

Pete Graves – Acoustic Luthier

In 2013 one of my grandsons wanted an acoustic guitar to add to the collection of electric guitars that he plays. Rather than buy one I decided to have a go at making one and bought a book entitled *Guitar Making* by Cumpiano & Natelson, which turned out to be an excellent guide. However, it contained too much descriptive text so I distilled much of it into a series of process steps that an engineer could follow!

A key aspect for the starting point for building an acoustic guitar is the choice of wood. The top, back and sides are made from high quality book-matched pairs of wood, <2.5mm thick, and straight, fine-grained spruce is the favoured wood for the soundboard.

The wood for the back and sides (ribs) is usually the same, and I have used Indian rosewood, quilted maple and English walnut to make three guitars. Utile (a mahogany type) and maple are used for the neck. There are a number of on-line suppliers of wood but I use a 'Fred in a shed' luthier in Durham who is very helpful and belt-sands the wood to the required thicknesses.

So far I have made two classical guitars and one steel-string (aka Western) guitar.



*Steel string guitar with quilted maple back and ribs
with ebony bindings*



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The Build Process

The neck and headpiece is made by cutting and gluing two pieces of dimensioned wood together at an angle of 15°.

- Blocks of matching wood are glued at the heel end where the neck joins the guitar body. The headpiece and block are then cut and carved to the required shapes, a tedious process!

The body comprises a soundboard and back, each made from two pieces of wood glued together along the book-matched edge and held together by sides (ribs). Purflings and bindings are used to seal the end grain and protect the edges of the instrument.

- The long edges of the soundboard and back are each planed and sanded on a shooting board, and the edges 'candled' against a light to show irregularities that have to be removed. The boards are then carefully aligned so that any natural pattern is matched. They are glued together on a flat board using wedges to force the pieces together.
- The boards are then sanded by machine and by hand to remove any surplus glue and to achieve the required thickness. They are cut to the traditional acoustic guitar shape using a band saw.
- On the soundboard the recess for the rosette is routed out and glued into place, and the sound hole routed out.
- The soundboard and back are braced on their reverse sides, using spruce, or 100 year old pine and mahogany from my wood stock.
- The ribs are bent to the shape of the guitar by heating and clamping in a homemade jig.
- The soundboard is glued to the neck, and is then mounted face down on a work board called a solera. The sides (ribs) are glued into place using utility kerfing to give strength.
- A flexible strip of utility kerfing is glued to the top edges of the ribs and, after profiling them to a convex shape using a sanding board, the back is glued down using cross clamps.
- Grooves are routed out around the top and bottom edges of the guitar and decorative strips of contrasting wood purfling and bindings are glued in place.
- Now follows the tedious process of hours of sanding the whole structure with progressively finer papers to remove any surplus glue and assembly faults.
- An ebony fretboard is glued on top of the neck and frets malleted into place. The underside of the neck is now profiled using a spokeshave and sandpaper.
- The guitar now needs to be lacquered and I use a local professional French polisher who normally coats furniture, but likes the challenge of something different!
- The final major process is to glue on the bridge, which involves removing lacquer from a precise area on the soundboard so there is wood-to-wood bonding. A bone nut is fitted at the head end of the neck.
- Then it is time to attach the tuning pegs, string and tune, and get grandson's approval of the finished article and its tone!

