



Clamping a centre joint

Using a system of panel clamps and battens allows for a panic-free process when using hot glue

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When clamping up a centre joint for a back or belly, a commonly encountered problem is racking: one face of the joint may be securely closed while the other may be simultaneously forced apart. One way of solving this problem is to arrange for the clamps to have alternating jaw orientation. However, doing this in a way that ensures exact placement of the jaws can add extra time in working with hot hide glue, a process

where speed and accuracy are both critical. Not respecting this constraint could lead to failed joints; and centre joints are one of the most critical joints in lutherie.

The clamping method presented here – using panel clamps with battens – ensures that the clamping forces are evenly distributed on both faces of the joint without having to do any extra manoeuvring. It also allows the rubbing of the joint (if desired) before actual clamping, and reduces panic while gluing.



Panel clamps and their components, assembled and disassembled

1 For a violin or viola I use three panel clamps. Each of these clamps consists of a pair of wooden bars, each with a pair of holes drilled to accept the serrated posts of the metal hardware jaws – a tightening screw and a stop. One bar sits beneath the work to be clamped, and the other above. The sides and surfaces of the bars in contact with the work to be glued are faced with clear packing tape, so that any stray glue does not cause problems. The dimensions of the bars and the placement of the holes, and the number of clamps used, can be tailored for the application.



Melamine shooting board set-up, viewed from end

2 Before planing, I first ensure that the ambient temperature of the room is warm. This is especially critical in winter, to ensure proper working conditions for hot hide glue. I plane flat the bottom surfaces of the halves to be jointed, taking into consideration the end-grain orientation of the annual rings, the split of the fibre (so that the light will reflect across both halves in a matched way) and so on. Next I plane the centre joint 90 degrees to the bottom surface, using a melamine board with a cut-out to accommodate a jointer plane clamped on its side, in shooting-board configuration. The melamine board I use has a lower-friction surface than other boards, is flat, and is long enough to support the length of the pieces on either side of the plane's blade.



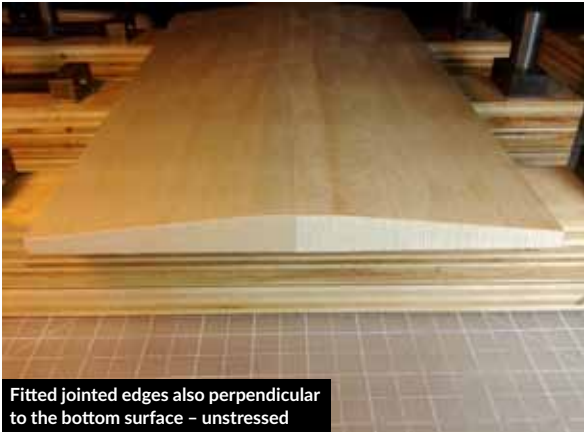
Melamine board set-up viewed from above

3 Afterwards I use the same set-up to plane the outside (non-gluing) edges. While these edges should be straight and square to the bottom surface, they don't need to be perfectly parallel to that of the joint - the panel clamps can accommodate some deviation from parallel. A pair of battens will be used in conjunction with the panel clamps. These should be flat and straight, and have sides that are square to the bottom surface. The battens should be thinner than the thickest parts of the halves to be glued, to ensure that the upper bar of the clamp sit on the halves during the clamping process.



Pre-setting the jaw openings of each panel clamp

4 I set the three bottom bars on a flat, stable surface - one at either end of the halves to be glued, and one in the centre. The jaws are opened just enough to accommodate the width of the halves plus two battens - each running the length of the halves inside the jaws, plus perhaps a few millimetres' margin for manoeuvre. The smaller the margin, the less time it takes to tighten the clamps. However, with too little margin, one risks having to make adjustments during the time-critical process of working with the glue.



Fitted jointed edges also perpendicular to the bottom surface - unstressed

5 I verify that the joint closes on all four sides. In addition, I ensure that the joint's surfaces will mate at 90 degrees while resting on the lower bars of the panel clamps, with no pressure applied.



Upper bars of panel clamps in place and clamps tightened

6 With the hot hide glue being within its desired range of temperature and consistency, I do three practice dry runs of gluing (without the actual application of glue), just to ensure that my muscle memory knows where everything is, and that there are no surprises or accidents when it's time to do the actual gluing and clamping. I also use a heat lamp set above the workspace to supplement the ambient room heat. The procedure I follow is:

- Heat both gluing surfaces with a hairdryer
- Use a large brush to apply the glue to these surfaces liberally, ensuring full coverage
- Set one of the halves down on the lower bars, against the batten next to the clamps' metal jaw stops, with the jointed surface away from the batten
- Set the other half down with its gluing surface mating with the first half
- If desired, rub the joint by holding down one half, and sliding the other back and forth against it
- Put the upper bars on top of the work, so that the posts of the hardware engage (contact between the upper bars and the plate is important)
- Tighten each clamp, starting with the middle one, but do not over-tighten – a starved joint may result



Action of panel clamps and battens on the jointed halves

7 The design of the panel clamp ensures that the simple act of tightening will evenly distribute the clamping forces on both faces of the joint, without any special or extra manoeuvring. The battens distribute this pressure along the length of the jointed halves. Note that while the bottom surfaces of the jointed halves should be first flattened – to ensure the stable resting on the lower bars, and set the orientation of the grain and fibre of the finished work – the top surfaces need not be.



After minimal resurfacing of the bottom

8 Finally I let the glue dry overnight. With minimal re-planing of the bottom surface, the jointed belly or back is ready to be worked.

As mentioned before, the panel clamp bars can be tailored to the application; one can change the bar size, the placement of the holes, and number of bars used, if one wants to use this method for clamping larger plates. A colleague has, in fact, adapted this method for jointing cello plates, with success. ●