USER Report
JET 16-32 Drum Sander
by Arnold Barkley

Photo.1

Since there is a large amount of sanding involved in most woodworking projects, the average woodworker's workshop boasts a number of power sanders.

Oddly though, not all that many Australian or New Zealand woodworkers appear to own a Drum Sander. Is it the cost perhaps? But there are plenty of other pieces of workshop gear that are commonly purchased even though they cost more. Perhaps the main reason why Drum Sanders don't find their way into a higher proportion of hobbyist or small professional workshops is that their benefits are not sufficiently appreciated.

I have to confess that I am a late convert to the Drum Sander having done without for many years while nevertheless mumbling: 'one day...'.

Having finally bought one, I realised I shouldn't have procrastinated for so long. (I assume it was the fact that I made this revelation known to all and sundry that eventually led to me being asked to write this USER Report.)

The *16-32 Plus* (Photo.1) is down at the bottom end of the JET range of Drum Sanders. It's generally purchased by recreational woodworkers and small professional workshops, though many of the latter opt for at least one size larger — the *22-44*.

The figures *16-32* refer to the maximum width of a board or panel that can be sanded. The machine can sand up to 16" (406mm) in one pass and double that in two passes.

Much further up the scale, there is a small group of super sized sanders which are now sold under the SuperMax brand.

With some help from the people at JET, I've traced the origins of the present JET and SuperMax ranges to the same source. They both sprang from the Performax Sanders of the 1980's.

Garry Green of Minnesota (USA) initially made a sanding machine for his own use by modifying a radial arm saw. This type of saw, which has now fallen into disfavour, was widely used at the time and the idea of adding a sander to it proved very popular.

After winning an Inventor's award, Garry and his wife Donna started making the first Performax sander in their garage.

Over the next decade, the venture grew until they were established in a 5000m^2 factory with some 30 employees, manufacturing a dozen different models of sander.

In 2001, Garry and Donna sold their business to JET and retired. The brand name on the machines has slowly changed to JET, although JET continues to own the Performax name.

Noticing that JET appeared less interested in the top of the range sanders, particularly the closed end models (ie. the drum is supported at both ends), two ex-employees of Performax negotiated to buy the rights to manufacture them.

The machines are now made in the US and sold under the SuperMax name while the smaller machines (with cantilevered drums) up to 24" in width are manufactured and marketed worldwide by JET.

Assembling the Sander

When I picked up my *16-32*, it was in two boxes, one containing the open stand, the other, the machine itself. They would both fit in the back of most hatchbacks, but you might need help with the machine box unless you've eaten all your Wheaties.

After wheeling the boxes into my workshop on a trolley, I first assembled the stand. This is a four legged affair with a rigid frame top and a flat tray towards the bottom, all made of sheet steel.

Since I needed the machine to be mobile in my small workshop, I'd ordered (optional) JET castors for the stand. These are large and sturdy; they work smoothly and are fitted with brakes.

The only downside I can see to their use is that they raise the machine about 90mm higher than it would be when using the normal feet.

In my case, this proved an advantage. Being tall, I welcomed the height of the worktable being brought up to about 900mm.

With the stand assembled, the castors attached and the brakes locked, the next job was to fit the machine. This is delivered in two parts, the main sander body and the power feed conveyor with its stand.

The total weight of the sander body and conveyor is around 65kg. Although each of the components is therefore less than this, I decided they were a bit too awkward to handle on my own and called for a little help.

First, the main sander body was lifted onto the open stand and secured in place using the same bolts and washers which were removed when unpacking it from the plywood frame on which it had been shipped.

The knob was screwed onto the height adjustment crank and the bolts securing the indicator arm were removed, the arm turned round so that it pointed to the vertical scale on the outside of the body and the screws replaced.

Next the power feed conveyor was installed and the power cable from the motor was inserted into the electrical connector on the control box.

At this stage, I had an urge to switch the machine on and try it. However, reading the manual, which incidentally, is brief but quite useful, I decided that I should first check the drum alignment and height adjustment.

Drum Alignment

The 127mm diameter, 410mm long aluminum drum is cantilevered out over the moving conveyor and in order to accurately sand boards flat, it must obviously be exactly parallel to the conveyor.

The procedure for adjusting the drum starts with removing the sanding strip. To

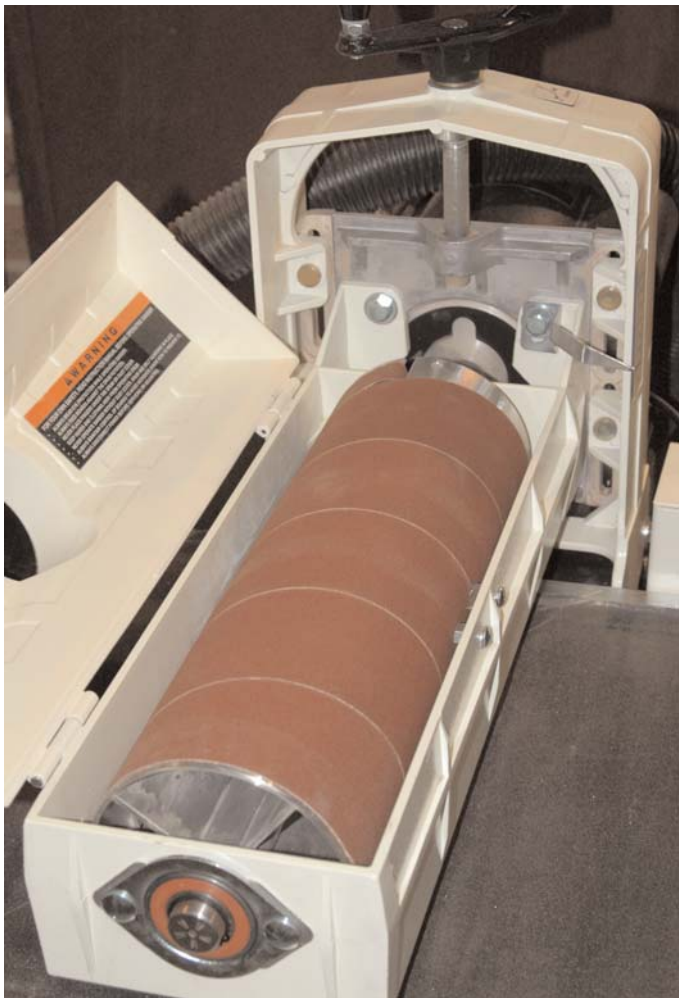

Photo.2: Swinging the dust cover back reveals the drum and sanding strip. The frame at the back carries the main bearing and height adjustment mechanism and is pivoted to allow the outboard end of the drum (nearest camera) to be raised or lowered

Photo.3: Bolt at bottom centre is one of four that secures the vertical drum support frame. The drum alignment knob as is at bottom right undere the motor.

Photo.4: The clip on the out-board end of the drum is easy to access

do this, the knob on the dust cover must be depressed and the cover swung out of the way (Photo.2).

The left hand (outboard) end of the strip is then released by reaching down the side of the drum and lifting the retaining clip (Photo.3). The strip is unwound and the clip at the other end also released (Photo.4).

(There is a special tool provided for operating the clip at the right hand end of the drum; this is discussed below.)

Now, the four bolts (two on either side) that hold the drum frame to the body are loosened. This frame has a three point support and loosening the bolts permits the frame to be tilted to one side or the other using a knob (the third point) which is located under the motor.

Tilting the frame raises or lowers the outboard end of the drum.

Using the crank handle, the whole drum assembly is raised to the point where a straight-edge placed on the conveyor under the inboard end of the drum just touches the lowest point on the drum.

The straightedge is then shifted to the outer end of the drum and the knob under the motor (Photo.3) is adjusted until the drum again just touches the straightedge.

The process is repeated until you are satisfied that the drum is truly parallel to the conveyor.

It should be mentioned that there are pressure rollers on both the infeed and outfeed sides of the drum and these add a little complication to the adjustment.

Also, unless the lighting in your workshop is very good, you may have to resort to the use of some kind of secondary lamp to be able to make the adjustment accurately.

While it's important to have the drum parallel to the conveyor when performing virtually any kind of sanding, this adjustment is absolutely vital when the machine is used to sand a board or panel in two passes.

If the drum is out of alignment, even slightly, when the machine is used for this purpose, a ridge will be left on the workpiece where the two sanding processes meet. The manual has this to say on the subject:

For optimum sanding of boards wider than the drum, the drum alignment is critical and must be exactly level to slightly high on the outboard end.

It doesn't take much use of the machine to understand why.

When a workpiece passes through the machine, it applies an upward force on the drum. Because the drum is cantilevered, this force is not evenly distributed. There is a tendency for the force at the outer end to be greater than that at the inner end, close to the support bearing.

Adjusting the outer end of the drum so that it rides a smidgin high overcomes this problem.

Once the drum is aligned, the sanding belt can be re-installed.

Inserting the end of a pre-cut strip into the left hand clip on the drum is relatively easy (Photo.4) The clip at the right hand (inboard) end (Photo.5) is a little more difficult to access, though I found it doesn't take long to get the knack. A special tool is, however, provided for this.

Called a TUF (Take Up Fastener) Tool, (Photo.6), it replaces fingers that may be too stiff to negotiate their way around the end of the drum to reach the clip.

Photo.5: The clip on the inboard end of the drum (seen here through a void in the frame) is a little harder to reach but a special tool is provided to help.

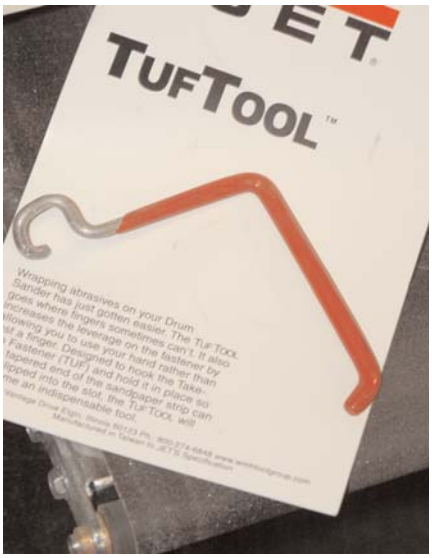

Photo.6: The TUF tool makes it easier to attach the inboard end of the strip

Photo.7: The controls consist of on and off switches and a variable speed control for the conveyor belt

It is essential when winding the strip onto the drum that there are no overlaps, that the strip lies flat on the drum, that the space between the wound edges is even and that the strip is wound tightly.

If the strip is even slightly loose, it will flap noisily during operation, sanding efficiency will be reduced and there is even the danger of damaging the workpiece and/or the conveyor belt.

Height Adjustment

To zero the height adjustment, the drum is wound down until the sanding paper is just touching the conveyor belt and the pointer is set to zero on the height scale.

Test Run

The machine can now be run without a workpiece to check the tracking of the conveyor belt. Two captive adjustment spanners, one on either side, can be used to skew the end rollers slightly so as to allow the tracking to be adjusted.

These adjustments are made while the machine is running by tightening the take-up screw nut on the side that the belt is drifting towards and loosening the corresponding screw on the other side.

Once all of this has been set up, all that has to be done is to connect a dust extractor.

The *JET 16-32 Plus*, in common, I assume with the rest of the JET range of sanders, is fitted with a 100mm dust port.

I originally connected the Sander to my central dust extractor but soon found that it so useful that I wanted it beside my bench. To do that, I used a reducer to connect it to a Shop-Vac.

As anyone who has one of these inexpensive little suckers will know, they are happily efficient and unhappily noisy which means I have to wear earmuffs everytime I put the thing on. Nevertheless that's a small price to pay for the convenience of being able to take a workpiece off the bench, pass it through the Sander and bring it back to the bench without having to move more than a pace or two.

Photo.8: Captive spanners are provided for adjustment of conveyor belt tracking

It's worth mentioning that operating this or any other Drum Sander without dust extraction is NOT an option. The amount of sawdust these things can create in seconds is amazing and aside from health issues, if a Sander is run without dust extraction, the dust that builds up in the machine will quickly ruin any chance of obtaining a satisfactory finish.

Even with extraction, dust will accumulate inside and around the drum and this must occasionally be blown out.

In-Use

The machine's two electrical controls are shown in Photo.7.

One is an on/off switch for the 1.5kW (input power) motor that rotates the drum at 1400rpm to give a sanding speed of about 9 metres per second.

The other is a rotating knob that allows the conveyor belt speed to be varied from 0 to 3 metres per second.

After the crank is used to lower the drum to the required height, the motor is started and the conveyor belt is set to a low speed. The workpiece is then placed on the belt which feeds it in under the sanding drum.

Care must be exercised to ensure that the drum is not set too low. This can cause the workpiece to jam, or at best, it may be burnt as the machine tries to sand away more waste than it is designed to handle.

If an attempt is made to overwork the machine by trying to remove too much waste, either by having the drum set too low or the conveyor belt speed set too high, a thermal overload will operate to protect the motor. This overload does not, however, switch off the conveyor belt.

Once the thermal overload switch has been triggered, the machine must be left for a couple of minutes to recover before pressing a switch on top of the motor to bring it back to life.

(I have found it necessary to add a felt pen marking on the top of the machine casing below the crank to show the direction the crank must be turned to decrease the load on the drum.

The need for this arose when I fed a longish board into the Sander without noticing a bump along its length. When the extra thickness reached the drum, the machine began to labour and I mistakenly turned the crank the wrong way.)

The instruction booklet recommends placing no more than two workpieces on the conveyor belt at one time. Also the minimum length of any workpiece is 60mm.

There is no maximum length but longer pieces must be supported both on the infeed and outfeed side of the sander in the same way as when using a thicknesser.

Another recommendation contained in the instructions is to angle workpieces across the belt to achieve greater waste removal. (It is suggested that the optimum angle is $60^{0.}$).

The final one or two passes are, however, made along the grain so as to reduce the amount of finish sanding necessary.

The instructions limit the minimum thickness of material sanded to 0.8mm. My 'shop made veneers are just over a millimetre thick and can be sanded easily on the machine.

The maximum height of a workpiece is 100mm which leads to an interesting use for the *16-32*. I've lightly sanded the top and bottom edges of small dovetailed drawers once I learned how to hold the sides down onto the conveyor belt — particularly on the outfeed side so that the box doesn't tip up as it exits the drum.

Sanding Grits

In addition to the 80grit strip already on the machine, the Sander was accompanied by a box of abrasive strips — one 36grit, two 80's and one 120.

This is the range of grits available.

36 *Abrasive planing, surfacing rough-sawn boards, paint and glue removal, maximum stock removal.*

60 *Surfacing and dimensioning boards, trueing warped boards.*

80 *Surfacing, light dimensioning, removing planer ripples.*

100 *Light surfacing, removing planer ripples.*

120 *Light surfacing, minimal stock removal.*

150 *Finish sanding, minimal stock removal.*

180 *Finish Sanding only, not for stock removal.*

220 *Finish sanding only, not for stock removal.*

At first, I used 80grit sanding strips almost exclusively. Then I found that since I tend to work in relatively soft woods, the 120grit is ideal. The amount of stock removal is still generally high enough for my purposes and the end result can be immediately hand sanded.

Is it a Thicknesser?

I believe that lists such as the one shown above may be the source of the claim that I have heard from time to time, that a Drum Sander can be used as a Thicknesser.

I'm sure the manufacturers would want to distance themselves from any such notion, but now, having lived with a Drum Sander for several months, I think it's partly true.

The purpose of the *JET 16-32* Drum Sander is not simply to sand the surface of a workpiece, but to allow it to be sanded so that the sides of the workpiece are flat and parallel. To some extent, it is a therefore a sort of Thicknesser.

The differences between the *Sander* and a conventional Thicknesser are the method of stock removal and the amount that can be removed in a single pass.

Any Thicknesser worth the name is capable of removing 2 or 3mm of stock — even Australian hardwood — in a single pass. Stock removal on a *16-32 Drum Sander* is more in the order of fractions of a millimetre in a single pass and even then, you will find that you have to use a slow feed rate when sanding very hard timbers.

Perhaps it's best to think of the Sander as a Finishing Thicknesser that overcomes some common problems.

For example, when preparing the boards for a project such as a box or cabinet, it is normal to start by running them through a Thicknesser. The boards are then sanded. Unfortunately, when this is done with belt or orbital power sanders, their surfaces may be made smooth, but the boards may not be exactly the same thickness.

Belt sanders tend to be fairly aggressive so it's easy to thin the boards towards the ends or sides. Even when using an orbital sander, however, the boards may be differentially thinned, especially when there are areas of harder wood such as curly grain or knots.

The Drum *Sander* simply sands the surfaces flat and parallel. So if you thickness your boards within a millimetre or two of the final size, you can now sand them smooth and still maintain the flat surfaces parallel to each other.

Obtaining the optimum efficiency from the Sander — using the appropriate sanding grit and balancing the feed height and feed rate for the species being worked so as to achieve the surface finish required in the fastest possible time — only comes with practice.

Conclusion

It is remarkable how quickly the *16-32* has become integrated into the way in which I work.

What is equally remarkable is the impact the Sander has had upon the speed at which I can work. Instead of reaching for the orbital sander that sits on a shelf to the right of my bench (already hooked up to its own dust extractor), I now usually turn to the left and pass workpieces through the Sander.

When it comes to finish sanding, I find that the marks left on the wood when using a 120grit sanding strip in the *16-32* can easily be eliminated by hand or power sanding at 220grit. I can then go on to handsanding alone.