

Uku can do it!

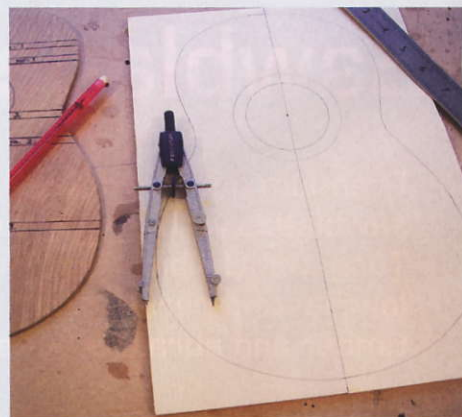
Carrying on from issue 303, in the second part of this series, **Shaun Newman** shows you how to make the ukulele's rosette, how to brace and fit the front, and puts the back into place

Carrying on from last month's article where I took you through the basic construction all the way up to making the soundboard, this time I'll describe how the rosette is made, how the front is braced and fitted and how the back is put into place. Let's start with the rosette.

The rosette

Once the soundboard has been reduced in thickness, it is time to inlay the rosette. It is possible to buy ready-made rosettes from, for example, Duke Luthier in the USA (see list of

suppliers at the end of the article). However, by using thin strips of coloured veneers, it is easily possible to make your own. The position of the rosette is marked out onto the spruce in relation to the rest of the front (**Pic.1**). The next task is to cut a channel around the centre of the soundhole around 8mm wide and 1.5mm deep, 35mm from the centre. This is best done with a Dremel mini router with a trammelling base (**Pic.2**). However, an ordinary router can be used with a homemade base that allows circles to be cut. When the channel is ready, thin strips of veneer are prepared



STEP 1. The soundboard dimensions and rosette marked out



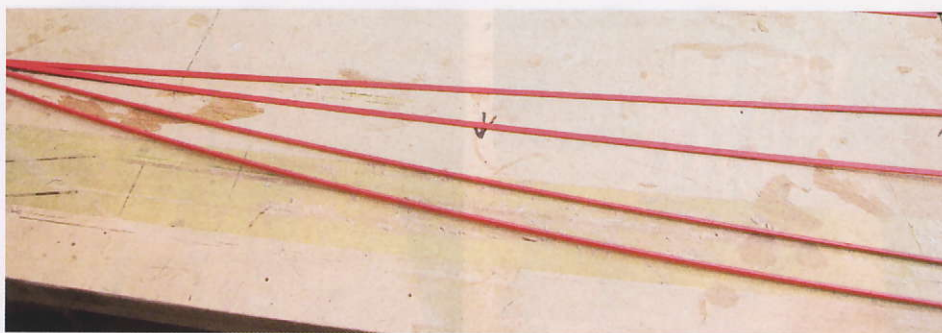
STEP 2. Cutting the rosette channel with the aid of a mini router

with a scalpel each at around 2mm wide (**Pic.3**). These can be bent on the hot iron (**Pic.4**) and placed into the channel or simply pushed in one by one (**Pic.5**). I normally start and finish with a black to offer good contrast against the spruce. If you work from the outermost strip towards the centre the veneers will try to push outwards, tightening themselves naturally as you build the rosette up. The last strip may need to be tapped in with a rubber-headed hammer to make sure everything fits tightly.

Once all of the strips of veneer are in place, the whole rosette is steeped in 'Zap-A-Gap Pink' CA adhesive, which is the best for this job as it is very thin and runs into all of the tiny gaps and holds the veneers in place. Once cured, the rosette can be levelled with a chisel (**Pic.6**) or small plane and finished with 320 grit abrasive. The soundhole itself can now be cut out with the router (**Pic.7**) or a fret saw leaving an edge of around 2mm-wide. As the rosette has been let into a channel 1.5mm deep and the spruce soundboard is just 2mm-thick, there is an area of weakness here which must be strengthened. A patch of 0.8mm model maker's plywood is attached to the inside of the board to strengthen that area (**Pic.8**).

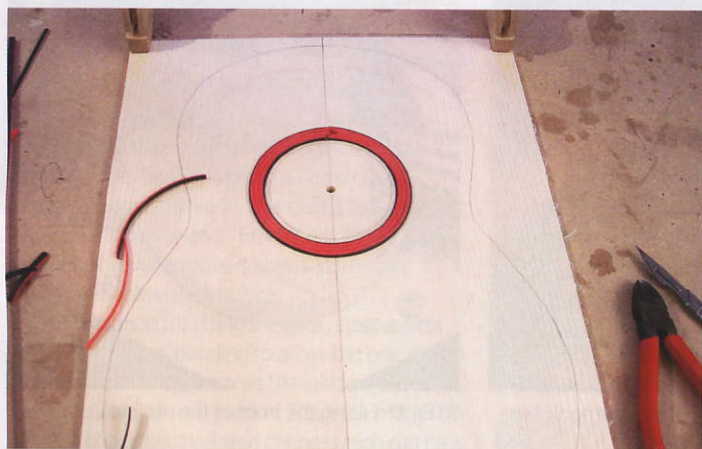
Bracing & fitting the soundboard

If a 2mm soundboard were fitted with no bracing to strengthen it, disaster would soon follow. The braces help to distribute sound and offer stiffness >



STEP 3. Veneer strips are prepared for the rosette

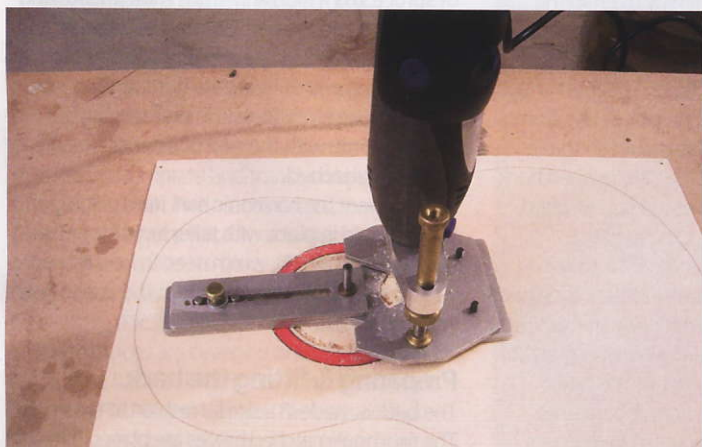
STEP 4. Bending the veneer strips on the hot iron



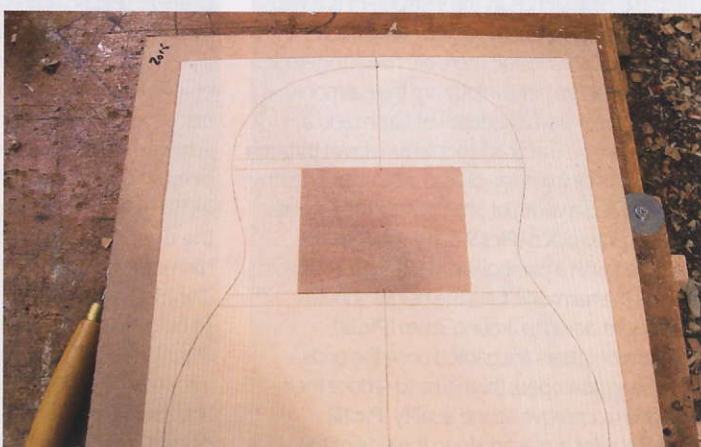
STEP 5. The strips are inlaid into the channel



STEP 6. Levelling the rosette with a paring chisel



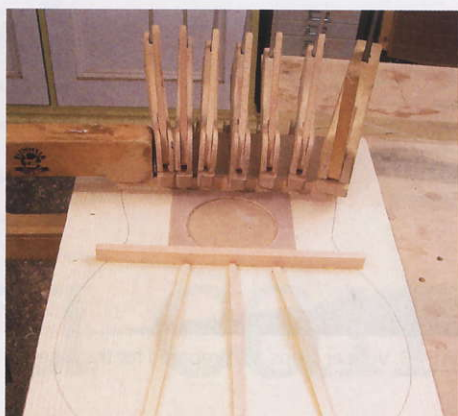
STEP 7. Removing waste wood from the soundhole



STEP 8. The support patch for the rosette



STEP 9. Clamping the fan bracing



STEP 10. Clamping the harmonic bars



STEP 11. Scalloping the fan braces



STEP 12. Scalloping the harmonic bars



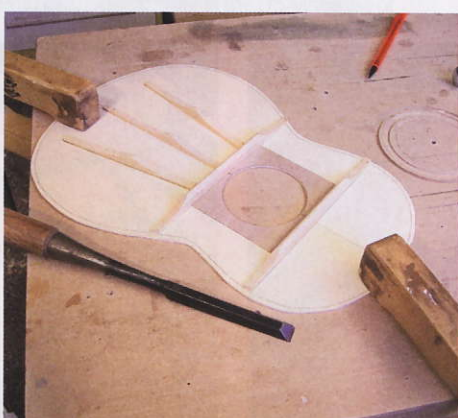
STEP 13. Gabling the harmonic bars



STEP 14. Cutting the front to shape



STEP 15. Marking the ends of the harmonic bars



STEP 16. Trimming the ends of the harmonic bars



STEP 17. Fitting the front of the ukulele

and strength to the front such that the stresses created by the strings as the instrument is tuned are counteracted. Each brace is made from fine-grained spruce and there are five altogether. The two that run horizontally are the harmonic bars and are made to a depth of 12mm and a width of 6mm. The grain should run down through the depth. The three fan braces are cut to a depth of 10mm and a width of 5mm. Once they are all cramped into place (**Pics.9 & 10**) the ends are scalloped with a parabolic curve (**Pic.11**). At the ends of the harmonic bars the height should be brought down to around 3mm (**Pic.12**). The harmonic bars are gabled once the ends have been scalloped; this helps to reduce their bulk and to improve sound quality (**Pic.13**). The steel ruler is placed along the side of the bar to protect the soft spruce during the process. Once braced, the soundboard can now be

cut to shape and fitted. It is cut out slightly oversize (**Pic.14**) and will initially overlap the sides when put into place. The neck and sides are removed from the mould and the front is placed face down onto its base. The front should be held in line with a small propeller-like clamp screwed into the base of the mould so that it does not move when the sides are pushed back in. Once they are sitting over the soundboard, the exact spot where the sides meet the harmonic bars can be marked with a pencil (**Pic.15**). The ends of the harmonic bars then need to be trimmed to allow the sides to sit flush onto the inside of the soundboard when it is placed into the mould (**Pic.16**). Once this has been achieved the tailblock and fingerboard end of the heel are coated in glue and held down onto the front with cam clamps (**Pic.17**), then the inside edges of the front can be secured using

'tentellones'; these are small triangular pieces of spruce 7mm high and 4mm wide (**Pic.18**) and are placed into the point where the sides meet the soundboard and held in place with Titebond glue. A long pair of tweezers does a good job and once the tentellone is in place, it can be pushed home with the end of a pencil that has an eraser attached.

To prevent the harmonic bars from pinging off they are held in place with taller tentellones (i.e. 45mm long) (**Pic.19**), which need to be clamped while the Titebond cures (**Pic.20**). These also help with sound distribution.

Preparing & fitting the back

The back is made in a similar fashion to the front. The two bookmatched halves are planed flat along the inside edge (**Pic.21**), squared and put into the gluing jig. This time red and black veneer



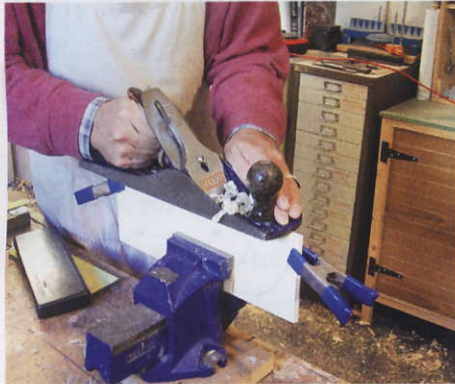
STEP 18. 'Tentellones'



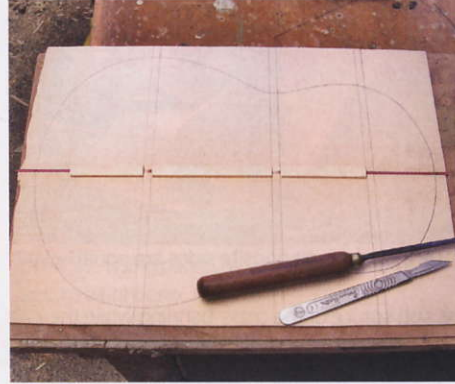
STEP 19. Extra-long tentellones



STEP 20. Clamping the long tentellones



STEP 21. Planing the inside edges of the maple back while clamped in the vice



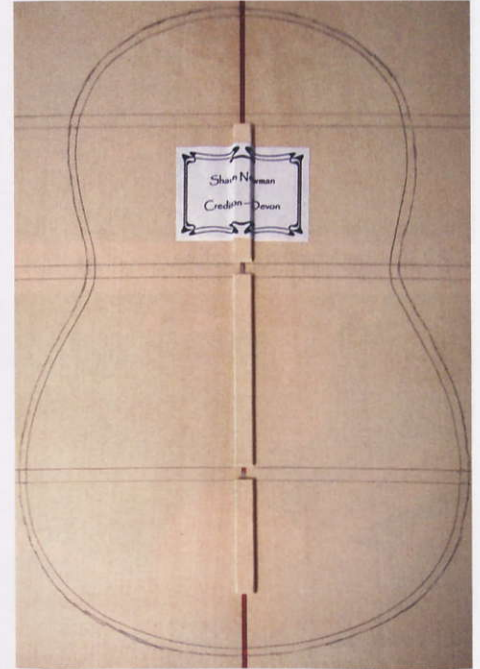
STEP 22. The cross-banding to strengthen the join in the back

strips are sandwiched between the two boards to form a decorative back strip. Once the glue is dry, the back can be reduced in thickness to 2mm all over. With the veneer strips running through the centre the join between the two halves of the back can be very fragile, so a thin piece of cross-banded spruce is laid along the centre and glued in place. This strip is usually around 12mm wide and 1.5mm thick, but may be wider if several veneers are used to make up the decorative centrepiece.

In preparation for fitting the back, slots are cut through the cross-banding to allow the braces to make contact right across the inside (Pic.22). Now the label can be glued in. There are many images of borders available online, which can be used to create a label such as the one here (Pic.23).

The next task is to make the back braces themselves. There are three in all each made from mahogany and 12mm deep and 6mm wide. These braces have to be curved slightly to offer a gentle profile to the back of the ukulele. The overall 'lift' on the back is around 3mm; this can be achieved by making a template and transferring the curve to a sanding stick. The braces can be roughly planed to the curve (Pic.24), and then the edges that will be attached to the back can be profiled on the curved sanding stick to get an even shape on all three (Pic.25).

These braces are clamped onto the back and as with the harmonic bars, they are scalloped at the ends (Pic.26) and gabled. The ends of the braces are reduced to 3mm. As with the front, a steel ruler is placed against the brace so that the block plane does not damage the back or



STEP 23. The label in place



STEP 24. Planing the curve onto the back braces



STEP 25. Sanding the curve to give a 3mm lift



STEP 26. Scalloping the back braces



STEP 27. Gabling the back braces



STEP 28. Trimming the sides with a thumb plane



STEP 29. Sanding the 3mm lift



STEP 30. Checking the curvature



STEP 31. Ensuring opposite sides are equal height



STEP 32. Clamping the kerfed lining into place



STEP 33. Cutting the back to shape

the soft spruce of the cross-banding while the gabling takes place (Pic.27).

Before the back can be fitted the sides, heel and tailblock have to be prepared. The 3mm lift must be applied here also. This is done by using a small thumb (Pic.28) or block plane followed by the curved sanding stick (Pic.29) and monitored by a simple cross-shaped jig, which has a cross-halving joint at its centre that is not glued. The longer part of the jig lies over the heel and tail, and the crossbar runs backwards and forwards enabling the exactness of the curvature on the sides to be checked (Pic.30). Throughout the process it is necessary to check that opposite sides are the same height all along (Pic.31).

Once the sides are prepared, a kerfed lining should be glued into place along the top inside edge to support the back. The lining is held in place with a number of mini clamps, which I bought from Poundland; around 50 are needed (Pic.32). The kerfed lining must be sanded flush with the top edges of the sides. Once the back has been cut to size – by around 5mm too large all round (Pic.33) – it is then placed over the sides with the scalloped

braces overlapping. A small slot should be cut exactly where the braces stand out over the sides so that the back itself can lie flush (Pic.34). Once this has been achieved the back can be glued on (Pic.35). If the large number of cam clamps is not available, it is possible to hold the back down with large elastic bands while the glue sets (Pic.36). Some makers use linen strips to tie the back into place, but elastic bands do a very good job and apply considerable pressure.

Bindings & purflings

The bindings are there to protect the edges of the ukulele. This is particularly important for the front as the spruce is very soft and can easily be damaged. The purflings are there for decoration and lie between the bindings and the outer edges of the back and front. They are not essential but do add considerably to the overall appearance. Before both can be fitted, the top and back need to be trimmed flush to the sides; this can be done with a flush cutting router bit or a sanding stick. Channels must be cut around the edges of the instrument at 5mm deep and 2mm wide for the

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TENOR UKULELE ROSETTES

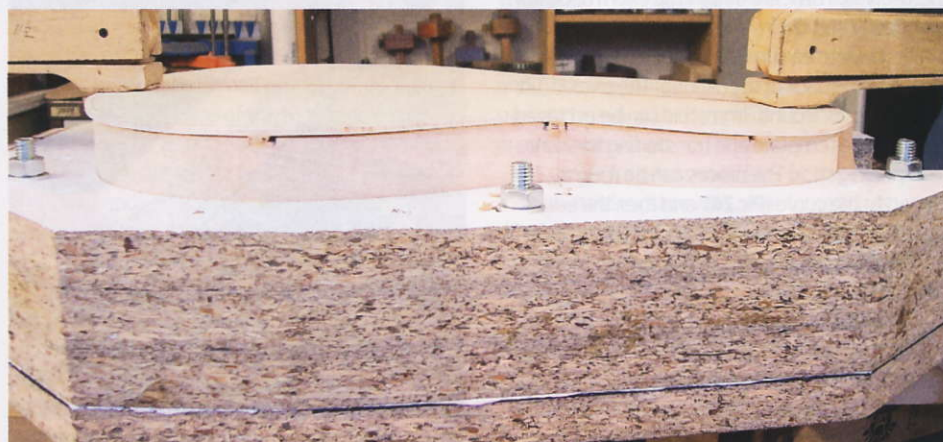
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VENEERS

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STEP 34. Locating the correct position for the back of the instrument



STEP 35. Clamping the back in place



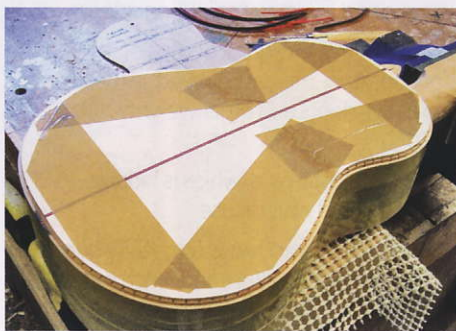
STEP 36. Elastic bands hold the back in place



STEP 37. Cutting the binding and purfling channels



STEP 38. Chiselling the slots



STEP 39. Using parcel tape, as shown, helps to ensure a tight grip



STEP 40. The bindings and purflings held in place with masking tape



STEP 41. Trimming the bindings flush

bindings and 3mm deep and 1.5mm wide for the purflings (Pic.37). The purflings are made from strips of coloured veneer in a similar way to the tailblock and headstock inlays.

The bindings are rosewood and are bent into shape on the hot iron. This is a tricky job as they break very easily if too much pressure is put on them during the bending operation. I find that a strip of flexible stainless steel held directly behind the binding helps to prevent breakages during the process.

When the bindings are bent to shape and cut to length, slots must be cut into the neck and heel to allow them to be put into place neatly (Pic.38). The slots in the neck will be covered by the fingerboard so can be cut roughly to length, but the ones into the heel must be pretty much exact. If the bindings and/or purfling do not quite meet at the heel, then the heel cap can be cut in such a way as to hide the join.

The bindings and purflings are glued along the inside edges and held firmly in place by strong masking tape. To help the masking tape to grip tightly, I put strips of parcel tape around the sides of the ukulele and over the top and back (Pics.39 & 40). This is easily removed once the glue has

dried but care must be taken with the front as the spruce can easily tear. As the binding channels were cut to a depth of 5mm and the bindings are supplied at 6mm deep, the top edge should be trimmed flush. I use a small thumb plane for this job (Pic.41), but a flat sanding stick with 120 grit abrasive can just as easily do the job. If coloured purflings are put in, some of the colour will get into the grain of the spruce; this can be removed as the front is sanded with finer and finer grit paper. By the time 400 grit is used, the spruce will be clean.

Next comes the heel cap, which is made from a small piece of rosewood 2mm-thick. It is clamped on first having been cut roughly to shape and then is trimmed to the correct profile once the Titebond has dried (Pic.42).

That's it for now – join me again in GW307 where we'll complete the build. **GW**



STEP 42. Fitting the heel cap

NEXT TIME

In issue 307, Shaun will describe how to fit the frets, prepare and attach the fingerboard and fit the tuners and the bridge. He will also look at how to make the bone nut and saddle, how to apply a good finish and, finally, how to string up and tune your finished instrument!