

Case study
The restoration
of the
1755 John Snetzler Organ
at
Clare College Cambridge

Soundboard

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The Soundboard

The soundboard is made in a method often used on the continent. An oak frame dovetailed in the corners with oak screw-bars tenoned in. The remaining bars of pine are glued in the slotted rails. Both the top and the bottom of the grooves are filled in with oak fillings (sometimes only 3mm thick), leaving the pallet slots open.

Bottom of the grid with the thick paper stripped off ready for repair



All pallets have the same length, as is usual in continental organs. The pallets are of pine with springs of brass. The pallet box is closed with two bung boards.

Recessed face boards with rope pulls



Apart from its (for England) unusual construction, there are some features about this soundboard which proved a challenge in the restoration. It is rare to find a chamber organ with a totally diatonically arranged soundboard. This means that there has to be a rollerboard with a full complement of rollers, for which not many chamber organs offer space.

The Hautbois has its slider on a clamp extension at the back of the soundboard. A set of conveyances transport the wind to the Swell box above. These are the only conveyances in the organ. All other pipes standing off-slider spacing, get their wind supply through grooving in the upperboards.

The sliders occupy the majority of the top surface of the soundboard. Treble and bass sliders are positioned next to each other running through at their full width.

As a result of this there is precious little bearing surface for the upperboards (In one case barely 2mm).

The upperboards are leathered over their full width. Adjusting them to give the sliders appropriate clearance, proved thereby very time consuming indeed.

Slider tracks and bearers before restoration (note the width of Bass and Treble sliders)



Apart from the layer under the shifting movement sliders, the upperboards are made in halves. The screws holding them down are large cheese-heads. Where two meet in the width, these are positioned in between the upperboards. In the middle, one screw and a large square washer holds down the corners of four upperboards. The three shifting movement sliders run on a grooved slider track of the fairly thin lower layer of upperboards. This Lower layer is now screwed down with reasonably modern looking screws and old long screws tightened up the top

layer through the bottom layer onto the soundboard grid. One could assume that either the screws have been added to make it easier to regulate slider clearance, or that the original screws have been replaced.

Original cheese-head upperboard screw



The Hautbois upperboard / swell box assembly was left together for restoration. The original screws had been replaced at some earlier stage. The remainder of original upperboard screws (25) are still in good condition.

The scalloped toe-board of the front pipes is glued at right angle to the combined Principal and Sesquialtra/Cornet upperboard (no conveyances to the façade pipes). The Dulciana upperboard shows that the bass octave was planned to have 4' helpers as well as it being grooved into the Diapason.

Unused non-return valves between Dulciana and Diapason holes



The organ was originally delivered with helper pipes for the Dulciana bass. Below G (Gamut) there are a set of unused toe holes and rackboard holes with corresponding holes in the roof. The holes in the roof would suggest a maximum scale for GG of 67mm diameter at roof level and AA 59mm at roof level. In case of a cylindrical pipe these values give a very narrow scale indeed, and could possibly indicate that the helpers were conical. We can't conclude this for certain, as no further evidence of these pipes has remained in the organ. These pipes would have made the interior of the organ very crowded, making tuning the bass pipes of the Diapason impossible (access is already quite difficult).

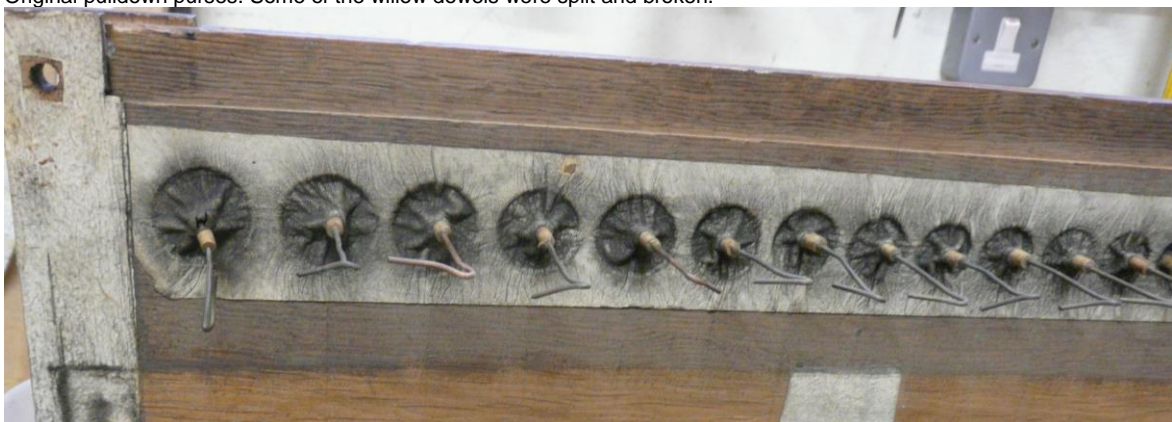
. It is not known when these pipes were removed. The toe-holes are covered with patches of leather which look quite historic.

Helper toe-holes covered with leather patches (note the repaired screw holes)



Inside the pallet box there are two paper labels stating the year and maker's name. The pallet springs are located on the pallet into a hole with the usual hooked leg. The lower leg of the spring finds its position somewhere in the groove in the spring rail. As expected they look slightly untidy, but after careful regulation they function well. On the front of the spring rail is written the word *devant* meaning front in French. This would indicate the mother-tongue of the person who made the soundboard.

Original pulldown purses. Some of the willow dowels were split and broken.



The pulldown purses, still functioning before the dismantling, vary in size according to the available space. The action movement is identical despite this.

The pallet guide pins are in two thicknesses, the thicker type where only one pin is needed between two pallets.

The restored pallet box showing original springs, thick and thin guide pins, the word *Devant* on the spring rail and one of the two signed and dated labels (up-side-down). The lever was used to regulate spring tension.



Condition and restoration

When dismantling any screws which are removed are put in a drilled block or a sturdy piece of card to indicate the position they came from. The pallet springs were also stored in the correct order so they could be reinstated in their original place. The slats over the pallet tails were apart from nailed down with an enormous number of nails, also glued down over the pallets. These slats were replaced with new wood.

The pallet surface in the wind box was covered with writing paper. The Grid behind the foundation bar was covered in a thick brown laid paper. The inside of the Swell box is also lined with the same paper. Several splits had ripped through the paper where fillings-in had shrunk loose. The paper was removed and the loose fillings-in re-glued with some additional veneers added to fill in the shrinkage gaps. The restored lower surface of the grid was later re-lined with a thick laid paper of a similar kind to the original.

The surface under the slider tracks had latterly become very uneven due to loose fillings-in and opened up seams. The top of the soundboard received similar treatment after removal of the leather and bearers. The removal of the bearers was very difficult because they were nailed and glued.

The leather tracks removed showing the many shrinkage cracks



Glueing back the sections of filling-in with hot glue



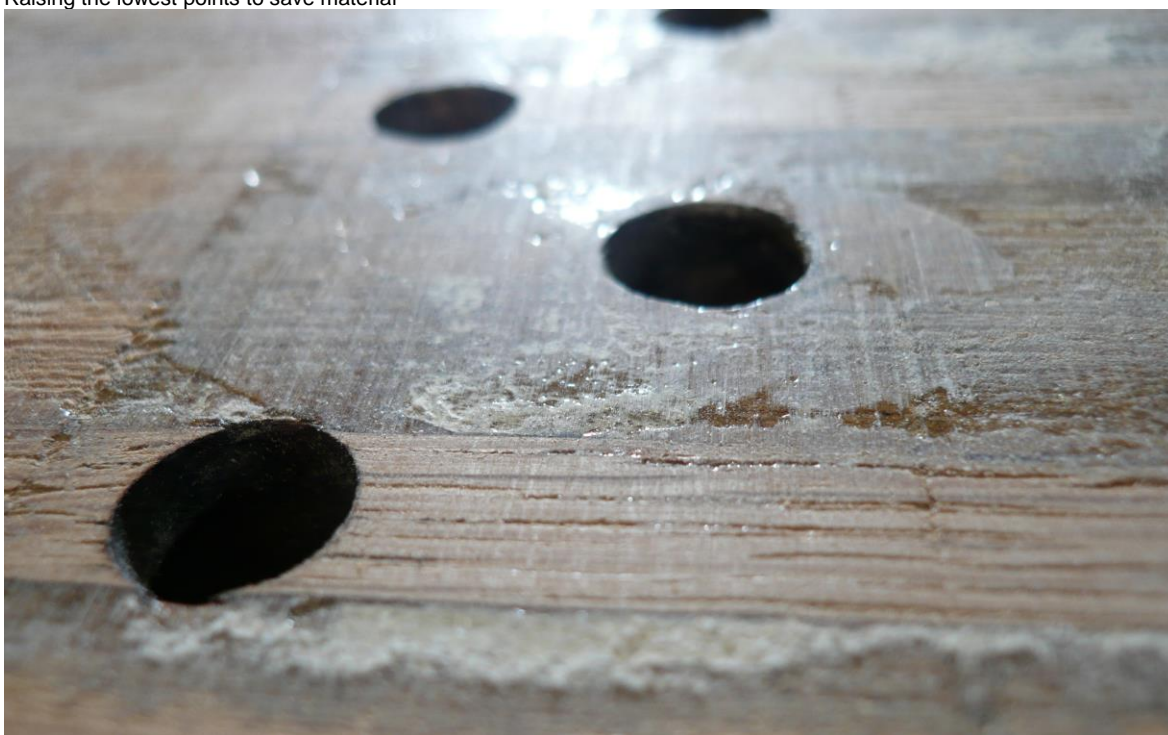
The oak fillings are unusually thin and varied in thickness. Care was taken not to leave them proud of the surface when they were re-glued, in order not to make them thinner when flattening the surface after repair

was done with a minimal removal of material, sometimes raising the lowest points in the process.

Flattening the top of the soundboard



Raising the lowest points to save material



Glueing out to grooves was not practical, so the corners at the pallet slots were glued out and also the bores into the Hautbois clamp. The bearers were again glued down as this adds strength to the fragile surface. Leather strips of even thickness were glued onto the slider tracks.

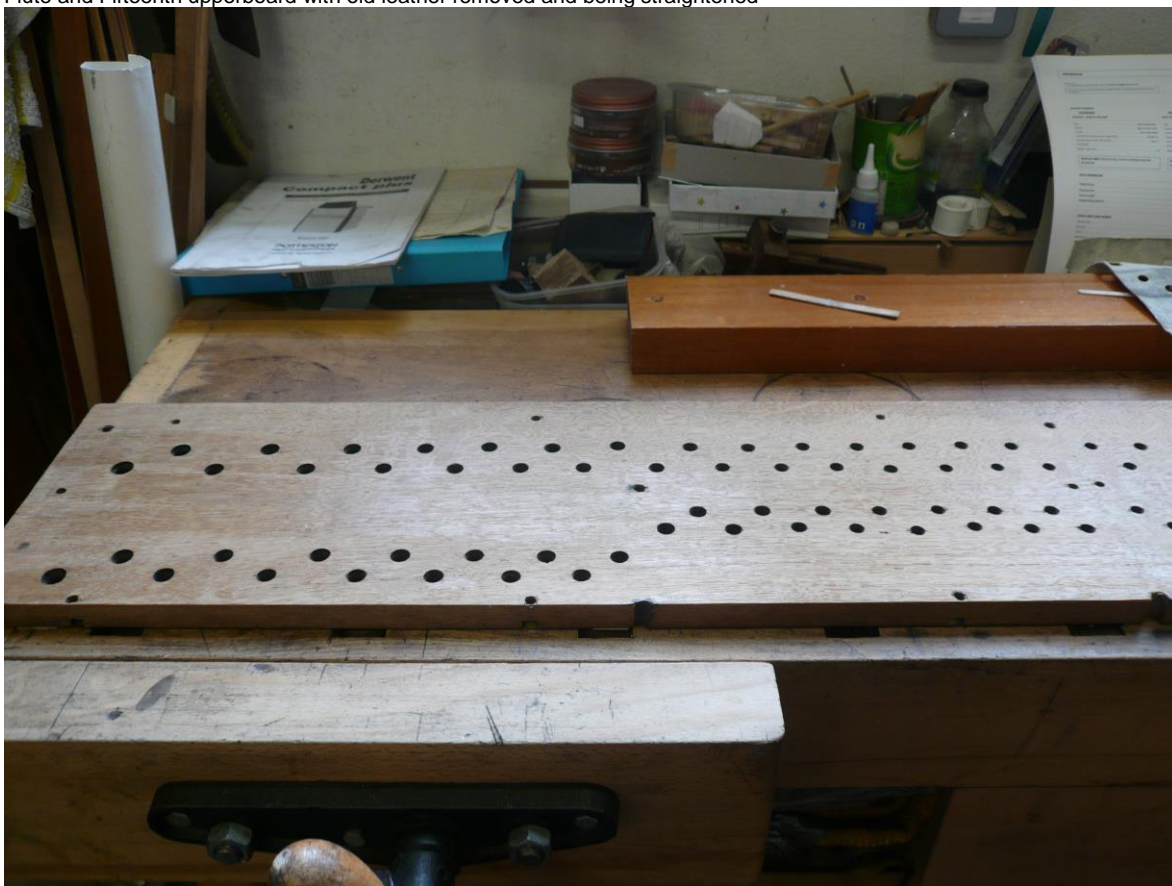
With the grooves now closed except for the pallet slots, the grooves were tested for airtightness. One running occurred at the end of the central screw-bar, which was resolved by injecting glue.

The pallets were straightened (almost not necessary), and re-leathered with two layers of sheepskin. The guide pins were put back and the pallets were glued back in place. The springs were put back in the same position as the came out.

Adjustment to the springs was made with a gadget registering the tension on the pull-down eye. Most springs produced the same tension. Ones which did not conform were adjusted. Moving the pallet a few times made the spring settle in the slot in the spring rail, after which the tension was checked again.

Before opening up the slider holes in the tracks, it seemed to be a good idea to fit the sliders and upperboards and give the sliders their right clearance. The airtightness could then be checked whilst finding the right balance between drag on the leather. The drag on leather is considerable and the surfaces were therefore treated with talcum powder as they originally were. Some sliders had to be straightened and the Flute upperboard was severely warped and needed correction. Some correction was also needed to the front upperboards, as the upstand for the front pipes render it too rigid to be pulled down onto the bearers by the screws.

Flute and Fifteenth upperboard with old leather removed and being straightened



The tapered slider stops of forged iron, measuring 4 x 6.5mm at the exposed end, are 25 – 30mm long. They were de-rusted and put back in their original position. The bearing surface for the screw heads had been chewed away by the sometimes irregular underneath of the heads. These were pieced in where necessary to restore a matching thickness for two adjoining upperboards. This is essential, because one screw head has to, with equal pressure, hold down two or four upperboard edges.

Bearing surface for a screw head part-way through being renewed



The leather on the bottom of the upperboards was renewed with leather of even thickness.

The adjustment of the slider movement was done with pieces of paper and card. This was a very time consuming work given the fact that the leather under the upperboards can be compressed, while many screws serve two or four boards at once. After a satisfactory balance between tightness and freedom of movement had been achieved, the soundboard was ready to be put into the organ once again.

Finished soundboard reinstalled in organ. The removed face board shows the new pulldown purses



Technical data

Groove widths (Bass) GG to e^{'''}, f^{'''} to AA (Treble):

(GG) 20.8; 17.6; 16.2; 17; 14.8; 14.7; 13; 12; 11.7; 10.7; 10.8; 10.1; 11; 11.5; 10; 11.1; 8.9; 11; 9.3; 8.8; 9.3; 8.4; 9; 9.7; 7.5; 9.2; 8.8; 8.3; 8.9 (e^{'''})

(f^{'''}) 7.8; 7.8; 8.6; 8.2; 7.8; 8.6; 8.9; 8.7; 9; 8.8; 8.8; 10.3; 10; 10.6; 11; 11.6; 10.6; 11.1; 10.5; 10.2; 11.8; 11.3; 13.2; 13.5; 15.8; 16.6; 15.4; 18.8; 20 (AA)

Slider holes:

Hautbois

(c') 14.7 x 8.3; 14.6 x 8.4; 14.1 x 8.3; 13.8 x 8; 14.1 x 8.3; 14 x 8.3; 14 x 8; 13.6 x 7.8; 13.5 x 8; 13.3 x 7.4; 13 x 7.3; 13.5 x 8; 13.2 x 7.6; 13.5 x 7.8; 13.5 x 7.6 (e^{'''})

(c[#]) 14.5 x 8.5; 13.8 x 7.8; 14.2 x 8.2; 13.2 x 7.7; 14.1 x 8; 13.7 x 8.2; 14.1 x 8.2; 13.6 x 8; 13.4 x 7.8; 13.3 x 7.4; 13.6 x 8.2; 13.2 x 7.4; 14 x 7.8; 13 x 7.5; 13.5 x 7.8 (f^{'''})

Diapason

(GG) 19.2 x 11.4; 18.8 x 10.7; 17.4 x 10.3; 16.9 x 9.5; 16.9 x 9.7; 15.9 x 9.7; 12.1; 11.7; 11.3; 10.8; 10.5; 10.4; 10.6; 10.3; 9.7; 9.2; 9.3; 9; 8.5; 8; 8.8; 7.6; 8; 7.9; 8; 7.6; 7.2; 7.2 (e^{'''})

(f^{'''}) 7.9; 7.8; 8; 7.9; 8; 8.2; 8.8; 8.3; 8.4; 8.3; 8.5; 9; 9.3; 10; 10.4; 9.6; 9.8; 10.2; 10.3; 10.8; 10.8; 12; 12.3; 16.4 x 9.4; 16.5 x 9.8; 17.3 x 10.3; 17.3 x 10.3; 18.3 x 10.5; 19 x 11.3 (AA)

Dulciana

(GG) 19 x 11.6; 18.7 x 10.6; 17.7 x 10.4; 16.1 x 9.6; 15.8 x 9.5; 15.1 x 9.3; 12.1; 12; 11.6; 11.7; 10.8; 11.1; 10.3; 10.6; 9; 8.9; 8.8; 8.6; 8.3; 8.3; 7.8; 7.6; 8; 7.8; 8.3; 8.2; 7.8; 8.3; 7.3 (e^{'''})

(f^{'''}) 7.5; 8; 7.8; 7.8; 7.8; 8.5; 8.4; 8.3; 8.4; 9; 8.8; 9; 9.3; 9.3; 9.8; 10; 10.5; 11.4; 11.2; 10.6; 11.6; 11.9; 12; 16.3 x 9.4; 16.6 x 10; 16.8 x 9.5; 17.3 x 10.3; 18.3 x 10.8; 19 x 11.4 (AA)

Flute

(GG) 12.3; 11.4; 11; 10.3; 10; 10; 9.8; 9.7; 9.7; 10; 9.8; 9.5; 9; 9.5; 9.3; 9.1; 8.6; 8.1; 8.3; 8.2; 8; 7.6; 7.7; 7.5; 7.5; 7.6; 7.8; 7.7; 8 (e^{'''})

(f^{'''}) 7.4; 7.8; 7.8; 8.1; 8.4; 8.5; 8.5; 8.5; 8.4; 8.6; 8.5; 8.8; 9; 9.6; 9.6; 8.4; 9.1; 9.6; 9.2; 9.2; 9.5; 9; 9.5; 10.4; 10.5; 11; 12; 11.8; 13 (AA)

Fifteenth

(GG) 12.3; 11.8; 11.2; 10.8; 10.5; 10.5; 10.1; 9.8; 9.8; 9.6; 9.3; 9.2; 9.2; 10.1; 9.3; 9.1; 9.5; 8.8; 9.3; 9.1; 8.5; 8.4; 8.5; 8.5; 8.2; 8.1; 8.5; 8.5; 8.6 (e^{'''})

(f^{'''}) 7.6; 7.8; 7.6; 7.9; 7.8; 8.2; 7.9; 8.4; 8; 8.4; 8.6; 9.1; 8.4; 8.7; 9.1; 9.3; 9.4; 9.5; 9.6; 9.8; 9.2; 9.9; 11.1; 10.6; 10.3; 10.5; 11; 11.1; 11.8 (AA)

Sesquialtra/Cornett

(GG) 12.8; 11.7; 10.9; 10.7; 10.1; 10; 9.7; 9; 9.2; 9; 9.3; 8.6; 8.4; 8.3; 10.3; 10; 9.5; 9.1; 9.5; 9.8; 9.3; 9.4; 8.8; 8.8; 8.5; 7.7; 8; 8.1; 7.8 (e''')

(f''') 7.6; 8; 8.5; 8.3; 9; 8.4; 8.9; 9.1; 8.6; 9.1; 9.2; 9.5; 9.5; 10.2; 10.5; 8.7; 9; 8.5; 8.8; 9.3; 9.4; 9.5; 9.2; 9.5; 9.6; 10.3; 10.3; 10.8; 12.4 (AA)

Principal

(GG) 13; 12.8; 12.2; 12.5; 10.7; 11; 10.3; 10.4; 9.8; 9.8; 9.5; 9.5; 9.4; 9.7; 9.3; 9.1; 8.8; 8.8; 8.3; 8.5; 8.3; 8.7; 8.3; 8.2; 8.3; 8.3; 7.6; 8.3; 7.7 (e''')

(f''') 8.3; 7.9; 8.1; 8.4; 9.1; 9; 8.4; 8.9; 9; 8.9; 9.9; 9.7; 9; 9.5; 9.8; 9.7; 9.9; 9.8; 10; 9.9; 10; 9.6; 10.1; 10.5; 11.2; 11.5; 11.5; 12.8; 13.5 (AA)

Grid height (external) 85

Groove height 72 - 79

Pallet length 205

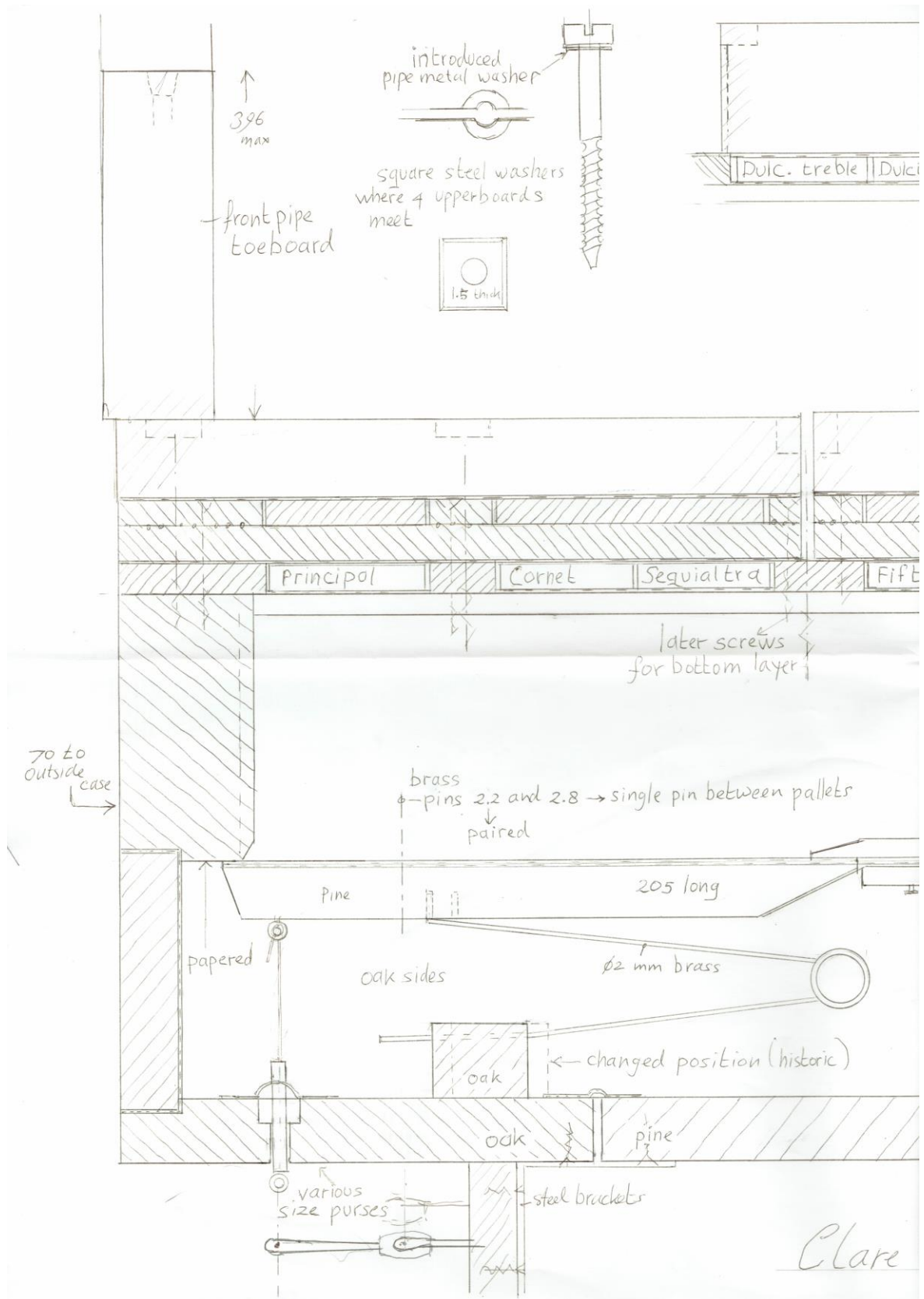
Pallet overlap 7.5 (half of which each side)

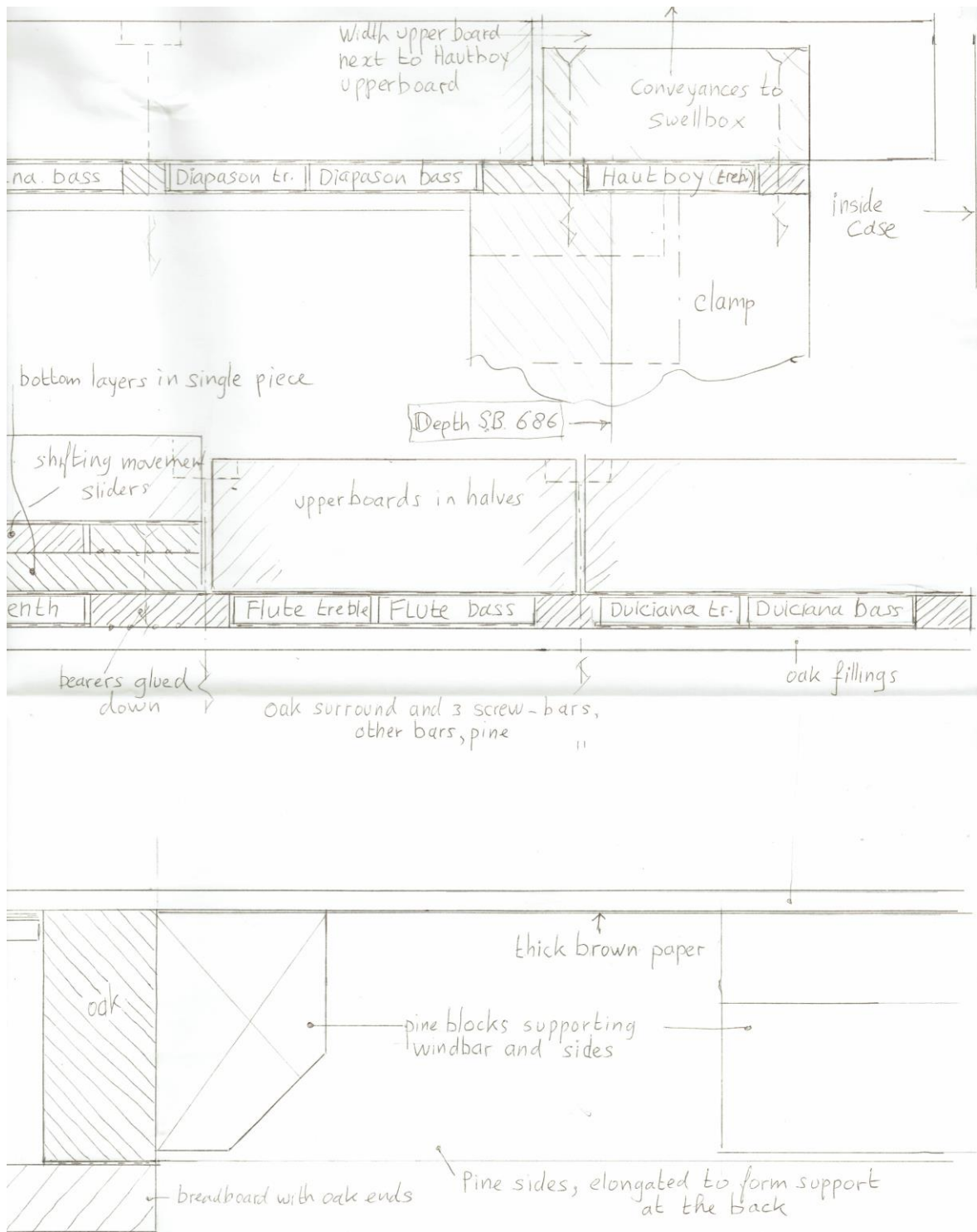
Height wind pallet box 76

Depth pallet box 252

Groove length (internal) 601

Cross sections through soundboard





College John Snetzler 1755