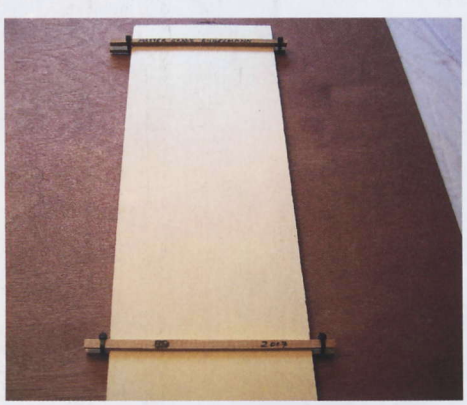
Photographs by
Dave Hutton

LUTHIER'S LUTE

In the second part of this project, **Shaun Newman** discusses the making and attaching of the lute's soundboard and fingerboard

In part 1 I described a little of the background to the lute, its origins and history. I then went on to describe the plans and jigs needed to make a start, and how to prepare the bowl back of the instrument, then came a description of how to make the neck and peghead.



29 A bookmatched set of Engelmann spruce for the soundboard

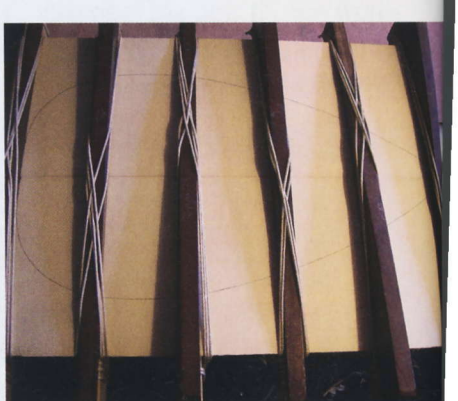
The soundboard

As with virtually all stringed instruments this is the most crucial component. Poor quality wood or incorrectly made or applied bracing will have a detrimental effect on the sound quality. It is well worth spending a few extra pounds on the spruce for the front. I usually choose Sitka or Engelmann spruce and will always look for master grade or the nearest. Either way, the bookmatched boards should have very narrow grains with no run out.

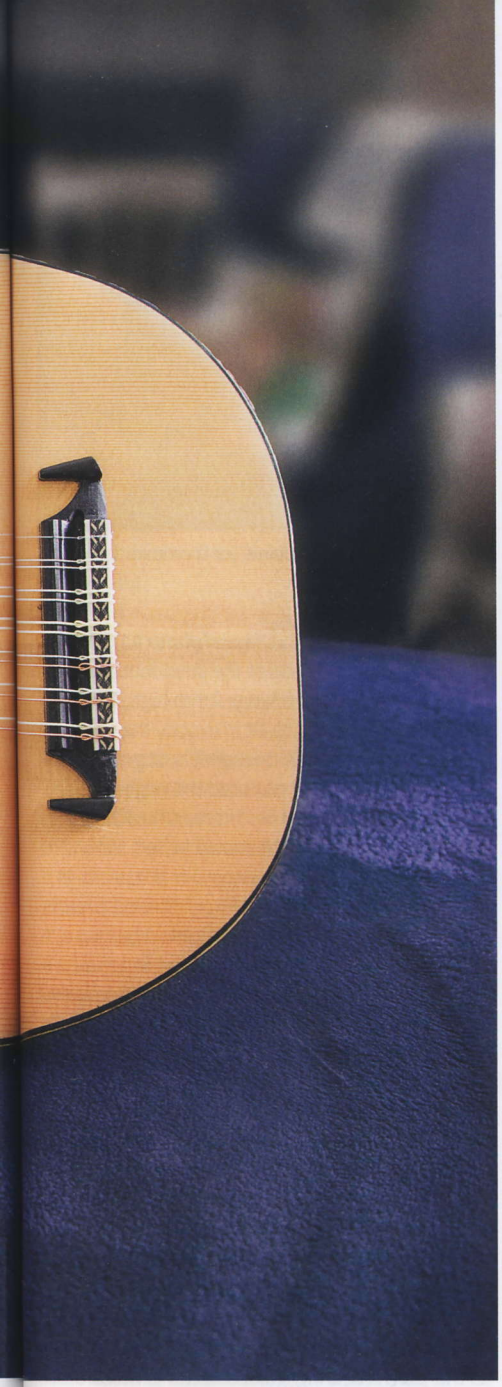
Spruce boards are normally supplied in thicknesses of between 5 and 3.5mm and as a 'bookmatched' set (**photo 29**). Eventually, to obtain the best possible responsiveness and resonance, the soundboard will be reduced to around 2mm in thickness. Before then the two boards must be joined along the centre. First, the edges to be joined must be planed true and then checked for squareness. I usually sand the edges square with a sanding stick made from an old spirit level, 600mm long with abrasive attached to the edges with double-sided tape.

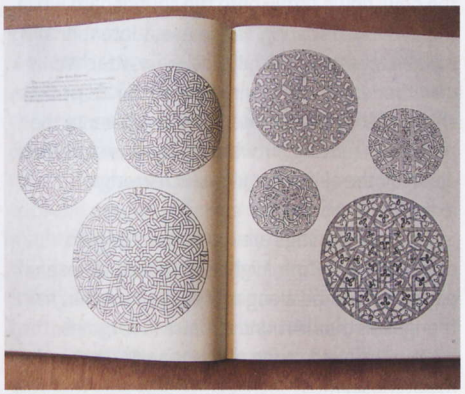
The two boards are then held in a 'wedge and lace' jig until the Titebond cures (**photo 30**). When the soundboard is removed it is delicate as no bracing has yet been attached, so considerable care is needed while it is being handled.

Once out of the wedge and lace jig, the soundboard can be reduced in thickness, and by

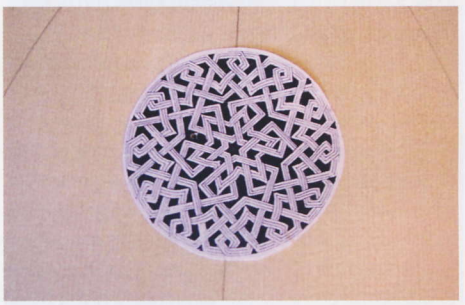


30 The soundboard in the wedge and lace jig



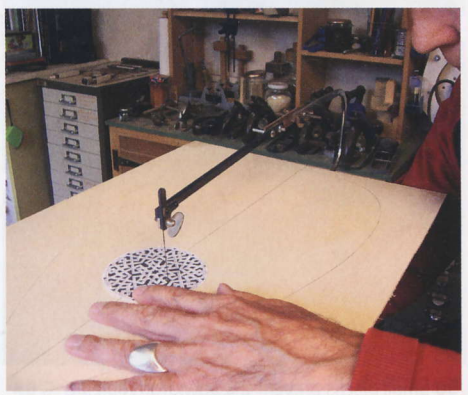


31 Some rosette examples in Robert Lundberg's book *Historic Lute Construction*



32 A photocopied rosette pattern glued into place

33 My 'long reach' fret saw



34 Fretting out the gaps in the design

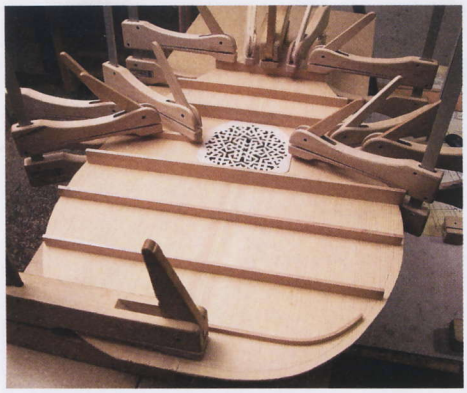
now it is scarily thin and needs extreme TLC, no more so than when the rosette is carved into the sound hole.

The rosette

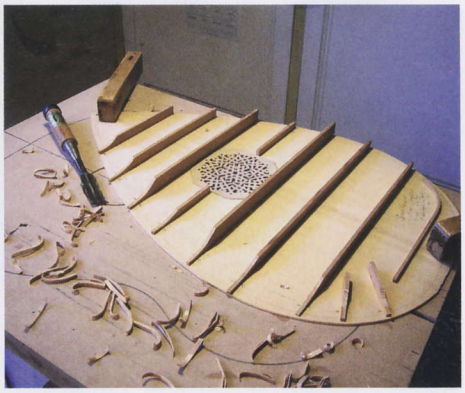
The rosette is perhaps the greatest challenge in the construction of a lute. The patterns seen in some older instruments are truly astonishing, and of course were cut out by hand using inferior tools to those of today. I am always in total admiration of the early lute makers' craft.

To begin, a pattern should be chosen. I chose a popular design attributed to Georg Gerle, the Austrian maker, which is thought to date from around 1580. I love the design as it constantly changes as you look at it. One moment the square profiles emerge, then the curved, then the over-under knot-like patterns, followed by the rather Moorish looking shapes and so on. By now the soundboard is just 2mm thick, so it is advisable to strengthen the area below where the rosette will be positioned with some thin model-maker's plywood. I used a piece of 1mm thick three ply from a local model shop and this helped give me confidence as I was cutting out the rosette. When the pattern has been chosen it can be drawn onto the soundboard in pencil, or for greater symmetry and accuracy, I chose to photocopy the design from RZ Taylor's book *Make and Play a Lute*. There are also many beautiful designs in Robert Lundberg's book *Historic Lute Making* (**photo 31**). The photocopied rosette design can be glued onto the front of the soundboard and work can then begin on cutting it out (**photo 32**).

Some makers use nothing more than a surgeon's scalpel to create the rosette, but I found it more practical to use a fret saw to take out most of the waste wood and to finish the job with a scalpel and very sharp 2mm chisel. The 'Two Cherries' ones are good for this job, particularly for the over-under work. My normal fret saw did not have the reach to get to all of the parts of the rosette, so I extended the reach by buying an old second-hand one and cutting the frame off with a hacksaw, then bolting it onto my existing fret saw, which had the benefit of making the reach almost twice as long (**photo 33**). It helps if you have arms like a gorilla at this stage! (**photo 34**).



35 The soundboard bracing pattern



36 The brace ends are scalloped

37 Nails act as anchor points for the elastic bands

Bracing the soundboard

When the rosette is completed it is time to consider the bracing pattern. If the soundboard were not strengthened with braces it would collapse under the pressure of the strings bearing down on the bridge. There are many different bracing patterns, but most consist of a series of horizontal struts 15mm high and 5mm wide with smaller, angled ones on the treble side and a hockey stick shaped one on the bass. In some lutes a couple of the horizontal braces run under the rosette and are visible. As the rosette area has been strengthened, this can be avoided by running those struts up to the edge of the sound hole (**photo 35**).

Once the braces are all in place the ends should be scalloped down to a height of 3 or 4mm from a position of around 5cm from the end (**photo 36**). In some lutes, the ends are left at the same height as at the centre of each strut, but this can give rise to buzzing if, perhaps, the soundboard is not fitted to the bowl with surgical precision. I realise that I am breaking with tradition in using this approach, but my experiences in guitar making have shown me that if ever an interior buzz occurs, it can be fixed through the sound hole. This is not possible if the sound hole has a carved rosette in it.

Attaching the soundboard

Traditionally the soundboard would simply be glued around the edge, which attaches to the bowl, having a little extra support if the brace ends are left at the same height as the centre point. This makes for a potentially weak structure, so for this lute I am again breaking with that tradition and using kerfed linings similar to those used in classical guitar making. The method involves making another jig.

This is really a frame that is made in such a way that it can be held in a vice, i.e. it is attached to a piece of 4×2 timber running along its underside. The cross arm is to prevent the outer edges of the jig from bending out of an exactly flat plane. The frame has nails tapped in around the edges (**photo 37**). These nails are anchor points for long elastic bands that will be used to hold the bowl down firmly onto the soundboard while the adhesive is curing. The frame is intentionally made oversize and small blocks are attached on either edge, each 2mm from the exact outline shape of the bowl (**photo 38**). This prevents the bowl from moving outwards when it is squashed down by the elastic bands, which exert an extraordinary pressure.

The kerfed linings are made from lengths of mahogany 15mm high × 7mm thick. These pieces are planed along one edge to form triangular strips. Around a metre in length is plenty. The inside edge of the triangle, that is the hypotenuse, must then receive saw cuts that run almost through to allow the strips to bend easily (**photo 39**). They are then glued in place with the help of small clamps. They should be left slightly proud of the upper edge of the bowl, later to be levelled with a flat sanding stick around 600mm long. The linings do not run around the entire inside edge of the bowl as small gaps are needed for the brace ends. Care must be taken to ensure that the gaps are in exactly the right place as otherwise the ends of the braces will foul on the linings and make the task impossible (**photo 40**).

The soundboard may now be attached and held in place on the jig by the bands (**photo 41**). Clearly where the narrower end of the soundboard meets the neck there will be a ledge 2mm high. This will allow the fingerboard to sit in exactly the same plane as the soundboard when it is later fitted.

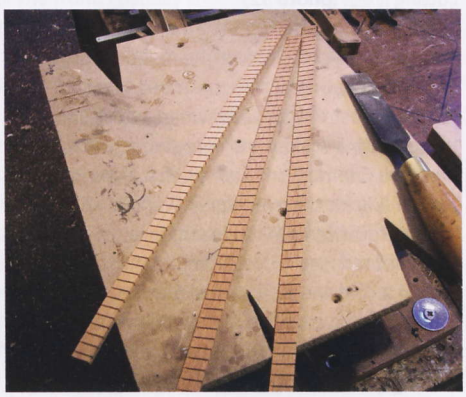
After the adhesive has cured the edges of the soundboard should be trimmed flush, but the overlap onto the neck should be left for later attention.

Binding the soundboard edges

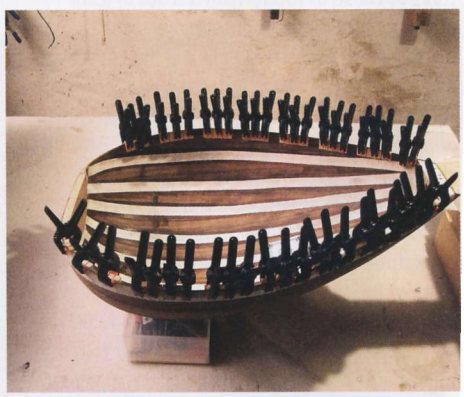
Older lutes had no edge bindings, leaving the join between the bowl and soundboard vulnerable. For this lute I am inserting bindings, which will protect the edges from any damage. The bindings are made from two strips of ebony 2mm thick, 6mm high and around 650mm long. They are bent on a hot iron to conform to the outer edge of the bowl and placed into position in channels that are routed around the top edge of what is now a three-dimensional structure.

I have routed many hundreds of yards of binding channel over the last 30 years and by far the best method I have discovered is to use the small hand-held router made by Bosch known as the 'Colt'. A bearing-guided cutter is fitted that will create a rebate 2mm wide and 6mm deep allowing an exact fit for the binding (**photo 42**). The lower ends of the bindings meet as a butt join at the tail end of the lute, but the ends that go in the opposite direction are inset into the edges of the neck for around 4 or 5mm. These insets will later be covered by the fingerboard. To keep the bindings in place as the adhesive cures, strips of strong masking tape are used. This method seems primitive, but it is very effective and commonly

38 Small blocks prevent the bowl from bulging outwards



39 Kerfed linings in mahogany, ready for use



40 Small spring clips hold the linings in place as the glue cures

41 Long bands hold the bowl down onto the soundboard

used by luthiers (**photo 43**). Once the tape is removed, the bindings can be cleaned up with a sanding stick in preparation for the next stage.

Preparing the fingerboard

The fingerboard on a lute is much thinner than on a guitar or even a ukulele; it is just 2mm thick to enable it to lie flush with the soundboard once it is in place. It is prepared from a billet of ebony around 3mm thick, 75mm wide × 250mm long. It is planed true on both sides and brought to a thickness of 2mm (**photo 44**). There are several options to consider at the point where the end of the fingerboard meets the soundboard. One method is to cut 'bee stings' into the top edge of the soundboard with corresponding shapes cut into the end of the fingerboard. This is a tricky operation, so for this lute I chose to make a 'V' shape instead. By now the traditionalists will be tearing their hair out and ready to subject me to a flogging, but it is time for yet a further break with tradition.

Early lutes had gut frets, which reduced in thickness progressively as they moved down the fingerboard. Each fret was tied with a special knot and this method allowed for the frets to be moved to change the pitch of individual notes. This was very important at the time as there was no standardised tuning and no specific way of setting the instrument up for playing. A common approach was to tune the first string up until just before it breaks and then to tune the others to that one. Now that tuning is standardised to A=440 there is no need for moveable frets, so the fingerboard is slotted to receive medium gauge classical guitar ones.

42 The Bosch 'Colt' is ideal for routing out the binding channels

The fret slots should be cut into the fretboard while the edges are still parallel. This way all slots will be at 90° to the nut end of the fingerboard and there is less risk of intonation discrepancies. A fine dovetail saw is good for this job, though specialist fret cutting saws can be obtained (see suppliers list), and several suppliers sell fret slotting jigs made of metal with bearing-guided blade holders that guarantee a precise cut (**photo 45**). Unless the maker is going to produce more than one fretted instrument, a standard mitre block can be used and the depth of cut can be measured with a simple device made from a small, thin, flat piece of steel. A piece of masking tape is placed along one edge of the steel away from the edge by the depth of the fret tang; this simple device can be inserted into the cut from time to time to ensure the correct depth (**photo 46**).

NEXT MONTH

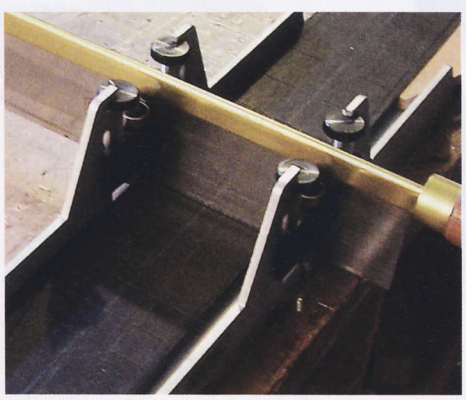
In the March issue, Shaun shows you how to attach the fretting and fingerboard, prepare and fit the tail strap and bridge, before attaching the strings and finally tuning up

43 Masking tape holds the bindings in place

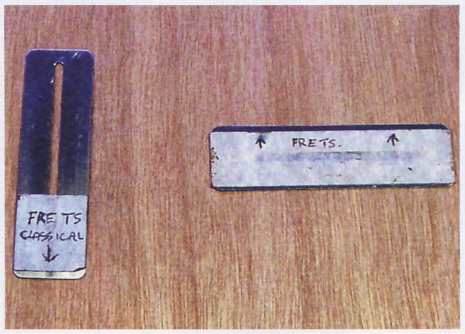
SUPPLIERS & SOURCES OF HELP

- The Lute Society for plans, sheet music, literature and lists of teachers – **www.thelutesociety.co.uk**
- Touchstone Tonewoods – for timber and tools – **www.touchstonetonewoods.co.uk**
- Tonetech – as with Touchstone – **www.tonetechluthiersupplies.co.uk**
- Stewart-Macdonald – for plans, tools and all manner of luthiers' supplies – **www.stewmac.com**
- The Guild of American Luthiers – for plans and literature – **www.luth.org**
- David Dyke – for timber and tools – **www.luthierssupplies.co.uk**
- The Early Music Shop – for specialist strings, cases and pegs – **www.earlymusicshop.com**
- The Luthiers Nook – for pegs – **www.luthiersnook.com**
- Madinter Wood – for music, pegs and timber – **www.madinter.com**
- Keystone Timbers – for exotic timber – **www.tonewoods4luthiers.co.uk**
- Strings Direct – for all manner of strings – **www.stringsdirect.co.uk**
- Dictum – for pegs, timber and tools – **www.dictum.com**
- 'In the Making', Vimeo, a film about the work of Steven Gottlieb – **https://vimeo.com/96809354**
- *Historical Lute Construction*, Robert Lundberg. Published by the Guild of American Luthiers, 1972 – possibly the most comprehensive book on lute construction available
- *Make and Play a Lute*, R.Z.Taylor – published by Special Interest Model Books, 1983

44 The fingerboard under preparation



45 A specialist fret cutting tool



46 Depth gauges for frets