reach 10,000 pounds per square inch. Half way up hole, the combination of pressure and tension can force a cable to cut into the earth's rock formation. This is called *key seating the cable*. Constant cable movement is the way to prevent such a disaster. When a cable is *key seated*, operations cease, and you're in big trouble. Our *sonde* was at the bottom of the hole and it was paramount that we start moving it up.

"What's going on with the winch?" was my query to Ron, the guy in charge. He snapped back "Everything's out, no power!" Now, a logging truck has several sources of power. When parked, its diesel traction engine turns a 220-volt 3-phase alternator that runs both the computers and air conditioner. The winch's drive motor operates hydraulically from a pump, also connected to the engine. All control circuits, especially those that command the winch, operate on low voltage supplied by the truck's battery. I told Ron about the running light that went out around the time of the winch failure. His terse reply was, "That's got nothing to do with it! They're on battery." Well, you don't want to ask more dumb questions of a man who has his hands full. So, I went over to one of the other technicians, as he stood there bewildered. I asked if I could borrow him, a screwdriver, and a voltmeter. We removed the lens cover from one of the lower, but still lit, truck marker lights and removed the bulb. The meter read 22 volts. "That's impossible!" was the tech's response. "We just replaced the truck's battery."

So, back to the headman to ask my second dumb question, "Do you know that the trucks battery is 22 volts?" "IMPOSSIBLE!" Ron shouted back. "I put new batteries in last night." "May I see them?" was my reply. "Sure, come here!" as Ron swung up the truck driver's cab to reveal its battery bank. He told me the alternator went out last night. After parking, the motel's owner asked him to move his truck around back. He couldn't restart the engine. The battery was dead. Ron called a mobile repair service and they replaced the alternator. Because our test was such an important job, Ron had them also replace all of the truck's batteries.

The battery bank on this behemoth truck was composed of four individual large 6-volt batteries connected in series-parallel. And indeed, that's how they appeared wired to both of us. My voltmeter, when placed across chassis ground and the truck battery's positive feed cable, still indicated 22 volts.

Now, there comes a time when two people facing a dilemma simultaneously arrive at the same conclusion. Call it that *aha* moment. We both saw that the number of cells in each individual battery was 6 and not 3. All four of the original 6-volt batteries had been replaced with similar sized 12-volt ones. The truck was running on 24, not 12 volts.

Ron and I knew what had happened. We said little to one another the rest of the day, both confident in his newly found wisdom. We went about picking up the pieces caused by a *sonde* stuck in a 4-mile deep Oklahoma hole. But, that's a story for another time.

Here's my understanding of the events that transpired. Ron noticed that the truck's headlamps were dim the evening he arrived in Tulsa. When the truck couldn't be restarted, he correctly surmised that the alternator had gone out and the battery was dead. During the journey, his truck had been running on a declining battery. After replacing the alternator and installing new batteries, he was surprised that the truck unexpectedly sprung to life as he turned the key. The headlamps also appeared brighter than usual. "Maybe I was just tired and seeing things after that long drive from Houston," he recalled.

At the well site, the next day, all went well till the winch malfunctioned at TD. Excessive battery voltage *fried* the winch's control relays and solenoids. Recall the smoke. When the winch operator tried to reverse direction, he lost control. As I watched the truck's running lights burn out from high battery voltage, I was bewildered rather than alarmed. The truck's engine quit when the coil in its electric fuel valve finally burned up. A diesel engine is shut down by starving it of fuel rather than by switching off an ignition.

I learn an important lesson from that truck and the retort *"That's got nothing to do with it!*" Incidental observations are often clues leading to the solution of a baffling mystery.