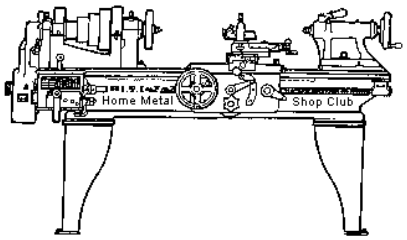
Home Metal Shop Club

February 2012
Newsletter

Volume 17 - Number 2



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 a presentation with Q&A, followed by ***show and tell*** where the members can share their work and experiences.

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

About the Upcoming March 10 Meeting

General meetings are usually held on the second Saturday of each month at 12:00 noon in the meeting rooms of the Parker Williams County Library, 10851 Scarsdale Boulevard, Houston, TX 77089. The meeting location and time has been confirmed through March. The next meeting will be held on March 10th.

Visit our website for up-to-the-minute details and for meeting topic.

Recap of the February 11 General Meeting

By Martin Kennedy, with photos by Jan Rowland, John Hoff, Martin Kennedy and Dick Kostelnicek

Vance Burns

Thirty-three members and three guests – Gary Stevens, Norm Burls and Filip Balica - attended the 12:00 noon meeting at the Parker Williams County Library. President *Vance Burns* led the meeting.

Club Treasurer *Emmett Carstens* reported that the total paid membership is now 44.

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 - Editor Dick Kostelnicek.

Ideas for programs at our monthly meeting are always welcome. If you have an idea for a meeting topic, or if you know someone that could make a presentation, please contact John Hoff.

The officers and members of the Home Metal Shop Club send their condolences to the family of *Rickey Rouse*, a lifelong machinist and one of our former members who passed away recently.

Presentation

John Hoff

This month, we had three presentations, two from John Hoff and one from Martin Kennedy.

John Hoff, our club Vice-President, showed photographs that he took at the recent Cabin Fever 2012 model engineering show and auction held during the January 14th weekend in York, PA.

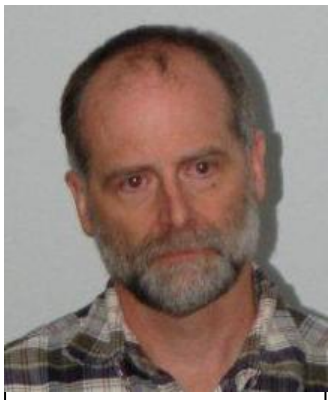
The show was held in two large halls. Over 100 exhibitors were present. Although the most common models shown were hit and miss engines, many other detailed models were shown; including a Harley Davidson engine, multiple car engine models, a 22 caliber Gatling gun, a merry go round, cylindrical aircraft engines, a scale machine shop, locomotives, steam tractors and a full size 1901 steam powered car. Several steamboats were demonstrated in a large shallow water tank located in one of the halls. A large sandbox was used to demonstrate shovels, trucks and other earthmoving models. Machining techniques, such as EDM, were demonstrated. Other displays were of antique model boats and airplane engines.

John Hoff then talked about punch dies and precision radius grinding (left photo). He showed several pictures of different types and sizes of surface grinders. When surface grinding, the tooling used includes, a good surface plate, the grinder itself, a height gauge, gauge blocks, a diamond point radius cutter to dress the grinding wheel to the desired shape, a dial indicator, and a grinding vice.

John is working on a project to make a gun ammo clip (right photo) that is no longer commercially available for

one of our club members. John's example from that project was a cut that he made first with punch and die, then finished with a precision grind.

He made the punch dies within 0.0005 -.0010 of the final size. The dies were then heat-treated. The final step was to grind the precision finish to the exact dimension. For inside and outside dies, he heat-treated the inside die, but not the outside. He then used the hardened inside die to push through the relatively soft outside die to make an exact fit. The outside die was then heat-treated.

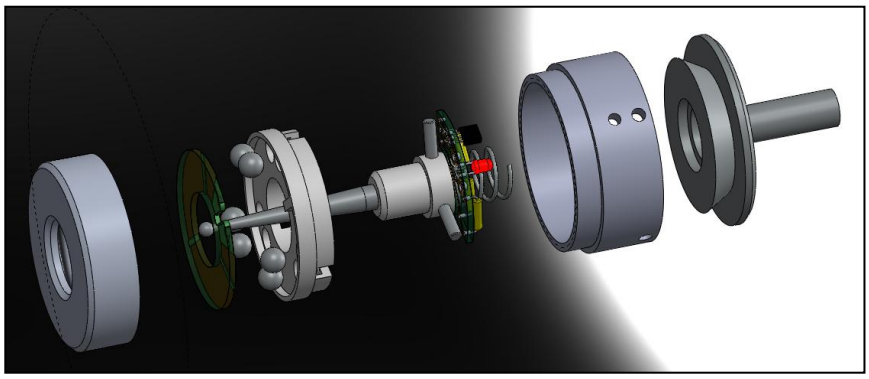


Martin Kennedy

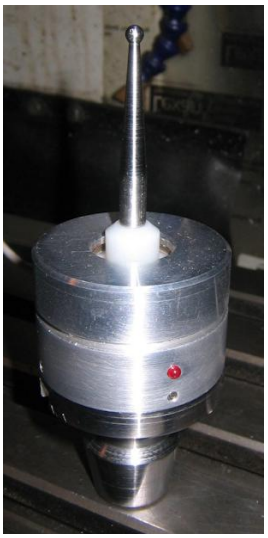
Martin Kennedy, our club secretary, gave a presentation – click here for slides - covering many aspects of a project to build an electronic probe for his mill, from research through design and construction.

Martin decided that he wanted an electronic probe to help set the zero position on his CNC mill. He began the presentation by discussing different ways of setting zeros using several types of probes and edge finders, and the accuracy of the methods. This included conventional edge finders, plus other ways of finding edges, such as laser edge finders and video cameras. The capabilities of electronic probes were discussed, including the ability to generate a point cloud with 3D digitizing.

Typical electronic probes utilize a probe connected to three arms that act as three normally closed switches in series. Movement of the probe in the X, Y or Z direction interrupts in the circuit.



Martin began research into what type of probe he wanted over the Internet. Information on many commercial and homebuilt designs was readily available. Commercial probes were very accurate and repeatable, but expensive. Some lower priced commercial probes were found. Another source of information was patents. Patent information can be searched online at the website of the United States Patent and Trademark Office. The applications frequently include detailed design information.



Several homebuilt designs were found in the search. Information available ranged from photos to detailed drawings. Another source of information cited was magazines, and an example of a probe built by a club member and published in Digital Machinist magazine was shown.

Finally, a simple electronic probe with no moving parts was shown.

Ultimately, Martin decided to create his own design (left photo). His design incorporated features that he liked from many of the designs researched. Martin enjoys designing and fabricating parts, and this particular project required precision machining to maintain accuracy of the completed probe.

The evolution of the design through four designs was shown. Each design had desired features that were incorporated in the next design, or undesired features that were eliminated. Complete drawings were produced for the fourth design, and are located below in the articles section of this newsletter.

The probe design centered on an insulated ball carrier made of Delrin. Photos of the machining fixtures and the Delrin part were shown.

An electronic circuit was added to the probe to invert the polarity the signal produced. This made the probe produce a compatible signal with a tool touch-off probe that he also built.

Martin runs Mach3 software on his CNC mill. He looked for add-ins that would allow using the probe on the Mach3 website. A few were available, but the free ones had limited functionality, and the more advanced ones were very expensive. He decided to generate his own software.

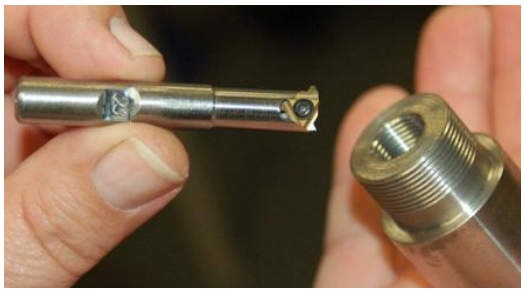
Two videos of the operation of the probe were shown, one on finding the center of a hole, and one on finding the center of a rectangular piece of stock.

Accuracy of the probe was found to be acceptable, from 0.0001" to 0.0003"

Show and Tell

Joe Williams (left photo) purchased an inexpensive tool holder from CDCO tools. – The holder itself was fine, but the top nut was threaded at an angle, making it non-functional. He showed the replacement nut that he received after complaining.

Martin Kennedy had a single point thread mill that he made out of a carbide lathe-threading insert (right photo). He showed left and right hand external and internal threads that he machined with his mill in this video.

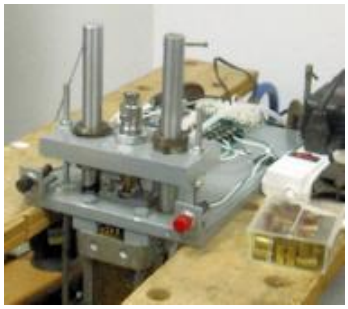


Stan Reves said that he bought Evapo-Rust from Northern Tool. He said that it's the greatest stuff he's ever tried to remove rust, including electrolytic methods. The product is non-toxic, and can be filtered through a coffee filter and reused.

He passed around a "cat-head" lathe chuck sleeve that he built with four setscrews on each end. It can be used with a three-jaw chuck to have some of the capabilities of a four-jaw chuck, such as chucking square stock. He also uses a cat-head with a lathe steady rest.

He made several speed handles, and passed one around. He said that computer mouse balls, after being drilled and tapped, make fine ball ends for a speed handle.

Tom Moore showed some "Lacquer Stick Wipe On Paintstik" markers used to fill in engraved text and numbers with color.



Dennis Cranston built an air-operated cartridge shell reloading press (left photo). The press resizes the casings and punches out the primer. An automatic kicker removes the shell. The press uses an Arduino processor to sequence the operations.

Randy Jacobs passed around a punch that he built (right photo) to put holes in thousands of gift

cards for an art project. Similar to Stan Reves' insight cited above, Randy found that golf balls worked well as ball ends for machine handles.

Stan Reves volunteered to assemble a collection book based on problem solutions submitted by club members. He can be contacted at his email address.

Problems and Solutions

A member had a 1962 international tractor that was leaking 2 GPD of hydraulic fluid from the rockshaft arms (left photo). Upon disassembly, it was found that the bushing was badly worn (right photo), and the forging had 0.125" wear in the bushing housing. The part was no longer commercially available, and too large to put into his mill. He sought advice on repair. It was suggested that using JB weld, Moglice or steel epoxy to fill in the gap around the bushing might work. Other suggestions were to bore the housing and shrink in a new liner. He could build a hand cranked boring tool. One member remembered seeing an article in one of the Bedside Readers in our library.

A member has a mill drill, and wants a digital readout. He wants to make mounts for the glass scales. He wanted to know, should he drill and tap, or clamp the scales on? It was suggested that scales generally come with several mounts, and he should try to use those. He might try DROPros.com, who sell inexpensive parts and documentation on line.

A member removed the gap (removable section of a lathe bed) from his 12" lathe. It was rusty and dirty, and he cleaned it up, including removing some Bondo on the casting. Now it does not fit correctly. One member recounted how he had built a jig to clamp on the ways, which he could then use for reference. Another member said that it could be that the bed is slightly twisted, and shimming the lathe base might clear up the problem.

A member sought a good supply for gun bluing, and was referred to Brownells.

A member was rebuilding a Bridgeport mill, and needed help replacing the variable speed bushings. Another member said that he had done that on his mill, and was willing to help.

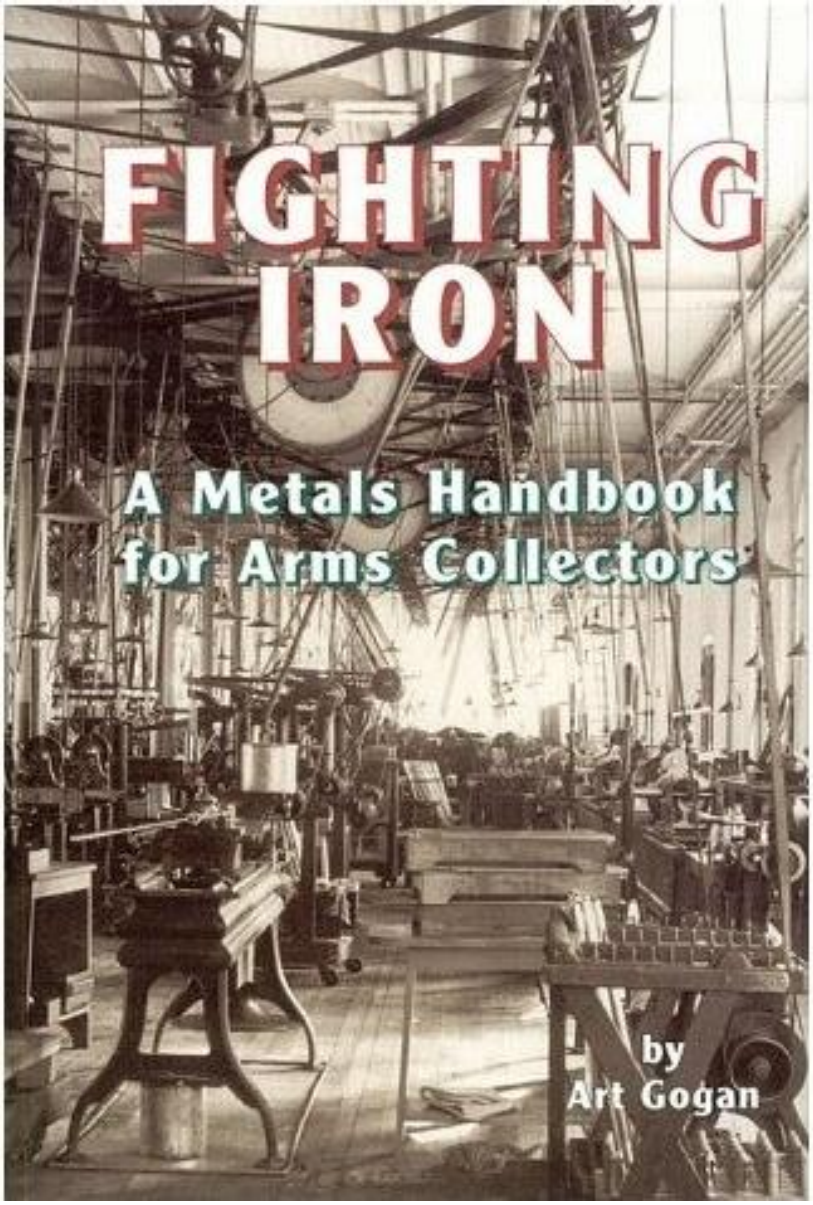
Novice SIG Activities

Rich Pichler and the novice group discussed and practiced grinding and sharpening of various tools. Rich had many examples of tools and equipment to illustrate grinding (right photo).

Articles

FIGHTING IRON *a book report*

A Metals Handbook for Arms Collectors - by Art Gogan - Reviewed by Vance Burns



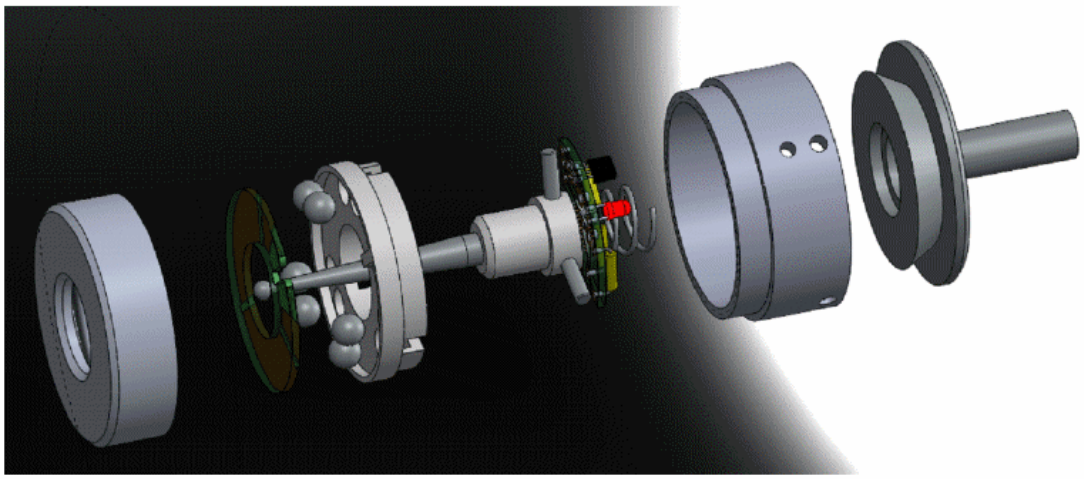
A dear friend loaned me this volume, and I am so glad he did. The author Art Gogan has taken pains to gather metallurgical information on historic weaponry, and presenting it in a most approachable format.

If you are a collector, restorer, or just own some piece of fighting history, you will find this volume to be a gold mine of information, and a careful overview of how your period piece can be better understood, *even authenticated.* If you are just a closet metallurgist, as am I, you will begin to understand the materials evolution of our historic past and see deeper into the mindset of arms inventors through the ages.

As with most “systems of knowledge” Metals Science is burdened with a near endless stream of unique nouns, some logical, some merely marketing fluff. Pile it on for a few centuries, salt with anachronism, avoid anything resembling standardization, and stir in an army of pitchmen. Gogan to the rescue; His book touches on all aspects, manufacturer's nomenclature, cross referenced, sorted and filtered. Grogan cuts through the layers of confusion.

Art discusses diagnostic techniques, and what to expect of things like x-rays, ultrasonics - when they might be helpful, and when they are not. He further touches on what must be every type of metal used in ordnance, ferrous & non. There is also a section on bringing out worn or corroded stampings and serial numbers.

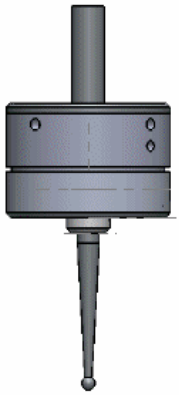
Navy Chief Petty Officer Arthur J. Gogan was a Naval metallurgist and a President of the “Winchester Arms Collectors”, Art worked at the Fort Douglas Military Museum, and set up Fort Douglas' Cannon Park - creating it and restoring many of its late-19th century and early 20th century cannons.



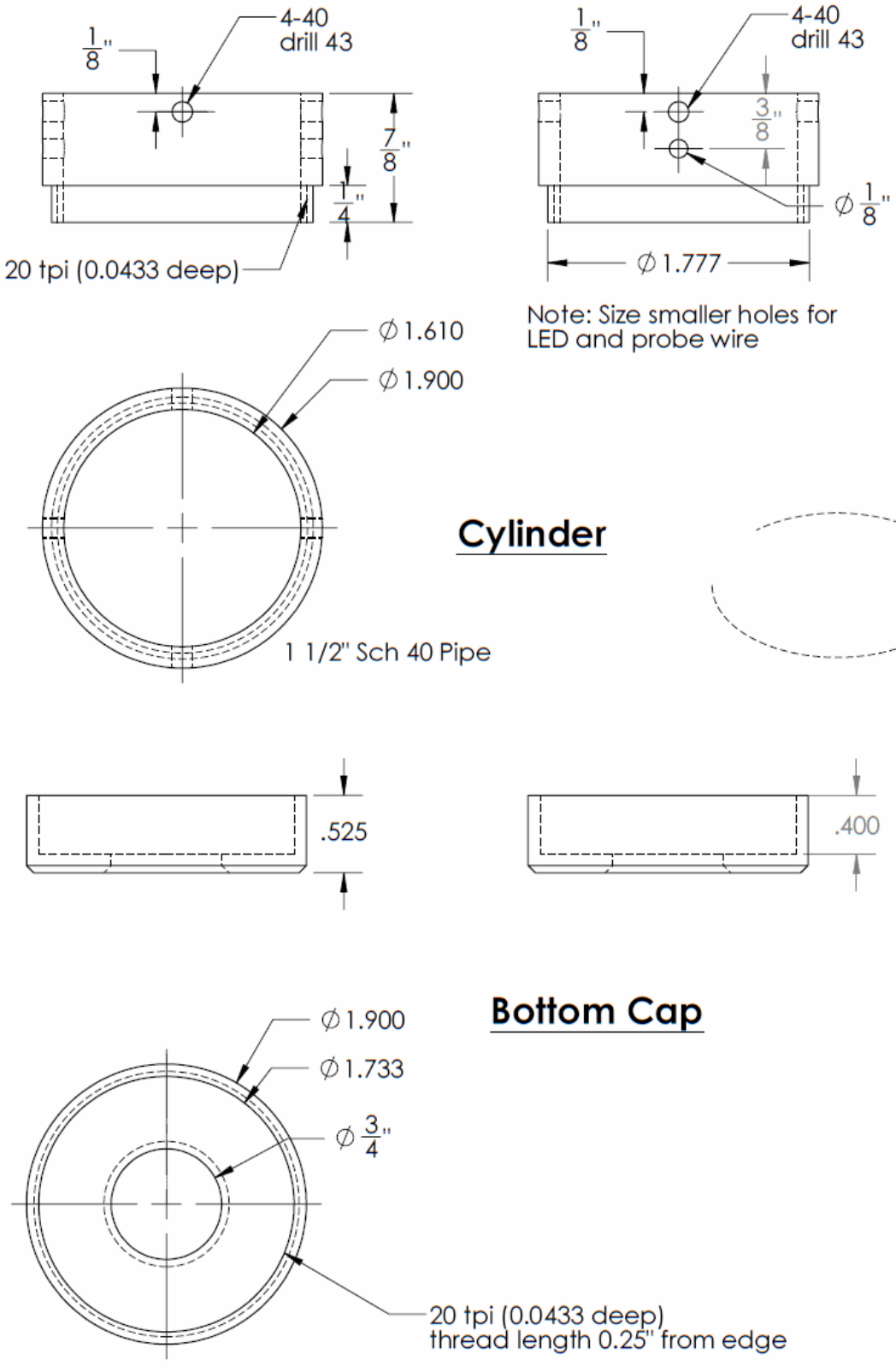
Touch Probe

by Martin Kennedy

February, 2012



SIZE	FILE NAME	REV.
A	Touch Probe Drawings	A
SCALE 1:1	Touch Probe	SHEET 1 OF 7


1/8"
4-40
drill 43
7/8"
1/4"
20 tpi (0.0433 deep)
1/8"
4-40
drill 43
3/8"
Ø 1/8"
Ø 1.777
Note: Size smaller holes for
LED and probe wire
Ø 1.610
Ø 1.900
1 1/2" Sch 40 Pipe
Cylinder
.525
.400
Bottom Cap
Ø 1.900
Ø 1.733
Ø 3/4"
20 tpi (0.0433 deep)
thread length 0.25" from edge
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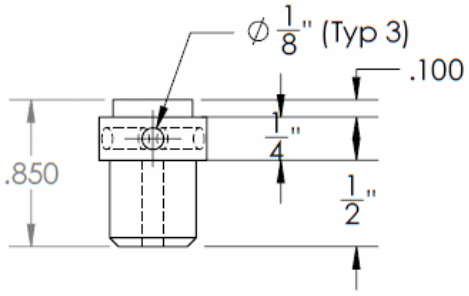
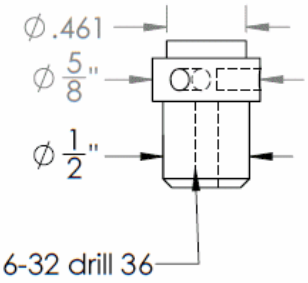
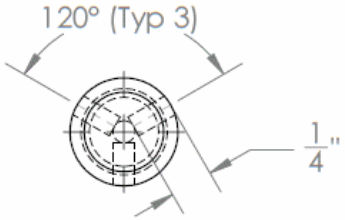
SIZE A
FILE NAME Touch Probe Drawings
REV. A
SCALE 1:1
Cylinder and Bottom Cap
SHEET 2 OF 7



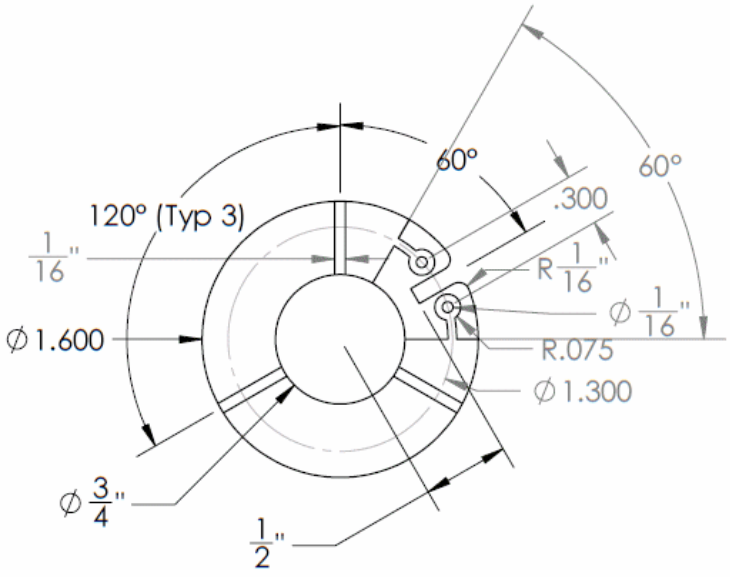
Modify top dimension to match ID of spring



Note holes do not intersect - Need electrical isolation



Spider



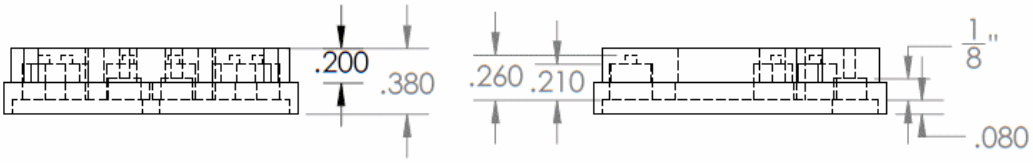
Circuit Board

Pads optional

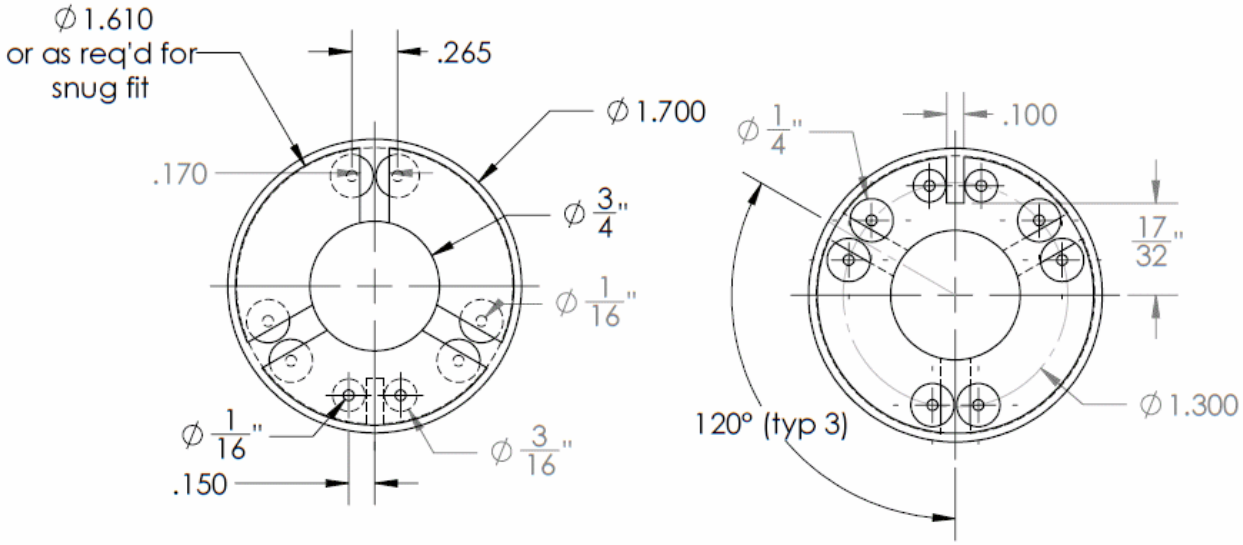
Depth of slots sufficient to cut through conductive layer. Hole through pads does not go through board.

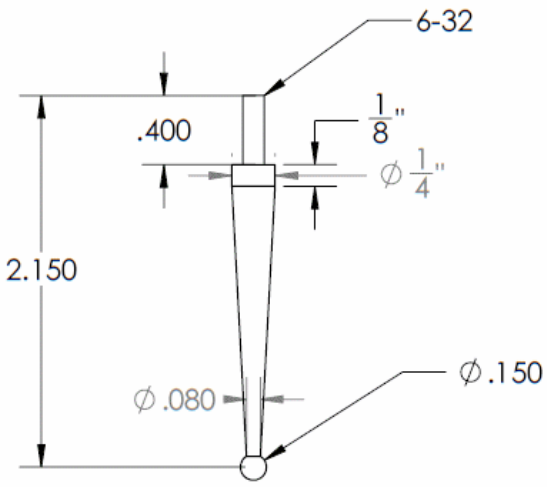
SIZE	FILE NAME	REV.
A	Touch Probe Drawings	A
SCALE 1:1	Spider and Circuit Board	SHEET 3 OF 7

Use 1/4" bearing balls



Bearing Carrier





Measurement Tip

SIZE	FILE NAME	REV.
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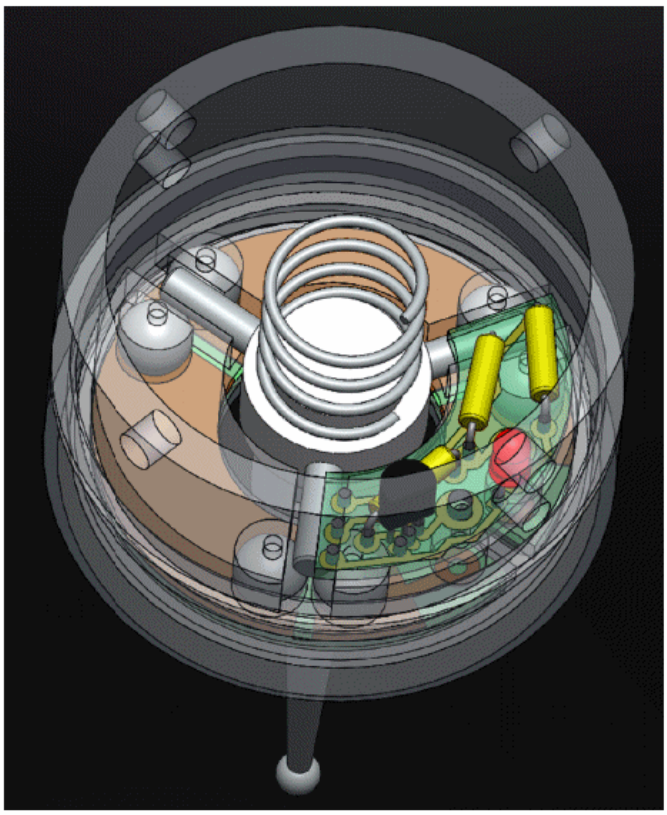
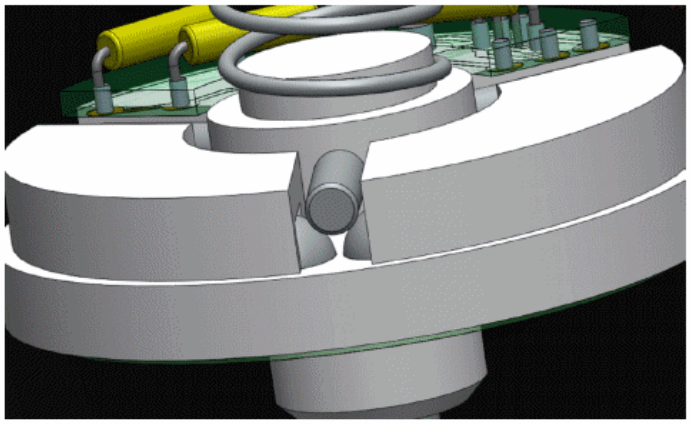
SCALE 1:1	Carrier and Tip	SHEET 4 OF 7





SIZE	FILE NAME	REV.
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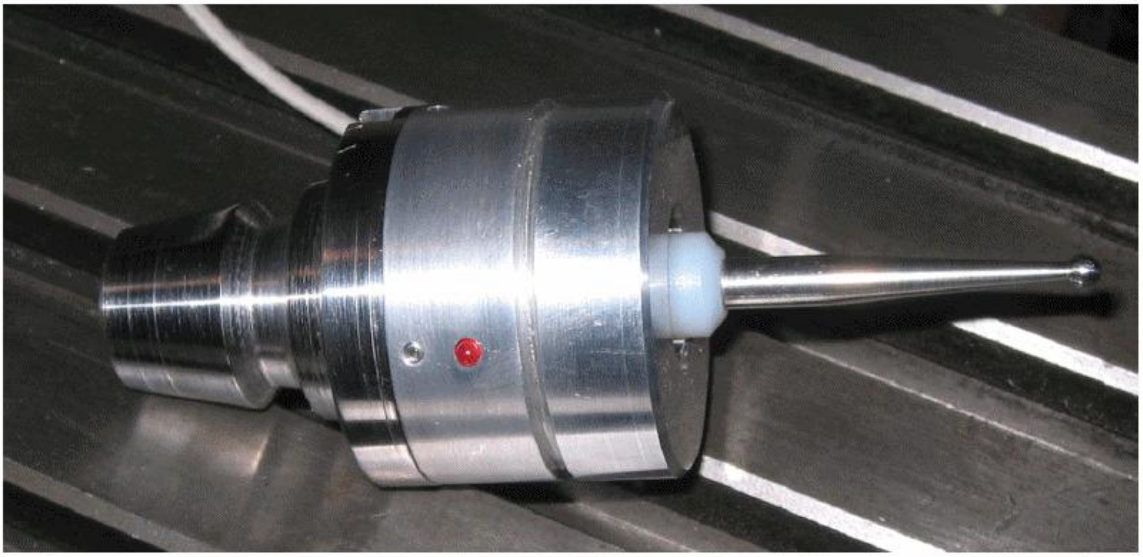
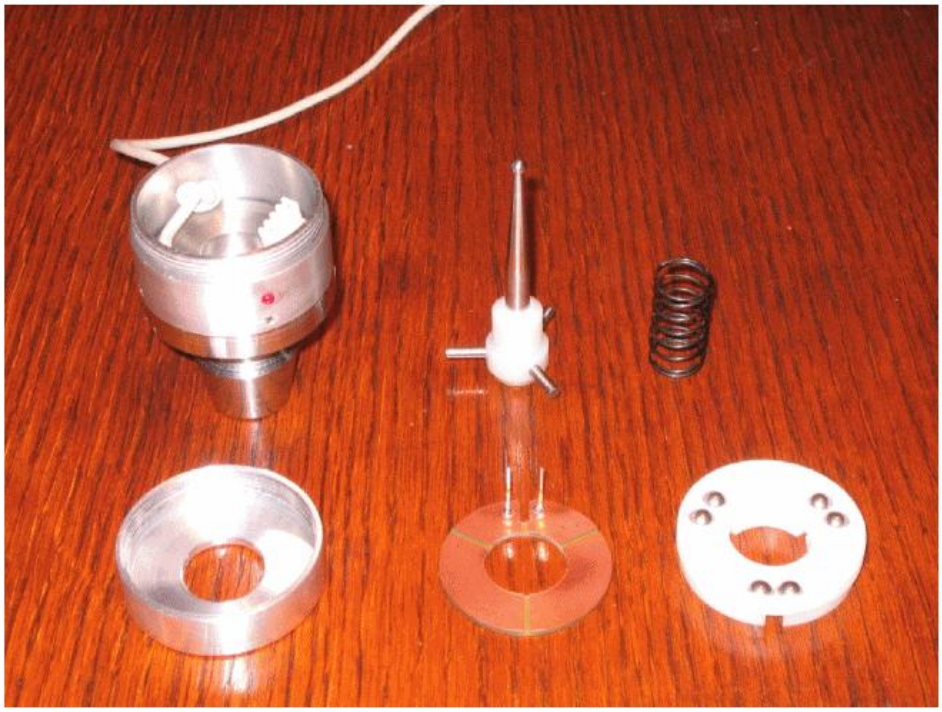
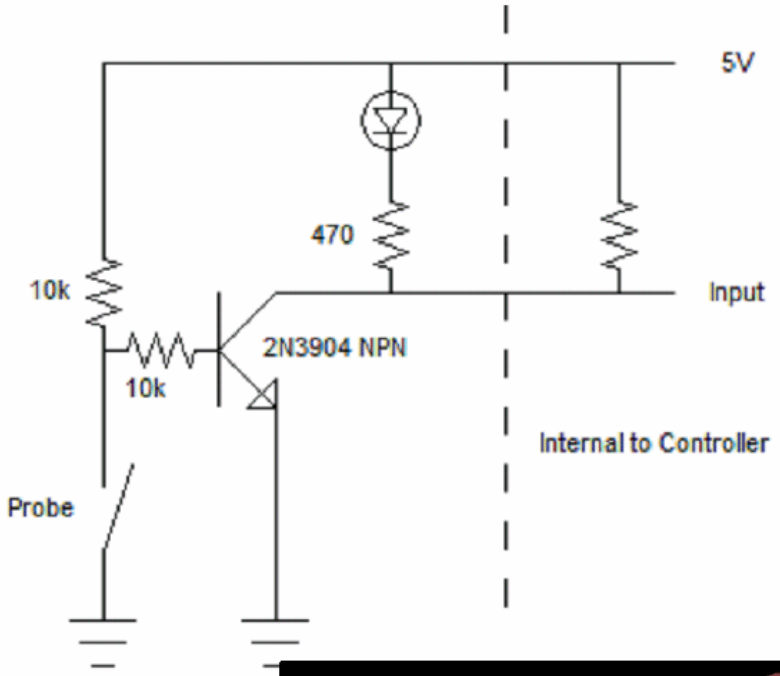
SCALE 1:1	Views	SHEET 5 OF 7

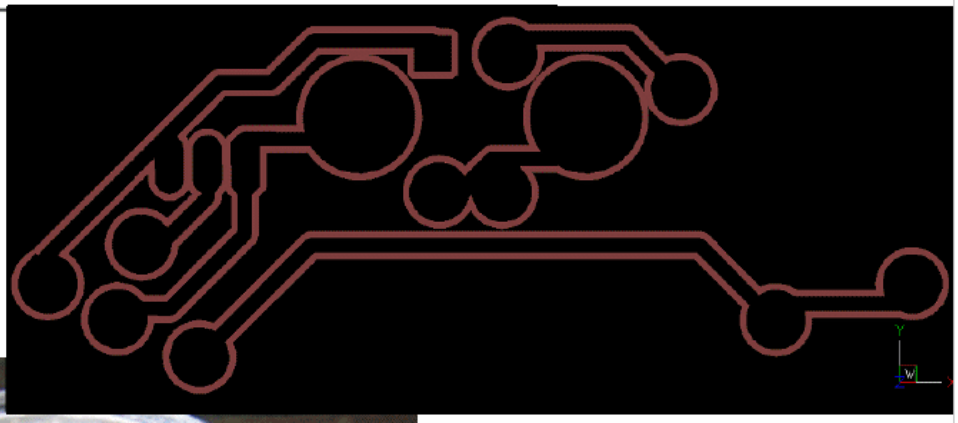




SIZE	FILE NAME	REV.
A	Touch Probe Drawings	A
SCALE 1:1	Photos	SHEET 6 OF 7



Circuit only necessary if you desire to invert the output from Active High to Active Low



Layout for underside of board

Completed board inside of probe Note that there is an insulating plastic sheet between the circuit board and the pins to prevent shorts. You could also design a smaller circuit board.

SIZE	FILE NAME	REV.
A	Touch Probe Drawings	A
SCALE 1:1	Electrical Circuit	SHEET 7 OF 7