

Welcome

Vice-President Steve Yauch substituted for President Jay Stearns and welcomed everyone to the October meeting.

Announcements

Joe Polich brought in free stuff for club members.

Bodie Pyndus brought in free melamine panels.

Josh McGuire is looking for plans or kits for cub scout projects. Lowes and Home Depot were suggestions.

Steve Yauch was contacted by Glen Pruitt who is looking for someone to repair a table leg. See Steve for details.

TJ contacted Steve Y. about a friend who is selling his woodworking equipment. Steve will send out an email with the details.

Steve Y. has been contacted by a restaurant that has 40 tabletops they want refurbished. See Steve for details.

John Loftis says that the Plano Woodcraft store is now offering sharpening service.

Shop Questions

Bodie Pyndus is looking for someone to repair his drum sander's belt hold-down. Greg Merrell was one suggestion.

Dave Cassman needs someone to rewire and I-Vac switch to work with a 220V dust collector. Bee Stewart said he could help Dave.

Gary Turman bought some ebony that was sealed in wax and is looking for an easy way to remove the wax. Suggestions included using a toaster over or microwave to heat the wax; scrap it off and use naphtha to remove the residue; and finally, to use a heat gun.

Show & Tell



Chris Kersey made this cutting board designed by his daughter.



Bee Stewart uses his Alexa and an Alexa Smart Plug to turn his dust collector on and off.



Brian O'Donnell made this wishing well flowerpot cover using scrap wood. The roof is made of individual cedar shingles glued in place.



Jim Polanco remodeled a bathroom for his wife and made this mirror and shelving units from ambrosia maple.



Ron Peyton brought in one of many hand planes he has made and a sample of a marquetry piece he made for a Paul Schurch program.



Dale Smith made several cutting boards from John Loftis cutoffs. He used inlay bands and turquoise epoxy on this one.



Kelly Geer shows off a lazy-susan made from a "cookie" with the cracks filled in with colored epoxy.

And the winner of the \$10 Show & Tell drawing was **Chris Kersey**.

Guests

Jenny Felker found out about NTWA from Woodcraft. She wants to build furniture and "free" wood is her favorite.

Stuart Sheffield is a friend of Chris Kersey. His mother refinished furniture her whole life which got him into repairing furniture. Black walnut is his favorite wood.

Camille and Ty Watanabe are new to woodworking and are anxious to learn from club members.

Program Ideas

Steve had each table write down suggestions for future programs. The list was pretty impressive and will be shared with Program Chairman Neil Pappion.

Raffle

Raffle Chairman Gary Turman really outdid himself thanks to the generosity of his wife Elaine. The club owes Elaine a huge thank you!

Dale Smith – Warrior 4.3amp, 4 ½" angle grinder w/ Hercules grinding wheel.

Camille Watanabe - Warrior 4.3amp, 4 ½" angle grinder w/ Hercules grinding wheel.

Jim Polanco – Milwaukee Shockwave 15pc titanium drill bit set.

Bill Jacobs – Lenox High Tension hacksaw frame.

Ed Mastin - Lenox High Tension hacksaw frame.

Bee Stewart – Warrior 2 pc. step drills and 2 Bauer 4 ½" flap discs.

Brian O'Donnell – Dasco 2 punch set (center and prick punches).

Josh McGuire – Dasco 2 punch set (center and prick punches).

Chris Kersey – Dykem blue layout fluid.

Steve Yauch – HomeRite Gold waterstone additive; Shapton 5000 and 12000 grit water stones.

The following members received a set of 3 Lenox hacksaw blades: 32, 24 and 18 teeth:

Dave Cassman

Alvin Illig

Joe Polich

GT Robinson

Stuart Sheffield

And 5 others

Program

Tonight's program was presented by club member Gary Turman on metal working and metal working tools.

Gary is a retired tool and die maker who has a complete metal working shop at his house to compliment his woodworking shop.

Gary started his adventure in metal working in 1961 in his high school metal shop class. He says working with metal is very similar to working with wood.

A complete handout of Gary's presentation follows this newsletter and is an exceptional resource for basic metal working in a home shop.



Next club meeting:
Tues., Nov. 16th
7:00 pm at the
Party Barn
5948 McKamy Trail
Plano, TX 75024

Newsletter edited by: Joe Polich
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Photos by: Ed Mastin

Basic Metal Work in a Home Shop

Introduction

- A. I'm Gary Turman been a club member for 20 years
- B. Worked as a Toolmaker for Miller Brewing Co for 40 years making special tools to repair Packaging equipment
- C. A supervisor told me part of my job was to make fast running packaging equipment run faster and last longer
- D. First started machining in High School in 1961

Metal work is just like woodwork only slower and with a totally different material

- A. Instead of Hardwood and Soft wood Metal are ferrous and non-ferrous meaning with Iron or without Iron
 - 1. Ferrous is Steel, Cast Iron, Stainless Steel
 - 2. Non-ferrous---- Brasses, Aluminum, Copper Bronzes, I'm not sure but I think Titanium is a non-ferrous
 - 3. Softer –Yellow Brass, Aluminum, and Copper can be machined with woodworking power tools
- B. Where can you buy metals of use in your shop??
 - 1. Home Depot, Lowes, Ace Hardware, Tractor Supply have craft metal display racks usually light weight , smaller sizes of mostly steel, some aluminum
 - 2. Story about Son and customer wanting 6inch aluminum round stock
 - 3. Metal Supermarket has a local store in Plano and sells cut to size of various kinds of metal and offers some services shearing sheet metal to size and bending same
 - 4. Online Metals, McMaster-Carr, MSCdirect are online sources for all kinds of metal
 - 5. Most larger suppliers want to sell full lengths which are 10 to 12 foot for bar stock and 20 and 24 foot for structural shapes, angles, square tube, pipe, round tube

How can I cut my metal after I get it Home???

A. A Hacksaw

1. Any ol' hacksaw works, BUT the new high tension hacksaw frames with the proper choice of blade is better, faster, and EASER.
2. Did you know there are basically 3 choices in tooth pitch of hacksaw blade---32 TPI for thin material like EMT conduit, sheet metals, and 1/16 inch and thinner shapes----24 TPI for 1/4 inch bolts, 1/8 -3/16 thick materials----18TPI for 1/4 inch and thicker
3. Buy only BI-METAL blades, they have a harder steel at the teeth that last 5 or 6 times longer than the cheaper carbon steel

B. An Angle Grinder with an abrasive cut-off disc

1. Angle grinders come in sizes from a 4 inch wheel to a 9 inch diameter wheel
2. I recommend a 4 1/2 inch grinder, smaller, light weight easier to maneuver
3. Many options for grinding wheels, cut-off disc, flap sanding disc, wire wheels, and bristle disc, plastic with abrasive molded in are available in 4 1/2 inch size
4. Use your safety gear, cut-off disc during heavy cutting will burn the laces out of your tennis shoes
5. Deburr your parts after each operation or you will walk away bleeding

Layout the features to include on each individual part (Having a drawing or sketch, even a rough sketch is best “remember it easier to change marks on paper than to change anything else” make your calculations on the same paper so that you can find any error should the part not fit)

A. Use Dykem Lay-out fluid or a felt-tip marker to color the area where layout lines will be

1. Using a scribe, either steel or carbide tipped, a combination square, dividers, and scales layout the cut lines, hole centers, and other features of your part
2. Lines that are scribed deep enough to be felt with the tip of a prick punch will result in much more accurate placement of the feature
3. What's the difference between a Prick Punch and a Center Punch----A prick punch is sharpened to a much more acute angle and needs to be kept sharper----A center punch is sharpened to approximately 45 degrees and is used to mark the center of drilled holes

4. The entire layout should be done first with a prick punch marking intersection of cut lines, center of radius, and hole locations. These marks are small, just big enough to hold the tip of your dividers, your scribe, or center punch
 5. After verifying the layout, remark the drilled hole locations with your center punch, this mark needs to be large enough to center a spotting drill, a center drill, or a small twist drill, 1/8 " -5/32" depending on final hole size
- B. Cut away un-needed material, remember parallel sides are needed to hold your part in a vice for drilling
1. Shape and finish your part using files, grinders, and belt sanders
 - 2.

Drilling a hole, sounds simple BUT

- A. Most of what I'm going to say applies to using a drill press, but can be done when using a hand drill motor if you work carefully enough. Keeping the motor square and still is critical to drilling and maintaining an accurate hole location. I will use the word drill or drill bit when referring to the cutting tool and drill motor when referring to a power hand drill.
1. **Always** hold the part in a vice or have it clamped to the drill press table ---A spinning part regardless of size will break fingers and drills and maybe sling things across the room
 2. How many of you never change the speed on your drill press??

The material being cut determines the speed in "Surface feet per minute" The diameter of the cut determines the speed in "Revolutions per minute"

A 1 inch drill, a 1 inch end mill, and a 1 inch diameter shaft in a lathe all require the same RPM when cutting the same material with high speed steel tools

Speed charts are on the side of some drill presses and are available online--- use the correct speed for the job, your tools will last much longer.
 3. Start the drilling process using a spotting drill or center drill smaller than the finished hole---A spotting drill is a very short, center cutting drill made for this purpose. You allow the part to float enough to center the punch mark under the drill but secure it as soon as movement stops. Drill deep enough to create a dimple only the diameter of this drill. Change to the proper size drill without moving your part, plan ahead, how much quill travel will be needed to change drills.
 4. Lubricate the drill with cutting oil, not motor oil, not 3-in-1, not WD40. Drilling dry will shorten the cutting life of your tool tremendously and make a rougher hole

5. Chamfer the edge of the hole with a counter sink-----counter sinks can be purchased with a 90 degree included angle to create 45 degree chamfer
6. Using this method, you can expect a hole location accuracy of plus or minus .010"
7. To increase location accuracy use the prick punched mark only, align the part with a tool called a Wiggler. This tool has a movable pointer that is centered with the drill press running. This centering gives the exact center of rotation of the drill chuck. Small movements of the part is aided by the use of a cross slide vice clamped on the drill press table
8. Using this method, you can expect a hole location accuracy of plus or minus .005"
9. To increase accuracy farther, use the graduated dials on the cross slide vice for incremental movement between hole locations, or use a dial indicator to measure these moves
10. Using this method, you can expect a hole location accuracy of plus or minus .002"
11. As you can see by the above descriptions absolute hole location between parts is nearly impossible, so adding clearance to one set of holes is common practice. 1/64 inch added to the clearance diameter is critical work, adding 1/32 inch to the clearance diameter is average work, and adding 1/16 inch to the clearance diameter may be necessary if using a drill motor.
12. If your part is made from sheet metal less than 1/8 inch thick using a cutting tool called a step drill will result in a rounder cleaner hole. Standard drills leave a "trilobeular" shaped hole. The diameter steps are usually in 1/16 inch increments. Use a felt tipped marker to mark the step larger than you want so the mark can be seen with the tool turning. The step above your chosen diameter can be used to chamfer the top of the hole, turn the part over and chamfer the bottom to deburr.

I've been asked "How do you drill an accurately sized hole" You CAN'T Accurate diameters require a Reamed hole

- A. Reamers are a cutting tool that have multiple flutes and the OD is ground to very accurate diameters. Reamers come in sizes that are under or over nominal size by .001", can be sized to nominal dimensions, and come in sets that are made for use with hardened dowel pins, one will be for press fit and another for slip fit.
- B. Begin by drilling a 1/64 under sized hole at the required location, chamfer the hole to a diameter larger than the finished size, change to the appropriate sized reamer, do all of this without moving the part if possible ---The reamer RPM speed needs to be about half of the drill RPM,---Apply cutting oil to the reamer before it makes contact---Feed the reamer through the part with a slow consistent pressure---the reamer should leave a smooth finish inside the hole.

- C. Reamer sets are rather pricey, so take care not to bang the edges and store them in proper containers.

Tapping an internal thread

- A. Start by drilling the proper tap drill hole, the size is listed on Tap Drill Charts found in reference books, online and on wall charts
- B. Hand Taps come with 3 different tapers ground on to the cutting end. The first is a Starter Tap its taper extends over 5 to 7 threads. The long taper makes starting the tap perpendicular easier. The second is a Plug Tap its taper extends over 3 to 5 threads. It's the general purpose tap. The third is the Bottoming Tap its taper extends over 1 1/2 threads. It's used to tap to the bottom of a blind hole to gain maximum depth of threads in a shallow hole.
- C. Machine Taps come as a Spiral Point used for thru holes because it pushes its shavings ahead of the Tap and Spiral Flute Bottoming used in blind holes because its shavings are lifted out the top of the hole.----Machine Taps are made to be power turned by machines that can reverse direction to back the tap from the hole.
- D. All tapping requires generous amounts of cutting oil to keep the shavings moving

If your part needs external threads

- A. I suggest tapping the part and using a set screw as a stud or a piece of all-thread rod as a stud. This is much simpler for the beginning metal smith

There is one aspect of metal work that every woodworker must learn

A. Sharpening

- B. Not enough time to cover that subject in an evening
- C. There a pair of Shapton Japanese ceramic water honing stones, a 5000 grit and a 12000 grit, along with a bottle of Hone-Rite Gold Water additive as tonight's grand prize in the Raffle