



Crosscut

Newsletter of the Witwatersrand Woodworkers' Association

PO Box 411346, Craighall, 2024

Thin CA glue from Qualichem used by Woodturners for filling cracks.

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Go to <http://mysite.mweb.co.za/residents/tpope/homepage.html> for back issues of *Crosscut*.

Next Main Club Meeting on Wednesday, the 8th August from 18h00 at the WWA clubhouse at REEA. Dennis Lock (from the East Rand Club) will present on Designing and Constructing Cabinet Doors.

Next Turner's monthly meeting is on Monday, the 6th August at 18h00 at the WWA clubhouse at REEA. Butch Smuts will talk on harvesting and treating and preserving your wood. If there is time, he may also include a demo on his use of the sanding disc that he uses to carve with.

News



July Main Club Meeting. Anita Speedy demonstrated some scroll saw techniques, including some clever three dimensional shapes. She gave some advice on buying a saw and blades to use. The picture of the castle shows an application of cutting at a slight taper to make 3-D shapes that expand out.



July Turner's Meeting. John Speedy demonstrated back cutting used by Richard Raffan for hollowing out small vessels using a spindle gouge. He starts by drilling out the centre using the gouge to the depth required. Then, holding the gouge against the toolrest and using the lip of the hole as support, he cut using the left hand side of the tip, with the gouge held at the two o'clock position. This is not a conventional cut, and is rather counter intuitive, but can work for the experienced turner. John hollowed the blank and then shaped the outside, which is opposite to the way most people work. In trying to save time, he cut the wall too thin and went through, which happens to most of us (more often than we would like to admit.)

From the committee:

Show-and-tell and Ask-the-club. If you have something you would like to show off – a project or a clever solution or tool, please come and share it with the club. If you have a problem or question, don't be afraid to ask. Free raffle tickets for contributions and questions.

Raosebank Rooftop Market. The WWA will have the main stand on Sunday the 29th July 2007. Rick Florence is co-ordinating. We need people to man the stall and to demonstrate on the day. We would like to sell wood craft items, turned as well as non-turned, as much as possible, as we will have plenty of space. As per the arrangement for the Craighall River Market, you can leave stuff for sale at the clubhouse, appropriately marked, with price and your name. We agreed on a general commission of 10% for items sold, or you can donate the whole proceeds to the club if you wish. Don't forget to label your goods for sale with your name and price. A two-part label is suggested, so that one part can be detached and kept as a record of sales.

To volunteer your services on the day, please contact Rick on 011-788-9922 (h), 011-886-9922 (w) or flocat@mweb.co.za. Rick gave out parking permits for the basement for those exhibiting. He will be there at 7h30 to start setting up the stall. The market opens from 9h00 till 17h00.

Training. Consult the list of courses on the notice board. Payment for courses booked will be in advance, to ensure attendance.

Toymakers. The toymakers meet on the first and third Monday of every month, at 09h00 till 12h00 at the new clubhouse. Contact Eddie Marchio on (011) 678-8062 or renato@pixie.co.za for more information.

Wednesday Workshop. The Wednesday evening workshop is on the first and third Wednesdays of the month, from 18h00 till 20h00. Contact Winston Klein on (011) 674-1513 for more information.

For Sale:

Dewalt planer / thicknesser model dw50. Excellent condition - fully reconditioned. R4500-00.

Ryobi thicknesser model ap-10. Made in Japan. R1500-00. Contact Norman Cheerin on 082.443-7325.

Approximately **3 cubic metres of timber**, including Iroko, Meranti, Imbuia, etc. Sizes range from 600mm to 1200mm. Please contact Russell on 076 972 4999 or rgerlag@mf.co.za. Russell is based in the south of Johannesburg.

Chuck – SuperNova with standard 50 mm jaws. Needs insert to adapt it to your lathe. If your spindle thread is M33 x 3.5, then this chuck is not suitable, because M33 threads are too big for the body of the chuck. R900- Contact Andrew Riley on 083 442 0914.

Bench drill press with tilting plate and height adjustment. R450.00

Spindle Moulder - Electra Beckum TF 100, with cutting head and a box of various cutters, plus two T/C rebate cutters. Little used. R7000.00

Wood lathe, Rockwell Beaver Cat.3400. 36 inches between centres. Includes a set of Diamic chisels (as new) approx. 45cm long. Also includes a large Diamic gouge chisel plus assorted new Diamic and Marples chisels and a 6-in-1 universal chuck. All in very good condition. R4000.00

Riempies - white. 100 lengths of new chair riempies, approx. 1,85m long. R900.00 for the lot.

Items to be collected from benoni. Please call Jim on 011-849-3680 for more information

Walker-Turner Woodturning lathe. Completely rebuilt. Cast-iron construction. 300m swing over the bed, 400mm in the gap. Outboard facility with left hand thread face-plate allows 600mm swing. 900mm between centers. 5 speed poly Vee belt drive. Large ½ hp large frame motor with good torque characteristic. Complete with substantial steady, vacuum chuck including faceplate and ¼ hp vacuum pump. Must be seen. R5000-

Contact Syd Marshall on 011 477 1115 or 083 457 4421.

(Syd has built his own lathe which is similar to the Stubby to replace this one.)

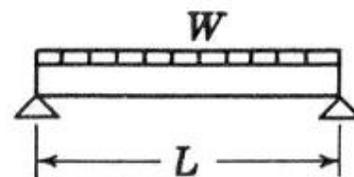
Wooden Shelves – Understanding why they sag

Why do shelves seem to sag so readily in the middle? If they are too thin or too long, then nature is against you even if you have the most exotic hard wood. How much thicker should you make them?

Well, those of us that studied mechanical engineering design may recall an equation that predicts what will happen – a bending equation that will help you to understand the effects of changes in dimensions.

The diagram shows a shelf supported loosely at both ends, and loaded with weight uniformly distributed across the length – a typical application. The shelf is rectangular in cross section, so the theory predicts a deflection (sag) δ in the middle according to this equation:

$$\delta = \frac{WL^3}{6.4Ebh^3}$$



Where: W is the distributed load

L is the length of the shelf
E is the modulus of elasticity (a measure of how strong the material is)
b is the width of the shelf
h is the height of the shelf

Absolute values are not important. This equation is to help you understand the effects of changing different values:

Logically, if you increase the load W, the deflection δ increases proportionally.

Also if you increase the length, the deflection increases, but to the third power of the length. So if you double the length, the deflection increases eight times! (2^3) This equation tells you why long shelves are bad news. Even a small reduction in length will dramatically reduce the deflection (sag).

However, usually the length is given by the design, as well as the width b. The properties of the material can make a difference too, but not much, as E only varies by a factor of 2 to 3 over a whole range of woods.

The only other variable left to play with is the thickness of the shelf, and it turns out that this has a dramatic effect. Logically, the deflection or bending decreases as you make the shelf thicker. In this case the equation predicts that it will improve by the third power! This means that if you double the thickness, the droop goes down by a factor of $1/2^3 = 1/8$! So it is easy to make a large improvement by only a small increase in thickness. To halve the sag of a particular shelf, you need to increase the thickness by the cube root of 2 ($2^{1/3}$) which is 1.26. So an increase of 26% in the thickness will halve the droop in the shelf for the same load. This is the same as going from 16mm to 21 mm thickness.

I skipped over the effect of E which depends on the material properties. It is tempting to treat wood as a uniform, homogenous material, but it isn't. In the above example, it will be stiffer if the grain runs longitudinally, and much weaker if the grain runs across, which you can verify experimentally. This is why chipboard is much weaker than the same cross section of wood with the grain running in the correct direction. The grain in chipboard is random and the length of the individual fibres is short, so it is not able to resist bending nearly as well. Also if it should get wet, then you have a disaster.

(If you wish to make some real calculations, the Encyclopaedia of Wood published by the American Forest Products Laboratory and Sterling, 1987 gives tables of E for different species. E is quite variable and depends on the direction of the grain - working values of 1 to 2 million psi are a start.)

Jet Mini – Some Comments

Following the completion of the cabinet for my Jet Mini, I used the Jet to make some small, turned boxes, a task for which it is well suited.

I found that all the adjustments of the Jet are quick and easy to make. The boxes I made are around 50 to 70 millimetres in diameter and require precise and detailed work to get the lid to fit properly. Frequent trial fits are required, so the easy adjustment of the tool rest was appreciated.

The Jet is lot lighter than my Hegner HDB175, so it doesn't have the same rigidity. This is noticeable when taking heavy cuts when vibration can set in. When hollowing to the bottom of a box, to a depth of 50mm or more, I found significant vibration would occur, unless a light cut was taken. This was not the case on the much heavier Hegner. I think the vibration is due to a combination of flex in the chuck, spindle, headstock, the bed and the tool rest. This is not to say that the Jet is bad, it just requires a lighter touch.

The locking action for the tool rest banjo and the tailstock is smooth and easy to operate, but you have to push the lever down hard to lock them down solidly. This is a noticeable problem when using a Forstner type drill in the tailstock as the tailstock tends to move away when the hand wheel is cranked to push the



bit into the work piece. Also, the locking lever that fixes the tool rest height is a bit small – generating the force required to lock it firmly is uncomfortable on the hand.

When using a chuck that uses levers to operate, a spindle lock would be nice, or a third hand. The lathe ships as standard with a 6" (150mm) tool rest, which meets most needs. For spindle work, the optional 8" (200mm) tool rest can save moving the tool rest about. There is also a 2" (50mm) tool rest that can be useful for small end hollowing work.

There were a few minor things that I did have to fix:

- The tool rest banjo would not move smoothly past the fan shroud of the motor as the banjo was slid towards the headstock. This was corrected by grinding about 0.5mm off the bottom of the bolt that protruded through the nylock nut underneath the cam-lock.
- Another problem was the misalignment of the headstock and tailstock axes. The tailstock axis was 0.9mm lower than the headstock and the headstock was misaligned front-to-back by 0.5mm. This may not sound much, but for making boxes, it was a problem. When reversing the base or lid onto a jam chuck, and then using the tailstock live centre for support, this misalignment was excessive. This is because with each rotation, the tailstock imposed a movement of over 1 mm forcing something to give – creaking or squeaking noises as the work-piece moved on the jam chuck gave this away. The error of 0.5mm front to back was corrected by loosening the four Allen bolts holding the headstock to the bed and aligning the two centres by eye. To raise the tailstock, I glued 0.9mm metal sheet shims under the tailstock using epoxy. They were carefully trimmed to size, and unless you know to look for them, you won't see them. The modification is also completely reversible – with some heat the epoxy will let go and the shims can be removed. To check that the two axes were parallel, I used a long #2 Morse Taper drill inserted in either the headstock or tailstock tapers and checked against a centre inserted in the opposite end. Obviously, the drill centre must be accurate, so this can be checked when the drill is inserted in the headstock by rotating the spindle. The alignment is as close as I can see with the naked eye and good enough for wood turning now.

There is some noticeable wear on the top of the tool rest already, so the material used is not really hard enough. When it becomes a problem, I will grind down the tool rest until it is straight again and glue a length of silver steel along the top of the tool rest using epoxy. Silver steel rod is carbon steel that is accurately ground to a smooth finish and even in the annealed state, in which it is sold, is fairly hard. (It typically has about 0.9% carbon, so it is very hardenable, probably to 60 Rockwell, if required.)

Overall, the Jet is good value for money. It is portable and easy to use for small work like box making. Movement of the tool rest and tailstock is light and quick. Speed changes are quick and easy to make. It is not suited for deep hollowing, as the forces generated can be quite considerable unless very light cuts are taken. For that I use my Hegner lathe.

Jet also offer a variable speed version of the Mini Lathe (1014VS). This is the same as plain 1014 except that the motor is a ½ hp DC motor, driving a poly-V belt with a choice of three pulley ratios. Together, these give a speed range of 500-3900 rpm. You can see the speed control electronics mounted on the left of the headstock, with an on/off switch and a knob to set the speed. I would prefer a lower minimum speed, even down to a crawl, which would be useful for sanding and polishing. I have heard criticism that the motor lacks torque at the lower speed range.

There is space for another ratio on the pulleys and At Smit and I suggested to the rep from Jet that this would be a useful addition. The new model also has a spindle lock that engages in multiple holes, so it can be used for indexing as well. You can see a spring loaded thumb screw above the headstock handwheel in the picture. (See www.jettools.com for more info.)

