



Photography by Andrew McNinch

Open-heart surgery

Shaun Newman performs a complex operation to save the life of a Salvador Ibañez guitar

When an enquiry arrived in my inbox from Belgium with photographs of a damaged Salvador Ibañez salon guitar I investigated with interest.

Salvador Ibañez was one of Spain's greatest luthiers in the late 19th and early 20th centuries. His instruments, which included guitars, bandurrias, lutes and mandolins, were highly prized not only because of their superior sound but on account of their outstanding workmanship.

It was clear immediately from the pictures that this instrument was pretty much at the top end of his work, and carried the label with the address 'Bajada de San Francisco 23', indicating that it must have been made between 1898 and 1906.

I could see straight away that beneath the corrosion the machine heads (tuners) were made of brass. This indicated that the instrument was probably intended for export. The better-quality tuners at the time were

made in France and were much more expensive than the steel ones from Spain. Ibañez' business acumen saw the huge market in the salons of such cities as Paris, and therefore his best instruments went abroad.

But even from the pictures the instrument seemed in a sorry state.

I arranged to meet the owner who travelled from Antwerp and decided that I could take the job on, but only on the proviso that the front would require removal. This is a tricky operation and needed the full agreement of the owner. Approval was given and I set to work.

First, the diagnosis

As can be seen from the pictures there were extensive cracks and splits in the ribs and front, in fact all over (Pics.1-3). At one point the front had detached from the ribs and a piece of rosewood was missing. The fingerboard was worn and the machine heads were corroded,

The bridge was warped and partially detached, so I thought...well... all is fixable...

I had undertaken several similar restorations in the past and knew that if you take such an instrument apart it can spring out of shape, making accurate reassembly very difficult. I therefore made a cradle from plywood and spruce blocks in the form of the instrument so that I could hold it firmly and in its original shape while working on it (Pics. 4 & 5). This proved invaluable.

I'm going in...

Once I had removed the old strings, the top nut and the saddle bone I could get a better idea of the next stage, which was to remove the fingerboard. To do this I had to pull out all of the frets – it seemed as though open-heart surgery was beginning with dentistry!

Then it was necessary to make cardboard shields (Pic.6) to protect the delicate inlays in the

Vintage salon guitar



▲ Pic.1 Splits in the side and cracks in the front were an early sign of what lay ahead



▲ Pic.2 The tail end of the guitar had seen better days.



▲ Pic.3 The fingerboard had been badly worn down and the machine heads had all but seized up



▲ Pic.4 The cradle, made from plywood and pine blocks, kept the structure of the instrument intact during surgery



▲ Pic.5 The damaged guitar in its cradle awaiting surgery



▲ Pic.6 Protective cardboard guards prevented scorching of the rosette and purflings during fingerboard removal

rosette and edge purflings while taking the old fingerboard off. I intended to use heat (Pics.7 & 8) first to soften the glue and then a spatula specifically made for the job to prize the fingerboard off. Sounds simple... but it takes time. The heat was transferred through the fingerboard to the glue line via a thick alloy slab, which along with the spatula was heated to 250°.

Once the fingerboard was off it was time to tackle the bridge (Pics.9 & 10). This was a more straightforward operation as it had already partially detached. However, great care needs

to be exercised during such removals as if too much heat is applied and for too long it will cause the struts that are inside the front to detach, causing more difficulty later on.

Removing edge bindings

So, all was set now to remove the edge bindings of the instrument so that the top could be taken off. A small router, in this case a Dremel (Pic.11), can be used for this task, but it needs some sort of edge guide. I chose the Waverley attachment made for Dremel to help with this task.

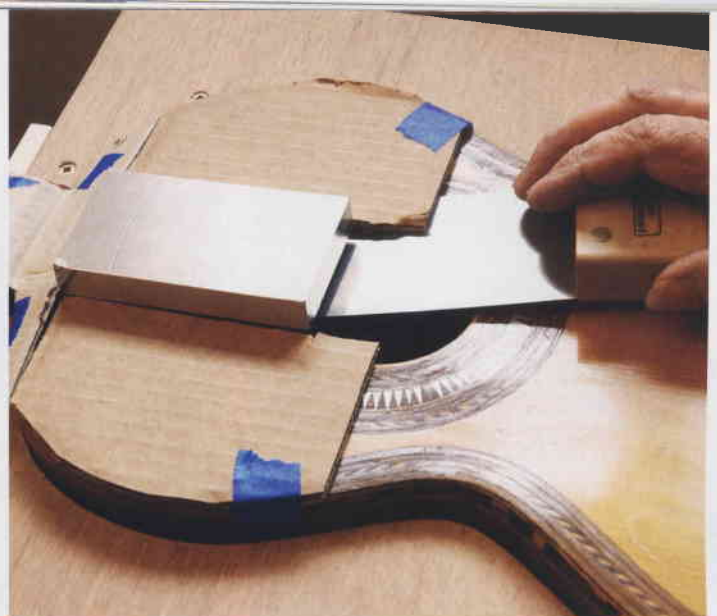
However, even with the bindings cut away, the top was still held in place with small wedges of spruce called tentellones. To remove the top successfully I used a micro handsaw with a blade just 1½in long and ¼in wide. And then... the full extent of restoration work ahead became apparent (Pic.12).

At some stage in the life of this vintage masterpiece someone must have tried to repair damage to the front and ribs. There was evidence that the back had at some stage been removed as excessive glue application to the

Restoration project



▲ Pic7 A domestic iron was used to heat both an aluminium slab and a spatula to aid removal of the fingerboard and bridge



▲ Pic8 The spatula in use



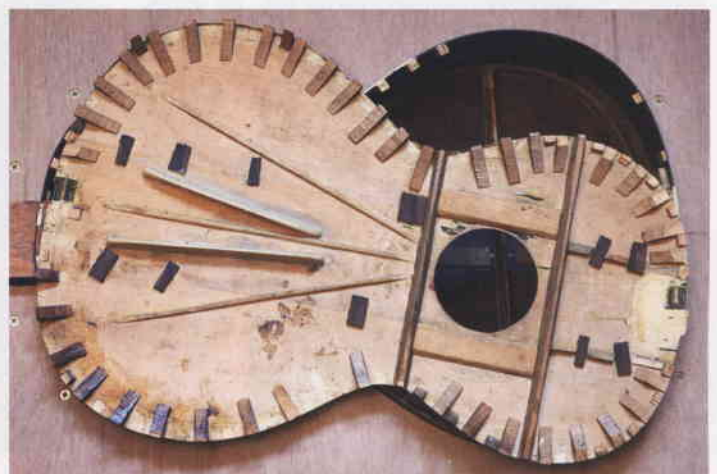
▲ Pic9 Once the fingerboard was removed further evidence of the need for extensive restoration work became evident



▲ Pic10 Once the bridge was removed, tearing of the grain in the top was uncovered



▲ Pic11 A Dremel mini-router was used to cut out the old bindings before removing the top



▲ Pic12 Once the top was removed the full picture of current damage and previous interventions emerged. What a mess!

back struts was visible. The repairer had used a variety of scraps of timber to patch things up, and at one point had obviously soaked an old piece of linen in glue and simply stuffed it into a crack (Pics.13 & 14). All of these crude interventions must have ruined the sound, and in the long run clearly proved to be ineffectual.

Stripping & cleaning

The next stage was to clean everything up by stripping all of the unnecessary scraps out and

to strengthen the edges of the inside of the front and the ribs. I used model maker's plywood just 1mm thick that worked extremely well around the edges. It was strong enough to hold everything in place, but light enough not to impede the movement in the top for a good strong sound.

Above all, the plywood around the edges formed a solid foundation for the extensive edge purflings on the outside of the top.

Replacing the missing pieces of rosewood

▲ Pic13 A previous repair attempt had involved an old piece of linen soaked in glue and stuffed into a crack





▲ Pic14 The tail block had been crudely strengthened with old pieces of spruce which offered next to no support



▲ Pic15 The edges of the top were strengthened with 1mm ply and cracks were cleated with spruce. Old braces were trimmed to improve sound



▲ Pic16 A detailed view of spruce cleats cross banded for strength



▲ Pic17 The ribs were strengthened with 1mm ply strips held in place with mini clamps



▲ Pic18 The inside was now clean, with a rosewood tailblock support, rosewood braces and 1mm ply edge strengtheners



▲ Pic19 A kerfed lining was put into place and levelled to receive the top

from the ribs required a little ingenuity. The simplest solution would have been to cut out an oblong section from around the missing area and to replace it with a similarly sized rectangular piece of thin rosewood bent to the shape it would fill.

I chose to trace the outline of the missing piece from the inside onto a card and transfer that shape onto a piece of rosewood with similar grain pattern and patch it over the ply strengthening strip. This worked well when the

edges were blended in using the techniques described below.

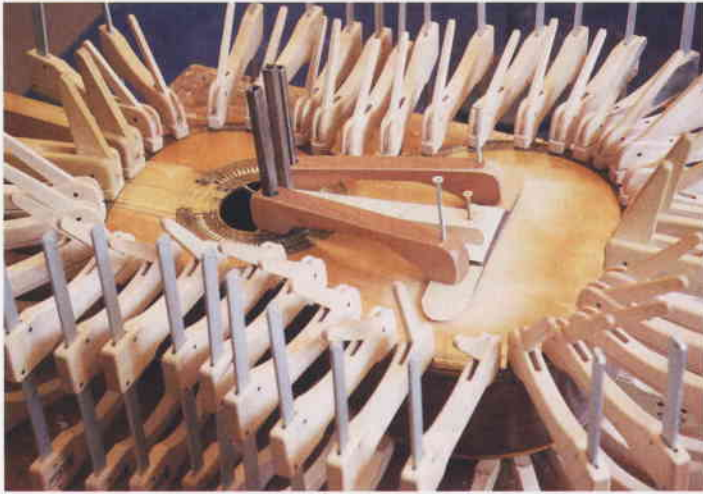
Making cleats

The inside of the front required cleats to help seal cracks (Pics.15 & 16). These are made of spruce, and cut into lozenges, cross banded. The shape of the cleats reduces the amount of material required, which in turn helps to maintain sound quality. The ribs were just 1.5mm thick, and had many cracks. These were

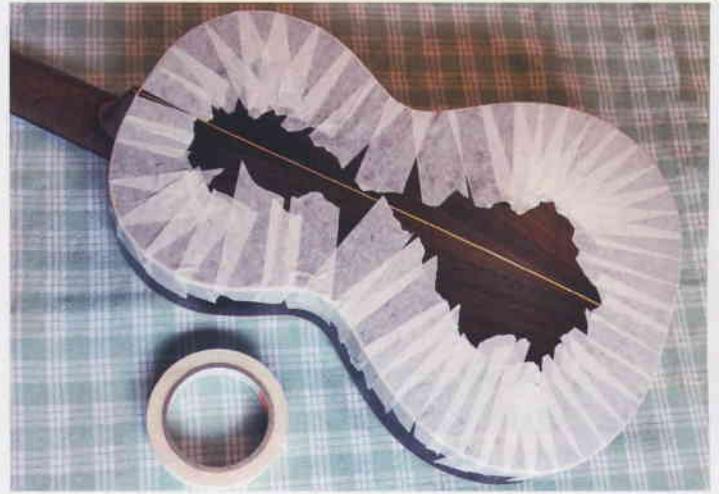
sealed with cyanoacrylate adhesive and rosewood dust, and the whole structure of the ribs was strengthened with rosewood struts all around the inside (Pic.17).

With the front off, it was also possible to tackle cracks in the inside of the back, which received similar treatment, i.e. cyanoacrylate adhesive and rosewood dust (Pic.18). These selfsame cracks would later be treated from the outside as well in the same way. Before filling any cracks on the outside it was

Restoration project



▲ Pic.20 A woodworker can never have too many clamps! The top and bridge were now in place



▲ Pic.21 Nylon reinforced 'library' tape was used to hold the bindings in place as the Titebond cured



▲ Pic.22 Fresh bindings, made from an old maple floorboard, in place



▲ Pic.23 The frets were fitted, trimmed, levelled and polished

necessary to remove all traces of the old varnish. Once the area was back to the wood, rosewood dust was rubbed into the crack, glue dribbled in and then both were smoothed in with fine sandpaper.

During an earlier intervention someone had glued heavy struts to the inside of the front under the bridge. I guessed that this was because the front had cracked horizontally under the pressure of the strings. These struts were far too heavy, so needed trimming with a violin-maker's thumb plane – a tricky job because if too much is taken off it will lose strength, and if too much is left on it will impede sound... the luthier's dilemma.

▲ Pic.24 Ensuring the restorer's label sat right



Kerfed lining

Once the front was intact and ready to fit back into place, I needed to attach a lining on the inside edges of the ribs to increase the gluing area and support the edges (Pic.19). This is standard practice in hollow-bodied instruments, and needs considerable precision. The best linings for this task are 'kerfed' in that they are flexible and easy to fit with small hobby clamps.

A long flat sanding stick is used once the linings are in place to ensure they are exactly level, otherwise the top would be higher on one side than the other, but worse still the bridge would not lie in the same plane as the fingerboard.

In the meantime I had made a new bridge from rosewood. It seemed to me to be important to rescue the mother-of-pearl pieces that had been inlaid into the original bridge, which I did. They were fitted and all was set for a good-looking front, especially when the rosette was treated. The technique there is to soak the rosette in cyanoacrylate adhesive, to skim it with 420-grit sandpaper and finish it with wet-and-dry; this not only protects the inlays, but it brings out the colour and levels the surface.

All went well, and the top and bridge went back on, but this task required the aid of just about every clamp in my workshop (Pic.20)!

New bindings

Once the top was firmly in place it was time to fit new bindings. Luckily I had a length of old floorboard made from maple salvaged from a skip outside a demolition site, and this was just right for the job.

Guitar bindings are normally around 2mm thick and 5mm wide, so some care is needed in making them.

Once the top bindings were in they contrasted starkly with the old back ones, so the latter needed to be replaced as well to ensure a good colour match.

Holding the bindings (Pic.22) into the routed channels is achieved through the simplest of methods: they are secured with strong adhesive tape while the glue dries. I use nylon reinforced tape known as 'library tape' (Pic.21), as it is narrow and very strong; the narrowness allows even pressure along the entire length of the binding.

Ebony fingerboard

Things were by now really taking shape, and it was time to make a new fingerboard from ebony and to consider the frets. I normally make each fret individually when I construct my guitars, and this restoration job received the same treatment (Pic.23). By working in this way you can guarantee a good fit and reduce the need for levelling later down the



▲ Pic.25 The headstock polished and the machine heads freed and buffed



▲ Pic.26 The front during finishing



▲ Pic.27 The rosewood back cleaned and polished

line. The fingerboard was fitted, the frets put into place, levelled and polished, and shortly it was time to consider the finish.

Finish considerations

There are several options when finishing a classical guitar (Pics.24-27), ranging from urea formaldehyde resin to nitrocellulose lacquer, French polish etc.

My preferred choice here, which was agreed upon with the owner, was an oil finish. This approach has attracted the attention of many luthiers today and is very successful because an oil finish does not lock in the sound of the instrument. My choice was Liberon Finishing Oil.

Three or four coats are needed to build a reasonable finish, and to help produce a deep shine the penultimate coat is applied with a pad of 0000 steel wool. Once that has been buffed the final coat, or perhaps two if

required, should be applied with 1200-grit wet-and-dry.

Final buffing then takes place over the next few days. One considerable advantage of an oil finish is that it does not cause the colour to bleed across from the rosewood back and sides into the pale maple of the bindings. Spirit-based finishes all too often cause this problem.

Moment of truth

The finish was complete and the top nut and bridge saddle were in place, the machine heads were re-fitted having been extensively cleaned, the strings were put on, and the first notes were played. The initial consideration was whether it played in tune... and it did. Then the sound gradually improved as the strings stretched and the timbers came back to life. So this lovely old guitar, which had survived almost a century, had been allowed to sing again (Pic.28).

Making the case



The guitar in its custom-built case

Making the case for it was a real pleasure, as by now I realised just what a worthwhile instrument it was. The case is principally of 3mm ply, lined with Dacron fibre held in place with double-sided carpet tape and further lined with crushed velvet fabric. To ensure sufficient structural strength the sides and ends of the case are made from 5/8in pine. The lockable clasps are made by Centurion



The owner, Chris Elliott, right, receiving his restored guitar

and the 90° hinges and the handle are available from Stewart Macdonald in the USA.

The owner, Christopher Elliott, a software engineer working in Antwerp, was simply delighted when he came to collect his guitar. He could see how passionate I was about the restoration and I could see how much he was going to love owning and playing this truly exceptional instrument.



▲ Pic.28 The finished restoration