

If you want to start rose turning, rosettes present you with many puzzles. What material do you make them from? What size should they be? What shape? How many waves? How much throw?

The problem is much more serious if you intend to build a traditional machine, with a full barrel of rosettes, before you have the experience to know what's needed for your style of work. I'd advise anyone to have a go with simple equipment, with perhaps just one rosette, to learn the basics. Adding rosettes one at a time, with the designs based on your practical experience and the needs of your next project, allows you to develop a set of rosettes that really suit you.

Let's get the easy question out of the way first. You can make rosettes from any material that's available. It needs to be rigid, resistant to abrasion, and machinable. Brass is still the best for a fine traditional machine. It doesn't have to be expensive new brass if you get to know a helpful scrap dealer. A lot of people use acrylic (perspex) or a hard kind of lubricated nylon (some of the black nylon materials are a bit soft). At least one member of the SOT has MDF rosettes, treated with a wood hardener, but he's a very careful worker- I'd probably ruin them in no time. I use separate swash plates, made of tubing that sleeves over the mandrel, or fits a rosette holder on the mandrel. Brass is the most convenient material for me.

The size of the rosette is always a compromise. The larger the rosette, the gentler the curves will be for a given throw, which should lead to easier operation. There are always practical limitations on the size, particularly with a rocking-head machine, where the rosette diameter should be in proportion to the height above pivots. If it's too large, it may increase distortions. With a sliding or swivelling-head machine, the layout of the equipment will probably set a limit on the size. The dimensions of the off-cut of brass you bought from the scrapyards may determine the size. On a small machine, 5" or 6" diam is generally about right. If you're spending a lot of money on new brass rosettes, you could choose a standard size (Holtz used 7") and mounting, so you can borrow odd rosettes from a friend with a Holtz.

Some of the shapes are shown in Holtz vol. 5 opp. p. 330. Others are found in Holtz adverts. Sine waves (Holtz **A**), concave lobes (Holtz **C**), and convex lobes (Holtz **D**) can all be produced from the same rosettes, by using suitable rubbers.

A sine wave on the rosette is easiest to use, and gives the most accurate sine wave on the work, but concave is much easier to cut.

You can't generate an **A** shape from a **D** rosette.

Many turners use simple polygonal shapes to generate convex and concave waves. The straight edges are normally made as slightly convex curves, to reduce the throw and ease operation. This only works with low counts. You might get up to 10 waves on a 7 inch rosette, less on a smaller size.

We use **F4** as the traditional British Rose Turned shape. Anything you do with it will have an antique, traditional feel. It's not the easiest shape to generate and cut, the reverse of the shape is much easier. There seems to be a lot of variation in **F** shapes. Your version is as good as anyone else's. Draw the shape at the size you intend to work. Derive larger and smaller drawings using the same throws, to check they look ok. If you're satisfied, derive the rosette shape. Don't know how to derive these shapes? Just remember that they have the same throw at the same angles, whatever diameter they are. To copy a shape, add the throw to a circle. To reverse a shape, subtract the throw from a circle. A computer program that allowed you to manipulate rosette shapes would be really useful, if anyone fancies a little project.

Other rosettes are variants of the basic shapes (e.g. **B** is **A** with one dip in 3 missing, **K** is **F** with 3

points instead of one), some look very different (e.g. L has repeats of broad convex and narrow convex curves). There are many other shapes used today, which are unlike any of the Holtz shapes. Some of them give very attractive results, but I feel it's best to get some experience with simple shapes first. Of course, if you're interested in work of a particular period, you'll want traditional rosette shapes for that time.

Remember that in the 17th century, court turners would cut a rosette to suit a specific design, rather than adapt the design to suit the available rosettes. To do this effectively, you first need a clear understanding of how rosette shapes actually work on your machine, with your practical skills. Some of the tricks you'd like to try will seem to be impossible to execute- try again in a year or two. Many ideas composed in 2 dimensions don't work effectively in 3D. It's easiest for a beginner to understand what's going on, by using simple shapes without too many tricks.

Rosettes are expensive, particularly if you're buying new brass. I'd always suggest that you don't cut many until you've got some practical experience, then you can choose new shapes which help develop your style. If you start with a full barrel of rosettes, you'll modify your ideas to fit in with what's available. I'm sure that Rose Engines were first fitted with lots of rosettes to make them look more impressive to their aristocratic owners. Quick change of patterns would help a commercial turner to make the machine pay. I suppose if you have the time and money, you could start with a full barrel and experiment. In time, you'll want other shapes to go with your favourites. Use these to replace the ones you don't use. You may end up with 2 barrels, suitable for different styles of work. I always feel that a couple of blank rosettes on the barrel are the sign of someone who intends to learn, and then use their knowledge in an original way.

Any imperfections in the shape of the rosette will be transferred to the work, but you still shouldn't be scared of hand cutting them. Charles Holtzapffel was the first to generate the shapes mechanically around 1840. You might choose, for example, to cut a series of indexed concave cuts around the blank, and then to hand-file the convex bumps to create a sine wave. You have to position the lobes accurately, but the precise curves are less important, so long as they're all very similar. You could drill a series of accurately positioned holes at key points around the shape, and then join the dots. If you're working in brass, a powerfile or small linisher makes life much easier.

If you're a beginner looking for a simple solution, find a hexagonal plumbing fitting that's the right size to cobble onto the mandrel. A bit of turning will probably be needed to make it fit, or to make an adaptor to hold it. In theory, the rosette should always be larger than the work. With a really simple shape, you can get away with magnifying the rosette. If you work with a broad flat rubber, you only have to worry about the shape of the points.

The number of waves depends on the type and size of work you're doing. If you're shaping small work, you'll probably use under 10 waves. A fine surface pattern on a larger piece might use up to 36 waves. An engine turner might want much larger counts.

With the smallest numbers, 3, 4 and 5, the shape is so simple it becomes a dominant feature of the design. As the count increases, the rosette shape becomes less overpowering, until very high counts become surface patterns.

The human brain is pre-programmed to look for symmetry. Even if you aren't consciously aware of the number of lobes, your view of the work will be strongly influenced by the symmetry, or it's lack. We generally find a slightly complex symmetry more exciting.

3 is still part of the continental repertoire. It's likely to be extremely difficult to operate. Most 3 wave rosettes would dominate any design, apart possibly from **F3**, which was popular in Victorian times.

4 is always likely to look solid and, dare I say, boring, but the double curve of the **F4** rosette makes it more interesting. This is a good thing because **F4** is the traditional Tudor rose, which is the basis of so much British rose turning.

5 is often regarded as a magic number. I suspect, in part, this is because the brain finds 5 lobed shapes interesting. It's likely to produce a very dynamic shape. It could work well on a traditional piece, but if a design is already pretty wild, 5 lobes could turn it totally OTT. Perhaps not for beginners.

6 is very effective on small work, whatever style you're using. There's "enough symmetry, but not too much". I'd regard it as **the best starter rosette**. It adds a useful stability to a wild design.

7 is a number I've never tried or noticed on a rose turned piece.

8 is likely to produce a very solid, static shape.

9 is the most satisfying number for small to medium work. **The second essential starter rosette**. The potential dynamism is counteracted by the number of lobes. It works with any style of work.

10 isn't used that often, perhaps because **9** looks so much better. If you were working with **5** or **20** you might need **10** to go with them.

Above **10**, you're not really aware of the number of lobes, but you still react strongly to the symmetry. Compare figures with 15 and 16 lobes, if you don't believe me.

If you've decided the diameter of the work, and you know how broad the lobes should be, this may determine the count you need, but be a little cautious if you've come up with one of the larger prime numbers. For example, you may need 17 or 18 lobes. In most cases, I suspect you'll get more satisfying results from an 18 wave rosette.

The numbers you choose for your first rosettes will have a long-term impact on your style. When faced with impossible complications, it's natural to fall-back on an old favourite which you know is likely to look good.

If you're producing a barrel of rosettes, start by deciding the basic numbers which might suit your style. I'd choose **5**, **6** and **9**. You could then add multiples, perhaps **10**, **12**, **18**, and even **20**, **24** and **36**. If you like to play safe with designs, omit **5** and its multiples. I'd actually find the multiples most useful as pumping rosettes. **5** and **6** are best cut as polygons, perhaps up to **24** as sine wave, and higher counts as convex lobes, if you can generate the curves.

A British rose turner will want **F4**, and possibly **F3**.

Of course, if you have a twin-mandrel machine, you can get any count you want from a single wave rosette, just by changing the gearing.

The throw of the rosette (the amount of sideways movement caused by the rosette, American turners may be more familiar with the term stroke) depends on what you intend to do with it. Look at any traditional rose engine, and you can see the kind of work it was built for. I use the machine for shaping work (mostly wood), on a small scale (4 inch diam. and under). Because I'm rotating the work by hand, I can use extreme rosette shapes which would be difficult to operate on a conventional machine. Try to avoid steep slopes and sharp points, if you want easy operation. If a plunge cut is steeper than the angle of the side of the cutter, it will cut badly.

By varying the rubber size and shape, you can change the effective shape and throw of the rosette. Of course, you can reduce the throw of a deep rosette, but you can't add to the throw of a shallow one. It makes sense to have deep rosettes, but it's got to be possible to operate them on your machines. It's a compromise.

There are tremendous advantages to variable-throw arrangements. One set of rosettes can be fine-tuned to suit any work (starting from a fairly large throw). If you're building a machine which you intend to use for any length of time, you'll end-up kicking yourself if you don't use a variable throw design. A beginner has no idea how important this is. I'd always suggest starting with very simple, cheap equipment before building your final machine. Get some experience, and find out what kind of work interests you. After a year's practical experimenting, you'll design a rose engine that's way beyond your current dreams.

A traditionalist may simply want to copy Holtzapffel rosette shapes. If you have the opportunity to do this, it's a great idea. The original rosettes were presumably designed in the 1790s. Holtzapffel had recently come from Alsace, so I guess they reflect continental design of the later 18th century. Lignum vitae was first imported in the early 1600s, and a British style of domestic wares with rose turned decoration had developed. I guess Holtzapffel must have taken popular shapes into account. The photos of Tweddle's machine show it had an unusual number of rosettes, many of them rather different shapes from those used in later machines. It would be interesting to see accurate drawings of rosette shapes from different Holtz rose engines, to see how the shapes developed. I guess there must have been some rationalisation when the rosette forming machine was built, around 1840.

You may notice that I'm not in a hurry to commit myself to actual figures for the throw. I suppose I can pin-down the extremes. ½ mm throw would be visible if you were cutting a fine pattern with a V-point drill. The top limit is more difficult. I suppose a deeply indented rim on a 12" platter might use an inch of throw, but this would be way beyond the capacity of most machines. For smaller work, 12mm would normally be regarded as excessive, but I find it useful. Swash plates need similar throws. (I should explain, I use metric for accurate measurements and Imperial for approximations. I can't read the inch scale of my vernier any more without a magnifying glass.)

Looking through old pieces of my work, something between 3 and 6mm throw seems typical, though there are plenty of examples of 10mm throw, even on 2 inch work. If your only pumping rosettes are face cuts on the standard set, you may have problems. Rosettes like this are fine for engine turners, but for shaping you need much deeper waves, which can only be cut from a ridiculously thick brass blank. You also need to be able to phase between pumping and lateral rosettes. There's a lot to be said for having a separate mount for a pumping rosette.

It's important not to be dogmatic about the throws that should be used. Very shallow rosettes often surprise me. It's hard to believe that such tiny movements of the mandrel can produce such effective patterns. I often find that cutting a shape "too deep" leads to interesting and unexpected results. The important question is- can you operate the machine successfully with this rosette, using your chosen method of rotation. If you can't, you've got to think- do I really need this shape? Remember that a rosette that seems impossible to use today may be easy in a year's time, when you have more experience. If the shape's essential now, you've got to find a way of improving your technique to get it under control.

Wouldn't it be nice to have just one rosette, with variable shape and throw, then you wouldn't have to worry about all these questions. Various people have tried, with some success. The simplest version would be a disc with perhaps 6 or 12 smooth-headed bolts sticking out. These can act as the corners of a polygon, bearing against a broad flat rubber. I've been experimenting with this idea. The rosette has some unexpected characteristics. I'll be writing more when I understand it better. Child's Universal Rosette took things further. If you're shown a rose-turned butterfly shape, this is probably how it was turned. [description not written yet.] Full details in Bulletins 34 and 120

Phasing:

A lot of rose turned patterns depend on phasing the rosette relative to the work, usually by half a

wave, between rows. There are also times when you want to offset the row by a smaller amount, so that the down-cut of one row touches the up-cut of the next. A traditional machine has the rosettes mounted on a barrel, and it's possible to rotate the barrel relative to the mandrel. Simple indexing is controlled by a click plate (an engine turner would call it the "crossing plate"). These normally use some kind of detent in a slot, though a pin in a hole may be simpler. Remember that most of the arrangements you're likely to see were designed for engine turning, where you may be clicking backwards and forwards hundreds of times. You need $\frac{1}{2}$, and perhaps $\frac{1}{4}$ wave steps, but only for the rosettes you're likely to use. If you're faced with an old machine, it can often be entertaining trying to work out what the cryptic markings on the click plate actually mean. If you had a section for 48 waves, it would also cover 6, 12, and 24. For fine adjustments, most machines also have a worm wheel. Holtz shows patterns where this kind of fine adjustment is needed, to bring the up-curve of one row close to the down-curve of the next.

Slow rotation of the barrel on the mandrel, as the mandrel rotates and the sliderest traverses the work, produces a spiral rose effect. Fit a starwheel to the worm, with a fixed pin attached somewhere convenient, to turn it 1 step per revolution of the mandrel. If you put an eccentric chuck on the mandrel, with a similar drive on the nose index, you could cut Robinson-style eccentric spirals, without the irregular surface that his manual methods were supposed to produce. (I've seen one of his spirals, and the finish looks pretty good to me.)

The simplest way for a beginner to phase rows of cuts is to rotate the work in the chuck. It works fine if you can maintain concentricity. When real accuracy is needed, I drill small indexing holes around the spigot, and use the drill bit as indexing pin, bearing against no.1 chuck jaw.

Building a fine rose engine is an admirable project. We need more of them. If you have this level of engineering skill, you should bear in mind that there are an awful lot of useful tricks that can be added to a rose engine to produce more advanced work. If you're shaping work, a spherical sliderest seems like an essential to me, though you may find a curvilinear suits you better. Wave on wave effects could be very effective. I love the idea of a fine surface pattern on a rose turned shape. A tidy spiral facility (Goyen or Pittler style) would be worthwhile, and might encourage attempts at eccentric spiral work. If you think of rose turning as rotation, combined with 2 (or 3) linear movements, which often involve reciprocations, you can see that components from modern machines might find a place in a new rose engine. For example, ball screws are designed to produce reciprocations without backlash. Back in the 1960s, Douglas Gall's pattern generating computer gave us a glimpse of the potential of mechanically programmed pattern generation without rosettes, but he was many years ahead of his time, and he was never able to produce a 2 axis plus rotation version for shaping work. All of this looks like a major detour from an article on rosettes, but I think it's important to have some idea of the possibilities beyond simple rose turning.

I don't think I'd like to work with a traditional rose engine with a barrel of rosettes. I'd prefer a sturdy headstock, with a quick-change mount for 1 or 2 rosettes, and a separate swash plate. A box of rosettes to go with it would be nice, so long as there were plenty of blanks. The problem is, you can't ever have enough rosettes. A twin mandrel machine, using single-wave rosettes, would be much more sensible, with a lever arrangement for the rubber to produce variable throws.

Since I've been thinking of rose turning in terms of rotation and linear movements, I'm beginning to think that one could do much better than conventional machines. My ultimate rose engine would probably be very different from any existing design.

