THE ENGLISH VIRGINAL

Volume Two

CATALOGUE OF INSTRUMENTS

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VOLUME TWO –

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CATALOGUE OF INSTRUMENTS

RESEARCH METHODOLOGY

The examination of instruments carried out for this thesis commenced in 1990. All of the instruments have been seen on more than a single day, but in varying conditions. Some instruments - the 1668 SK and AH virginals have been easily accessible and can be examined at leisure. The 1664 JP was restored by the author, which has allowed very complete access, although in a short time span. Other instruments have been given repeated visits — the Mar, the 1656 JW and the 1664 RH have all been seen on five or more separate occasions. The other instruments have generally been examined on two or three occasions, sometimes on consecutive days, sometimes on days following the examination of another instrument. There are published drawings of the 1642 TW and 1668 SK virginals, and an unpublished drawing of the 1662 TB instrument. No external measurements have been taken from these drawings, although they are all in my possession, and have been used to determine hidden constructional features. I also have photographs taken during the restorations of the 1664 RH, 1668 SK and 1671 PJ virginals, and other photographs taken during an examination (by Miles Hellon) of the 1638 TW instrument.

As many of the instruments are in public collections it has often been essential to work around the opening hours and display facilities in place. A number of instruments have been examined *in situ*, often with low light, and in cramped conditions. It has also been impossible with some instruments to get access around the entire corpus. As a result of this, some measurements have been impossible to collect.

Unless otherwise indicated all of the wood identifications are by the author and are from visual examination only. In some rare cases microscopic examination has been carried out. As the taking of wood samples without permission would be clearly unacceptable, this has been restricted to examples where the wood was easily accessible, the removal was totally unobtrusive, and for which specific permission was requested, and given by the curators or owners. They have been acknowledged in the appropriate places in the text. The visual examination of woods has been hampered by poor lighting conditions in many cases, and often by the woods themselves being covered in layers of varnish which has obscured the grain. In some cases only microscopic examination can distinguish between wood species. This is particularly true of spruce,

fir and pine. When one of these woods has been used for case members they have been referred to under the blanket term "deal", and in soundboards they have been referred to as of "conifer wood".

All of the measurements have been taken with metal measuring tools. Longer measurements have been taken with an expandable metal tape measure which can measure up to a length of 3 metres. Where possible the tape measure was held with one end at 100 millimetres, and the reading taken from the other end, and then deducting the 100 mm. Where that has been impossible the end of the tape was hooked on the object and read directly, calibrated to ensure consistency with the former method. Measurements taken with this tape measure have been measured to the nearest half millimetre, referred to in the text as "*x* ½". However, due to the method of measurement, the figure given should not be considered to be more accurate than plus-or-minus one millimetre. Measurements of less than 300 millimetres were generally taken with a steel ruler calibrated in half-millimetres. The figures taken with this ruler have also been expressed in the text as "*x* ½" and, in this case, can be considered as accurate to plus-or-minus a half-millimetre. For measurements under about 150 millimetres a metal dial calliper, calibrated in 0.02mm units was used where possible. The measurements were taken to the nearest tenth of a millimetre, and are quoted in the text as "*x*.5". The accuracy of these measurements should be taken as plus-or-minus one-tenth of a millimetre. It should be emphasised that different researchers often quote different measurements for the same nominal length. This can be attributed to different measuring tools and/or measuring techniques. With the exception of the 1653 TW, and some of the measurements of the Theewes harpsichord, all of the measurements quoted in the catalogue have been taken by the author.

Most of the instruments are in public collections, and those in private collections are invariably well cared for. Therefore, although humidity can affect wood dimensions in principle, it is likely that the humidity conditions that the instruments were measured in were within "normal" museum limits of c. 45 - 65% RH. The humidity conditions were not recorded in any examinations.

Although not systematically shown in the catalogue, instrument moulding impressions were taken wherever possible to compare instruments and makers. To take the mouldings, a two-part compound "Optosil® P plus", manufactured by Heraeus

Kulzer, D-41538 Dormagen, Germany was used. In all examples a barrier of thin aluminium foil was used to protect the instrument was risk from staining.

In order to compile all of the measurements, a standard "long form" was developed. This allowed the same measurements to be taken for all instruments. The pages of this form have been shown in the Catalogue Appendix. This form was developed over several years, as examinations of instruments showed what dimensions were essential and had been missing from earlier forms. All of the instruments have been measured with the assistance of this "long form". The "long form" was devised to allow, where ever possible, corroborating measurements to be taken. In this way, any errors due to misreading figures during an examination, or incorrectly transcribing these figures, could be discovered and checked.

The drawings throughout the catalogue have been compiled using various versions of the CAD programme "AutoCAD", produced by Autodesk, Inc. All drawings were made at full scale. The drawings have been printed with scales to give an indication of dimensions.

LAYOUT OF THE CATALOGUE AND CONVENTIONS

The instruments have been arranged alphabetically in the catalogue according to the maker's surname, and then according to the date of manufacture. The two unsigned instruments - the AH and Mar virginals - have been included at the front of the catalogue (in that order). Two harpsichords - the Theewes (1579) and Hasard (1622) - have been included at the end of the catalogue in that order.

The Catalogue is arranged according to the following order :-

Ownership and Provenance

References

Inscriptions

Construction

Case

Overall instrument dimensions; baseboard; spine; case ends; faceboards; keywell sides; nameboard; keywell liners; other liners; wrestplanks; baseboard frames; toolbox; jackrail and supports; lid; keywell flap; lower guide; soundboard; soundboard register; soundboard barring; wrestplank

capping pieces; soundboard mouldings; other mouldings; hitchpins and tuning pins; bridges.

String Lengths and (Plucking Points)

Keyboard and Action

Compass; keylevers; balance rail; keyframe sides and backrail; rack; frontrail; keywell batten; endblocks; keywell width; keylevers; natural touchplates; accidental touchplates; action cloths; jacks.

Decoration

Case exterior; soundboard and roses; keywell soundwell and faceboards; lid; keywell flap; stand; ironwork.

Condition

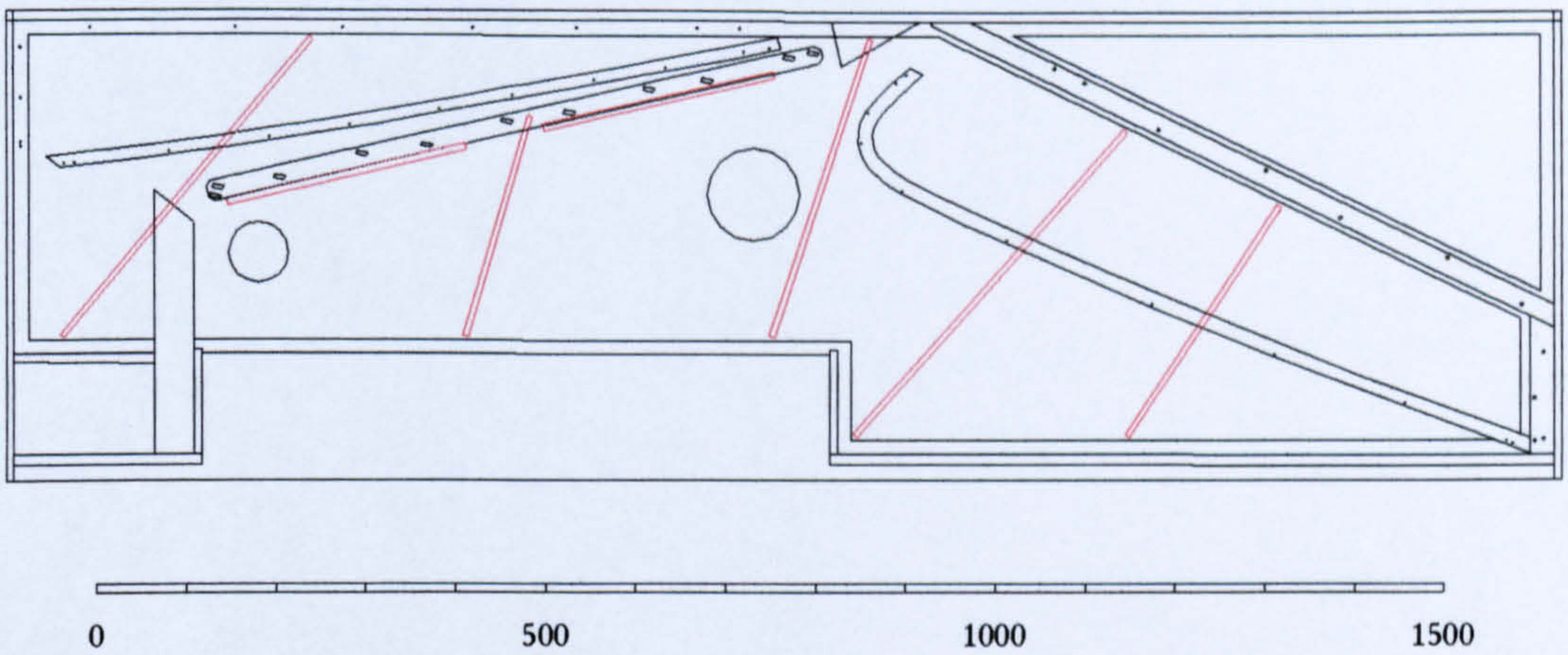
Commentary

Generally there are three drawn illustrations included in each catalogue entry. All of theses drawings include a marked scale at the bottom. These illustrations are:

1) Showing a plan view of the instrument. Figure Catalogue.1 shows a typical plan view drawing. The drawing includes the case members – spine,case ends, faceboards, keywell sides and keywell liner, with the positions of the wrestplank capping pieces, soundboard mouldings and toolbox – and the bridges and register. There has been no attempt to include any of the applied mouldings with the exception of those on the soundboard. The bridge- hitch- and tuning pins, plus the register slots, for all of the *c* and *f* notes, plus the top and bottom notes have been included. The soundboard barring has been drawn in red. Each catalogue entry describes the bars as far as possible, and differentiates between cut-off bars – bars which extend from the soundboard to the lower guide wood, and normal soundbars. The soundbars are invariably cut out where they pass under the right bridge, but not cut out under the left bridge. This has not been shown on the drawing. All bar positions show where the bars are actually glued to the soundboard. Due to the difficulties in measuring the soundbar positions there can be some error in their placement, particularly behind the right faceboard. Three instruments – the 1668 SK, 1671PJ and 1675SK – have divided wrestplanks. The wrestplank behind the left bridge has no corresponding

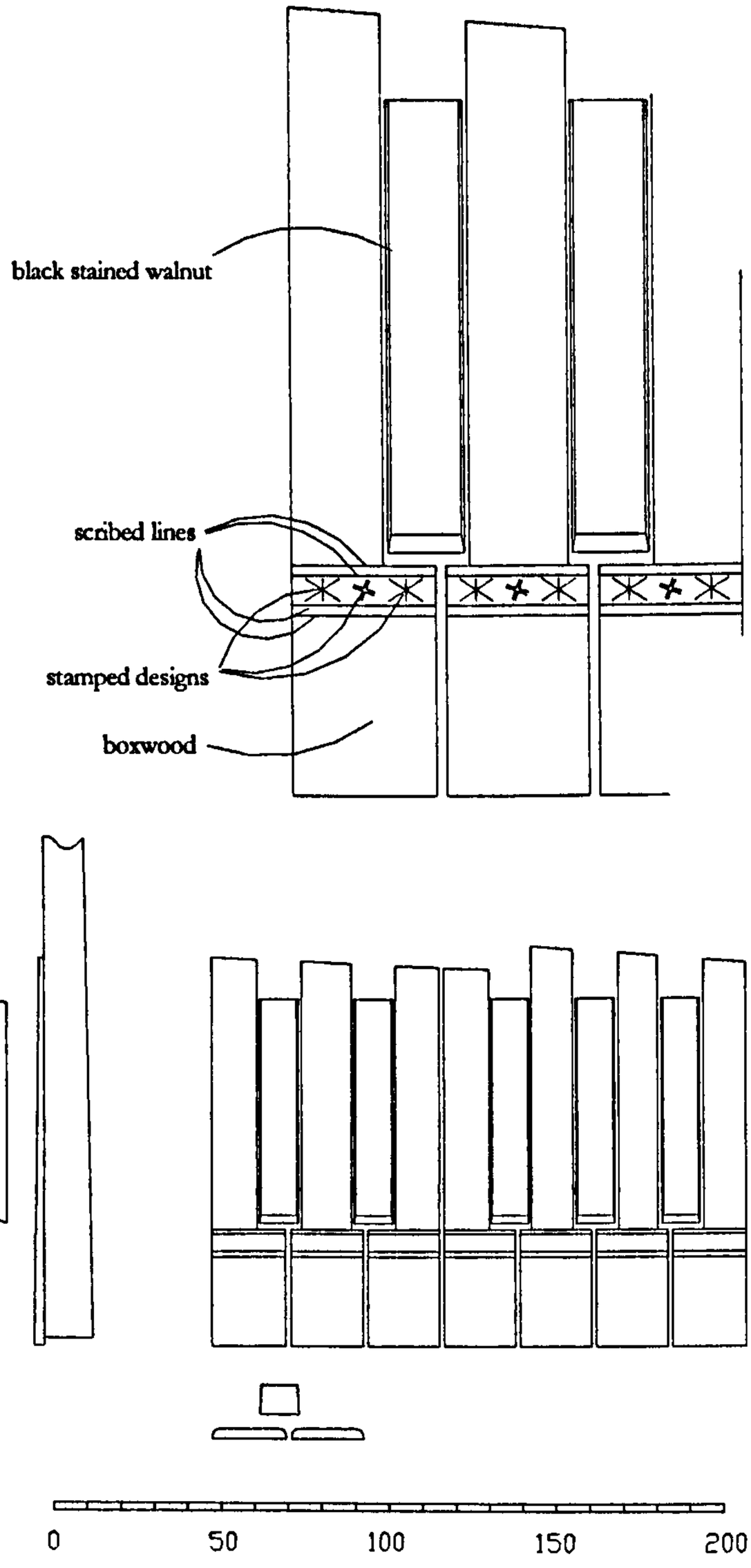
capping piece glued to the top of the soundboard. In these instruments the position of the left wrestplanks has been indicated in green.

Figure Catalogue.1 – Typical plan view drawing (1655 JL).



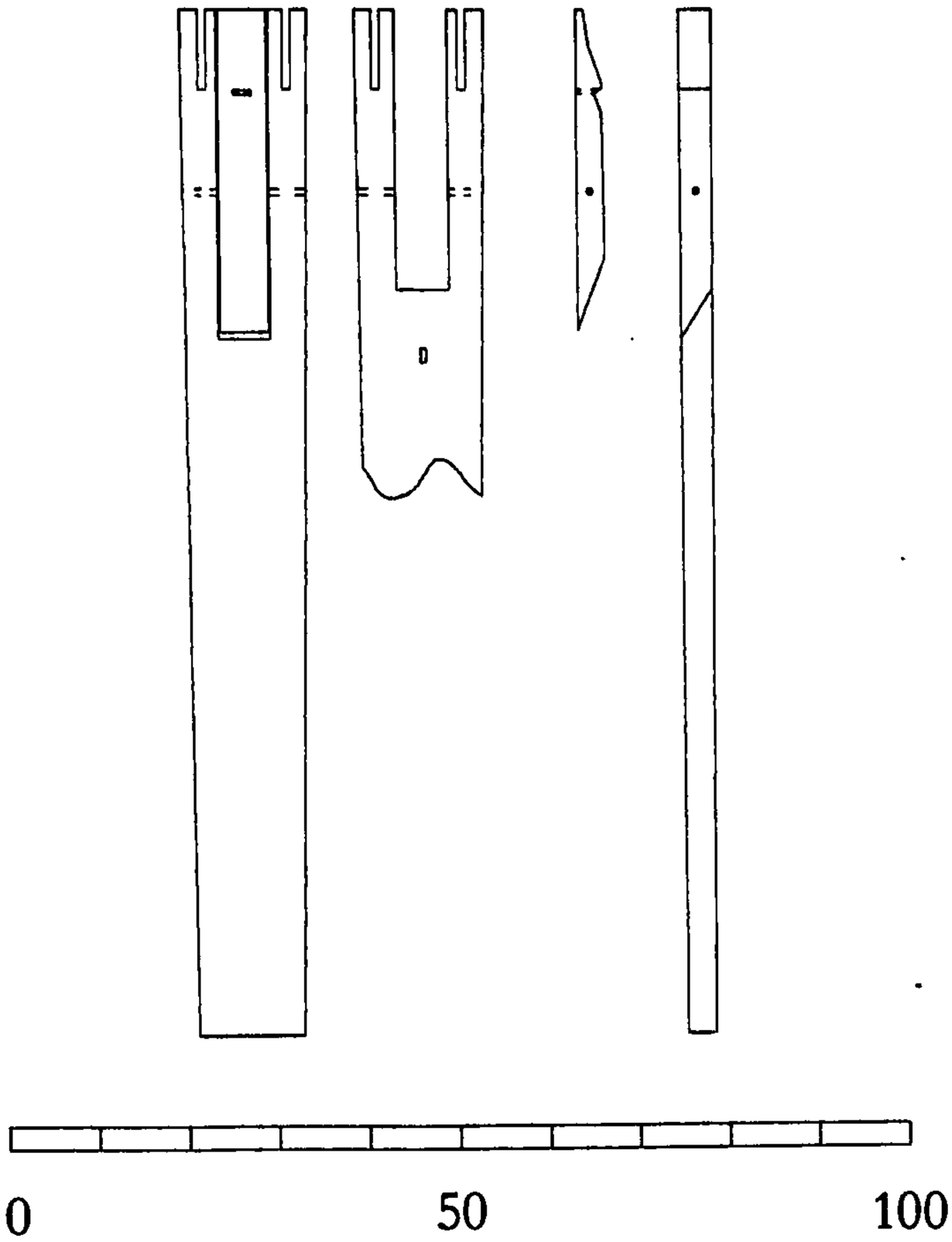
2) Showing the keyboard details (Figure Catalogue.2). This drawing shows the touchplates of an "idealised" keyboard octave. There is often some variation in the width of the rear natural touchplates, and they have been averaged out. Also included are side and front views of keys, and (at double scale size) details of the materials and decoration.

Figure Catalogue.2 – Typical Keyboard Details drawing (1644 TW).



3) The jacks (where original) (Figure Catalogue.3). Typically the drawing shows front, side and rear views of a typical jack and tongue. Where of specific interest a top view has also been included.

Figure Catalogue.3 – Typical jack drawing (Mar).



The construction (including the case, scalings and plucking points, and keyboard and action) details are given in a form using the above headings and described individually. Generally there has been an attempt to list the elements in the order in which they were built, and to link each part to the preceding and following ones. Although it is a little inelegant, often two or three measurements may be given for the length, width and/or thickness of a part. This is because the part in question varies by a significant amount. These measurements are expressed as, for example, the spine of the Mar virginal being 1652 long, 180 - 184 high, 10.7 - 11.5 - 11.4 thick. When a single measurement is given it is usually because only one measurement was possible (either because the instrument's situation did not allow other measurements to be taken, or

because of damage or alterations), or else that the measurement did not significantly vary. When two measurements have been given they have been taken at the ends and there is a more-or-less constant alteration over the piece. When three measurements have been given it shows a greater, inconsistent, variation. Without exception the order of the figures (either two or three) given is from left-right, front-back, or top-bottom, from the perspective of a player in front of and looking at the instrument, according to the individual circumstance. These variations have been included because it gives the best possible indication of the variations found within a piece as a result of the maker's competence or his working methods.

The commentary concerns features which are specific to that instrument, often containing argument essential to the thesis but not included there for clarity. The thesis contains cross-references to where the Catalogue argument is found. In examples where the maker has left more that a single example, or (in the case of the Mar and AH virginals, and the instruments by Keene, Jones and Bolton) belong to the same workshop tradition, there is a further commentary following the last instrument by that particular maker. As James White took over the workshop of his father Thomas those two makers have been discussed together.

All quoted measurements are in millimetres. The abbreviation "mm" has not been used at all in the list of measurement in the construction part of the catalogue entry, although it is occasionally used in the decoration, condition and commentary sections if it improves the clarity of the sentence.

AH

Plate AH.1 – Three-quarter view of the AH virginal.



Ownership and Provenance

Possession of the National Museums of Scotland, Catalogue number 1930.329. On loan to the Russell Collection of Early Keyboard Instruments.

References

Martin (2000/1), Martin (2001), Napier (1986), Raymond (1987).

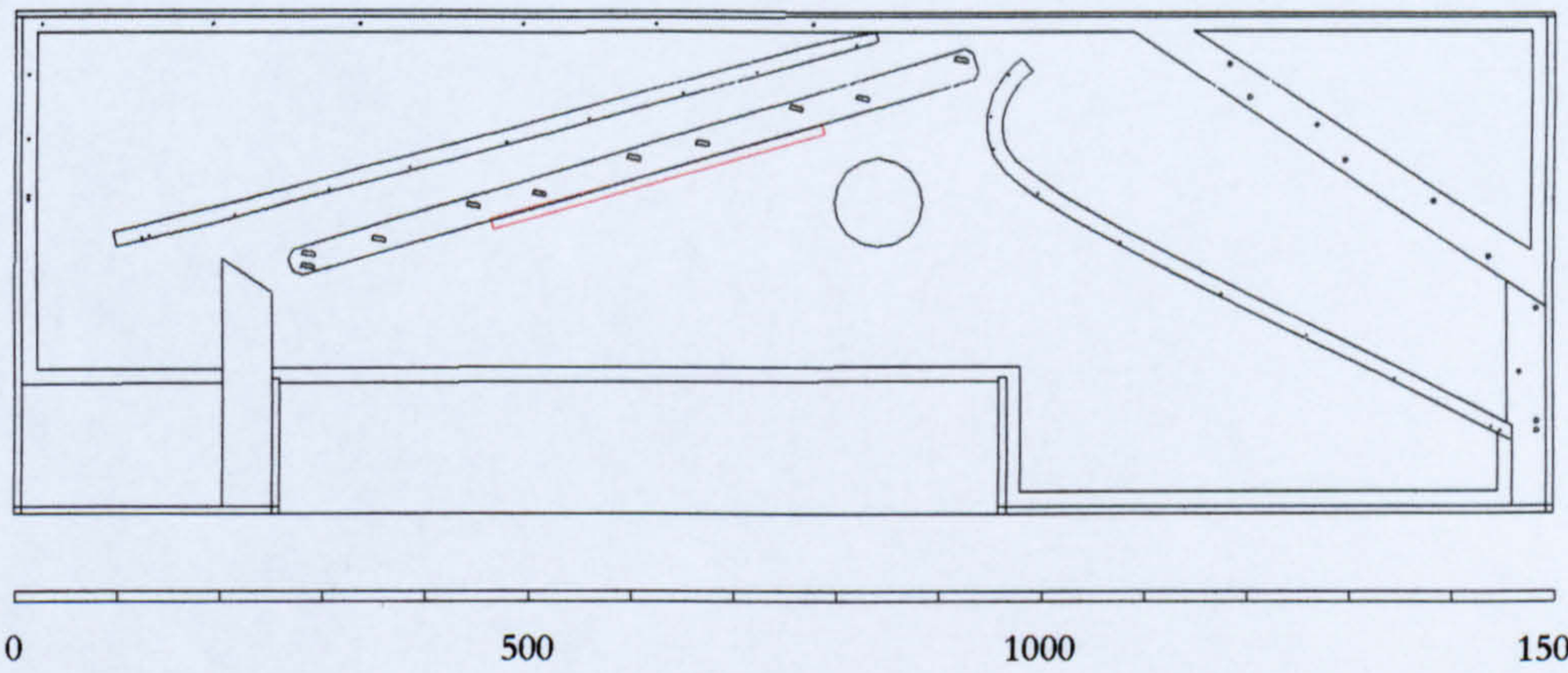
Inscriptions

The instrument is unsigned. Painted on the lid are the letters "AH", which most probably signify the instrument's original owner. A latin motto "PER AVRES AD ANIMVM" is painted on the lid, and another motto "MVSICA DEI DONUM" appears on the keywell flap.

Construction

CASE

Figure AH.1 – Plan view of the AH virginal



OVERALL INSTRUMENT DIMENSIONS: 1499 x 485 x 190.

BASEBOARD: Deal, 10.7 – 9.7 thick at the front.

SPINE: Not original. The present spine is oak, 1501 long, 190 – 189 high, 6.2 – 6.6 thick. The case ends butt up to the spine.

CASE ENDS: Oak, left case end 486 – 485 long, 190 – 191 – 189 high, 7.4 – 6.4 thick; the right case end 485 – 483 long, 186 – 190 high, 7.7 – 8.0 thick. The spine and case ends overlap the baseboard.

FACEBOARDS: Oak, dovetailed to the case ends. Left faceboard 258½ long, 178 – 179 high and 7.1 thick. Right faceboard 542 long, 177½ – 176 high and 6.6thick. Dovetailed to the keywell sides. The faceboards sit on the baseboard.

KEYWELL SIDES: Oak, 129½ (left) and 131 (right) long; 7.5 (left) and 7.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 116 – 120 (left) and 115½ – 120 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 708, 144 – 142 high, and 7½ – 9 thick.

KEYWELL LINER: Deal, thickness not determined, 64 – 61½ high.

OTHER LINERS: Cannot be determined.

WRESTPLANKS: Cannot be determined.

BASEBOARD FRAMES: Deal, 56 high. The inner edges form a continuation of the keywell sides. The frames are approximately 26 thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece (not original) is deal. The front edge is 117 – 118 from the back of the left faceboard. The toolbox lid hinges at the front, made of iron rod, 2.2 diameter. The lid is of pine with an added piece of pear to make up the required width. It is 193 – 193½ long, 115½ – 115 wide, and 9.1 thick.

JACKRAIL AND SUPPORTS: The original jackrail is missing, as is the treble jackrail support. The bass jackrail support is of deal, 18.4 thick and 47.7 wide. The left side is 239½ long, the right side 206 long. The bottom surface is 20½ from the top of the soundboard.

LID: Oak, coffered, of three pieces. The planks widths are 158, 177, and 168. There were originally mouldings on the top, but these are now missing. The end battens are of oak, the left 474 long and 15.0 wide, the right 470 long and 15.7 wide. The coffer height is 55 (left) and 52½ (right). The lid thickness at the front is 9.0 – 8.2 – 8.7. There were originally wire hinges between the lid and the spine. There is no evidence about how the lid was originally held open.

KEYWELL FLAP: Oak, spanning the area in front of the keywell only. It is 699 long, 178 high, and 8.0 – 8.4 thick. There are strap hinges between the keywell flap and the baseboard, let into the top of the baseboard

LOWER GUIDE BOARD: Glued to the top of the frames and the underside of the keywell liner is a full-width lower guide board (of conifer wood), extending from underneath the front of the keywell liner to the spine. The slots for the jacks have been cut into this board (and a leather guide glued to the underside surface). In front of the register is a full depth bar of deal, approximately 7 thick, glued to the top of the lower guide board and extending up to the soundboard. The lower guide board extends several inches past the edges of the baseboard frames.[1]

SOUNDBOARD: Coniferous wood, 3.2 – 3.3 – 3.2 thick at the keywell liner. The top of the soundboard is approximately 46 below the top of the case. There is a single rose (the present one is not original), 86 diameter.

SOUNDBOARD REGISTER: The soundboard register is not original, made of wood and glued to the top of the soundboard.

SOUNDBOARD BARRING: None (with the exception of the full-depth bar in front of the register.

WRESTPLANK CAPPING PIECES: Oak, not original. The treble wrestplank capping is 43 wide, and the bass wrestplank capping is 38.5 wide. They are approximately 10 thick.

SOUNDBOARD MOULDINGS: Oak, 4.1 thick and 13.9 wide. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 14.8, and the spine moulding 15.1 wide. Both are 3.5 high.

OTHER MOULDINGS: The faceboard mouldings vary in thickness from 3.9 to 4.7, where the edges can be seen behind the present faceboards. The cap moulding on top

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[1] In Martin (2000/1:161) it is stated that the lower guide board covers the entire length of the virginal. When viewing the lower guide board through the register at an acute angle it is clear that the lower guide board extends several inches past the outside edge of the frames. I would like to thank John Koster for pointing this out to me.

of the faceboards, keywell sides and nameboard is oak, 15.0 wide and 4.1 thick. The soundwell top edge mouldings are oak, 14.1 deep and 3.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are of iron, 1.68 diameter. The tuning pins are iron, protrude 21, and are 4.1 diameter. The tuning pins have been divided so that the notes up to d are on the bass wrestplank, and notes e^{b} — c^{3} are on the treble wrestplank.

BRIDGES: Poplar, not original. The present bridges are accurately placed in the same position as the original bridges, but are of the wrong shape.

STRING LENGTHS AND (PLUCKING POINTS)

The following string lengths and plucking points have been determined from a computer reconstruction of the original bridges and register.

		f^{1}	**441 (112)**	**F**	**1141 (144½)**
		e^{1}		E	
		e^{b1}		E^{b}	
		d^{1}		D	
		$c^{\#1}$		$C^{\#}$	
c^{3}	**151½ (102)**	**c^{1}**	**603 (125)**	**C**	**1314 (156)**
b^{2}		b		**ex C**	**1334½ (164)**
b^{b2}		b^{b}			
a^{2}		a			
$g^{\#2}$		$g^{\#}$			
g^{2}		g			
$f^{\#2}$		$f^{\#}$			
f^{2}	**231½ (107)**	**f**	**799 (127½)**		
e^{2}		e			
e^{b2}		e^{b}			
d^{2}		d			
$c^{\#2}$		$c^{\#}$			
c^{2}	**305 (110)**	**c**	**962 (140)**		
b^{1}		B			
b^{b1}		B^{b}			
a^{1}		A			
$g^{\#1}$		$G^{\#}$			
g^{1}		G			
$f^{\#1}$		$F^{\#}$			

Keyboard and Action

COMPASS: C - c^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail is oak, 35.6 wide and 15.7 high. The balance pins are iron, 2.1 diameter, and protruding 19½ above the top of the balance rail. The balance rail is half-lapped to the keyframe sides. There are key-clearance notches on the balance rail, the notches sloping from the front to the rear of the rail for the natural keylevers, and from the rear to the front for the accidental keylevers.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 45½ wide and 8.3 thick. The backrail is deal, 51.0 wide and 8.3 thick.

The rack is missing.

FRONTRAIL: Oak, 17.1 wide and 4.3 thick.

There is no keywell batten.

ENDBLOCKS: Deal. The left endblock is 149 long, 20.6 wide and 28.4 – 24.9 high. The right endblock is 155 long, 19.5 wide and 30.0 – 26.6 high.

KEYBOARD WIDTH: Overall width between the keywell sides 701, and between the endblocks 659. The overall width of the keyboard is 656, and the three-octave span is 476.

KEYLEVERS: Deal, 13.0 thick at the front, tapering to 9.8 at the rear. The non-original rackpins are leather. The lowest keylever is 336 long and the balance point is 118 from the front of the touchplate. The top keylever is 440 long, and the balance point is 159 from the front. The accidental keylevers are balanced 18.4 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, typically 110 to 115 long, and tapering in thickness from 3.1 at the front to 2.2 at the rear. There are three scribed lines on the front section, 29.0, 31.9 and 35.1 from the front edge. The touchplates overhang the keylevers by 3.0.

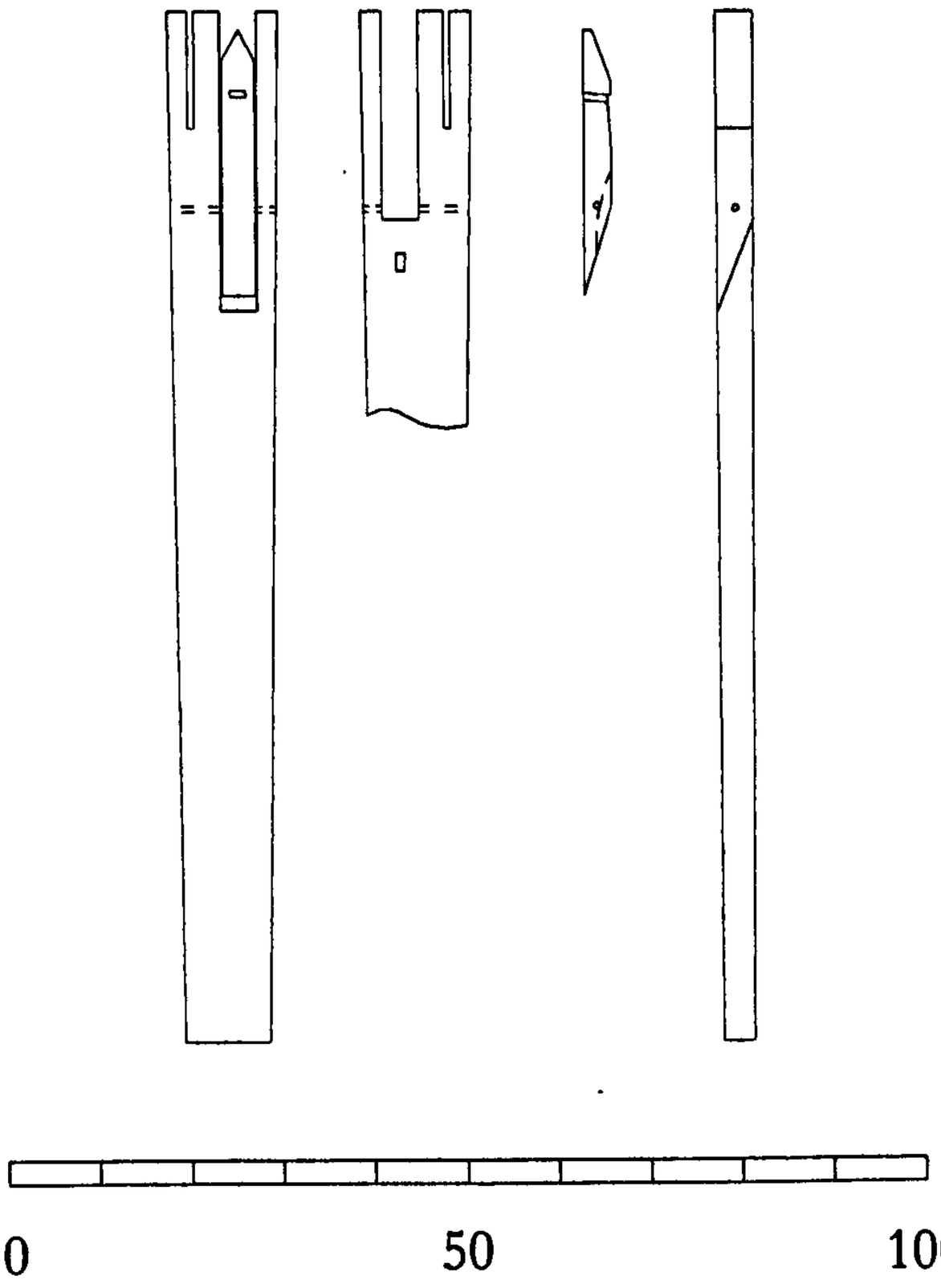
Many of the touchplates are not original. The original natural touchplate widths in between the accidentals are:-

		f^2		f^1		f		F	13.6
		e^2		e^1		e		E	13.6
		d^2		d^1		d	14.7	D	14.0
c^3		c^2		c^1		c		C	13.2
b^2	12.1	b^1		b		B	13.3		
a^2		a^1		a		A	12.0		
g^2	11.9	g^1		g		G	11.5		

ACCIDENTAL TOUCHPLATES: Pear, with inlaid pear, ebony and sycamore. The overall length is typically 63.2, and total height 9.15↔. They taper in width from 11.8 at the bottom to 10.9 at the top.

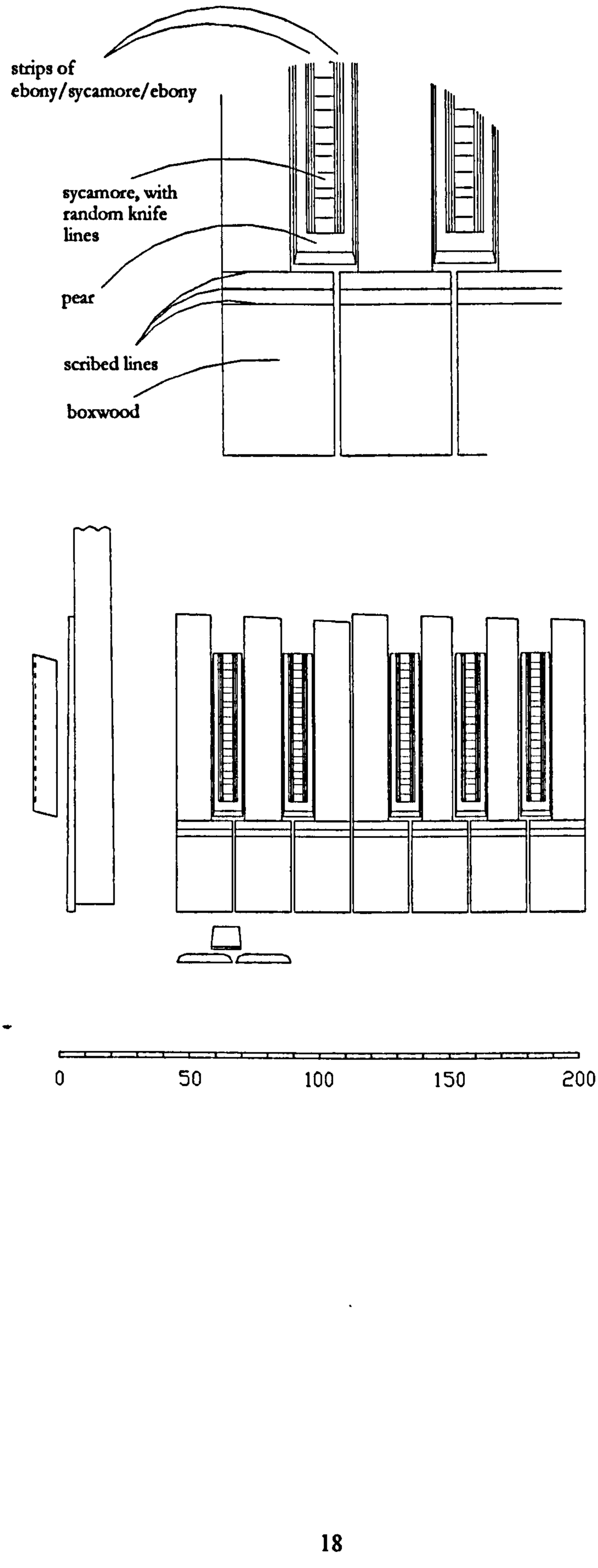
JACKS: Elm (?) with boxwood (?) tongues. The total length is typically 112. They taper in width from 12.0 – 9.2, and in thickness from 4.1 – 3.3. The axle pins are set 19.2 (66%) from the top of the tongue. Some of the jacks still retain old, possibly original, damper cloths.

Figure AH.2 – Drawing of a typical jack.



ACTION CLOTHS: There are heavily felted cloths on the backs of the keys, 33 long and 2.9 thick, uncompressed.

Figure AH.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but was otherwise decorated only by the ironwork strap hinges and lockplates. There is a hasp from the lid which attaches to a lockplate on the keywell flap. There are two strap hinges from the baseboard to the keywell flap. Originally the top surface of the lid had applied oak mouldings at the ends and along the coffer joins. These mouldings are no longer present.

The soundboard is decorated with arabesques, flowers and birds. There is a single non-original rose. The decorator appears to be from the same workshop as those who decorated the Theewes harpsichord and Mar virginal.

The keywell, soundwell and bass jackrail support are decorated with coniferous wood moulded bands separated by pressed papers. The flat part of the bands around the outer part of the keywell are decorated with painted black-painted geometric work. Inside the inner mouldings on the keywell sides and nameboard is a raised flat panel with light brown painted vinework surrounded by yellow borders on a black background. The gilt papers around the keywell and soundwell are of the "Bird and heads" design, and the single surviving arcade is of the trefoil design.

The lid and keywell flap interiors have unique decoration. The interior is painted a flat brown colour, with six diamond shaped panels on the lid, surrounding a panel with a Latin motto. The motto reads "PER AVRES AD ANIMVM", and there are diamond panels containing birds, two above and two below the motto panel, and a diamond panel at each end with flower paintings. There are yellow border patterns and arabesques, with the initials "AH" painted either side of the central arabesque above the panel. The keywell flap is also painted a flat brown colour with a central panel with a Latin motto "MVSICA DEI DONUM" surrounded by yellow border patterns and arabesques.

Condition

Although this instrument gives the appearance of decorative integrity, it has undergone considerable constructional alterations. The spine is not original, dating from the twentieth century, having ripple marks from a thicknesser on the rear surface,

the wrestplank capping pieces are replacements, as are both bridges and the register. The majority of the natural touchplates are replacements. The jackrail and treble jackrail support are missing. The lid was originally hinged to the spine with wire hinges which are no longer present.[2]

Commentary

The virginal has previously suffered major damage, and has been poorly repaired by someone unfamiliar with keyboard instruments. There are only 48 slots rather than the required 50 in the replacement register, the bridges are approximately twice as high as they should be, and the wrestplank capping pieces are also approximately twice the height of the originals. It is clear that the original positions of the bridges and wrestplank capping pieces were visible when the instrument was repaired, although it is unlikely that they were present when the repair work was carried out. There is no evidence of water- or other damage which may have caused the bridges to have separated from the soundboard, nor of any extensive worm damage, but the reasons are presumably related to those which caused the spine to be replaced.

The replacement of the bridges and register makes an accurate assessment of the original string lengths difficult. The present bridge pins and register slot positions are clearly of no use as some of the strings pass over the centre of the register slots. The lower guide board is intact and the register leather can be accurately measured in relation to the spine and the lower frames. Assuming the soundboard register was directly above the lower register, and combined with string angles that place the strings parallel to the register slots produces the string lengths and plucking points quoted above on page 14. In Martin (2000/1:162) it was suggested that the scaling-design note string length should be approximately 145 mm, rather than the 151½ mm as quoted above. This has implications for the intended pitch of the virginal, a string length of 145 mm implying V + 1s an 151½ mm suggesting V. It cannot be positively shown which string length is correct and therefore the actual pitch level cannot be determined with certainty. On the basis of the string angles in relation to the lower guide register slots, and the projected bridge pin positions in relation to the hitchpins and tuning pins it is likely that the pitch level should be V, with a 151½ mm c^3 string length.

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[2] The lid is no longer attached to the spine.

One of the most interesting features of this virginal is that the faceboards are of plain oak, dovetailed to the case ends and keywell sides, and that the keywell flap extends only over the length of the keywell rather than the entire instrument (see Plate AH.2). This is probably reminiscent of earlier practices[3] and it is probable that the AH is built entirely in an older style. The soundboard barring is minimal, consisting of only a single full depth cut-off bar. The use of diamond panels rather than a lid painting covering the entire lid interior is also suggestive of earlier practices. Although the construction and decoration show that the instrument is the product of the Theewes workshop tradition and likely to date to within ten (or at the most twenty) years of the Theewes harpsichord it cannot necessarily be assumed that the virginal was built later than 1579. Theewes is known to have been working in England from 1567 or 1568, so it is entirely possible that the virginal could date from the early 1570s, or even the late 1560s.[4] This is discussed further in the Further Commentary section below, page 47. If it was to date from soon after his arrival it is possible that the instrument could be the work of Theewes himself, something which might be supported by the balance rail key-clearance notches. Although none of the mouldings match the 1579 Theewes harpsichord it is possible that the moulding tools were replaced between the times that the two instruments were made.[5]

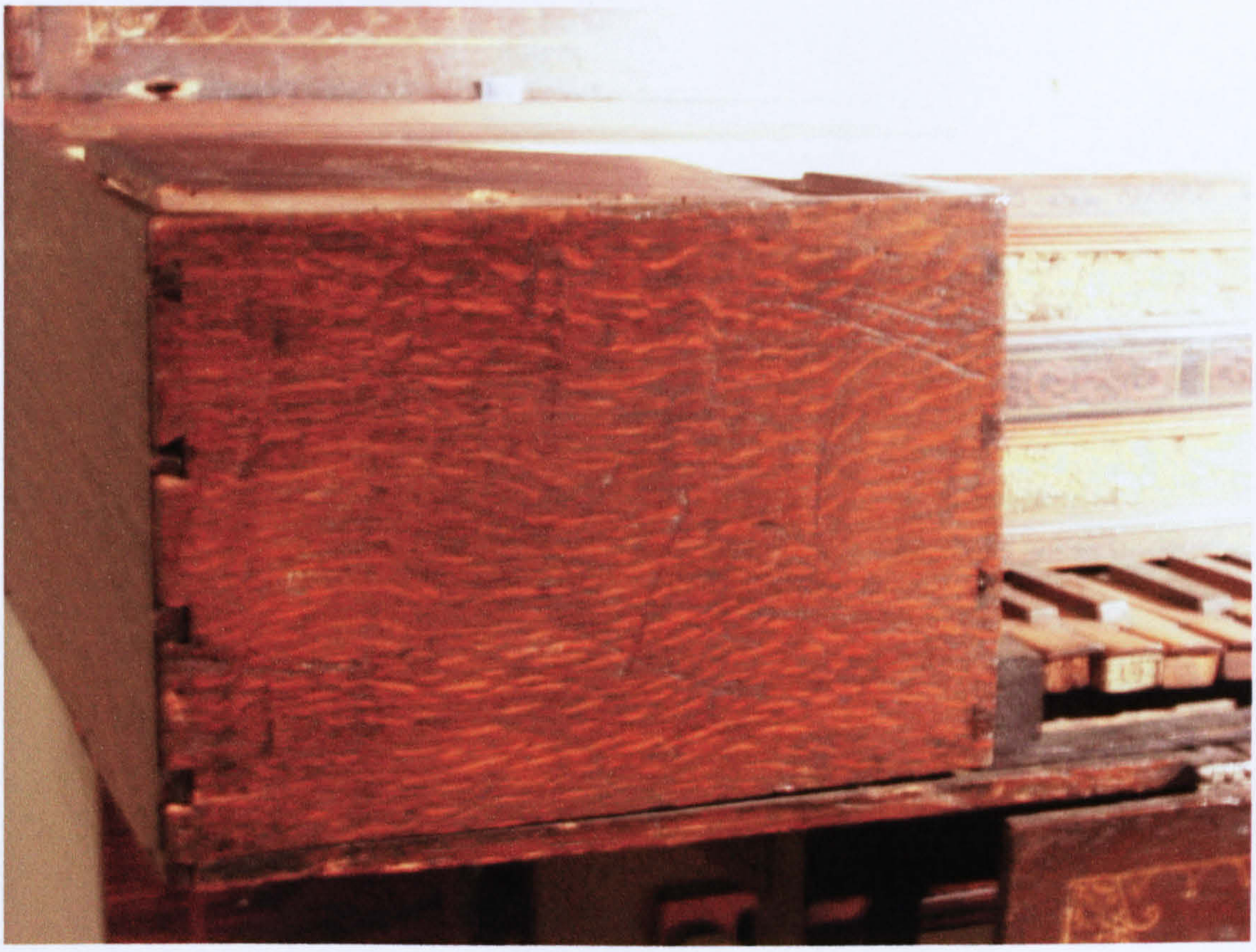
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[3] The instruments listed in the inventories of Henry VIII imply that the cases were of plain oak rather than being decorated with paintings.

[4] Dendrochronology may give a better indication of the date, or at least provide an earliest possible date of construction. The soundboard has been covered in a thick varnish which would make analysis difficult (information from John Topham (PC)).

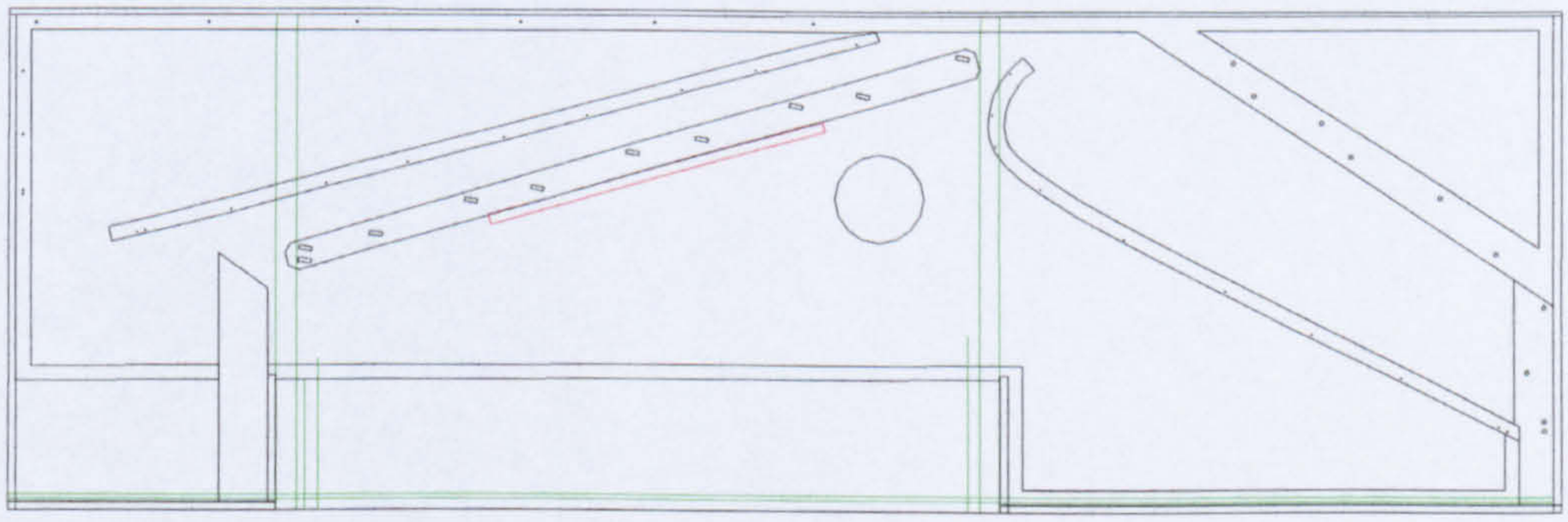
[5] It should not be considered that this is a firm attribution of the AH virginal to Theewes himself. Without further evidence the instrument can only safely be attributed to the same workshop tradition.

Plate AH.2 – Left faceboard of the AH, showing the dovetail joints to the left case end and the left keywell side.



An aspect of the instrument's construction which strongly points to Theewes being the maker is the use of specific scribed lines on the baseboard, and in particular the tools used to mark them. A diagram of the various scribed lines is shown below.

Figure AH.4 – Baseboard scribed lines (in green).



There are two scribed lines which are parallel to the front of the case, the one which is closest to the front edge of the baseboard indicating the front position of the

keyboard. The full width scribed lines that are perpendicular to the front of the case mark the positions of the inside of the keywell sides and frames, and the inside of the endblocks. The ends of the outer two short scribed lines mark the position of the bottom and top balance pins. The purpose of the second short scribed line on the left side of the case is not certain.

The scribed lines which mark the inner edge of the keywell sides and the endblocks are thinner than the other lines, and have been made using a knife rather than a scriber. An identical situation occurs on the soundboard of the Theewes harpsichord, in which the scribed line for the position of the 4' hitchpins has been made with a knife, and the 8' hitchpin position with a scriber. There is no obvious reason why a maker would choose to use different tools to mark scribed lines on the same piece of wood, and reflects a deliberate decision on the part of the maker. Combined with the evidence of the balance rail key-clearance notches, and the lack of other potential makers (see the Further Commentary section), the scribed lines from a strong case for the instrument to have been made by Theewes.

Regardless of any speculation concerning the specific attribution of maker and date of construction, the above-mentioned features suggest that this instrument is likely to be an instrument from c. 1570, with features that are typical of virginals built in England in the mid-sixteenth century.

MAR

Figure MAR.1 – Three-quarter view of the MAR virginal .



Photograph by kind permission of the National Museums of Scotland

Ownership and Provenance

Possession of the National Museums of Scotland, Inventory number H.LT 122. Bequeathed by Lord Ellisbank, FSA. Formerly on loan (1981-1990) to the Russell Collection, Edinburgh (Catalogue number 43). Believed to have been owned by Marie Stewart, Countess of Mar (died 1644). Marie Stewart was the daughter of Esmé Stewart,

the favourite cousin of James VI and I, who arrived in Scotland (from France) in 1579. Marie Stewart later became (by marriage) the Countess of Mar, and was (with her husband) responsible for the care and upbringing of James' children, the Princes Henry and Charles (later Charles I) and the Princess Elizabeth (later the Queen of Bohemia).

References

Marshall (1990), Martin (2000/1), Martin (2001), Napier (1986), Raymond (1987).

Inscriptions

The instrument is unsigned. A possible maker's mark, three appearances of the letter "M", increasing in size from left to right appear on the front face of the keywell liner. A workshop identification number, either an "8" or a "B" (see Figure Mar.2), is found on the left keyboard siderail and the inside of the toolbox. A latin motto, ending "…LSE CANO" was painted on the keywell flap.

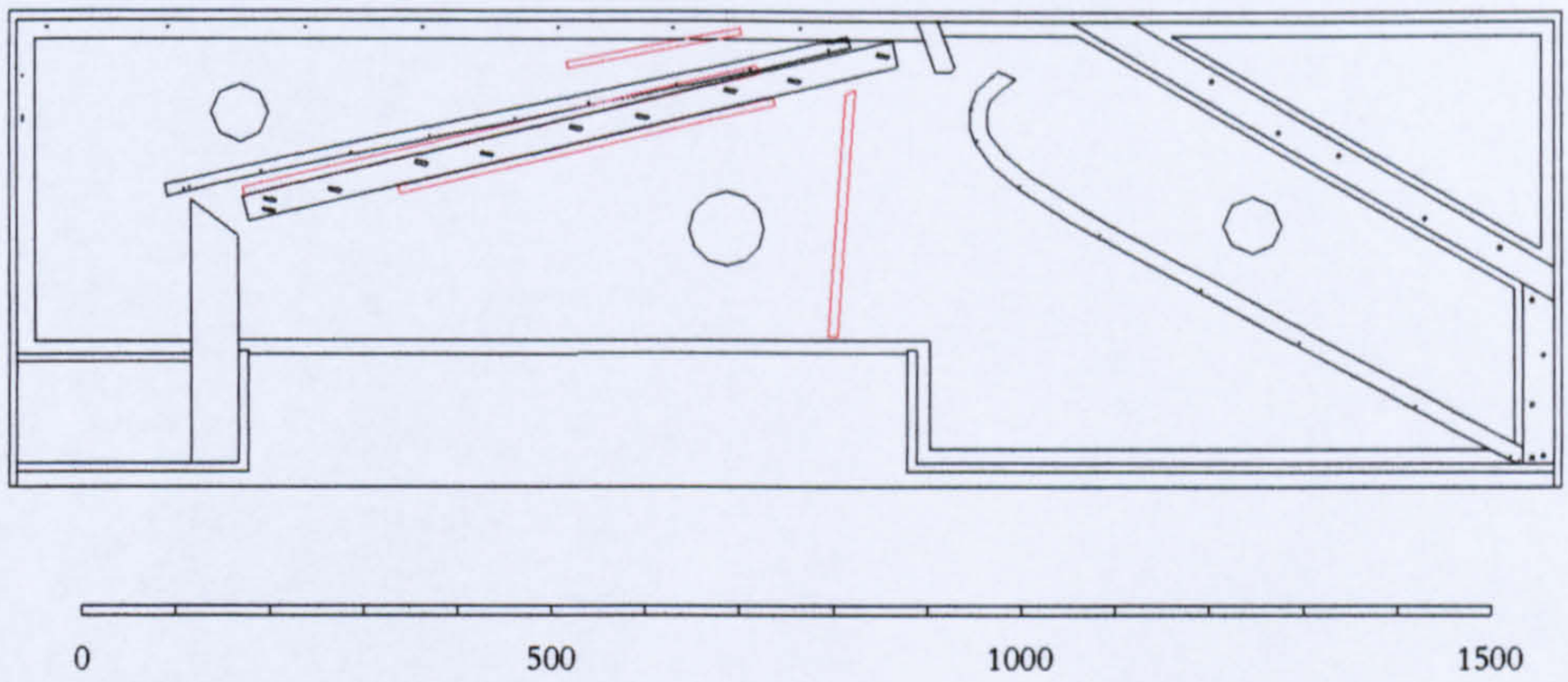
Plate MAR.2 – Photograph showing the left keyboard siderail with the workshop identification number.



Construction

CASE

Figure MAR.1 – Plan view of the MAR virginal



OVERALL INSTRUMENT DIMENSIONS: 1652 x 505 x 184.

BASEBOARD: Deal, consisting of two planks, the front one 277 wide. ‡ 13 thick.[1] The joint between the two planks has now separated.

SPINE: Deal, 1652 long, 180 – 184 high, 10.7 – 11.5 – 11.4 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 509 – 505 long, 182 – 180 high, 8.4 thick; the right case end 507 – 505 long, 180 – 184 high, 7.8 thick. The spine and case ends overlap the baseboard.

FACEBOARDS: Deal, glued to the top of the baseboard, and rebated into the case ends. This can be confirmed by examining the top of the case sides which have been cut away (see the Condition section below), revealing the case ends / faceboards joints. Left faceboard 246 long, 169 high and 9.9 thick. Right faceboard 689 long, 167½ high and 9.9 thick. Dovetailed to the keywell sides.

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[1] The thickness was not measured as there is a non-original strip, approximately 5 mm wide, glued along the front edge.

KEYWELL SIDES: Deal, 128 (left) and 129 (right) long; 10.2 (left) and 10.5 (right) thick. Slots for the nameboard have been cut into the keywell sides 113½ - 118 (left) and 113 – 118 (right) from the front of the keywell sides. The scribed lines, used to guide the chisel, extend to the bottom of the keywell sides.

NAMEBOARD: Deal, total length 712 – 711, 132 – 130 high, and 9 - 8½ thick.

KEYWELL LINER: Deal, ?11 thick, 63 - 64 high. Rebated so that its front surface is 4 mm in front of the back edges of the keywell sides. The keywell liner protrudes past the left keywell side by about 100 mm.

OTHER LINERS: Deal, ?38 x 19, with chamfered lower edges. The keywell side liners extend ‡70 past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Oak, ‡38 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 58 – 55 high. The inner edges form a continuation of the keywell sides. The frames are approximately 16 thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal and originally extended to the baseboard.[2] The top surface of this piece is 12.7 below the top of the left case end, and front edge is 106 – 107 from the back of the left faceboard. This toolbox piece is 8 thick.

JACKRAIL AND SUPPORTS: The original jackrail is missing, but the space between the jackrail supports is 762 (front) and 798 (back) long. The bass jackrail support is of deal, 17.5 thick and 49.9 wide. The left side is 279 long, the right side 240 long. The bottom surface is 23.5 from the top of the soundboard. The treble jackrail support is of oak, 20.6 thick, and a maximum of 57 long. It has a mortice to receive the treble end of the jackrail, set 5.7 – 13.0 below the top edge. The back corner is 656 from the right case end, and it is at an angle of 110° to the spine.

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[2] The bottom part of this piece has subsequently broken off below the level of the soundboard.

LID: Oak, originally coffered, but was flattened during alterations carried out in the nineteenth century (see the Condition section, below). It is of three pieces, the outside two of which have been reduced in width. In addition there is an added piece, approximately 20 wide at the bottom edge. The top of the lid is now panelled, and has non-original brass hinges.

KEYWELL FLAP: Oak. The original keywell flap now forms the visible faceboards of the instrument, with a missing section where the keyboard is placed. X-ray photographs taken from the front of the instrument reveal the original decoration (see Decoration section, below).[3] The thickness of the keywell flap is 9.3 – 9.7, measured at the top in its present position.

LOWER GUIDE BOARD: On top of the frames and glued to the underside of the keywell liner is the lower guide board (of conifer wood), extending from the front of the keywell liner to the spine. The slots for the jacks have been cut into this board (and a leather guide glued to the top surface). In front of the register is a full depth bar of deal, approximately 7 thick, which is glued to the top of the lower guide board and extending up to the soundboard. Two "windows" have been cut into the bar, leaving wood approximately 25 wide at the bottom and ends, and 13 wide at the top and the centre. The bar is shaped so that it is longer at the top than the bottom.

SOUNDBOARD: Coniferous wood, 3.2 – 3.3 – 3.2 thick at the keywell liner. The top of the soundboard is approximately 46 below the top of the case. There are three roses of gilded card. The roses are let into the soundboard and sit on a narrow ledge inside the hole. The rose diameters are 60.9, 79.0 and 61.0 from left to right.

SOUNDBOARD REGISTER: The soundboard register is, uniquely, made of walnut which has been let into the soundboard so that the top surface of the soundboard and the register are in the same plane. The numbers "30" and "40" appear on the register in a hand which matches those on the jacks, and have been written so the numbers can be read when viewed from the spine.

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[3] I would like to thank Sarah Gerrish, Conservator of Wooden Objects at the National Museums of Scotland, for arranging the X-ray photographs. Previously taken top view X-rays revealed that there was some decoration hidden which was fully visible when viewed from the front.

SOUNDBOARD BARRING: Deal, the visible bar to the right of the central rose is chamfered from top to bottom, ‡10 thick where it is glued to the soundboard, and 20 deep. The ends are tapered, starting at ‡40 from the end of the soundbar.

WRESTPLANK CAPPING PIECES: Oak, 4.1 thick. The treble wrestplank capping is 32.5 wide without, and 50.2 wide with applied mouldings, and the bass wrestplank capping is 33.5 wide. The applied moulding for the bass wrestplank capping is missing, but marks on the soundboard indicate that with the moulding in place it was 39.8 wide in total.

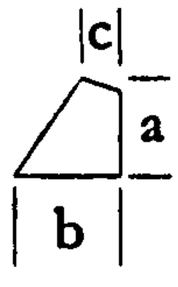
SOUNDBOARD MOULDINGS: Oak, 4.1 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. Both are 19.5 wide. The other soundboard mouldings are 14.5 wide.

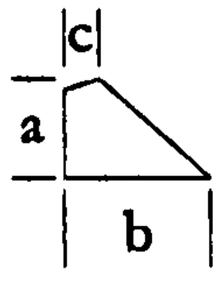
OTHER MOULDINGS: The faceboard mouldings vary in thickness from 3.9 to 4.7, where the edges can be seen behind the present faceboards. The cap moulding on top of the faceboards, keywell sides and nameboard is oak, 15.0 wide and 4.1 thick. The soundwell top edge mouldings are oak, 14.1 deep and 3.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are of iron, 1.68 diameter. The tuning pins are iron, 51.8 total length and 4.1 diameter. The tuning pins have been divided so that the notes up to $g^{\#}$ are on the bass wrestplank, and notes a — c^{3} are on the treble wrestplank.

BRIDGES: Beech. The treble of the left bridge has been cut away at the bottom to accommodate the soundboard moulding. The right bridge has been cut to shape, with the grain direction approximately 10° to the straight section of the bridge. The right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. There are no scribed lines on the left bridge. The bridge pins are of iron, 1.1 diameter.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	13.0	12.5	11.8	11.1	10.7
b	13.9	13.0	12.9	12.5	12.3
c	4.8	4.7	4.7	4.1	4.7

right bridge	C	c	c^1	c^2	c^3
a	12.2	12.4	11.8	12.6	11.2
b	17.5	18.0	18.4	18.7	18.1
c	4.1	4.3	4.1	4.2	3.8

STRING LENGTHS AND (PLUCKING POINTS)

		f^1	**466½ (58)**	**F**	**1253 (79)**
		e^1	509	E	1311
		e^{b1}	517½	E^b	1323
		d^1	572½	D	1379½
		$c^{\#1}$	582½	$C^\#$	1391
c^3	**176½ (57½)**	**c^1**	**633½ (65½)**	**C**	**1434 (88)**
b^2	176½	b	643½	**ex C**	**1448 (94½)**
b^{b2}	190½	b^b	695½		
a^2	194	a	706½		
$g^{\#2}$	210½	$g^\#$	758		
g^2	214½	g	769½		
$f^{\#2}$	234½	$f^\#$	825½		
f^2	**238 (48)**	**f**	**836½ (64)**		
e^2	260	e	893		
e^{b2}	266	e^b	905½		
d^2	291	d	958½		
$c^{\#2}$	297½	$c^\#$	970½		
c^2	**324½ (57½)**	**c**	**1028 (75½)**		
b^1	331½	B	1040		
b^{b1}	362	B^b	1104		
a^1	368	A	1144		
$g^{\#1}$	405	$G^\#$	1172		
g^1	413½	G	1184		
$f^{\#1}$	457½	$F^\#$	1241		

KEYBOARD AND ACTION

COMPASS: C – c^3, with an extra string and jack for C.

KEYLEVERS: Deal, 15.0 thick at the front, tapering to 11.6 at the rear. The rackpins are deal, 2.5 diameter.

BALANCE RAIL: Oak, 31.5 wide and 15.3 thick. The balance pins are iron, 2.25 diameter, and protruding 19 above the top of the balance rail. The balance rail is half-lapped to deal keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are generally 32 – 31 wide, and 8.8 thick. The backrail is deal, 45 wide and 9.4 thick.

RACK: Coniferous wood, glued to the top of the backrail with slots cut out for the softwood backguides to pass through. The rack is 4.9 thick, 36.4 high, and is scribed on the front for the top and bottom of the slots.

FRONTRAIL: Non-original, of mahogany, 22.0 wide and 4.5 thick.

KEYWELL BATTEN: Oak, with a moulded top edge along the front, 19.7 high and 4.7 thick.

ENDBLOCKS: Walnut. The left endblock is 128 long, 20.1 wide and 31.2 – 28.4 high. The right endblock is 127 long, 19.6 wide and 32.4 – 28.7 high.

KEYBOARD WIDTH: Overall width between the keywell sides 702, and between the endblocks 662. The overall width of the keyboard is 658, and the three-octave span is 478.

KEYLEVERS: The lowest keylever is 321½ long and the balance point is 117½ from the front of the touchplate. The top keylever is 460½ long, and the balance point is 168 from the front. The accidental keylevers are balanced 12.3 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, generally 114 long, tapering in thickness from 2.9 at the front to 1.4 at the rear. There are three scribed lines on the front section, 28.7, 31.6 and 35.5 from the front edge. The rear scribed line defines the total

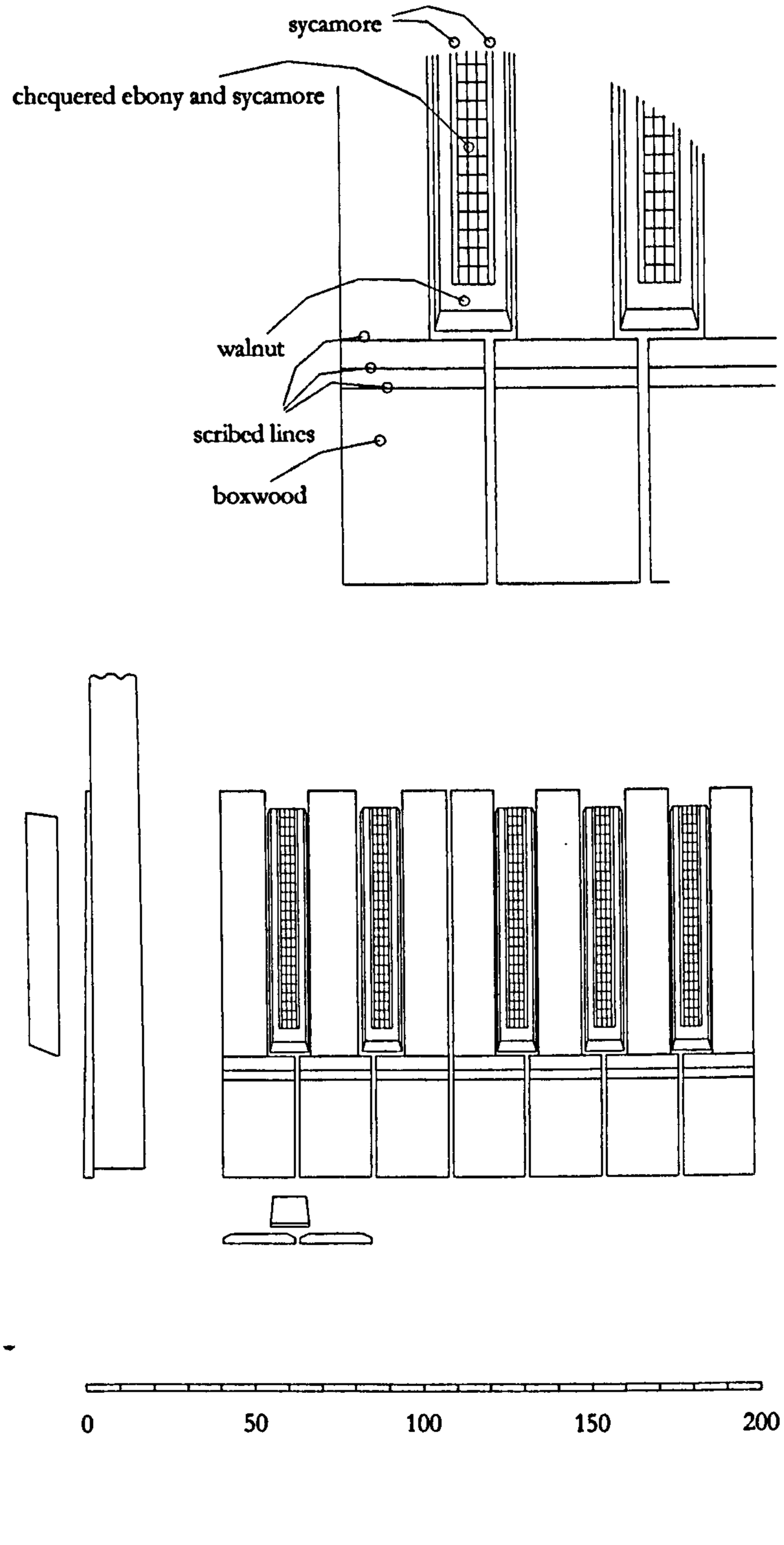
front touchplate length. These scribed lines (and the chamfer at the edges of the keys) are repeated on the endblocks.

The natural touchplate widths in between the accidentals are:-

		f^2	12.5	f^1	12.4	f	12.7	F	12.5
		e^2	12.9	e^1	12.6	e	13.0	E	13.0
		d^2	14.2	d^1	14.4	d	14.0	D	14.6
c^3	21.1	c^2	13.2	c^1	12.8	c	13.0	C	13.5
b^2	12.5	b^1	12.6	b	12.2	B	12.6		
a^2	12.8	a^1	12.8	a	12.9	A	12.5		
g^2	12.9	g^1	-	g	12.6	G	12.8		

ACCIDENTAL TOUCHPLATES: Walnut, with inlayed decoration of sycamore and ebony on the top surface. The total length is typically 71.3, and total height 9.1. They taper in width from 11.5 at the bottom to 9.9 at the top. The arcades are not original.

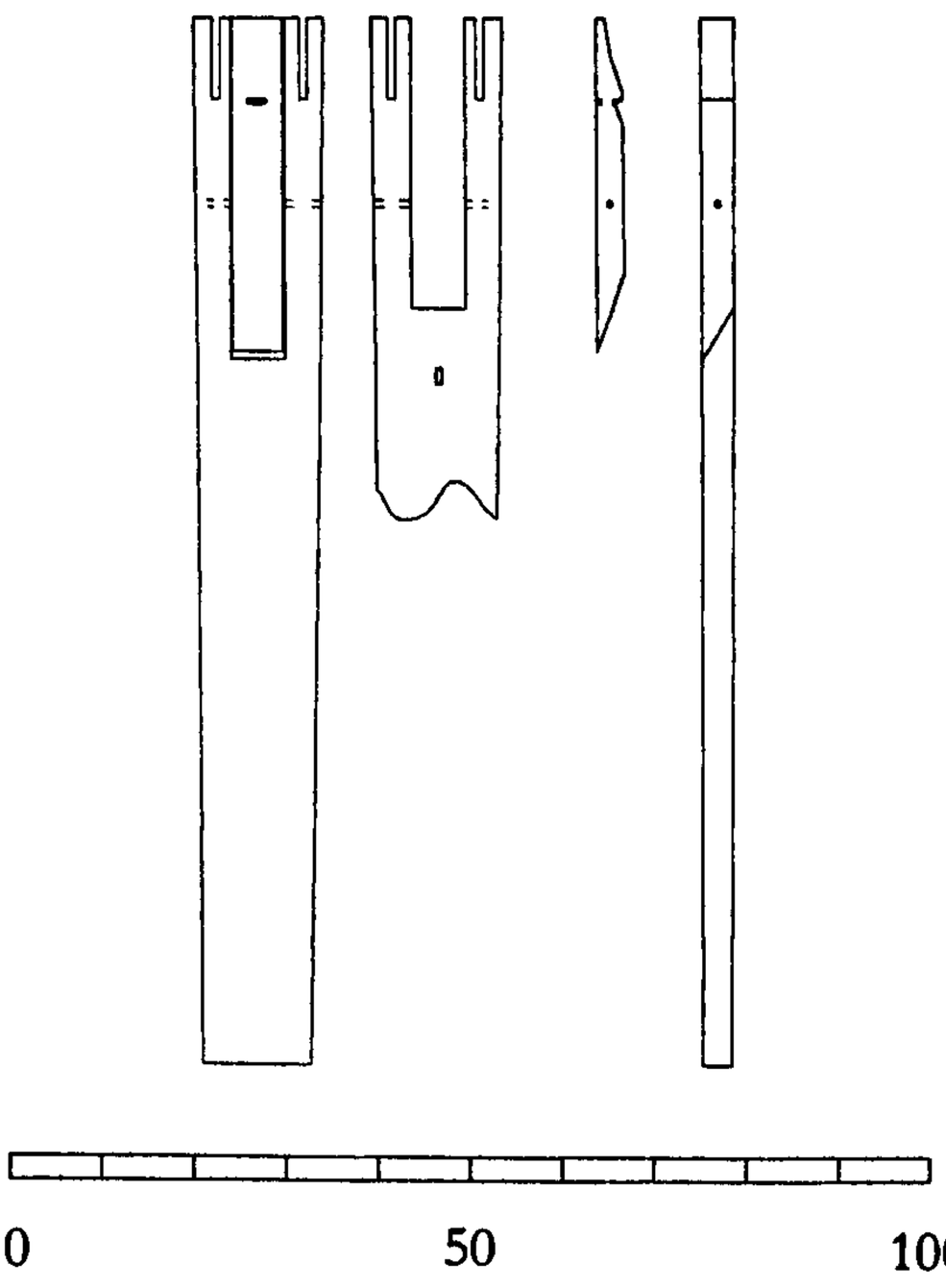
Figure MAR.2 – Drawing of major keyboard details.



ACTION CLOTHS: There are squares of white felted wool cloth around the balance pins, and possibly original action cloths on the back of the keys, consisting of a layer of red wool, topped by a black cloth and then a white leather glued to the top. The total combined thickness of these keyback cloths is typically 5.05.

JACKS: The jacks and tongues are of beech. The total length is typically 113. They taper in width from 14.2 – 11.75, and in thickness from 3.65 – 3.1. The springs are of bristle, with some iron replacements. The axle pins are 0.68 diameter, set 27.4 (77%) from the top of the tongue. Thirty four original jacks survive. Some of the jacks still retain old, possibly original, damper cloths. These dampers are angled at the upper and lower corners.

Figure MAR.3 – Drawing of a typical jack.



Decoration

The outside of the case has been varnished, but is otherwise undecorated. The outside of the original keywell flap form the present faceboards, attached to the original faceboards by nails in each corner. The top of the lid has been panelled during the alterations, and oak battens protrude down from the lid at the front and sides, necessitating the case ends to have been reduced in thickness at the top.

The soundboard is decorated with isolated flowers and birds, and arabesques in various corners. A thick coat of later varnish has obscured some of this painting. Only one original rose survives, made of three layers of card. The bottom layer is of a more intricate design than the two upper layers which have the same design, forming a double thickness. The rose is gilded. The roseholes are surrounded by painted red bands and arabesques.

The keywell, soundwell (and original faceboards)[4] are decorated with oak moulded bands separated by embossed papers. The original papers are now missing, and have been replaced during the nineteenth century by other papers, probably sheets of embossed wallpaper. Two widths of embossed papers were originally used — a design of 19 mm wide on the nameboard, bass jackrail support, keywell sides and outer part of the faceboards, and a design 25 mm wide around the soundwell and the centre of the faceboards. With the exception of the cap moulding on top of the faceboards, keywell sides and nameboard, only a single moulding shape was used, although the flat bands are of different widths. There is no painted work on any of the visible oak bands.

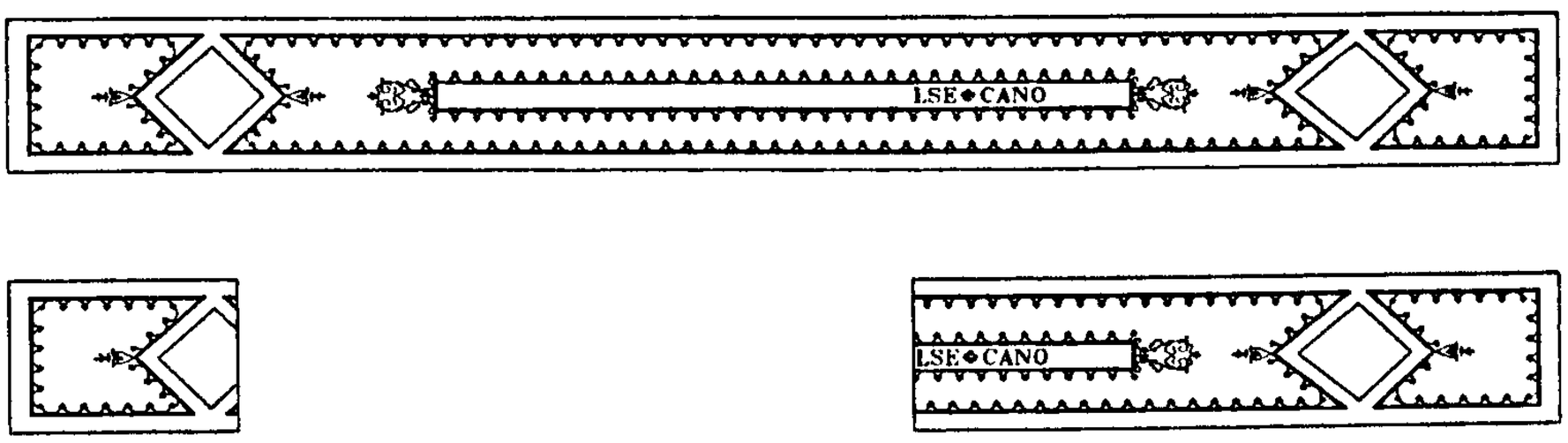
The X-ray photographs reveal details about the original keywell flap decoration. It probably had a dark brown background[5] with lead white or massicot[6] borders and arabesques with a Latin motto ending "...LSE CANO". The remainder of the motto is now missing. The word *cano* means "sing". It is possible that the second last letter is

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[4] Although the original faceboards cannot be seen apart from at the edges next to the keywell, but the X-ray photographs reveal details about them.
[5] This colour is used as the background for the lid, and can also be seen in places where the keywell flap has separated from the faceboards at the top.
[6] Massicot is a yellow colour produced by the gentle roasting of lead white. See Gettens and Stout (1966).

incorrectly written, and the word could be *dulce*.[7] Were this to be the case there are two mottos, both found on other keyboard instruments, which are potentially usable. They are *Intactum sileo percute dulce cano* ("Untouched I am silent, strike me I sweetly sing"), and *Dum vixi tacui mortua dulce cano* ("While living I was silent, now I sweetly sing"). With the available space for the motto (assuming that the keywell flap decoration is essentially symmetrical) only the second example would be able to fit, based on the letter spacing of the visible part. The diamonds at either side of the motto probably contained images or other decorations.[8]

Figure Mar.4 – Details of the keywell flap as can be seen from the X-ray photographs, with a reconstructed image of the whole keywell flap above. No attempt has been made to reconstruct the missing words or decoration inside the diamonds.



The lid decoration consists of three oval-shaped painted panels. The central panel shows Orpheus Playing to the Beasts, the left panel shows a river scene with a town in the background and boats, the largest of which has two flags. One of the flags consists of alternate horizontal red and white stripes, and the other flag is a red cross on a white background — the flag of St George. The panel to the right features a hunting scene with dogs. Surrounding each of the pictures is a yellow border with red scumbling on the top, which is in turn surrounded by an off white (lead white or massicot) thin border with arabesques. There are four flower paintings, one in each of the spaces between the panels at the top and bottom.

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[7] A similar misspelling occurs on the Theewes 1579 harpsichord, where the word *fesit* is used in place of the usual *fecit*.

[8] In Martin (2001) the author suggested that the diamonds may have contained the coat-of-arms of the Countess of Mar as illustrated in Dennis (1999). The coat-of-arms consists of a diamond with three stripes running from top left to bottom right, the outer stripes blue and the central stripe gold. On each of the blue stripes are three gold crosses. This coat-of-arms is entirely consistent with the decoration as can be seen from the X-rays.

The stand is not original, being a two-dimensional version of a plausible turned stand. It is possible that the present stand was based on the original stand which was too badly damaged to be used.

All of the original ironwork hinges and lockplates are now missing. Evidence from the filled holes on the instrument shows that it originally had three wire hinges between the spine and lid, and two strap hinges between the baseboard and keywell flap. The alterations and missing central section of the keywell flap make it impossible to determine if there was a centrally-positioned lock between the lid and the keywell flap. Small filled holed indicate that there were small hook on the keywell flap which attached to eyes on the front of the lid near each end.

Condition

The instrument has had at least one heavy restoration that has removed various aspects of the original decoration, although the musical integrity is essentially unaltered. The main decorative alterations, described in detail above, include the flattening of the lid, and applying panelling to the top and protruding battens at the ends and front; recessing the top of the case sides for the battens; using the original keywell flap as the present faceboards over the original ones; the removal of all the original pressed papers and replacement with later papers; removal of all the original ironwork and the introduction of replacement brass hinges between the spine and lid; and the application of a heavy coat of varnish over the soundboard.

The original jackrail is missing, the present one clearly dating from the time of the above-mentioned alterations as it is decorated with the same papers and could clearly never function with the instrument in a musical state. The toolbox lid is also missing. Two of the roses are missing, those roseholes having traces of later replacement roses around the edges.

The right bridge has been screwed to the soundboard to prevent it separating. It is still in its original position. The bridge is lifting along its front edge where the curve in the treble occurs.

There are a number of broken rackslots. There is some cloth woven around the top which, although appearing old, could never have functioned as a key-dip stop.

Plate Mar.3 – Photograph of the rack, showing the broken slots and the cloth woven around the top.



The instrument is unstrung, although traces of strings around some of the tuning pins may be from a period of historical use. It is impossible to measure these string remains without risking damage to them, and accordingly have been left untouched.

The case itself is in a fragile condition, showing considerable damage from recent movement. The soundboard is no longer flat, cupping at various points along its width, and the original keywell flap is warped and separating from the right faceboard.

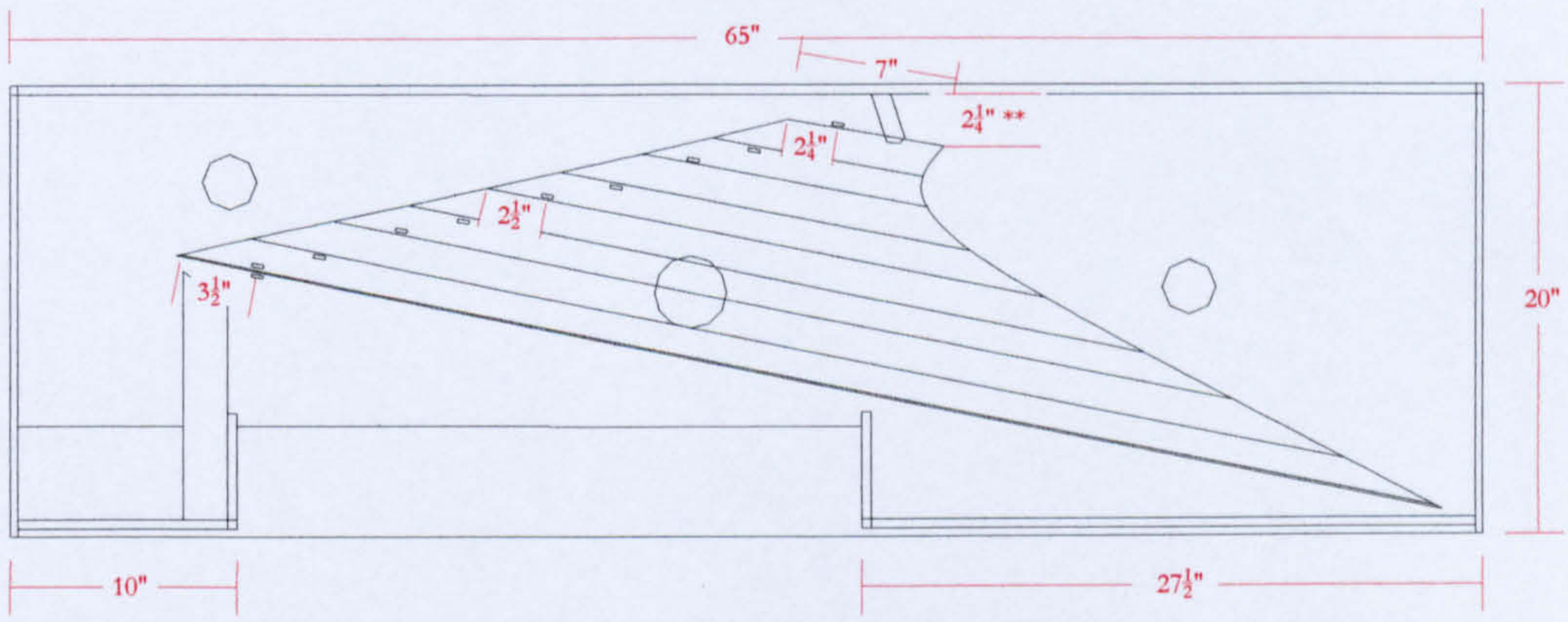
There has been recent damage to the rear part of the left case end at the top where its width has been reduced. This has been repaired but still remains very fragile.

Commentary

Despite the alterations to the instrument, it still retains much vital information. It has many scribed lines which give numerous details about the original design concepts and construction methods.

The instrument was probably constructed using the English inch for its main features. The spine is 65" long and the case ends were originally 20" long.[9] The baseboard was probably glued in place after the spine and case ends were joined together. Full width scribed lines mark the position of the inside of the keywell sides and frames and appear to have been measured from the *outside* of the case ends. This distance is 10" for the left faceboard and 27½" for the right faceboard. Further scribed lines, approximately half the width of the baseboard, are set 19 mm (¾") inside the keywell sides lines. These shorter lines probably indicate the intended position of the inside edge of the endblocks. The case is 7¼" high.

Figure Mar.5 – Design layout of the Mar virginal.



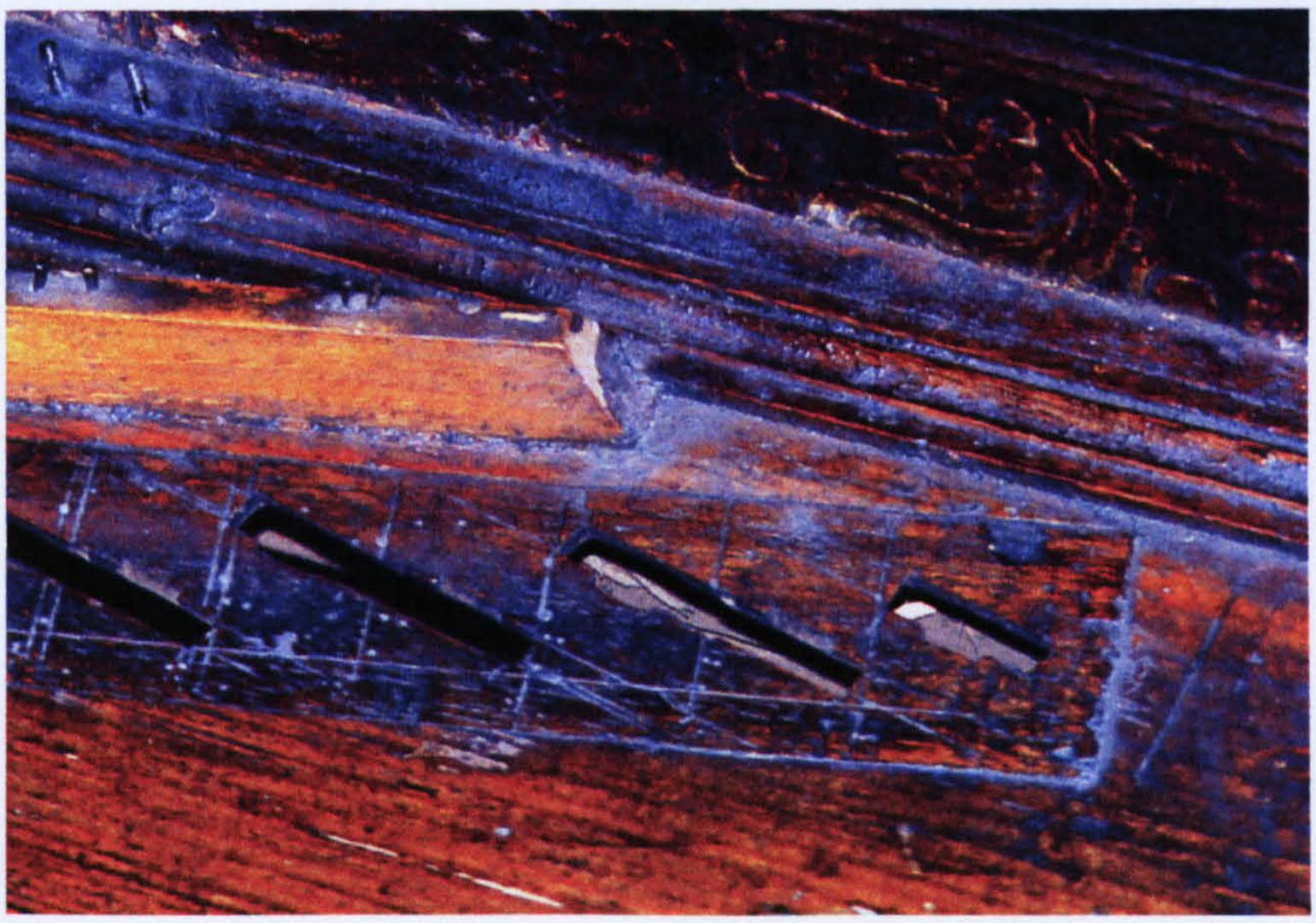
It is likely the register was the first designed element on the soundboard. Unusually it is of walnut, rather than leather, and it retains numerous construction marks and lines. There is a scribed line on the soundboard to indicate the inside edge of the treble keywell frame position, and the treble end of the register is approximately five mm inside this line. The register is 709 long and 27.4 wide. The marking out probably commenced with a scribed line along its length, set a quarter inch from the front edge. There is a series of spike marks generally about a quarter inch from the rear edge, probably marked with a compass, to indicate the position of a series of perpendicular lines. The distance between the top and bottom spiked mark is 667½ mm. This *may* represent an intended spacing of 11 spaces in 6 inches. An error has occurred in the treble where there are three instances of double scribed lines — the left line aligned with

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[9] The case ends have had their length reduced a little when the keywell flap was nailed to make the new

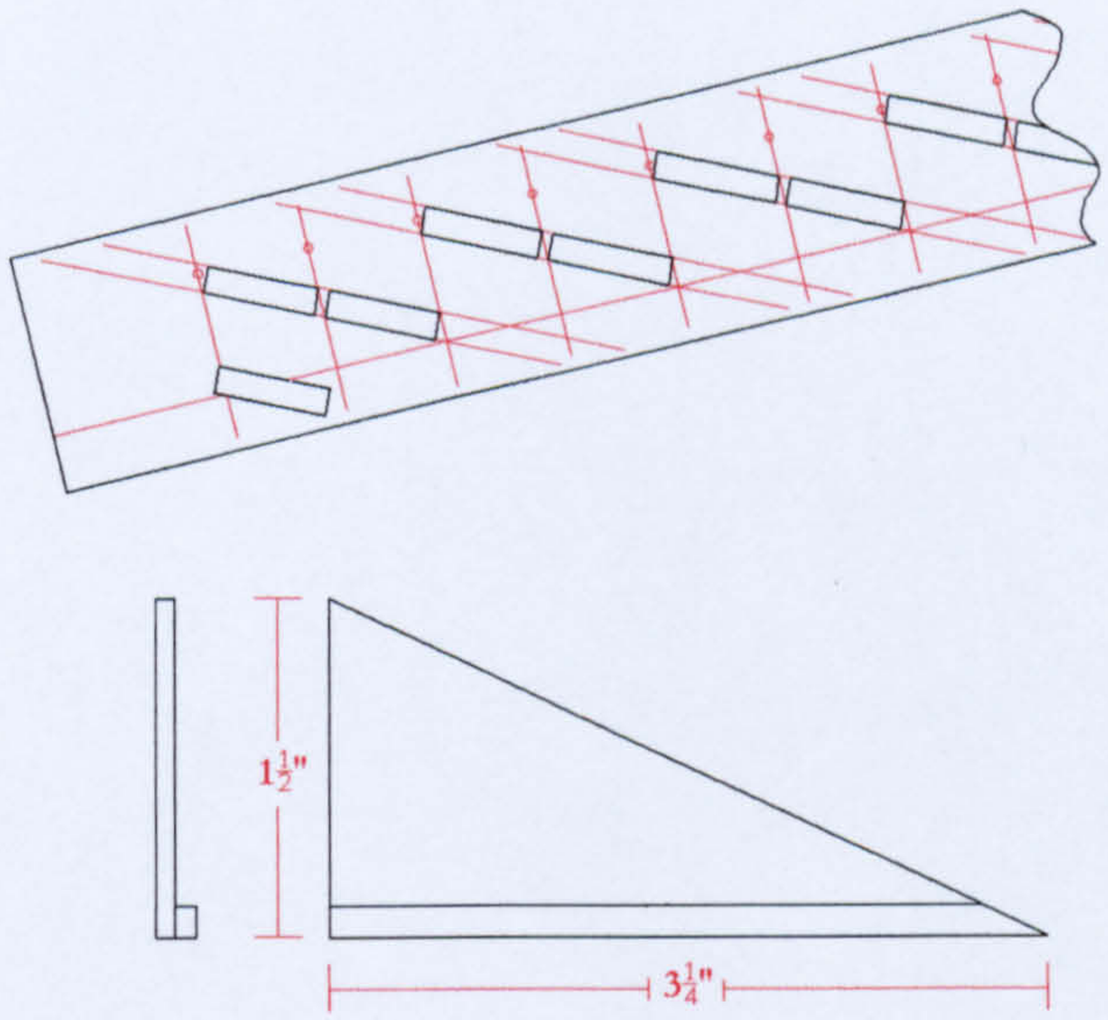
the spiked mark, although the actual register holes are based around the lines to the right. Finally, there are parallel lines, generally 3.0 – 3.1 mm apart which provide a guide for the sides of the jackslots. The front line coincides with the intersection of the scribed lines that are parallel and perpendicular to the front of the register. The variable distance between these two lines shows that the back line was done afterwards, rather than in the same process. These lines are at an angle of 24.8° to the front of the register wood, suggesting they were marked out with a jig set at a 13:6 ratio (probably achieved by having the long side (parallel to the register) 3¼" long, and the rear corner 1½" from the front.

Plate Mar.4 – View of the treble part of the register, clearly showing the scribed line on the soundboard, and the various marking out lines on the register itself.



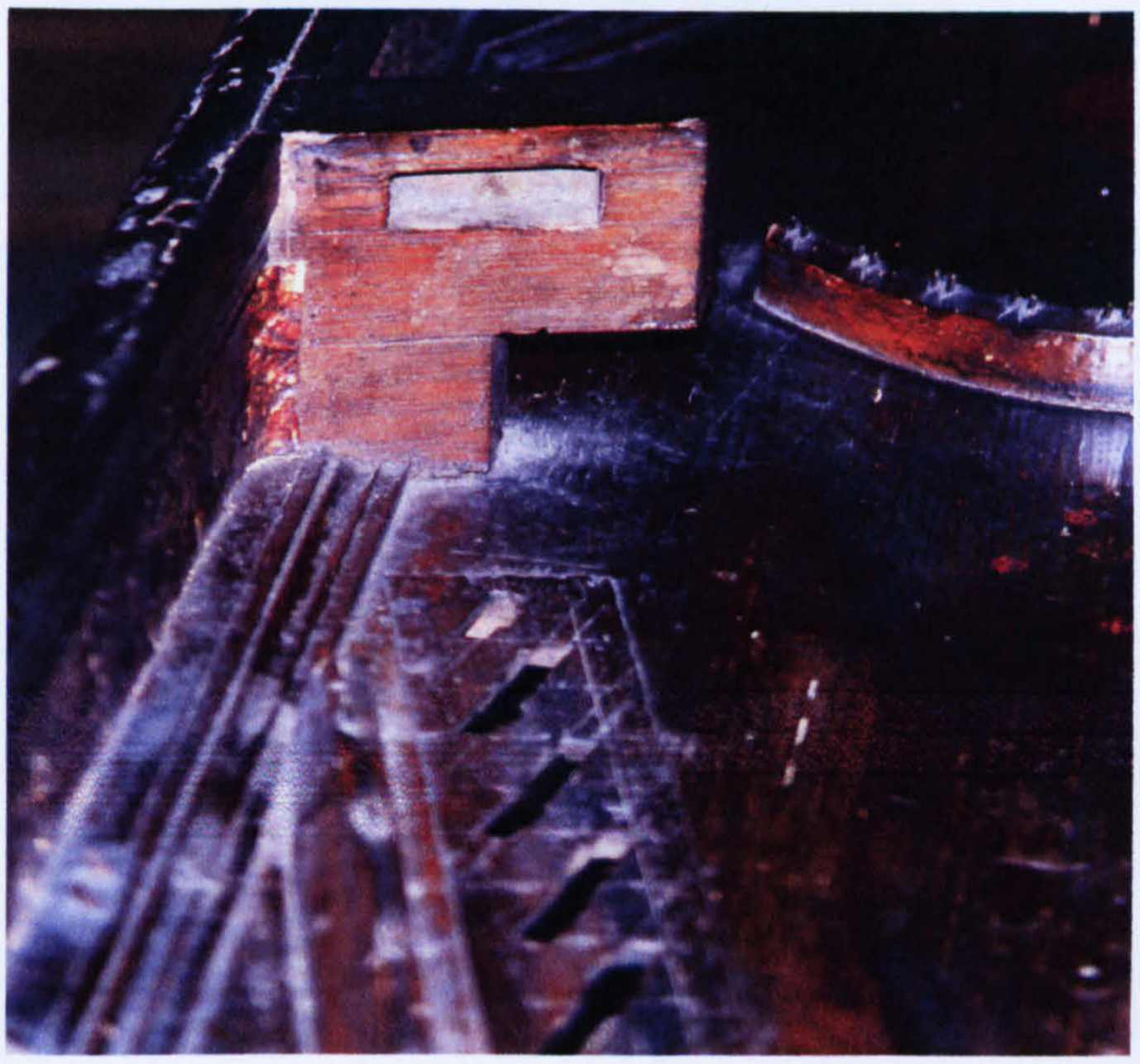
faceboards. The repairer planed the case ends at the front so they did not overlap the new faceboards. This reduction is not consistent.

Figure Mar.6 – Drawing of part of the register (top), detailing the various marking out lines; and angled jig (bottom) used for marking the sides of the register slots.



The right bridge was positioned with the help of scribed lines on the soundboard in the treble and bass. The lines in the treble go underneath the bridge, and mark the intended string positions for b^2 and a^2 (the front strings of the top two pairs). In the bass there is a broken scribed line on the soundboard marking the position of the C string in between the register and the left bridge, behind the right keywell liner, and behind the right faceboard. Another short line (only in the area behind the right keywell liner) marks the position of the D string.

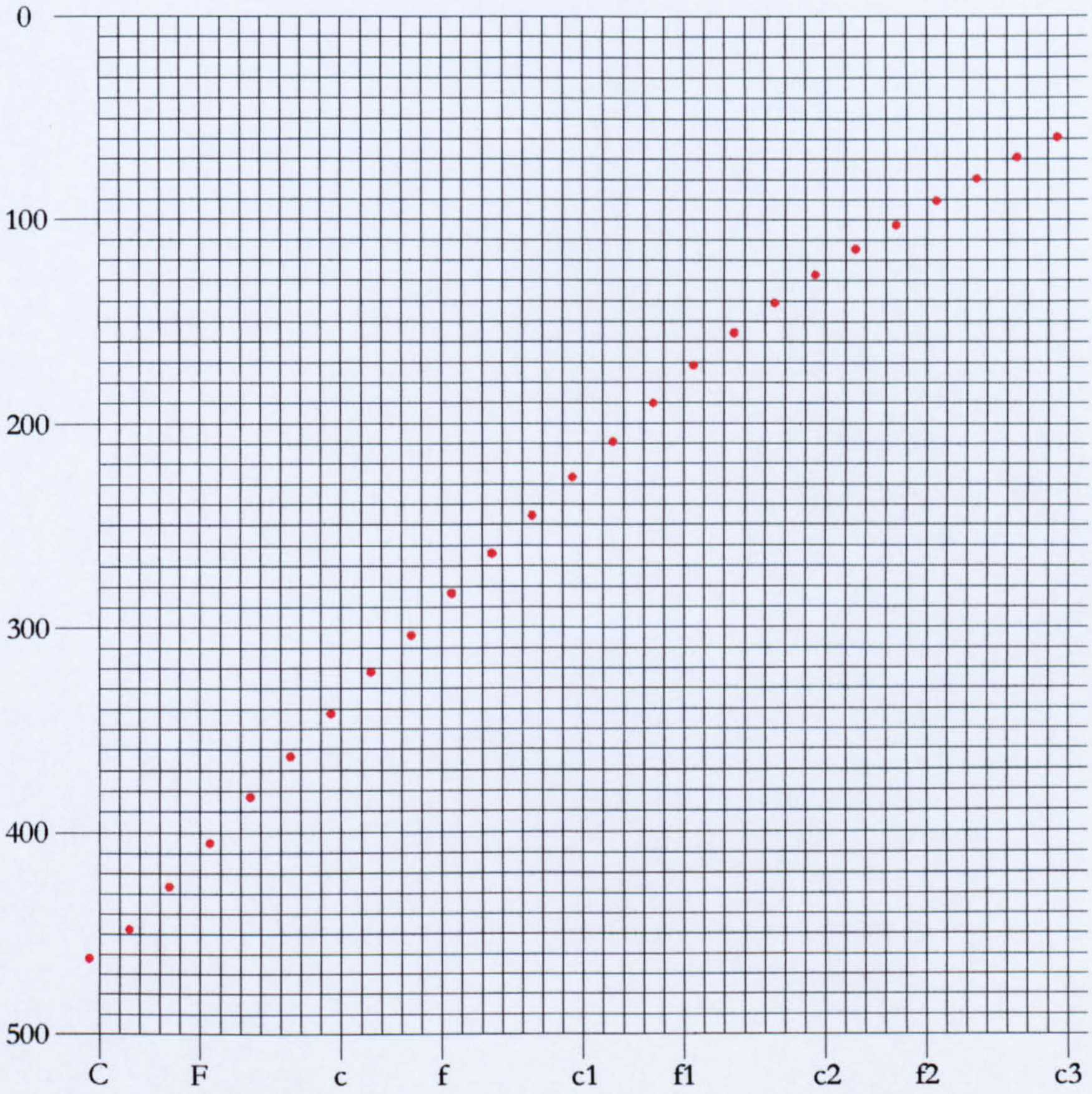
Plate Mar.5 – Photograph showing the scribed lines on the soundboard used to position the treble end of the right bridge.



The right bridge has a series of scribed lines, parallel to the spine, on the top surface that act as guides for the bridge pin positions. The highest line is 59 mm from the inside of the spine. The left-to-right position of the right bridge was determined by the scale (c^3 string length), and the plucking point in relation to the register. The plucking point is 57½ mm, probably intended to nominally be 2¼ inches. The bass end of the bridge butts against the bass wrestplank capping.

There is a single scribed line for each pair of bridge pins. The spacing of these lines from the spine is graphed as follows:-

Graph Mar.1 – Scribed lines measured perpendicular to the spine.



The spacing appears to have been devised in groups of three. Therefore, the scribed lines for the top three pairs of strings (b^2/c^3, a^2 / b^{b2} and g^2 / $g^{\#2}$) are equally spaced, as are the next three (f^2 / $f^{\#2}$, e^{b2} / e^2 and $c^{\#2}$ / d^2). This continues throughout the compass, with the bridge pin spacing changing at (from top to bottom) $f^{\#2}$, c^2, $f^{\#1}$, c^1, $f^{\#}$, c and $F^{\#}$. The lowest scribed line (between the two C strings) is a little higher, presumably to give a suitable clearance at the bass end of the bridge.

It is not certain how the left bridge was positioned. The treble end was positioned in relation to the right bridge (and the register) to ensure the correct string length. The bass end was probably positioned so that the plucking point of the C

string was 3½ inches. It is possible that the middle part of the bridge was positioned in a similar manner, using a c^1 plucking point of 2½ inches.

Although the instrument is unsigned and not dated, the general construction, design layout and decoration suggest it was built c. 1580 – 1600, and belongs in the same workshop tradition as the AH virginal and the 1579 Lodowyk Theewes harpsichord.[10]

[10] For a full discussion on this attribution see Martin (2000/1).

Further Commentary on the AH and Mar Instruments

The AH and Mar virginals are both missing their original jackrails, and probably as a result the names of the makers are not known. Both have suffered considerable alteration, although in different ways, which allows the hypothetical aspects of the two instruments to be related to each other.

The two virginals are from the same workshop tradition, and are also related to the Theewes harpsichord. Various features - such as the balance recessed balance rail which appears in the AH and the Theewes; the decoration, which also comes from the same workshop tradition, the use of lower-guide boards which span the entire area between the frames; the relatively shallow cases; the minimal barring; the scribed lines on the keyplank, natural touchplates and endblocks; and the accidentals - all provide evidence of this common workshop tradition.

As the Theewes is dated 1579, and the members of his "workshop tradition" are known, along with their dates, it is possible to attempt to establish the likely dates of the two instruments and to speculate on the makers. It has been shown that Theewes arrived in England in September 1567 or 1568, along with Pawyl Fandevell (his servant), and Jacob Albright. By 1571 Fandevell (also, and better, known as Paul Defield) was working with John James, another Flemish-born maker. By 1582 Defield was working for himself. Apart from both having Defield working for them, there is no known workshop relationship between Theewes and James, although an Isaac Theewes, probably the man baptised as a son of a Lodewyk Theewes in 1572, had a John James (and his wife) living with him in the parish of St Martin Le Grand in 1603 - 4. It should be pointed out that other records show a Lodewyk Theewes with a wife Helen, and children Lodewyk and Catherine are mentioned in 1585. It is therefore likely there were two Lodewyk Theewes' in London, not including the son of Lodewyk and Helen. Further, the John James listed as living with Isaac Theewes cannot be shown or necessarily assumed to be the virginall maker. It is tempting to make a connection between Jacob Albright and Jacob Aelbrechts, one of the makers who joined the Guild of St Luke in Antwerp in 1558, or the Lucas Aelbrechts who entered the Guild of St Luke in Antwerp in 1588. It is unlikely that the Albright who was with Theewes at his arrival was the harpsichord maker who entered the Guild of St Luke in 1558, but he

could be a son or blood relative. Jacob Albright does not appear in later London records.

As has been shown above in the AH Catalogue entry, the instrument is built in a style reminiscent of earlier virginals, and has various specific features (the notched balance rail, and the use of both a scriber and a knife when marking-out parts of the instrument) which suggest Theewes himself could be the maker, in the five or so years after his arrival in England. It would be difficult, in fact, to make a case for any other maker, as Defield was working for James, and Albright (assuming he was a maker) is not known to have worked independently in England.

The Mar virginal, on the other hand, appears to be from a period closer to the Theewes harpsichord, and the lack of identical handworking techniques make it unlikely to be the work of Theewes himself. Defield is an obvious candidate, and John James is another (less likely) possibility. The style of decoration is closer than that found on the AH, particularly in the use of landscaped scenes in panels which appear on both the Theewes and the Mar, rather than the birds and flowers painted in diamond-shaped panels on the AH. The identification of the print which was used for the central panel (Orpheus) in the Mar virginal, and its likely origin as a Flemish or French print from the 1570s, also supports a date close to the Theewes.

It is certainly true, even if the actual proposed makers are not correct, that the surviving sixteenth-century English-made instruments are by makers of Flemish origin. However, all of the design characteristics, as used by English virginal makers of the seventeenth century, are already present. The scaling-design note string is plucked towards the player, and the scaling-design note string length (of the Mar) is a simple multiple of the English inch. Furthermore, the AH, Mar and Theewes can be interpreted as using the English inch in their construction. The decorative similarities with the later instruments have also been established (in the Decoration chapter).

Making any general comments about the string lengths and scalings is made difficult by the replaced bridges and register in the AH, and the moved treble section of the 8' bridge in the Theewes, along with the replaced bass section of the 8' bridge and the replaced 4' nut and bridge. The quoted string lengths of the Theewes (page 332) must be relatively close to the actual original figures, due to the geometry of the

instrument. The likelihood of the AH being designed for a pitch of V has been discussed above on page 20. Although the geometry of the instrument would allow a pitch of V + 1s, both would give essentially Pythagorean scaling over the top half of the compass. The Mar scalings are not Pythagorean, but if the right bridge template was used with a c3 scaling-design note of 6" the scalings would be essentially Pythagorean. The top octave of the Theewes 8' register, and top two octaves of the 4' register, are Pythagorean. The use of Pythagorean scaling was probably normal for these makers, although, as the Mar shows, it was not strictly followed when there was a need to adapt the design for different pitch levels.

1662 TB

Plate 1662TB.1 – Three-quarter view of the 1662 TB virginal.



Ownership and Provenance

Private Ownership, London. First recorded owners were the family of Sir Mark Millbank, who sold the instrument at auction 11 August, 1967 to Mr William Lee of York. Subsequently purchased by Roger Warner of Burford.

References

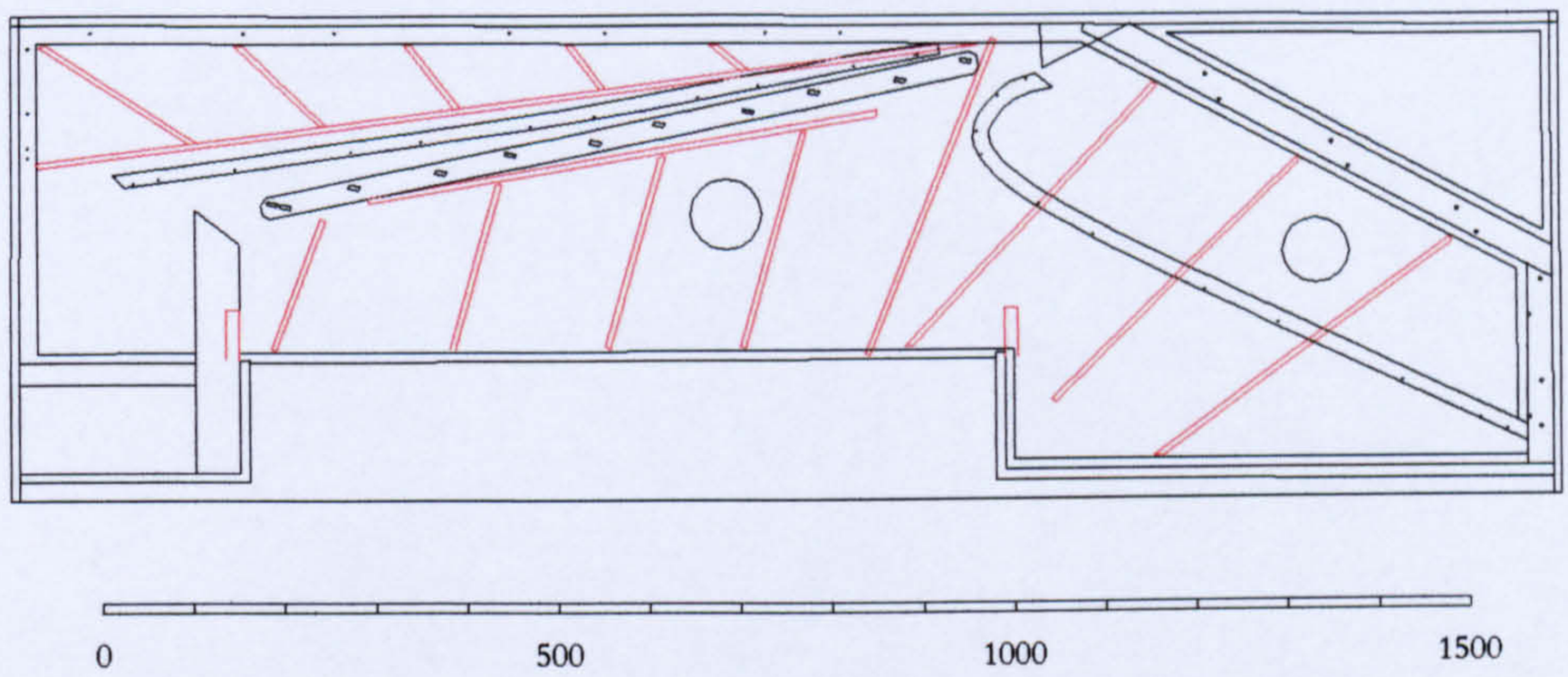
B2 English virginal table No. 8a, B2 Body, Thomas., B2 Illustrated Plates 11a and 11b, B3 No. BODY, T. 1662. Lee and Goodwin (1971).

Inscriptions

Signed "Thomas Body Londini Fecit I662" on the front of the jackrail.

Construction

Figure 1662TB.1 – Plan view of the 1662 TB virginal.



OVERALL INSTRUMENT DIMENSIONS: 1701 x 530 x 223.

BASEBOARD: Deal, three planks, the rear plank 223, the middle plank 228 wide. 11.0 – 11.4 – 12.9 thick at front. The baseboard is not rectangular – the length varies from 1682 – 1678, and the width from 520 – 513. The total (exterior) front length of the virginal is 1701½ (at the bottom).

SPINE: Deal, 1699 – 1698 – 1699 long, 223 – 225 high, 9.4 – 12.0 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 531½↔ long, 223 - 224½ high, 9.6 – 10.0 thick; the right case end 528 - 529 – 528 long, 224½ - 225 high, 8.9 – 9.2 thick. The spine and case ends overlap the baseboard, the ends nailed to the baseboard. The faceboards are morticed into the case ends. The case ends are made of two pieces of wood, glued lengthways – the top part of the left end 130½ - 134 wide, and the top part of the right end 154 - 149½ wide.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 253 long, 208 – 207 – 208 high and 9.8 thick. Right faceboard 612 long, 208 – 204 – 208 high and 13.0 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 132 (left) and 138½ (right) long, 10.9 (left and right) thick. Slots for the nameboard have been cut into the keywell sides 115 - 121½ (left) and 119 – 125 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 833 - 830½, 145 - 145½ - 145 high, and 8.6 – 5.6 thick.

KEYWELL LINER: Deal, 78↔ high, 13.0 – 13.4 thick.

OTHER LINERS: Deal. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard

WRESTPLANKS: Oak.

BASEBOARD FRAMES: Deal, 74 - 75 high. The inner edges form a continuation of the keywell sides. The frames are 21.8 (left) and 23.5 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 56 - 58½ high, set 92½ - 96½ from the back of the faceboard. Toolbox lid appears to be of mahogany, 183↔ long, 120½ - 120 wide and 8.2 thick. Iron rod hinges, 1.7 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 912 long (front), 943 long (back). It is 43.5 wide, and 18.1 thick. The bottom of the jackrail is 28.7 (bass) and 33.8 (treble) above the top of the soundboard. There is an old, probably original jackrail cloth, 2.8 uncompressed thickness, held by bent wire, 1.3 diameter. The bass jackrail support is of deal, 48.3 wide. The left side is 288 long, the right side 250 long. The treble jackrail support is triangular in shape, 107 at the front, and 48 at the end where it meets the jackrail. The back corner is 559 from the right case end, and it is at an angle of 154½° to the spine.

LID: Oak, coffered in three pieces. The planks are 176, 211 and 158½ wide on the inside, and the front thickness is 10.8 – 10.5 – 10.9. Applied mouldings along the joins and the ends on the top surface. End battens 21.0 (left) and 21.6 (right) thick, with an inside coffer height of 48.2 (left) and 47.3 (right). There are wire hinges between the

spine and lid; the present ones are not original, but are in the original positions. There are holes at each end, left by nails or hooks which were used to hold the lid open.

KEYWELL FLAP: Oak, 217 – 218 – 215 wide, and 11.2 – 10.8 – 11.7 thick. Wrought iron strap hinges, maximum 1.4 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 88 wide and 2.8 thick. Leather guide glued underneath. There is a full depth cut-off bar glued in front of the register, and another stiffening bar glued behind the register.

SOUNDBOARD: Coniferous wood, 3.8 – 3.2 thick at the keywell liner. The top of the soundboard is approximately 54 below the top of the case. Two gilded roses, 78½ and 73 diameter (of wood glued on top of parchment).

SOUNDBOARD REGISTER: Not original, of leather (the original register has been preserved with the instrument), 803 long, 24.2 wide, and 0.85 thick. Slots typically 12.1 x 4.0. There are small holes in the soundboard which were probably register template holes, the bass one 263 from the left case end and 207 to the spine, and the treble hole 622 from the right case end and 36½ from the spine.

SOUNDBOARD BARRING: Deal.

WRESTPLANK CAPPING PIECES: Oak, 4.5 thick. The treble wrestplank capping is 31 wide without, and 52.2 wide with applied mouldings; and the bass wrestplank capping is 28 (without) and 39 (with mouldings).

SOUNDBOARD MOULDINGS: Oak, 4.5 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 19.5 wide, and the spine moulding is 20.0 wide. The other soundboard mouldings are 10.0 wide.

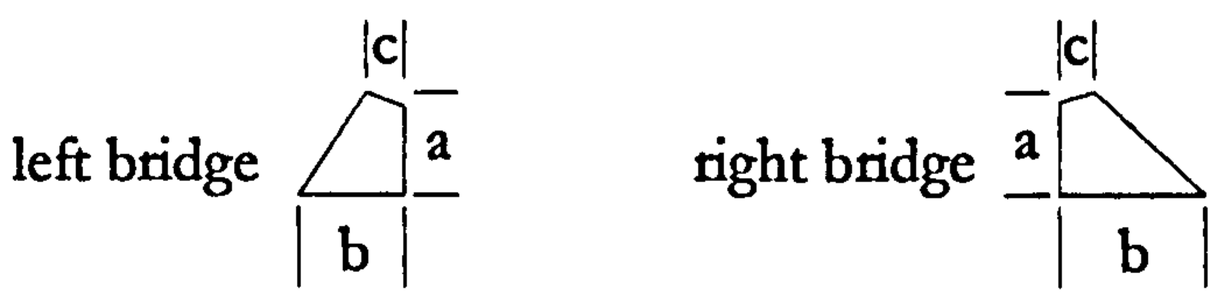
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 21.2 wide. The soundwell top edge mouldings are 22.5 and 4.0 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.7 diameter. The tuning pins protrude ↕29 from the top of the wrestplank capping piece, 3.5 diameter,

and are of an iron material. The tuning pins have been divided so that the notes up to f are on the bass wrestplank, $f^{\#}$ is on the join, and the notes g to f^{3} are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. There are scribed lines on both bridges, either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of brass, 1.2 – 1.3 diameter. There are marking out lines parallel to the strings on the top surface of the right bridge. There are scribed lines at the front of both bridges, and positioning holes in front of the right bridge.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	9.7	9.6	9.6	9.3	9.8
b	15.2	15.6	15.2	15.8	16.5
c	4.9	4.6	4.5	4.5	4.6

right bridge	C	c	c^1	c^2	c^3
a	9.3	8.3	8.6	8.4	8.0
b	16.2	17.2	17.4	18.6	19.1
c	4.9	4.9	5.0	4.4	4.4

String Lengths and (Plucking Points)

Many of the left bridge pins have been moved, the measurements below give the original positions.

f^3	**125[1] (52)**	**f^1**	**496½ (74½)**	**F**	**1301 (131½)**
e^3	127½	e^1	508½	E	1314
e^{b3}	140	e^{b1}	557½	E^b	1381½
d^3	144	d^1	568	D	1394
$c^{\#3}$	156½	$c^{\#1}$	615½	$C^\#$	1460½
c^3	**161½ (48½)**	**c^1**	**628 (69)**	**C**	**1475 (137)**
b^2	172½	b	675	GG/BB	1531½ (151½)
b^{b2}	178	b^b	687		
a^2	194½	a	745½		
$g^{\#2}$	198½	$g^\#$	756		
g^2	219½	g	805		
$f^{\#2}$	224	$f^\#$	817		
f^2	**244½ (59½)**	**f**	**875 (93½)**		
e^2	250½	e	887		
e^{b2}	276½	e^b	940		
d^2	282½	d	952		
$c^{\#2}$	311½	$c^\#$	1017		
c^2	**319 (55)**	**c**	**1034½ (93½)**		
b^1	349½	B	1091		
b^{b1}	358½	B^b	1105½		
a^1	394½	A	1163		
$g^{\#1}$	403½	$G^\#$	1174		
g^1	442	G	1229		
$f^{\#1}$	451½	$F^\#$	1242½		

[1] There are two holes for the top left bridge pin. The string length is 122½ mm originally and presently, but there is an unplugged hole behind the pin's present position 125½ mm from the right bridge pin, directly in the line of the top string. This hole does not fall on the scribed left bridge pin line, unlike every other altered pin. It is also of the same diameter as the original bridge pins. There is no obvious reason why the top bridge pin would have been moved after the instrument was built (as the pins are in the same altered line it cannot be considered that the pin was moved to position the string in a better position for ensuring a good quill length). The only logical conclusion is that the instrument was intended to have a 5 inch scale, but the bridge wasn't accurately placed so Body repinned the top note to give the correct scale.

Keyboard and Action

COMPASS: GG/BB – f^3.

BALANCE RAIL: The balance rail of oak, 36.0 wide and 29.5 high. The balance pins are iron, 2.4 diameter, and protruding 17 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 35 wide tapering from 20.0 – 15.0 thick. The backrail is deal, 50.3 wide and 20.0 thick.

RACK: Not original.

FRONTRAIL: Lime, 23.0 wide and 10.5 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 26.5 high and 3.8 thick.

ENDBLOCKS: Deal. The left endblock is 151 long, 26.0 wide and 40.8 – 38.0 high. The right endblock is 153 long, 25.9 wide and 42.2 – 40.2 high. There is a dustcatcher 34.1 wide and 8.1 thick which is let into the endlblocks.

KEYBOARD WIDTH: Overall width between the keywell sides 819½, and between the endblocks 767. The overall width of the keyboard is 765, and the three-octave span is 489.

KEYLEVERS: Deal, 15.4 thick at the front, tapering to 9.4 at the rear. The rackpins are not original. The lowest keylever is 335 long and the balance point is 124 from the front of the touchplate. The top keylever is 478 long, and the balance point is 170 from the front. The accidental keylevers are balanced 6.5 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, ↕113 long, and tapering in thickness from 2.65 at the front to 1.85 at the rear. There are four scribed lines on the front section, 27.7, 30.7, 33.6 and 35.6 from the front edge. The touchplates overhang the keylevers by 3.6.

The natural touchplate widths in between the accidentals are:-

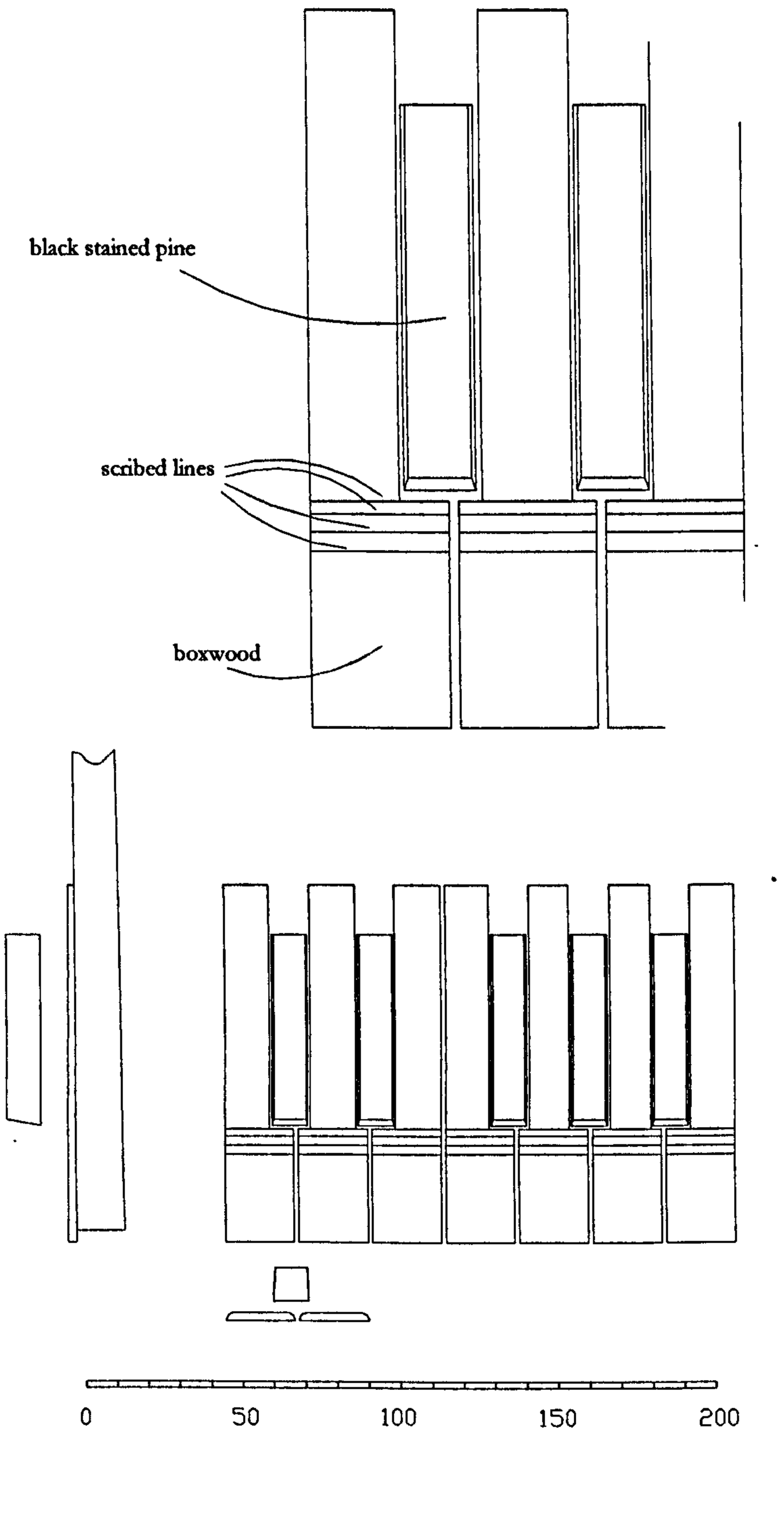
f^3	21.6	f^2	13.8	f^1	13.0	f	13.8	F	14.0
e^3	15.4	e^2	14.3	e^1	15.4	e	13.6	E	15.0
d^3	14.4	d^2	14.6	d^1	13.2	d	14.3	D	14.3
c^3	13.3	c^2	14.0	c^1	13.3	c	14.0	C	14.1
b^2	13.6	b^1	14.2	b	14.0	B	14.6	BB	21.6
a^2	12.8	a^1	13.0	a	13.0	A	13.2		
g^2	13.1	g^1	12.0	g	12.6	G	12.5		

ACCIDENTAL TOUCHPLATES: Stained deal. The overall length is 58.4 – 63.1, and total height 10.8. They taper in width from 11.5 at the bottom to 10.1 at the top.

JACKS: The present jacks are not original. Earlier jacks of beech with holly tongues survive. These jacks taper slightly from 11.5 – 11.3 in width,[2] and are 3.0↔ thick. The axle pins are positioned 17.6 (64%) from the top of the tongue.

ACTION CLOTHS: There is a layer of woven woollen cloth, with an uncompressed thickness of 2.8 attached to the underside of the jackrail. There were two strips of paper, each 0.7 thick in between the cloth and the jackrail, which have been removed during a recent restoration. There were keyback pieces (leather), 4.1 thick and ↕28 long, which were staggered so that each jack was centrally placed. These were preserved separately during the recent restoration.

Figure 1662TB.2 – Drawing of major keyboard details.



[2] Not including the bottom 10 – 15 mm which are noticeably angled in to avoid any interference from adjacent keylevers.

Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges, hasps, turnbuckles and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There are two roses which are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the later White and the 1664 RH instruments.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Elizabeth Shield" design, and the arcades on the front of the keyboard are of the "sunflower" design. Inside the inner mouldings on the faceboards, keywell sides and nameboard is white scrollwork on a black background. In the middle of the nameboard and right faceboard are octagonal plaques, each decorated with painted roses.

The lid and keywell flap interiors have typical landscape paintings. The lid depicts a biblical scene, and the keywell flap shows a typical landscape scene. Both have been painted over a gessoed background.

Condition

The instrument is restored to fine decorative and playing condition. Prior to restoration by Christopher Nobbs in 1990 – 1992 the virginal was restored by Alec Hodsdon in 1968.

Various parts of the action have been altered, most noticeably at the back of the keylevers, where the rack has been replaced and the rack sliding system altered. Some of the virginal's original cloths survive and have been preserved with the instrument.

Commentary

This virginal is the earliest surviving English virginal which does not have the extra C string and jack,[3] and the third extant instrument (after the 1644 TW and 1661 JW) which has a GG/BB – f^3 compass. Thomas Body was apprenticed in 1647 to Joseph Body, an organ maker associated with an organ built for Canterbury Cathedral shortly after the restoration. It is almost certain that Thomas Body was himself active as an organ maker, at least as an apprentice.

The 1662 TB is the first instrument that can be said to have all of the characteristics of the later English virginals. Body's workmanship is sound although not especially accurate. He uses two pieces of wood – glued edge-to-edge – for each of the case ends, suggesting economy was needed, although the keywell flap is a single piece.

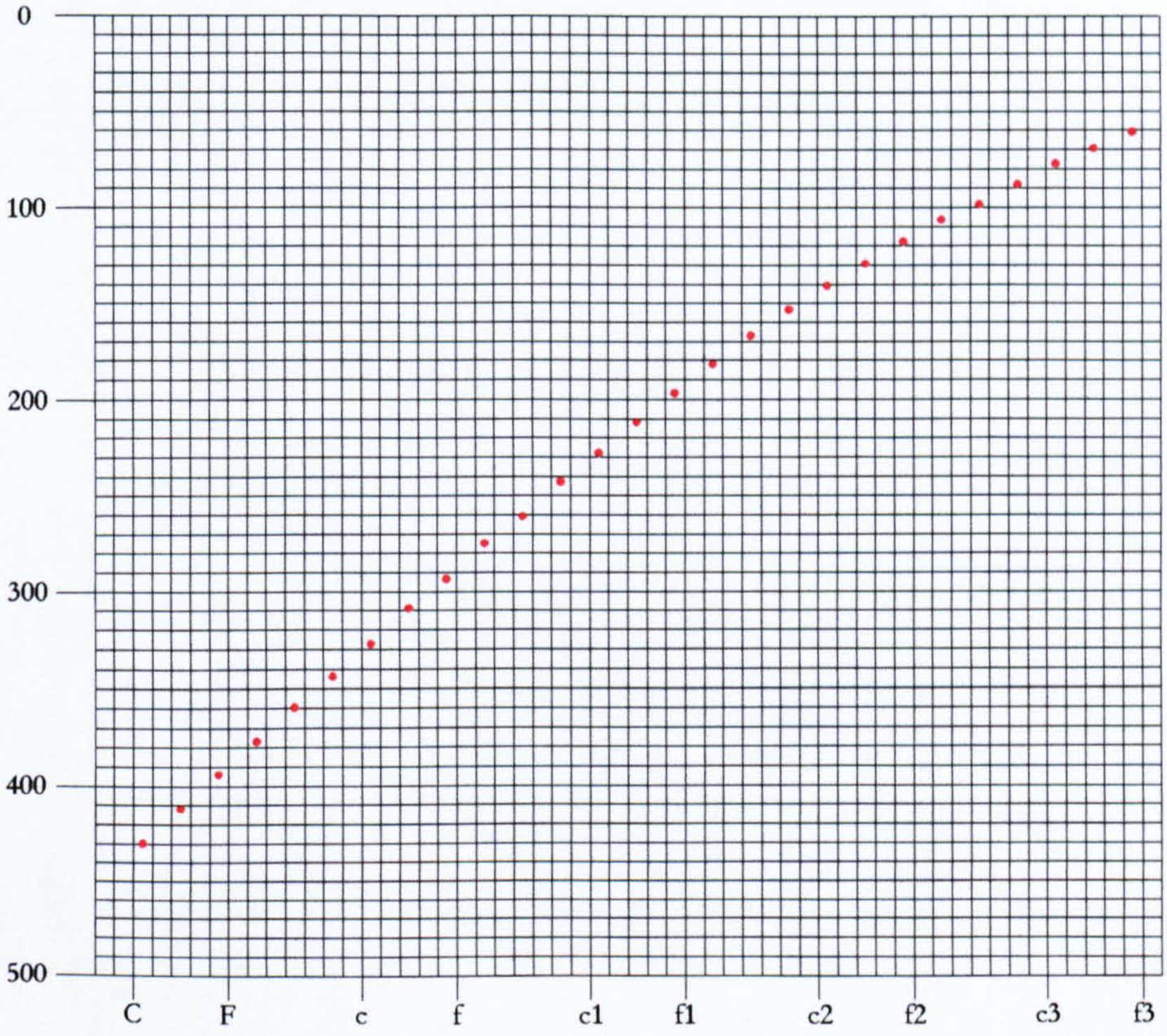
Of particular note is the effort Body went to in ensuring the correct scale for the instrument. As discussed above (footnote 1, page 54), Body re-positioned his scaling-design note left bridge pin to ensure the string length was as close to five inches as possible. That Body thought it was important enough to alter a string length by 3 mm suggests that the makers were actively concerned with accurate scaling lengths. As English virginal makers used c^3 or f^3 (if the compass went that high) as the scaling-design note, each semitone difference amounts to only a quarter-inch difference in string length, and therefore accuracy is needed to be certain that an instrument could play at the desired pitch. The actual intended pitch level of the 1662 TB is V – 2s.

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[3] Not including the 1644 TW which is double strung from GG/BB – A.

There are scribed lines on the right bridge as a guide to position the bridge pins. They are parallel to the strings, positioned in between each of the close pairs of strings. As they are at an angle to the spine it is difficult to ensure accuracy when measuring them in relation to the spine, but the following graph measures perpendicularly from the scribed line at the crest of the bridge to the spine.

Graph 1662TB.1 – Scribed lines measured perpendicular to the spine.



Although the above graph shows the scribed lines measured perpendicular to the spine, the scribed lines would probably have been measured in relation to a virtual spine, set at an angle to the rear of the soundboard.[4] The exact angle of the virtual spine must be known before any attempt can be made to determine the relationship of the scribed lines. As the strings are not parallel to each other[5] the exact angle cannot be positively concluded.[6] Instead, the only approach that can be used is to try various angles and see if the line-spacings fall into logical units. If both the angle of the virtual

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[4] See Chapter Three, page 129 for more details.
[5] See Chapter Three, page 129.
[6] Examining the instrument itself visually cannot determine the angle with enough accuracy.

spine (expressed as a ratio) and the line-spacings can be expressed in the same unit then the interpretation can be reasonably supposed to be correct.

The following table gives the angles of each of the *c* strings to the spine, and expressed as a ratio:

Table 1662TB.1 – Angles and ratios of the *c* strings to the spine.

Note	Angle (in degrees)	Ratio
c^3	12.9	0.229 (2:9)
c^2	11.7	0.207
c^1	11.0	0.194
c	10.5	0.185 (3:16)
C	10.2	0.180

The above Table shows that the strings are not parallel to each other, the angle to the spine being more acute towards the bass. Only the c^3 and c strings have an angle which can be expressed as a simple ratio. The scaling-design note (f^3) has not been included because of the questions concerning its re-pinning. It is unlikely that simple ratios were deliberately used in this, or any, English virginal to determine the angle of the strings to the spine or register. It is probable that any simple ratios which do appear are by chance, and that the maker used simple measurement on a marking-out stick from a virtual spine to position the right bridge pins.

1684 TB

Plate 1684TB.1 – Three-quarter view of the 1684 TB virginal.



Ownership and Provenance

Possession of Warrington Museum, Cheshire. Record number WAGMG: 1864.30, assigned number RA 654. Acquired as a gift from Mr (?) Wadsworth, 1876.

References

GD3 & GD4 No. 12; B1 & B2 English virginal table No. 18, B1 & B2 Haward, Charles (attributed) No. 7(?), B3 No. BOLTON, T. 1684.

Inscriptions

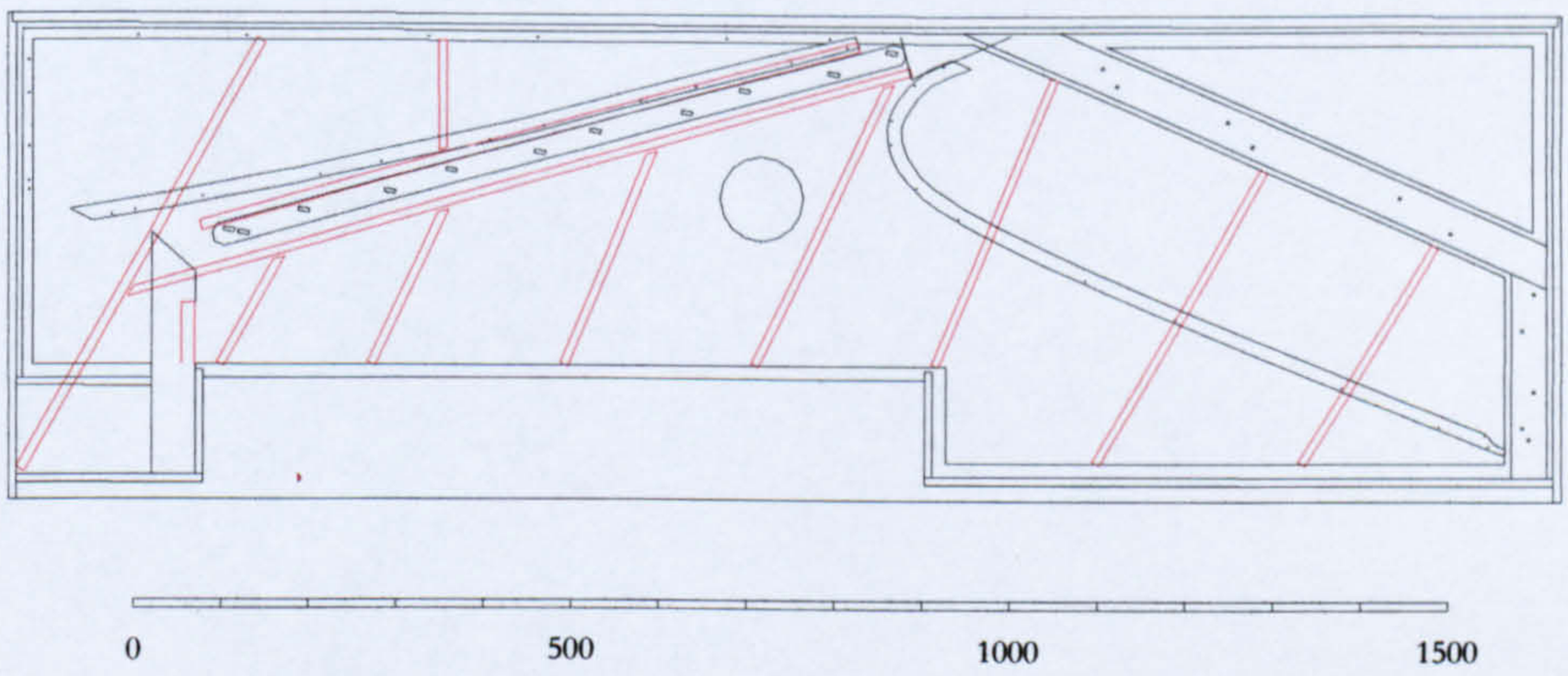
Signed "made by Tho: Bolton 1684" on the lowest jack. In place of the normal name applied to the nameplate on the front edge of the jackrail is a Latin inscription "MVSICA D[EI] DONVM".

Plate 1684TB.2 – Photograph showing the makers signature on the lowest jack.



Construction

Figure 1684TB.1 – Plan view of the 1684 TB virginal.



OVERALL INSTRUMENT DIMENSIONS: 1770 x 550 x 224.

BASEBOARD: Deal, two planks, the front plank 280 wide. 11.3 – 11.4 thick at front. The baseboard is not rectangular in shape, the width at the left is 540 and the right 537, and the full length of the instrument at the front is 1770, whereas the spine measurement (at the top) is 1775.

SPINE: Deal, 1775 long, 224↔ high, 11.9 – 11.4 thick, half-lapped to the case ends.

CASE ENDS: Oak, left case end 555 – 552 long, 222½ - 224 - 225½ high, 9.1 – 9.6 thick; the right case end 548 – 547 - 548 long, 222 - 225 high, 9.5 – 9.3 – 9.6 thick. The spine and case ends overlap the baseboard. The faceboards are morticed into the case ends.

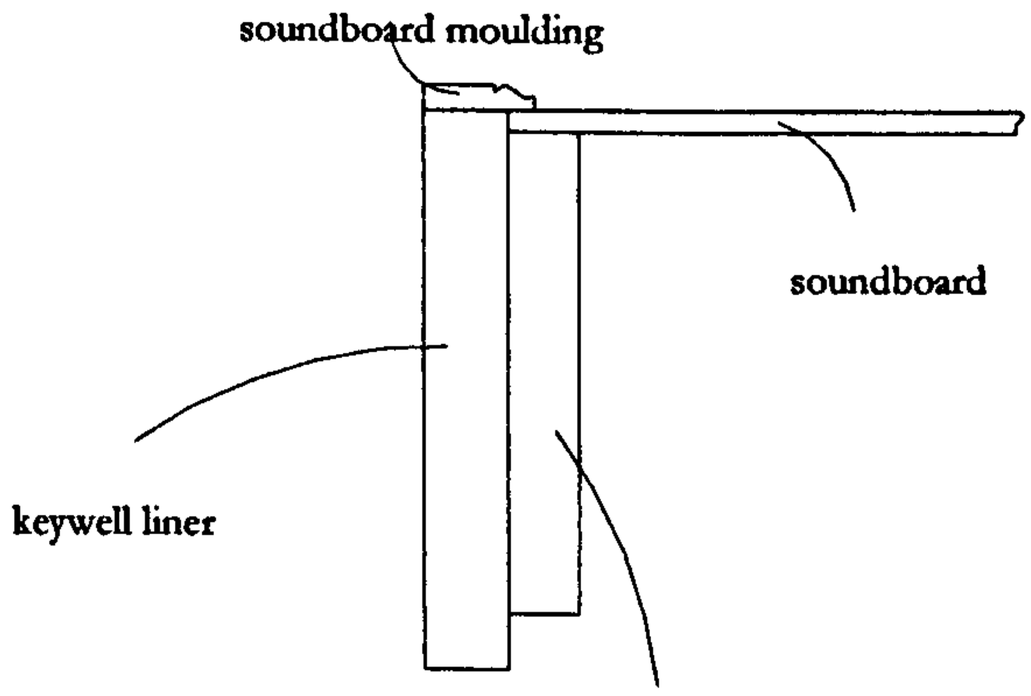
FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 213½ long, 207 – 206 – 208 high and 9.3 thick. Right faceboard 718 long, 208½ – 206 – 207 high and 9.4 thick. The keywell sides butt up to the faceboards. The right faceboard has a drawer let into it at the bottom.

KEYWELL SIDES: Oak, 120½ (left) and 121½ (right) long (not including the faceboards which overlap), 8.7 (left) and 8.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 100 - 107½ (left) and 101½ – 109 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 828 – 826, 157 - 157½ - 156 high, and 9.8 – 8.8 thick.

KEYWELL LINER: Deal, 81↔ high, 12.0 + 10.2 (left) – 9.1 + 12.9 (right) thick. The keywell liner is made of two pieces glued together, the soundboard butting up to the edge of the front piece and glued on top of the back piece.

Figure 1684TB.2 – Section drawing showing keywell liner arrangement.



OTHER LINERS: Deal, c. 45 x c. 15. The left keywell-side liner extends past the keywell liner forming a tapering protrusion under the soundboard.

WRESTPLANKS: Beech, treble 38, bass 45 thick. The bass wrestplank has an added (original) oak piece glued to the inside edge to increase the width.

BASEBOARD FRAMES: Deal, 82 - 81½ high. The inner edges form a continuation of the keywell sides. The frames are 22.0 (left) and 23.5 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 30.3 high, set 102½ - 102 from the back of the faceboard. Toolbox lid is missing, but there is evidence to show it originally hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 853 long (front), 891 long (back). It is 50.0 wide, and 16.5 thick. The bottom of the jackrail is 26.5 (bass) and 28.0 (treble) above the top of the soundboard. The bass jackrail support is of deal, 50.0 wide. The left side is 277 long, the right side 232 long. The treble jackrail support is triangular in shape, 126 long at the rear, 123½ at the front, and 50 at the end where it meets the jackrail. The back corner is 613 from the right case end.

LID: Oak, coffered in three pieces. The planks are 194, 183 and 196 wide on the inside, and the front thickness is 6.2 – 8.4 – 9.3. Applied mouldings along the joins and the ends on the top surface, plus others across the width of the lid, dividing it into three sections. End battens 17.5 (left and right) thick, with an inside coffer height of 66 (left) and 63½ (right). Iron strap hinges between the spine and lid. There is no evidence of holes or ironwork which might have been used to hold the lid open.

KEYWELL FLAP: Oak, 210 – 213 – 209 wide, and 10.5 – 12.1 – 10.7 thick. Wrought iron strap hinges, maximum 1.25 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 93 - 87 wide and 4.0 thick. Glued to the top of the frames. Leather guide glued underneath. There is a full depth cut-off bar, 11½ thick, of deal, glued behind the register, and another bar 25 high glued in front of the register.

SOUNDBOARD: Coniferous wood. The top of the soundboard is approximately 54 below the top of the case. Gilded rose, 94½ diameter, (of wood glued on top of parchment), glued from underneath. There is a bevel on the soundboard around the rose.

SOUNDBOARD REGISTER: Leather, 815 long, tapering slightly in width from 25.5 (bass) to 24.5 (treble), and 1.0 thick. Slots typically 12.5 x 4.5. There are some string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks, originally all of the wide gaps probably had guiding marks, but the register leather is now very dusty. There are register template holes at either end of the bridge.

SOUNDBOARD BARRING: Deal, generally 25 high and 9.5 wide, except the left-most bar which is 35 deep and 11 wide.

WRESTPLANK CAPPING PIECES: Oak, 5.0 thick. The treble wrestplank capping is 43.5 wide without, and 57.7 wide with applied mouldings; and the bass wrestplank capping is 40.5 (without) and 48.3 (with mouldings).

SOUNDBOARD MOULDINGS: 5.5 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 11.9 wide, and the spine moulding is 12.5 wide. The other soundboard mouldings are cedar, 15.8 wide.

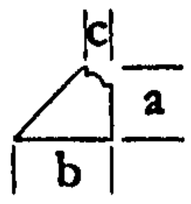
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 3.7 thick. The moulding on top of the faceboards, keywell sides and nameboard are 15.7 wide. The soundwell top edge mouldings are 15.5 deep and 3.7 thick.

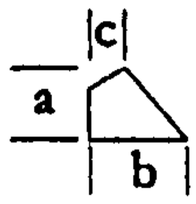
HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.66 diameter. The tuning pins protrude 19½ from the top of the wrestplank capping piece, 3.6 diameter, and are of iron. The tuning pins have been divided so that the notes up to $f^{\#}$ are on the bass wrestplank, and notes g to d^{3} are on the treble wrestplank.

BRIDGES: Oak. The treble of the left bridge has been cut away for the top 40 to accommodate the soundboard moulding. There are no scribed lines on either bridge. The bridge pins are of iron, 1.36 diameter. Notes BB and $C^{\#}$ on the left bridge are

backpinned. There are pin marks in between the bridge pins on the right bridge. There are scribed lines in front of the left bridge which extends 25 past the bass end. There are positioning holes by both bridges.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	10.0	10.3	10.0	10.2	8.7
b	16.9	17.0	17.3	17.3	17.1
c	6.1	6.1	6.1	6.0	5.6

right bridge	C	c	c^1	c^2	c^3
a	9.9	9.6	9.0	8.4	9.7
b	16.6	16.0	15.4	17.5	17.0
c	6.6	6.5	5.1	5.3	5.3

String Lengths and (Plucking Points)

f^3	**112 (51)**	**f^1**	**430½ (62½)**	**F**	**1315½ (115½)**
e^3	111½	e^1	439½	E	1330
e^{b3}	126	e^{b1}	477	E^b	1404
d^3	128½	d^1	489	D	1418
$c^{\#3}$	141	$c^{\#1}$	533	$C^\#$	1489½
c^3	**143 (46½)**	**c^1**	**541½ (59½)**	**C**	**1506 (125)**
b^2	155½	b	595	GG/BB	1592 (135)
b^{b2}	157½	b^b	608½		
a^2	177½	a	668½		
$g^{\#2}$	180½	$g^\#$	681		
g^2	200½	g	739½		
$f^{\#2}$	203	$f^\#$	751		
f^2	**226½ (57½)**	**f**	**813 (80½)**		
e^2	230	e	824½		
e^{b2}	255½	e^b	895½		
d^2	261	d	911½		
$c^{\#2}$	284½	$c^\#$	974½		
c^2	**290½**	**c**	**987½ (80½)**		
b^1	316	B	1061		
b^{b1}	322½	B^b	1076		
a^1	352	A	1143½		
$g^{\#1}$	359½	$G^\#$	1158½		
g^1	390½	G	1227		
$f^{\#1}$	397	$F^\#$	1244½		

Keyboard and Action

COMPASS: GG/BB – f^{3}.

BALANCE RAIL: The balance rail is beech, 40.8 wide and 23.0 high. The balance pins are iron, 2.3 diameter, and protruding 16½ above the top of the balance rail. The balance rail is rebated into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 39 wide and 11.1 thick. The backrail is deal, 40.8 wide and 17.4 thick.

RACK: Poplar, attached to the top surface of the backrail. The rack is 3.5 thick, 39 high. It is scribed on the front and rear surfaces for the top and bottom of the slots, and on the front for the sides of the slots.

FRONTRAIL: Deal, 23.0 wide and 10.5 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 25.9 high and 4.3 thick.

ENDBLOCKS: Deal. The left endblock is 166 long, 21.0 wide and 37.5 – 34.7 high. The right endblock is 166 long, 21.6 wide and 39.5 – 34.5 high.

KEYBOARD WIDTH: Overall width between the keywell sides 822, and between the endblocks 776. The overall width of the keyboard is 775, and the three-octave span is 491.

KEYLEVERS: Deal, 11.9 thick at the front, tapering to 9.7 at the rear. The rackpins are deal, 1.4 wide and 4 - 4½ high. The lowest keylever is 334 long and the balance point is 121 from the front of the touchplate. The top keylever is 496 long, and the balance point is 192 from the front. The accidental keylevers are balanced 10 behind the naturals.

NATURAL TOUCHPLATES: Ebony, generally 98 long, and tapering in thickness from 2.0 at the front to 0.5 at the rear. There are three scribed lines on the front section, 25.1, 27.6 and 31.8 from the front edge. The touchplates overhang the keylevers by 2.0.

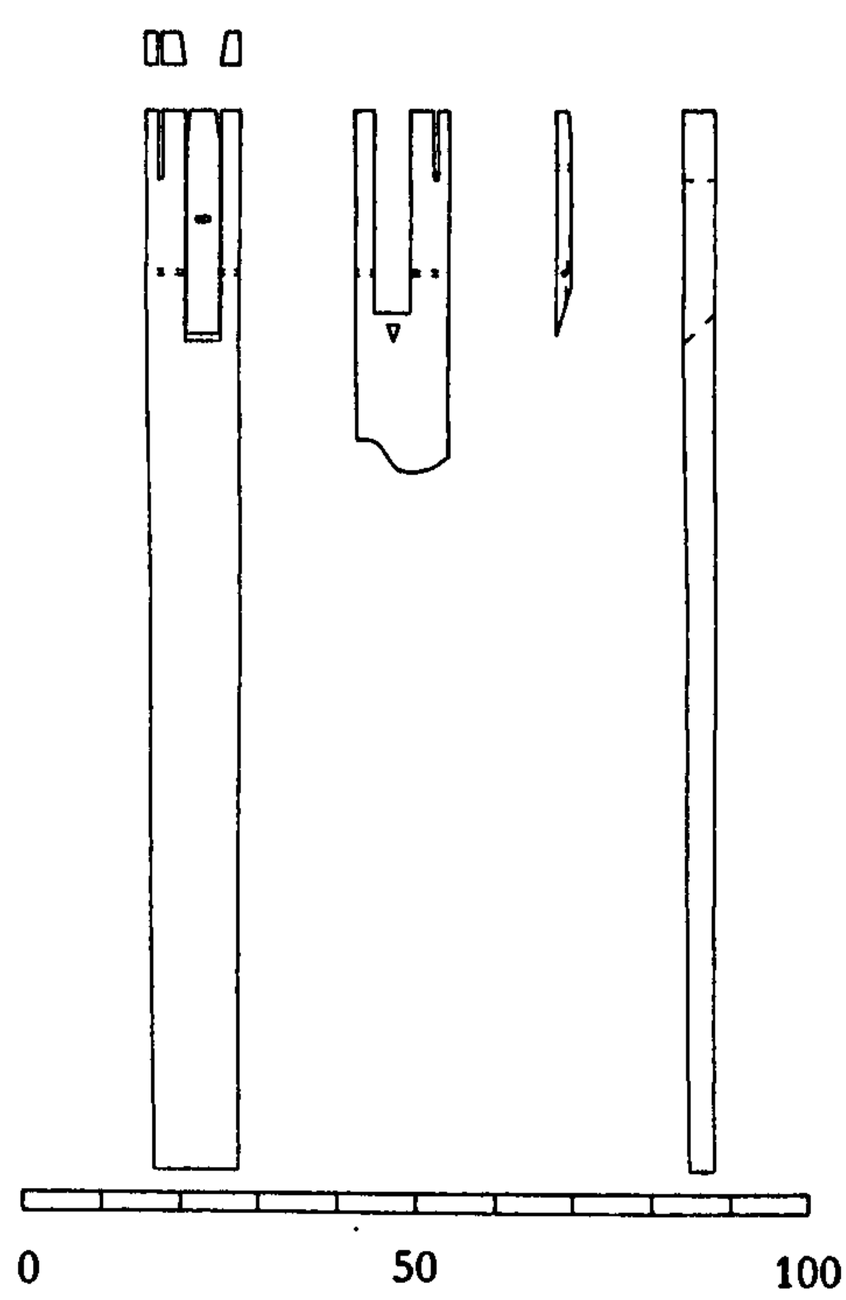
The natural touchplate widths in between the accidentals are:-

f^3	21.5	f^2	n.o.	f^1	14.0	f	13.8	F	13.5
e^3	12.6	e^2	12.2	e^1	n.o.	e	12.4	E	12.4
d^3	15.2	d^2	16.3	d^1	n.o	d	n.o.	D	16.1
c^3	14.0	c^2	12.1	c^1	13.3	c	n.o.	C	13,6
b^2	12.3	b^1	12.6	b	12.9	B	n.o.	BB	21.5
a^2	12.7	a^1	12.8	a	12.6	A	11.8		
g^2	12.4	g^1	12.0	g	12.4	G	12.8		

ACCIDENTAL TOUCHPLATES: Solid ivory. The overall length is typically 63.8, and total height 9.8 (front) – 1.9 (rear). They taper in width from 11.6 at the bottom to 11.2 at the top.

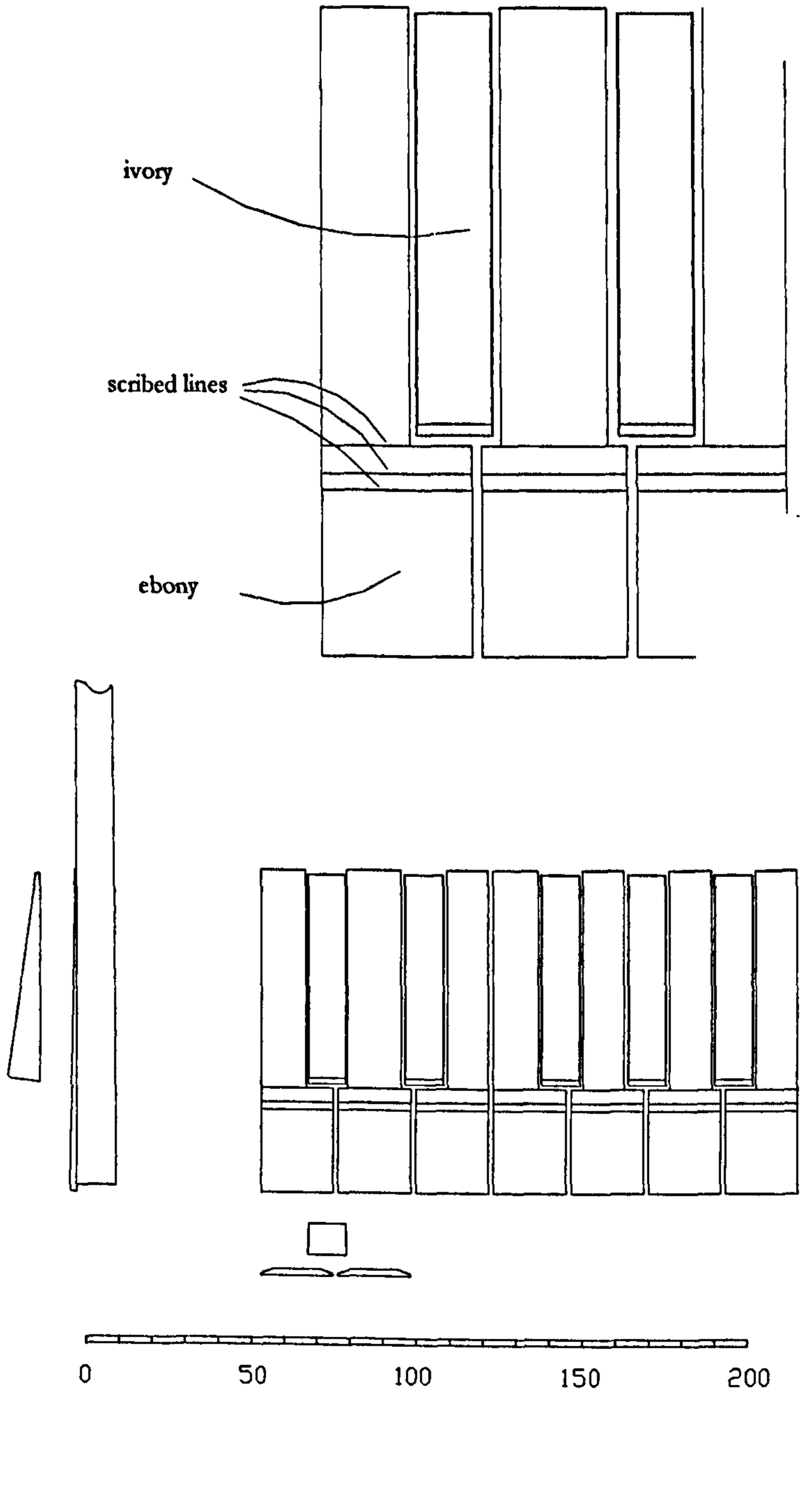
JACKS: The jacks and tongues are beech. They are typically 138 long. They taper in width from 11.9 – 10.7, and in thickness from 3.9 – 3.3. The axle pins are positioned 20.8 (71%) from the top of the tongue. All except one original jack survive.

Figure 1684TB.3 – Drawing of a typical jack.



There are no original action cloths.

Figure 1684TB.4 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap and the centre hasp attaches to a lockplate on the keywell flap. There are four strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends, along the coffer joins and dividing the length of the lid into three sections.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1668 SK, 1675 SK and 1671 PJ virginals.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The case top mouldings around the soundwell, faceboards, keywell sides and nameboard, as well as mouldings on top of the jackrail and bass jackrail support have evenly spaced decorative ivory studs attached. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Elizabeth Shield" design. The arcades are of the "trefoil" design. Inside the inner mouldings on the faceboards, keywell sides and nameboard have gilded panels with flowers painted on the surface, and there is an octagonal plaque in the centre of the nameboard with flower decoration. The nameplate at the front of the jackrail has a Latin motto in paint over a gilded surface rather than the maker's name.

The lid and keywell flap interiors have typical landscape paintings. This appears to be the work of the same artist who decorated the Keene and Jones virginals, but the figures are wearing clothing of a later date than what is shown in the other instruments. There is a substantial building in the background on the main lid, and a smaller building on the keywell flap.

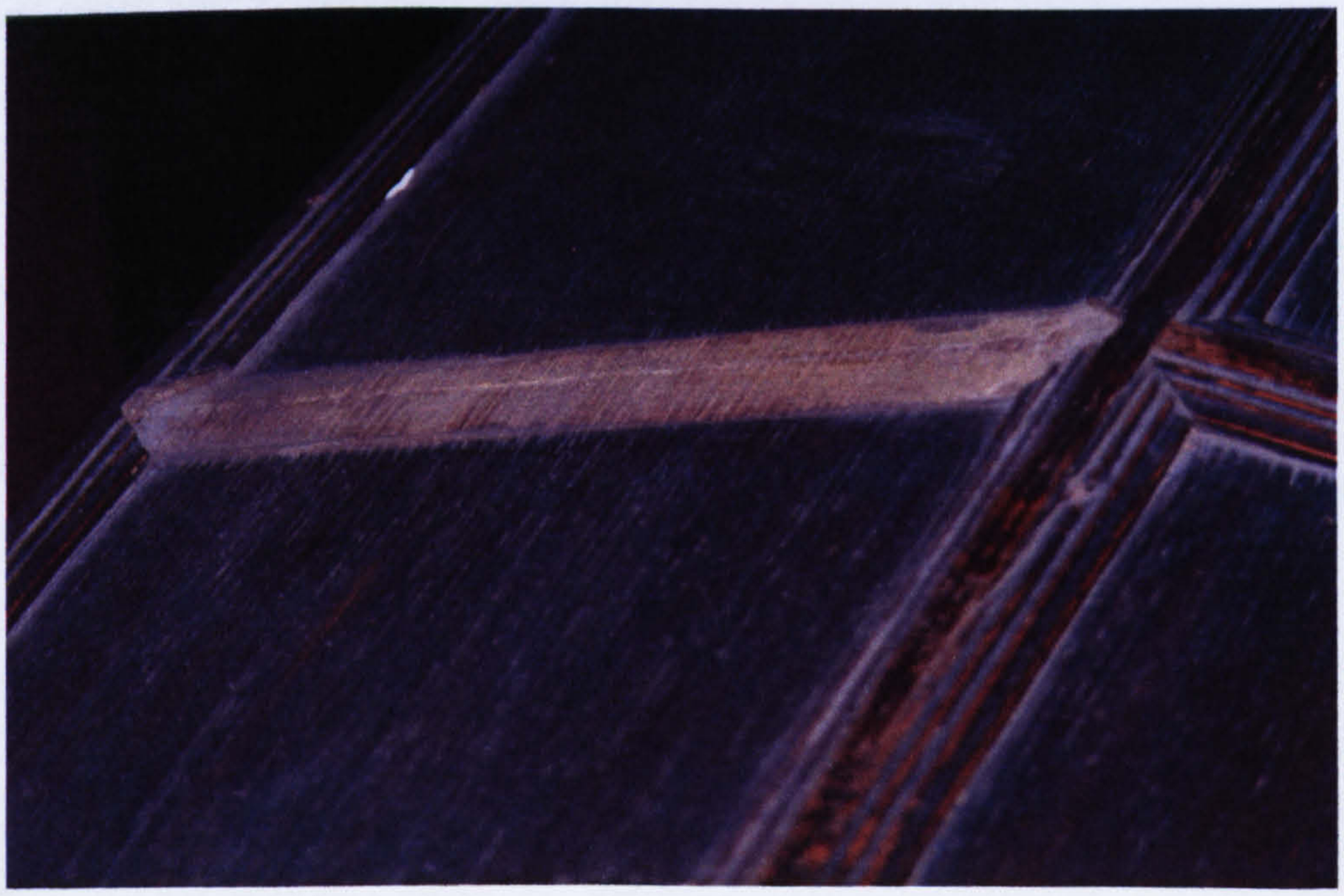
Condition

The virginal has suffered considerable damage since new It has been largely repaired in the historical period, and restored in modern times,[1] but is no longer in playing condition.

The repairs from the historical era are restricted to the replacement of 15 keys. That this work is likely to be historical can be shown by white letter markings on the back of the touchplates (some of which have been written incorrectly).

The present damage includes several large cracks in the soundboard, one from the register leather to the right bridge through the rose, along the entire length of the right faceboard at the front, and two cracks between the treble wrestplank capping and the right case end. There is a piece of the lid top moulding missing (see Plate 1684.3). There has also been some repairwork on the right case end at the front. This has included an added piece at the bottom (see Plate 1684TB.4), but there is still a gap in the case end wood which reveals the rebate joint between the case end and faceboard.

Plate 1684TB.3 – Top of the lid with the missing piece of moulding.



[1] By the firm Arnold Dolmetsch Ltd, Haslemere, Surrey, in 1953.

Plate 1684TB.4 – Repair on the right case end.



The gilded panels inside the faceboards, keywell sides, nameboard and on the jackrail have badly cracked due to humidity changes. Some of the overpainting has flaked off as a result.

Commentary

This is the latest English virginal, built at a time when other makers were making bentside spinets.[1] It is possibly the only extant instrument which originally had ebony naturals,[2] and one of two surviving virginals with a removable drawer.[3]

Apart from the signature on this instrument nothing is known about Thomas Bolton. It is clear on the basis of the design that Bolton is part of the Keene workshop tradition.[4] The instrument has similarities to the work of both Keene and Jones, but it cannot be positively shown which of the two Bolton is associated with.

The similarities between this instrument and those of Keene include an applied thickness of wood in the soundwell with a cap moulding, imitating an inner-outer construction, and decorated on top with ivory studs. This effect is also found on the 1668 SK. The centre of the keyboard has a large diagonal cross (see Plate 1684TB.5). The cross cannot be considered a construction mark, and (like the 1675 SK, which also has a cross, shown in plate 1684TB.6) the mark does not appear elsewhere on the instrument, so cannot be considered a batch marking.[5] There is a "dustcatcher" (also visible in Plate 1684TB.7) as found in the 1668 SK and the 1671 PJ. The rebate joint between the spine and case ends is similar to the butt joint used by Jones. The use of dark natural touchplates is the choice of the maker, and this also suggests Bolton was a member of the Keene workshop tradition. The decoration is almost certainly by the artist responsible for the instruments by Keene and Jones, although that in no way can be used to suggest that Bolton was an apprentice or journeyman of either Keene or Jones.

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[1] The earliest Player spinet is dated 1680 (Private Collection, Wiltshire), and the earliest Haward is dated 1683 (Earl of Haddington, Mellerstain House, Scotland).

[2] The 1664 RH has a replacement keyboard with ebony naturals and reused (probably original) bone accidentals. Although the natural touchplates must have been dark it is very possible that they were snakewood as found on the 1668 SK, 1675 SK and 1671 PJ.

[3] The drawer in the 1684 TB rests on the baseboard and is positioned in the centre of the right faceboard. The 1664 RH has two drawers under the keyboard.

[4] By "workshop tradition" is meant that Bolton was an apprentice or journeyman in the workshop of Keene or one of his followers.

[5] This is probably the strongest indication of Bolton belonging to the Keene workshop tradition as its existence can be considered a superfluous to the manufacture of the instrument. That two makers should use an identical, unnecessary, cross is extremely unlikely.

Plate 1684TB.5 – Keyboard, showing the cross in the centre (visible on the original keys from e^{b1} to $g^{\#1}$).



Plate 1684TB.6 – Keyboard of the 1675SK, showing similar cross.



Plate 1684TB.7 – Full keyboard with dustcatcher in position.



It must be questioned if the signature on the lowest jack, attributing the instrument to Bolton is authentic, and if so, if Bolton was responsible for the whole virginal or just the jacks.[6]

The signature (seen in Plate 1684TB.2) is written in the same hand as that which numbered the jacks, and appears to use the same ink, suggesting it was done at the same time. The appearance and style of the writing is entirely consistent with late seventeenth-century work and there is no reason to doubt it was written at the time. That the maker needed to sign the lowest key at all is unique, as all other virginals have the maker's name on the front of the jackrail.[7] The nameplate is present on this instrument but has a gilded background with a Latin motto painted on top. However, it cannot be proven that this is original – it is possible that the nameplate originally carried the maker's name and was gilded over at a later date.[8] The Latin motto cannot be used to identify the artist who painted it. Even assuming that the gilding on the nameplate is

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[6] A number of spinets signed by Keene have the initials of various workmen. Edward Blunt and Charles Brackley have both initialled instruments of Keene's.

[7] The AH and Mar virginals are missing their original jackrails, and therefore the maker's identities are unknown.

[8] Perhaps even 1684 when the instrument could have had its keyboard repaired by Bolton, or even when Bolton numbered the jacks and wrote his signature (the key repairs being done later)?

original it still does not show that the instrument *must* be the work of Bolton rather than another maker.[9] Despite the questions that arise concerning the signature, on the balance of probabilities it should be accepted as an instrument built by Thomas Bolton. This instrument shares no identical mouldings with the virginals of either Keene or Jones which might support an attribution to either of those makers.

The 1684 TB is one of only two instruments which have a drawer (see Plate 1684TB.8). The drawer rests on top of the baseboard, and is positioned in the middle of the right faceboard.

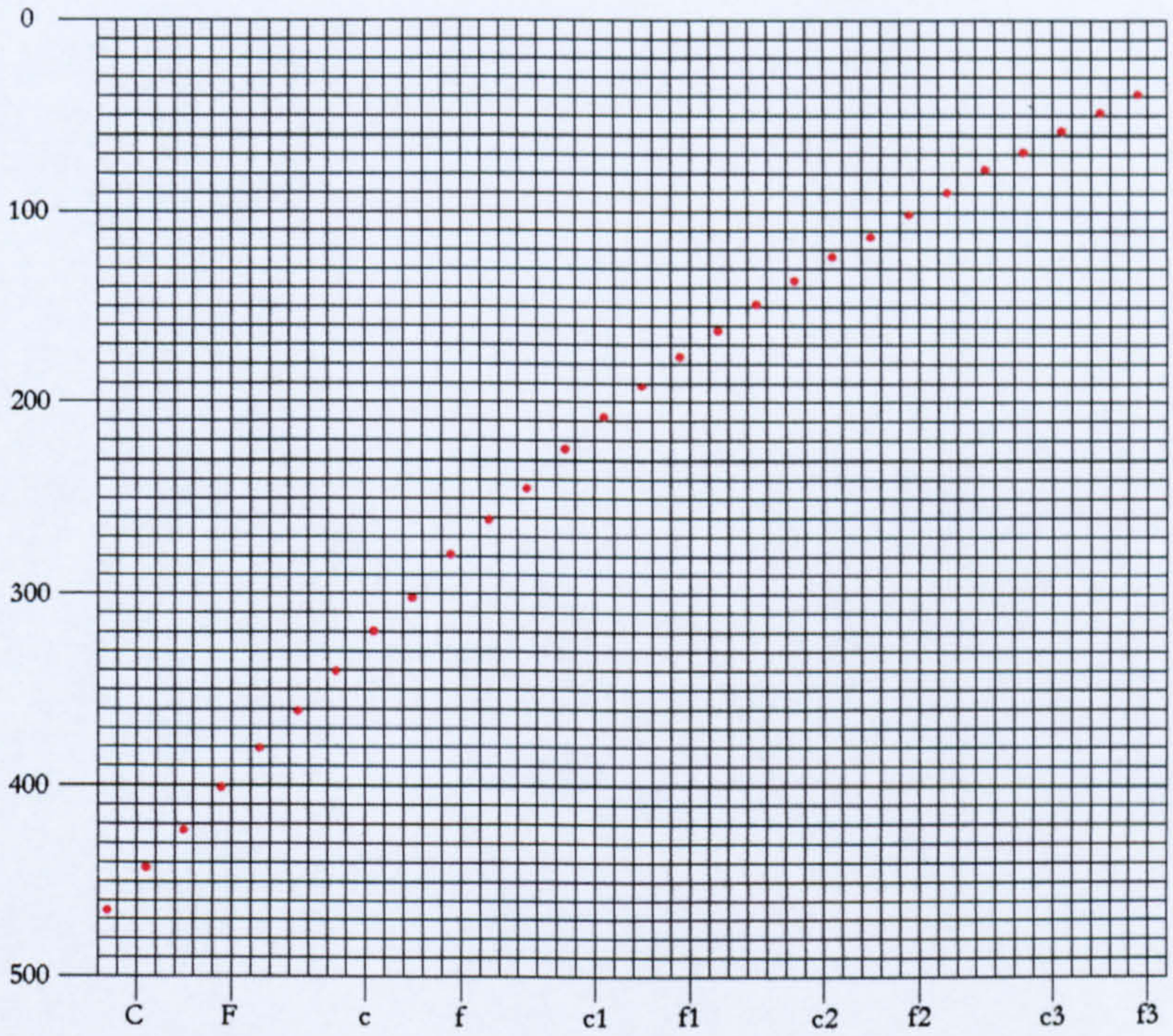
Plate 1684TB.8 – The drawer in the 1684 TB virginal



[9] This argument could be used for any signature on an original instrument; however, it is considerably easier to write an inscription on an unmarked jack than to erase and rewrite a signature on the front of the jackrail.

There are spike marks on the right bridge which are used as a guide for positioning the bridge pins. These marks have been tabulated from the spine and graphed below:

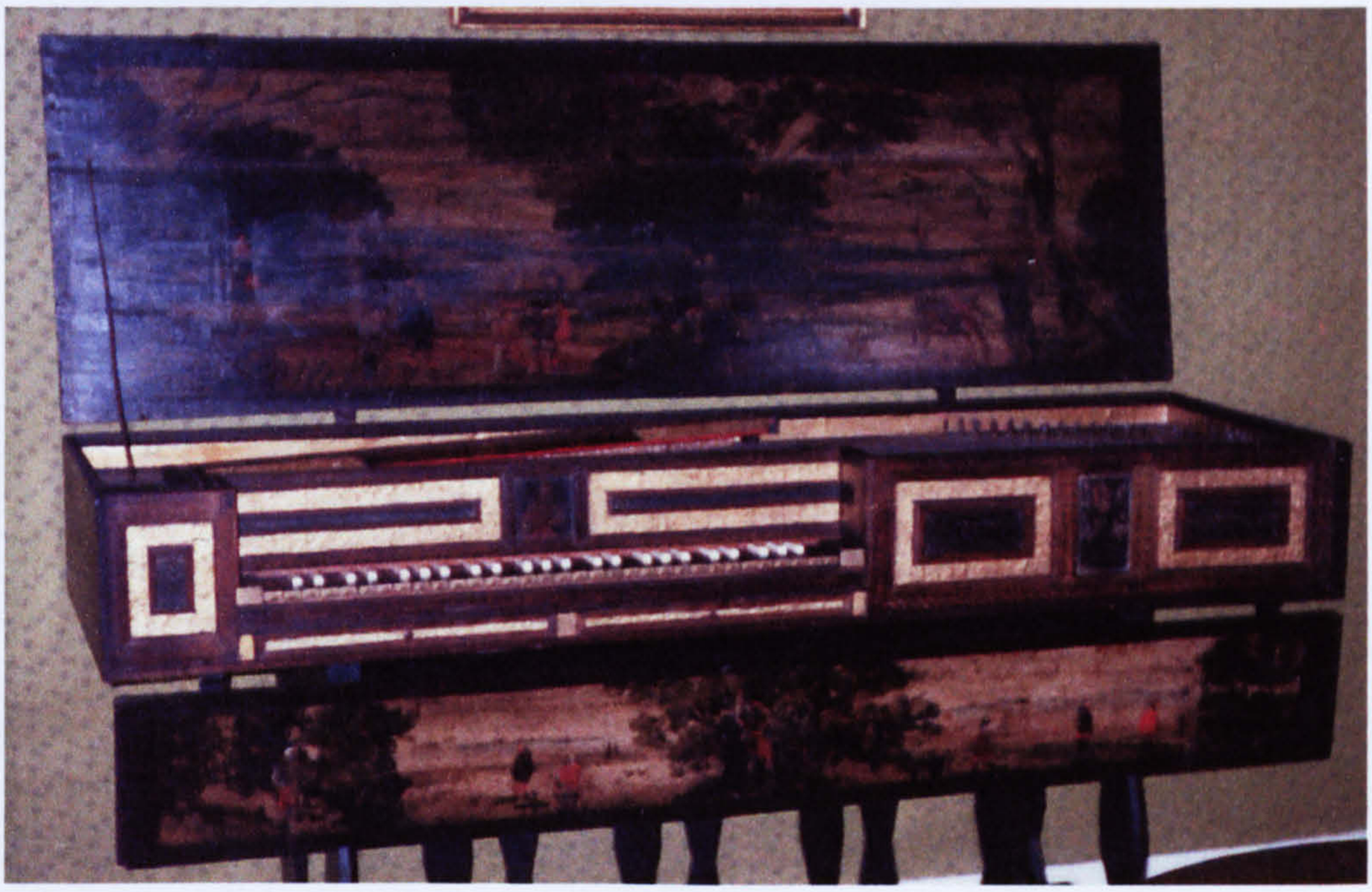
Graph 1684TB.1 - Graph of the bridge marks in relation to the spine.



The slope of the lines suggest that the top octave was divided so that six spaces are in 2½", the next six spaces in 3", the next six spaces in 4", and from there to the bass eight spaces in 6½". This can be compared with the bridge spacing used by Robert Hatley (see page 91). It is likely that both makers used a similar approach of dividing each of the upper octave into regular half-integral multiples and then kept a constant relationship over the lowest one-and-a-half octaves in the bass.

1664 RH

Plate 1664RH.1 – Three-quarter view of the 1664 RH virginal.



Ownership and Provenance

Benton Fletcher Collection, now owned by the National Trust and housed at Fenton House, London.

References

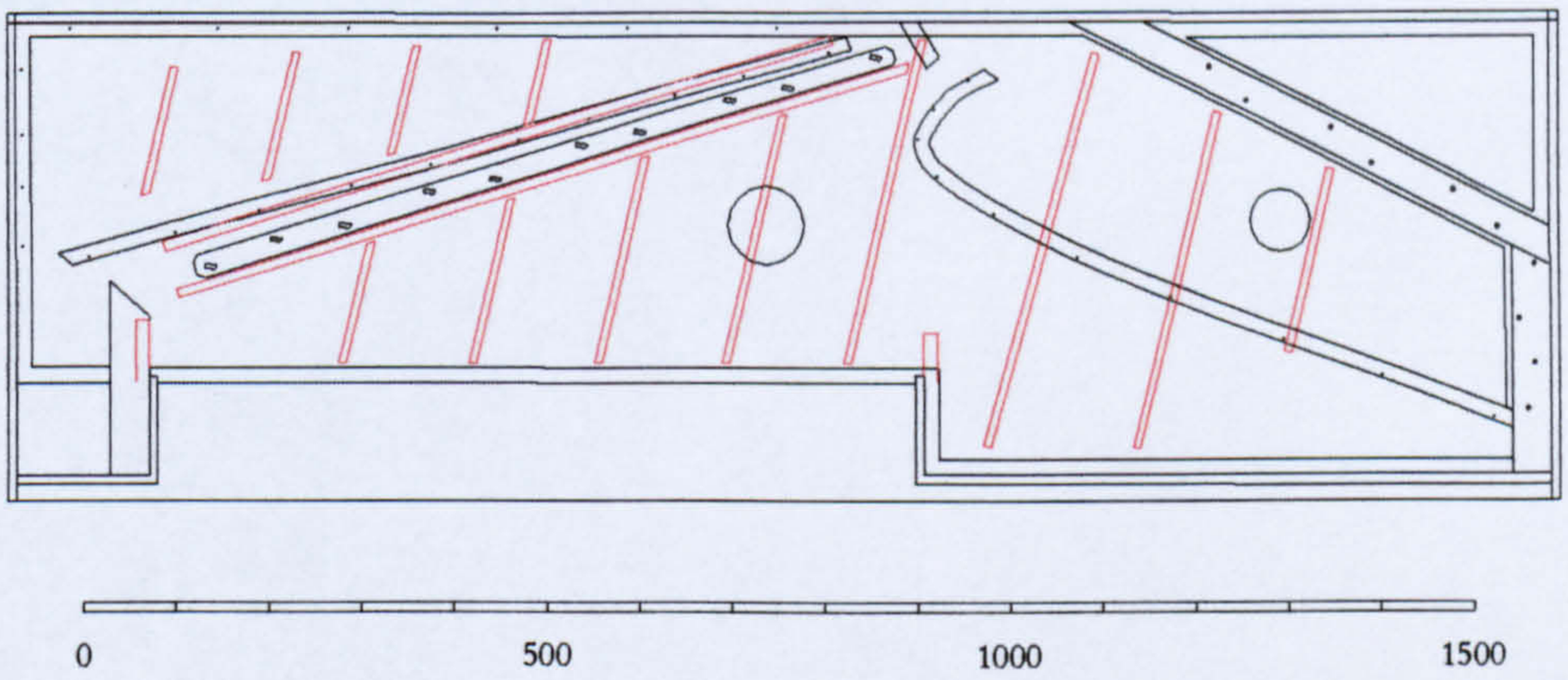
GD4 No. 6a; B1 & B2 English virginal table No. 9, B1 & B2 Hatley, Robert No. 1, B3 No. HATLEY, R. 1664. Russell (1957), Martin (2000/2), Waitzman (2003).

Inscriptions

Signed "Roberttus Hatley Londini fecit 1664" on the front of the jackrail. "RH •1•6•6•4" and "TC 1732" scratched on the keywell liner. Other (modern) inscriptions include – "L.Ward" (stamped) and handwritten "repaired by Alec Hodsdon, Lavenham, Suffolk, June, 1948" on the back of the nameboard. "Leslie Ward 1950" handwritten and "ARNOLD DOLMETSCH LTD., HASLEMERE SURREY" stamped on the baseboard, "L.WARD" and "ARNOLD DOLMETSCH LTD., HASLEMERE SURREY" stamped on the keywell liner, and "L.WARD" stamped on the bass wrestplank capping piece.

Construction

Figure 1664RH.1 – Plan view of the 1664 RH virginal.



OVERALL INSTRUMENT DIMENSIONS: 1674 x 520 x 220.

BASEBOARD: Mahogany, not original (dating from 1950).

SPINE: Deal, 1673 – 1674 long, 220↔ high, 10.1 – 9.9 – 10.2 thick, dovetailed to the case ends. The spine sits on top of the baseboard.

CASE ENDS: Oak, left case end 522 – 521 long, 221 - 222 high, 9.7 – 7.9 thick; the right case end 519 – 520 - 519 long, 220↔ high, 9.4 – 10.5 thick. The case ends overlap the baseboard.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 152 long, 211 – 210 high and 9.0 thick. Right faceboard 685 long, 207 – 209 high and 10.8 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 117 (left and right) long, 8.0 (left) and 8.4 (right) thick. Slots for the nameboard have been cut into the keywell sides 104 – 110 (left) and 103 - 109 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 828 – 823, 115 - 114 high,[1] and 8.9 – 7.2 thick.

KEYWELL LINER: Deal, 103 - 101 high, 18.8 – 18.9 thick.

OTHER LINERS: Deal, c. 35 x c. 20. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Wood material and dimensions cannot be determined.

BASEBOARD FRAMES: Walnut sapwood or poplar, 105 high. The inner edges form a continuation of the keywell sides. The frames are 24.3 (left) and 24.0 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 35 high, set 94 - 93½ from the back of the faceboard. Toolbox lid of lime, 94 - 93½ long, 107 wide and 9.8 thick. Originally iron-rod wire hinges, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 885 long (front), 904 long (back). It is 44.0 wide, and 15.4 thick. The bottom of the jackrail is 31 (bass) and 26 (treble) above the top of the soundboard. The bass jackrail support is of deal, 43.2 wide. The left side is 210 long, the right side 172 long. The treble jackrail support has parallel sides, 17.1 thick, 60 long in the centre, 57 at the front edge and 45 at the back edge. The back corner is 679½ from the right case end, and it is at an angle of 58½° to the spine.

LID: Oak, originally coffered in three pieces, but has now been flattened. The planks are 177, 173 and 150 wide on the inside, and the front thickness is 8.6 – 8.3. There

[1] The nameboard has been reduced in height in modern times to allow a dustcatcher to be fitted underneath.

were originally wire hinges between the spine and the lid, which have been replaced by brass strap hinges.

KEYWELL FLAP: Oak, 211↔ wide, and 10.0 – 8.7 – 9.4 thick. Iron strap hinges between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 75 wide and 3.8 thick. Nailed to the top of the frames. Leather guide glued underneath. There are strengthening bars, approximately 14 high and 6 thick glued to the board behind and in front of the register.

SOUNDBOARD: Coniferous wood, 3.2 – 2.1 thick at the keywell liner. The top of the soundboard is approximately 51 below the top of the case. Two roses, 82 and 65 diameter. Only the right rose, of wood glued on top of parchment, is original.

SOUNDBOARD REGISTER: The register leather is not original.

SOUNDBOARD BARRING: Only the cut-off bar is original. That bar is deal, 29 high and 9 – 5 thick.

WRESTPLANK CAPPING PIECES: Oak, 2.8 - 4.0 thick. The treble wrestplank capping is 36.1 wide without, and 48.5 wide with applied mouldings; and the bass wrestplank capping is 41.3 (without) and 48.5 (with mouldings).

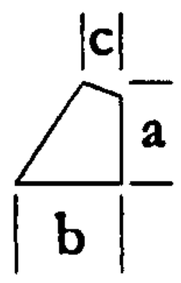
SOUNDBOARD MOULDINGS: Cedar, 3.7 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 16.7 wide, and the spine moulding is 15.2 wide. The other soundboard mouldings are 16.5 wide.

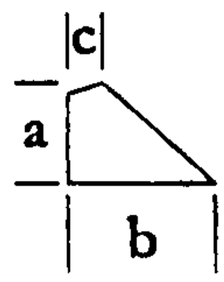
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.6 thick. The moulding on top of the faceboards, keywell sides and nameboard are 14.5 to 15.5 wide. The soundwell top edge mouldings are 18.0 and 4.8 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.4 diameter. The tuning pins are not original, 4.3 diameter, and are of iron. The tuning pins have been divided so that the notes up to $c^{\#}$ are on the bass wrestplank, and notes d to c^{3} are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. There are scribed lines on both bridges, either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.55 diameter. There are spike marks on the right bridge between the close bridge pins used as a guide for positioning the pins. There are bridge positioning holes, used to place the bridge correctly when gluing, at the front of both bridges.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	10.3		9.0		9.9
b	16.0		16.1		14.6
c	4.9		4.6		4.4

right bridge	C	c	c^1	c^2	c^3
a	9.7		9.5		9.8
b	16.4		15.9		16.9
c	4.8		4.2		5.2

String Lengths and (Plucking Points)

		f^1	**378 (54)**	**F**	**1112 (94)**
		e^1	415	E	1167
		e^{b1}	423	E^b	1182
		d^1	465	D	1239
		$c^{\#1}$	475	$C^\#$	12512
c^3	**153 (49)**	**c^1**	**518 (65)**	**C**	**1311 (117)**
b^2	158	b	530	BB	1327
b^{b2}	171	b^b	578	BB^b	1379
a^2	175	a	588	AA	1395
$g^{\#2}$	182	$g^\#$	632	$GG^\#$	1446
g^2	188	g	644	GG	1461
$f^{\#2}$	203	$f^\#$	691	**FF**	**1525 (130)**
f^2	**208 (49)**	**f**	**703 (66)**		
e^2	220	e	755		
e^{b2}	224	e^b	768		
d^2	241	d	821		
$c^{\#2}$	247	$c^\#$	834		
c^2	**266 (55)**	**c**	**890 (85)**		
b^1	272	B	903		
b^{b1}	297	B^b	959		
a^1	302	A	973		
$g^{\#1}$	330	$G^\#$	1031		
g^1	337	G	1043		
$f^{\#1}$	369	$F^\#$	1096		

Keyboard and Action

COMPASS: FF,GG – c^3.

BALANCE RAIL: The balance rail (not original) is beech, 31.4 wide and 31.6 high. The balance pins are iron, 1.7 diameter, and protruding 18 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 34½ (left) and 32 (right) wide and 8 to 9½ thick. The backrail is deal, 58 wide and 18.6 thick.

RACK: Beech, attached to the top surface of the backrail. The rack is 4.2 thick, 37.2 – 36.7 high. It is scribed on the front and rear surfaces for the top and bottom of the slots. There are small buttresses glued to the backrail and rack for added support.

FRONTRAIL: Deal, 36.3 wide and 5.5 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, glued on top of the frontrail. 31.7 high (36.4 including the frontrail) and 4.0 thick.

ENDBLOCKS: Deal. The left endblock is 142 long, 33.0 wide and 47.9 – 45.8 high. The right endblock is 145 long, 33.5 wide and 48.3 – 46.5 high.

KEYBOARD WIDTH: Overall width between the keywell sides 819, and between the endblocks 749. The overall width of the keyboard (not original) is 745, and the three-octave span is 474.

KEYLEVERS: Not original, of deal, 12.4 – 12.6 thick. The lowest keylever is 273 long and the balance point is 106 from the front of the touchplate. The top keylever is 469 long, and the balance point is 185 from the front. The accidental keylevers are balanced 18.8 behind the naturals.

NATURAL TOUCHPLATES: Not original, of ebony, 2.4 thick at the front, 3.0 at the rear. The front of the touchplate is 28.5 long. The front of the touchplates overhang the keylevers by 5.3, and the arcades by 1.4.

ACCIDENTAL TOUCHPLATES: Solid bone. The overall length is typically 54.9, and total height 9.0 (front) – 5.9 (rear). They taper in width from 10.5 at the bottom to 9.5 at the top.

The jacks and action cloths are not original.

Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. The brass strap hinges from the spine to the lid are not original. There are three strap hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap and the centre hinge attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There are two roses of a geometric design, only the right one of which is original. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator is possibly the same artist who painted the later White instruments.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The original gilt papers are of the "Elizabeth Shield" design. The soundwell papers are not original, dating from the work done by Leslie Ward in 1950. He probably re-gilded the other papers at the same time. There are rectangular painted panels in the centre of the nameboard and the right faceboard. Both have decorative paintings – that on the faceboard showing an image of a well-dressed lady, and that on the right faceboard having a single rose.

The lid and keywell flap interiors have typical landscape paintings. The main lid has been flattened in a restoration, almost certainly when the instrument was worked on in 1732, but this has not drastically affected the painting. The paintings appear to have been carried out directly onto the wood rather than a gessoed surface. Both scenes show human figures in a park.

Condition

The virginal is in superb playable condition, and is regularly used by students according the original conditions of the gift by Major Benton Fletcher to the National Trust.

The instrument has been heavily restored previously, firstly in 1732, when the lid was flattened and new brass strap hinges were placed between the spine and lid. Further work was carried out in the middle of the twentieth century, firstly by Alec Hodsdon, and then by Leslie Ward, working for the firm of Arnold Dolmetsch Ltd. This work included replacing the baseboard with one of mahogany, the introduction of a new soundboard register-leather and a new set of jacks, and work on the keyboard, including the making of a new balance rail, keylevers and natural touchplates. The accidental touchplates appear to have been re-used from the original keyboard, and the remainder of the keyframe is original. The embossed papers around the soundwell are 1950 replacements by Leslie Ward.[2] The instrument was most recently restored to its present playing condition in 1975-6 by Richard Clayson and Andrew Garrett.[3] The instrument is now kept in perfect playing condition under the care of Mimi Waitzman.

Commentary

The 1664 RH is one of three long-bass virginals which survive from the mid-1660s. The Hatley has 55 notes, the same as a standard GG/BB – f^3 compass.[4] It is probable that Hatley approached this instrument from a GG/BB – f^3 model, and it was designed using the English inch where possible. This has been discussed in detail in Martin (2000/2), but should be briefly reconsidered.

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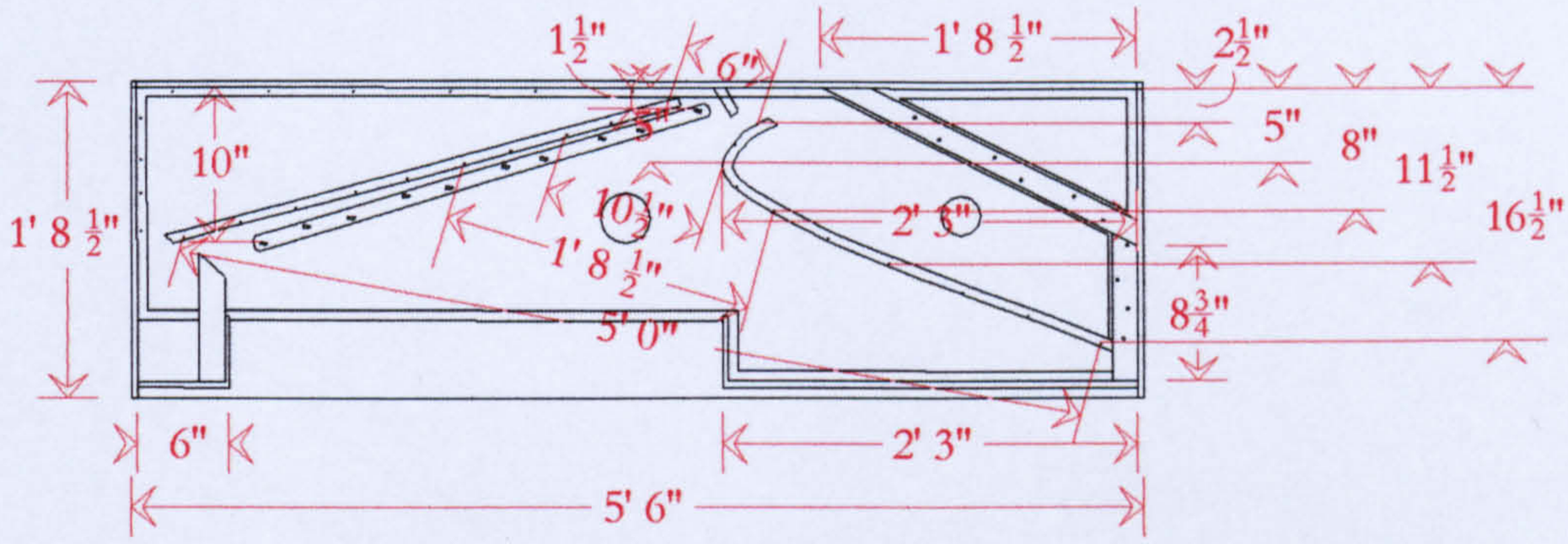
[2] The 1668 Stephen Keene virginal in the Russell Collection, Edinburgh, was also restored by Ward around this time. Some replacement papers on the Keene are the same as those used around the soundwell of the Hatley, and the Keene also shows evidence of having the original papers re-finished in the same manner. Leslie Ward told John Barnes (communicated privately to the author) that the replacement papers he used were paper cake-bands from Woolworths.

[3] I am grateful to Andrew Garrett for providing me with the dates.

[4] The two other instruments – the 1664 JP and 1668 SK – have 56 (GG – d^3) and 57 (FF,GG – d^3) notes respectively.

The case dimensions (overall length, width, height, faceboard height, left- and right- faceboard lengths), the string lengths of c^3, c^2, c^1 and FF, and the distance of the right bridge marking-out spike marks to the spine can all be defined in integral or half-integral inches. This can be shown in the drawing below.

Figure 1664RH.2 – Drawing of the design layout of the 1664 RH virginal.



That Hatley needed to use the English inch in all aspects of the instrument design suggests that he was unfamiliar with the FF,GG – c^3 compass design. The scaling-design note is six inches long, suggesting the instrument played at the common V pitch level. This pitch level would surely have been used on a regular basis by Hatley, and cannot explain the need for the systematic use of the English inch, and would, with the normal GG/BB – f^3 compass require a scaling-design note string length of 4½ inches.

A consideration of the bridge shape further suggests that Hatley commonly made instruments with the GG/BB – f^3 compass. The 1664 RH has scalings which foreshorten from the top note. At c^2 the equivalent c^3-scaling is 242 cents below that of the scaling-design note, and at c^1 it is 289 cents below the scaling-design note. It is likely that the bridge template was used for Hatley's normal GG/BB – f^3 compass, specifically designed for a pitch of V – 1s, where the c^3 and c^1 notes are in Pythagorean proportion to each other.[5]

Despite the compass descending to FF in the bass, it is unlikely that Hatley extended the overall case length of the instrument. The length is of typical dimensions,

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[5] The string length of c^2 is short in proportion to both the c^3 and c^1 regardless of what scaling-design note string length the instrument uses.

and the length of C is shorter than found in other virginals of the same pitch.[6] It is possible that the maker decided to keep the same length as his normal instrument, and reduced the length of the left faceboard.

The 1664 RH has two drawers positioned under the keyboard (shown in Plate 1664RH.2. This virginal is one of only two instruments with drawers (the other being the 1684 TB).

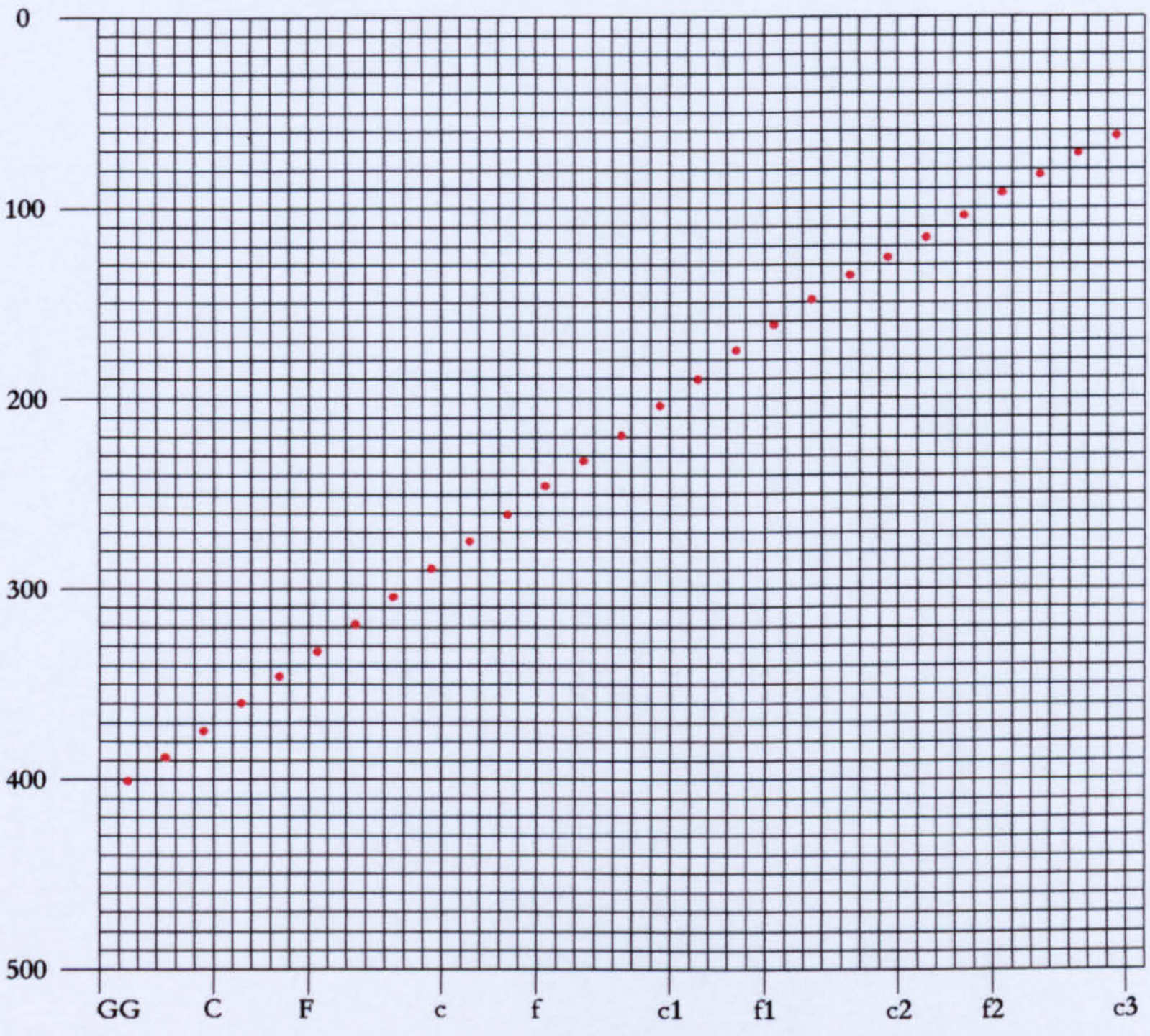
Plate 1664RH.2 – Photograph showing the drawers under the keyboard.



[6] The C of the 1664 RH is 1311 mm long. This can be compared to the two other long-bass virginals – 1383½ for the 1664 JP, and 1361 mm for the 1668 SK – and 1440 for the 1642 TW with a C – c^3 compass. All are at the same pitch as the 1664 RH.

There are, as remarked above, spike marks on the right bridge which have been used to guide the positioning of the right bridge pins. These have been graphed below:-

Graph 1664RH.1 - Graph of the bridge marks in relation to the spine.



These spike marks show a precise use of the English inch. The top spike mark (between the c^3 and b^2 right bridge pins) is 2½" from the inside of the spine. The top octave has six spaces in 3½", the next octave is six spaces in 3", the next octave is six spaces in 3½", and this spacing then continues to the bass.

There is little biographical information known about Hatley. The painted decoration is similar to that found on the later White instruments and the Body, but that does not necessarily imply that Hatley was part of the same workshop tradition. According to the various editions of Boalch[7] there is supposed to be one, if not two, other instruments by Hatley which survived until the middle of the twentieth century. This is further confused by the possibility that a Robertus Tolley (who is supposed to have left a "spinet" of 1661) is a misreading of Hatley.

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[7] B1 (1956), B2 (1974), B3 (1995).

1671 PJ

Plate 1671PJ.1 – Three-quarter view of the 1671 PJ virginal.



Ownership and Provenance

Tabley House, Knutsford, Cheshire. This instrument has always been at this location.

References

GD3 & GD4 No. 10; B1 & B2 English virginal table No. 14, B2 Jones, B3 No. JONES, P. 1671. Restoration report by Clayson and Garrett.

Inscriptions

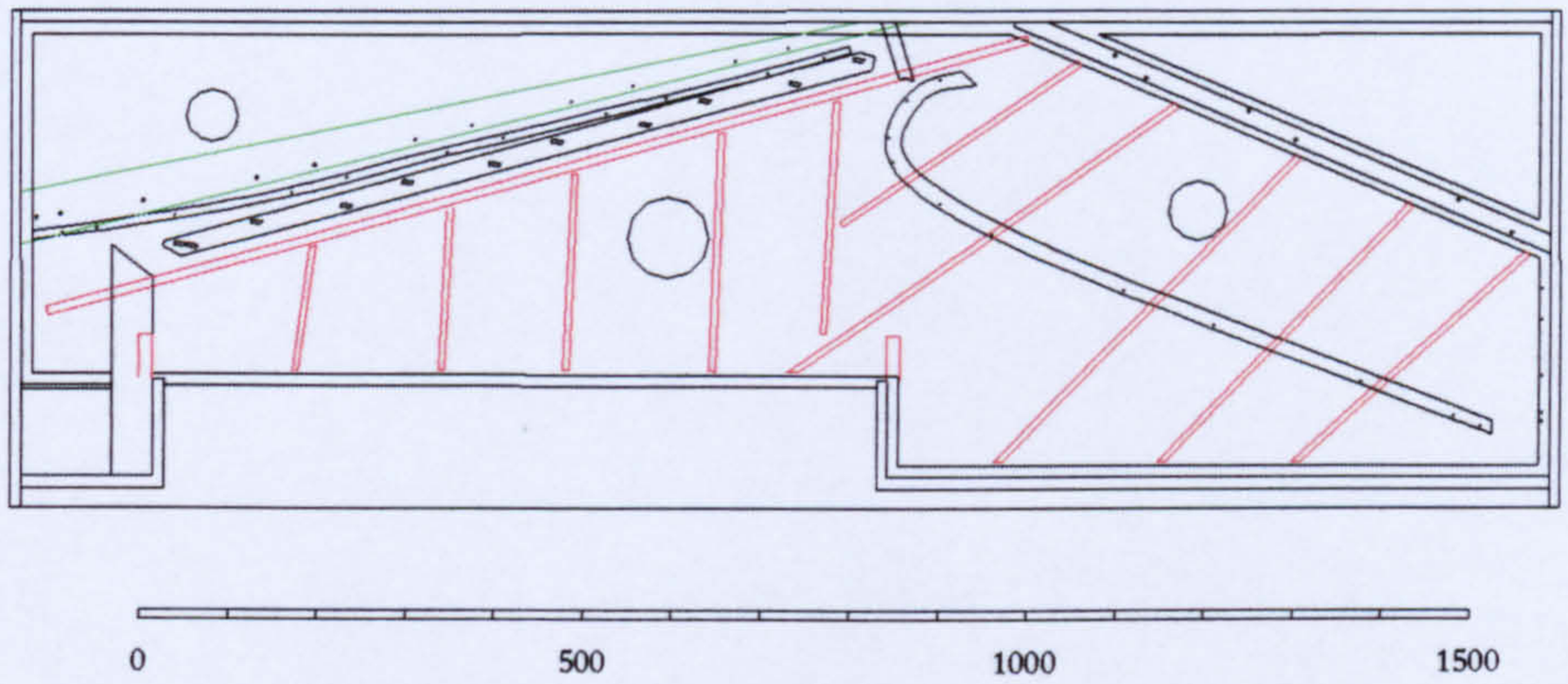
Signed "Phillip Jones Londini Fecit 1671" on the front of the jackrail.

Plate 1671PJ.2 – The maker's signature on the front of the jackrail.



Construction

Figure 1671PJ.1 – Plan view of the 1671 PJ virginal.



OVERALL INSTRUMENT DIMENSIONS: 1746 x 559 x 222.

BASEBOARD: Deal, two planks, the rear plank 263 wide. 12.5 - 11.5 – 11.7 thick at front.

SPINE: Deal, 1744 long, 220 – 221 high, 12.9 – 14.6 – 13.6 thick, nailed and butted to the overlapping case ends.

CASE ENDS: Oak, left case end 558↔ long, 222 - 221 high, 12.0 – 10.2 thick; the right case end 560↔ long, 222↔ high, 11.9 – 10.6 thick. The spine and case ends overlap the baseboard. There are nails from the case sides into the ends of the faceboards.

FACEBOARDS: Glued to the top of the baseboard. Left faceboard of lime, 160½ long, 206 - 208 high and 13.9 thick. Right faceboard of deal, 812 long, 206 – 204 – 206 high and 14.3 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Deal, 123 (left) and 122½ (right) long, 11.7 (left) and 10.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 106 - 111½ (left) and 106½ – 111½ (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 818 – 812 long, 148 - 144 high, and 8.9 – 7.6 thick.

KEYWELL LINER: Deal, 78½ – 78 high, 14.3 – 12.8 thick.

OTHER LINERS: Deal, c. 40 x c. 15. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard. These protrusions extend 50 (left) and 20 (right) past the keywell-back liner.[1]

WRESTPLANKS: Beech, ‡40 thick. There are separate wrestplanks for the bass and treble tuning pins.

BASEBOARD FRAMES: Deal, 77 (left) and 74 (right) high. The inner edges form a continuation of the keywell sides. The frames are 23.8 (left) and 26.0 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 29 high, set 97 - 96½ from the back of the faceboard. Toolbox lid not original. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 883 long (front), 902 long (back). It is 46.6 wide, and 15.2 thick. The bottom of the jackrail is 24.0 (bass) and 25.0 (treble) above the top of the soundboard. The bass jackrail support is of deal, 46.9 wide. The left side is 261 long, the right side 224 long. The treble jackrail support (not original) has parallel sides, 15½ wide, the front 66 and rear 67 long, with a curved end. The back corner is 737½ from the right case end.

LID: Oak, coffered in three pieces. The planks are 193, 189 and 192 wide on the inside, and the front thickness is 11.0 – 9.8 – 11.0. The hinges to the spine are not original, the instrument originally having wire hinges set 66½ and 578 from the left end, and 71 and 625 from the right end. The end battens are 13.8 (left) and 13.2 (right) thick and the interior coffer height is 51 (left) and 52½ (right). The lid was probably originally held open by lid cords at each end, both case ends having holes 185 from the front, with other holes on the lid 315 (left) and 260 (right) from the top. There are

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[1] The right protrusion has been broken off. It presumably originally extended a similar length to the left one.

other holes on the lid end battens at the very top. There are decorative mouldings on the top of the lids at the ends and along the front and rear edges and over the joints.

KEYWELL FLAP: Oak, 212 – 214 – 211 wide, and 11.1 – 10.6 thick. There are (non-original) strap hinges made of cast iron, maximum 2.8 thick. The keywell flap was originally held open with wire hinges.

LOWER GUIDE BOARD: Deal, 64 wide and 4.0 thick. Nailed to the top of the frames. Leather guide glued underneath. There is a strengthening bar, 35 high at the front of the register.

SOUNDBOARD: Coniferous wood, 2.0 - 3.0 thick at the keywell liner. The top of the soundboard is approximately 51 below the top of the case. Three roses (only the right being original), 58, 92 and 66 diameter, (of wood glued on top of parchment), glued under the soundboard and supported by small bars underneath. The soundboard wood is bevelled around each rose.

SOUNDBOARD REGISTER: Leather, 820 long, 22 wide and 1.9 thick. Slots typically 12.4 x 3.8. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the jacks.

SOUNDBOARD BARRING: Deal. 25 deep in the centre is 8 thick, and 10 - 7½ thick.

WRESTPLANK CAPPING PIECE: Oak, 4.2 thick. For the treble wrestpins, 19.6 wide without, and 39.6 wide with applied mouldings.

SOUNDBOARD MOULDINGS: Conifer wood, 4.3 thick. Left case end 13.0, spine 12.8, other mouldings 12.5 wide.

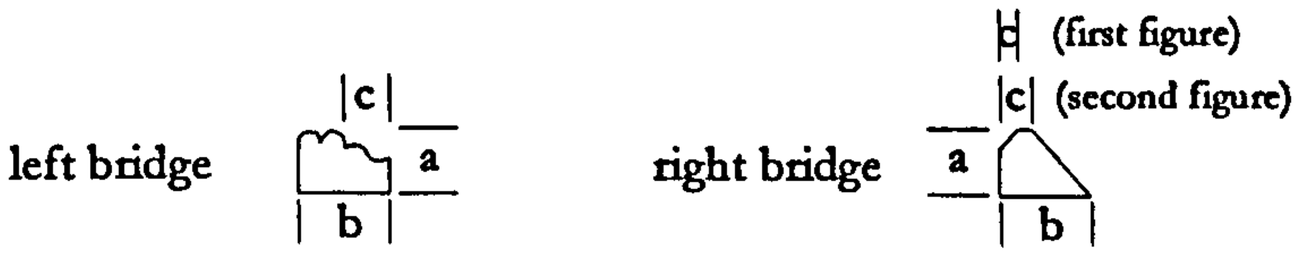
OTHER MOULDINGS: All other mouldings are of conifer wood. The faceboard mouldings are 3.9 thick. The moulding on top of the faceboards, keywell sides and nameboard are 16.0 wide. The soundwell top edge mouldings are 21.0 and 4.0 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.5 diameter. The original tuning pins protruded 27 from the top of the wrestplank capping piece, and are 3.5 diameter, and are of iron. The tuning pins have been divided so that the notes up

to b are on the soundboard behind the left bridge, and notes c to f^3 are on the treble wrestplank. The tuning pins presently in the instrument are replacements, the originals (retained separately) have remains of old, probably original, strings.[2]

BRIDGES: The left bridge of beech, the right of fruitwood, probably pear. There is a scribed line on the left bridge at the flat top, and one on the crest of the right bridge. There are several positioning holes at the front of the right bridge, nails of which have left damage on the front of the bridge.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	7.8	7.0	7.2	6.2	6.7
b	9.4	10.0	9.2	9.1	8.3
c	3.8	3.5	3.3	3.3	2.9

right bridge	C	c	c^1	c^2	c^3
a	10.0	9.4	9.0	9.2	8.7
b	15.9	16.4	17.3	19.5	18.4
c	3.2 / 6.2	3.8 / 5.8	3.4 / 4.9	3.9 / 5.5	3.4 / 4.7

[2] See Chapter Two, page 55.

String Lengths and (Plucking Points)

f^3	**133 (40)**	**f^1**	**496 (59)**	**F**	**1349½ (92½)**
e^3	133½	e^1	504	E	1367½
e^{b3}	142½	e^{b1}	550½	E^b	1435½
d^3	143½	d^1	560½	D	1453
$c^{\#3}$	159½	$c^{\#1}$	610½	$C^{\#}$	1524½
c^3	**158½ (31½)**	**c^1**	**620½ (57)**	**C**	**1543½ (115)**
b^2	178	b	671	GG/BB	1612 (135)
b^{b2}	180½	b^b	683		
a^2	199	a	741½		
$g^{\#2}$	201	$g^{\#}$	754½		
g^2	224½	g	815½		
$f^{\#2}$	227	$f^{\#}$	828½		
f^2	**253½ (45)**	**f**	**885 (68½)**		
e^2	258½	e	898		
e^{b2}	286½	e^b	959½		
d^2	291½	d	975		
$c^{\#2}$	322	$c^{\#}$	1034		
c^2	**328½ (47½)**	**c**	**1049½ (65)**		
b^1	360½	B	1112		
b^{b1}	367½	B^b	1127		
a^1	401½	A	1183		
$g^{\#1}$	409½	$G^{\#}$	1199		
g^1	446	G	1263½		
$f^{\#1}$	455	$F^{\#}$	1280½		

Keyboard and Action

COMPASS: GG/BB – f^{3}.

BALANCE RAIL: The balance rail is beech, 31 wide and 22 deep. The balance pins are iron, 2.8 diameter, and protruding 22 above the top of the balance rail. The balance rail is rebated into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 37 wide and 7.9 thick. The backrail is deal, 35.2 wide and 12.7 thick.

RACK: Maple (original?), attached to the top surface of the backrail. The rack is 5.4 thick, 37.1 high. There is some non-original card attached to the front surface, 1.0 thick.

FRONTRAIL: Deal (probably not original), 36.9 wide and 7.6 thick.

KEYWELL BATTEN: Deal, with a moulded top edge along the front, 28.0 high and 4.2 thick.

ENDBLOCKS: Deal. The left endblock is 138 long, 14.4 wide and 43.7↔ high. The right endblock is 183 long, 19.7 wide and 46.7↔ high. There is a "dustcatcher" which fits into slots in the endblocks and sits under the nameboard.

KEYBOARD WIDTH: Overall width between the keywell sides 802, and between the endblocks 763. The overall width of the keyboard is 762, and the three-octave span is 484.

KEYLEVERS: Deal, 14.1 thick at the front, tapering to 10.3 at the rear. The rackpins are not original. The lowest keylever is 409 long and the balance point is 117 from the front of the touchplate. The top keylever is 499 long, and the balance point is 192 from the front. The accidental keylevers are balanced in the same line as the naturals.

NATURAL TOUCHPLATES: Snakewood, generally 96 long, and tapering in thickness from 2.4 at the front to 1.3 at the rear. There are two scribed lines on the front section, 27.3 and 31.4 from the front edge. The touchplates overhang the keylevers by 3.0.

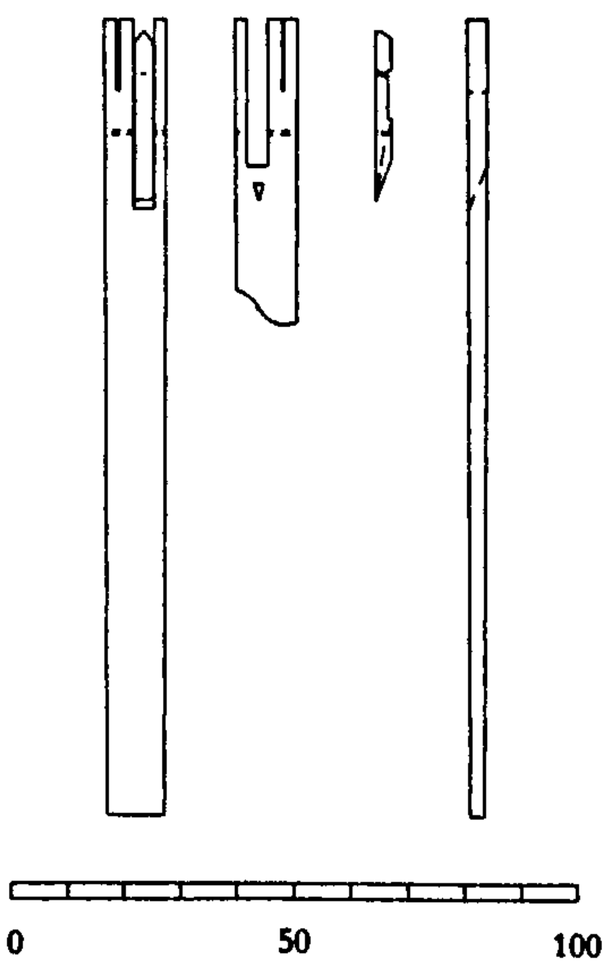
The natural touchplate widths in between the accidentals are:-

f^3	21.2	f^2	13.1	f^1	13.0	f	13.5	F	13.0
e^3	13.0	e^2	13.0	e^1	13.0	e	13.0	E	13.4
d^3	14.3	d^2	14.6	d^1	15.4	d	15.1	D	15.5
c^3	13.9	c^2	13.4	c^1	13.0	c	13.0	C	12.6
b^2	13.3	b^1	13.1	b	13.6	B	13.1	BB	22.0
a^2	12.9	a^1	13.1	a	12.6	A	13.1		
g^2	12.6	g^1	12.7	g	12.6	G	12.6		

ACCIDENTAL TOUCHPLATES: Solid ivory. The overall length is typically 56.6, and total height 8.3 (front) – 5.0 (rear). They taper in width from 12.8 at the bottom to 11.1 at the top.

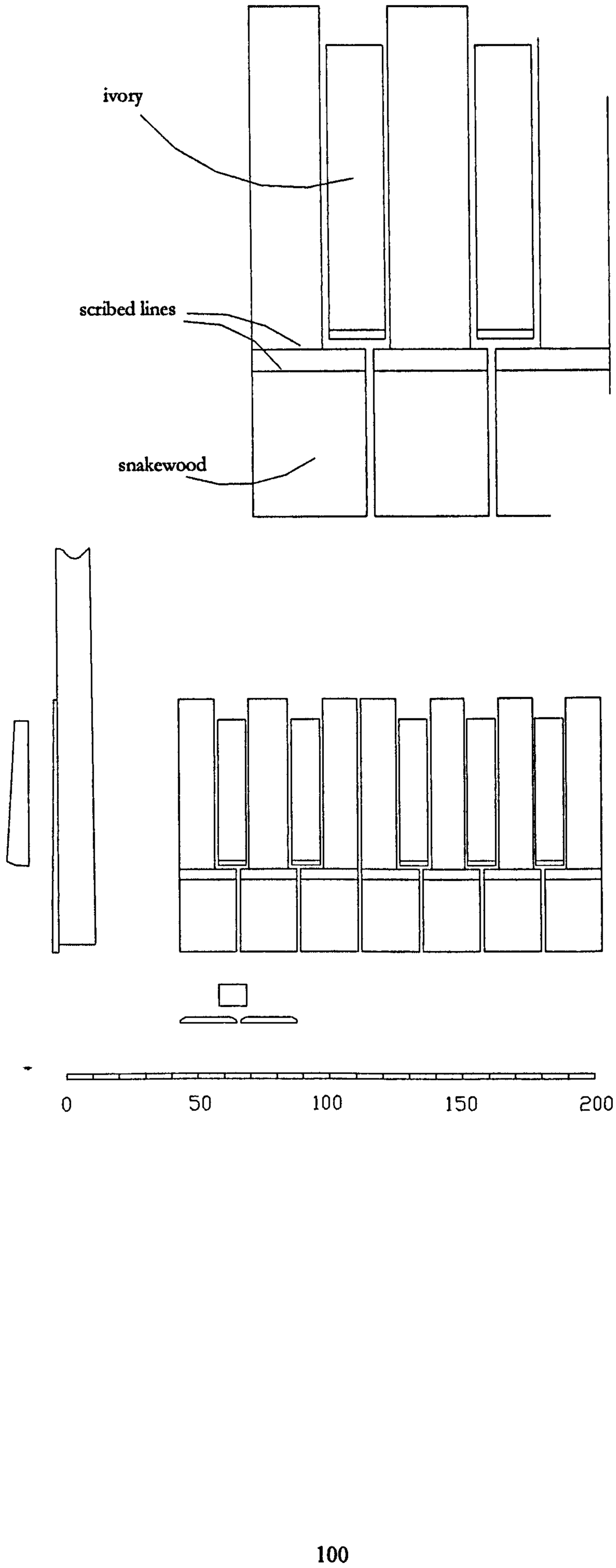
JACKS: The jacks and tongues are of beech. The total length is typically 138. They taper in width from 10.5 – 10.0, and in thickness from 3.5 to 2.5. The axle pins are positioned 17.5 (60%) from the top of the tongue. The plectrum hole is crescent shaped.

Figure 1671PJ.2 – Drawing of a typical jack.



ACTION CLOTHS: Cloths on the back of the keylever, 4.1 uncompressed thickness (covered with modern green felt).

Figure 1671PJ.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise was decorated only by the ironwork strap hinges and lockplates. With the exception of the treble turnbuckle-hasp the ironwork is not original, although the strap hinges between the baseboard and the keywell flap are of some age.[3] The stand is probably of a contemporary date to the instrument (although has been subject to some modification) and has been varnished a similar colour. It is of a cup-board type, consisting of framed upper- and lower-boards with turned legs at the front corners and rectangular legs at the rear corners.

Plate 1671PJ.3 – Photograph showing the instrument with the lid closed.



The soundboard is decorated with border patterns, flowers and birds. The roses are of a geometric design. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1668 SK and 1675 SK instruments.

The keywell, faceboards, soundwell and jackrail are decorated with deal moulded bands separated by embossed papers. The mouldings are painted or stained a green

[3] The information about the ironwork comes from the restoration report by Richard Clayson and Andrew Garrett, supplied to the author by Andrew Garrett.

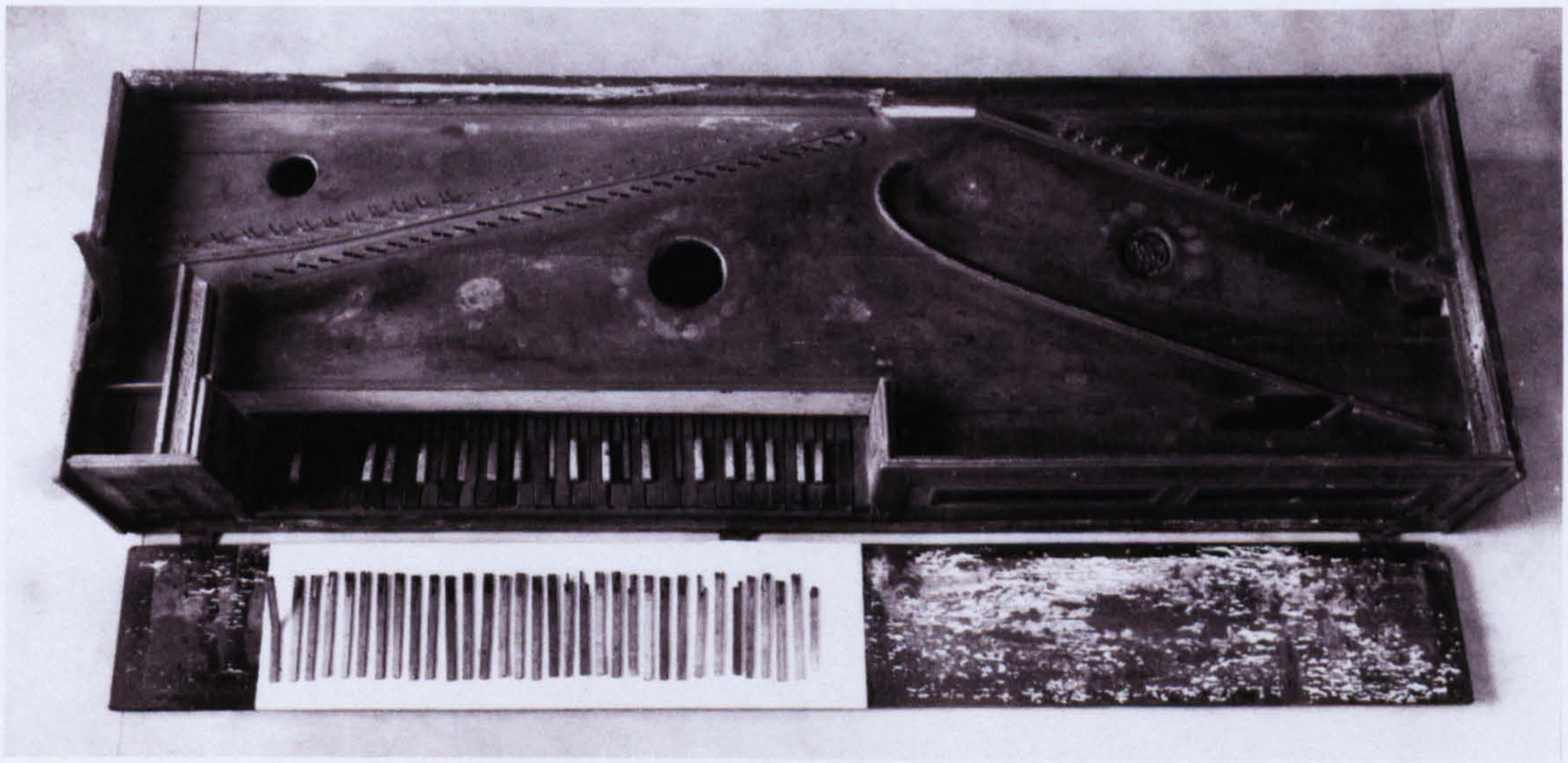
colour. The flat part of the moulding bands have painted floral-work in red and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Vinework" design, and the arcades are of the "trefoil" design. In the centre of the inner faceboard, keywell sides and nameboard mouldings there is black painted areas with white scrollwork.

The lid interior has a typical landscape painting with figures in front of trees and a building. The keywell flap interior has a similar painted scene, but without the building. There are flat black borders around both paintings.

Condition

Prior to restoration in the early 1980s the virginal was in a very dilapidated state (see Plate 1671PJ.4). The restoration has returned the instrument to full playing and decorative order.

Plate 1671PJ.4 – Photograph of the 1671 PJ prior to its restoration.



Photograph by kind permission of Andrew Garrett

Several parts of the instrument were not reintroduced following the restoration. The original jacks and tuning pins have been preserved separately from the instrument.

Commentary

Both in construction and decoration this virginal is closely related to the instruments of Stephen Keene, to an extent that this instrument is closer in style and execution to the 1675 SK than the other Keene is. Were this instrument to be unsigned an attribution to Keene would most likely be given. This is further emphasised by the fact that the jackrail moulding on the 1671 PJ is identical to the moulding used on the 1675 SK, clearly coming from the same cutter (including a distinctive flaw). This is discussed in the Further Commentary section below. Although Jones is known to have carried out his apprenticeship with John Haward (apprenticed in 1658 and made a Freeman in 1667) he must have worked for Keene as a journeyman before setting up his own business prior to the construction of this instrument.[4] The instruments of Keene and Jones are unusual in having the wrestplanks divided so the bass tuning pins are behind the left bridge, and having snakewood natural touchplates.[5]

Another unusual feature of this virginal is that the spine and case ends are butted, rather than dovetailed. The case ends overlap the spine, with nails passing through the case ends into the endgrain of the spine. A similar type of butt joint is found on the 1684 TB.

The scaling-design note string length of 133 mm implies that the instrument should be tuned to V – 3s, the lowest of the common pitch standards found in England during the seventeenth century. The virginal was probably designed to play at this pitch so that it could be used in collaboration with viols. The records of the house show that viols were possessed and were favoured instruments.[6] In the absence of any organ it would appear that the virginal provided an accompaniment to solo and consort playing. This use of virginals with viols echoes comments made by Mace (1676) who

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[4] The possibility that the signature is false cannot be entirely dismissed. The jackrail is unique in not having a nameplate on the front edge. Instead it has been painted black with the signature and other floral-work in white. In favour of the signature is the fact that the only person likely to have altered it is Jones himself, and it is difficult to imagine circumstances that would allow it to be done.

[5] The 1664 RH originally had a "reverse" keyboard which may have been snakewood, and the 1684 TB has ebony natural touchplates.

[6] A list of music books owned by Sir Peter Leycester include many books of viol music.

suggests that the "Pedal"[7] is the ideal instrument for music which is "Ayrey, Jocand, Lively, and Spruce".[8] An inventory of 1667 records a virginal amongst the possessions in the house,[9] so the purchase of the Jones in 1671 may have been desired particularly for accompanying other instruments.

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[7] A harpsichord with pedals for changing the registration. See Hubbard (1965:146) for a transcription of the complete passage.
[8] Mace (1676:235).
[9] The instrument mentioned in the Inventory is probably an anonymous Italian virginal (W694), still at Tabley House.

1668 SK

Plate 1668SK.1 – Three-quarter view of the 1668 SK virginal.



Ownership and Provenance

Russell Collection, University of Edinburgh, Scotland. Catalogue number V3-SK1668.8. Formerly owned by Raymond Russell, who purchased it from H.C. Moffat of Goodrich Court.

References

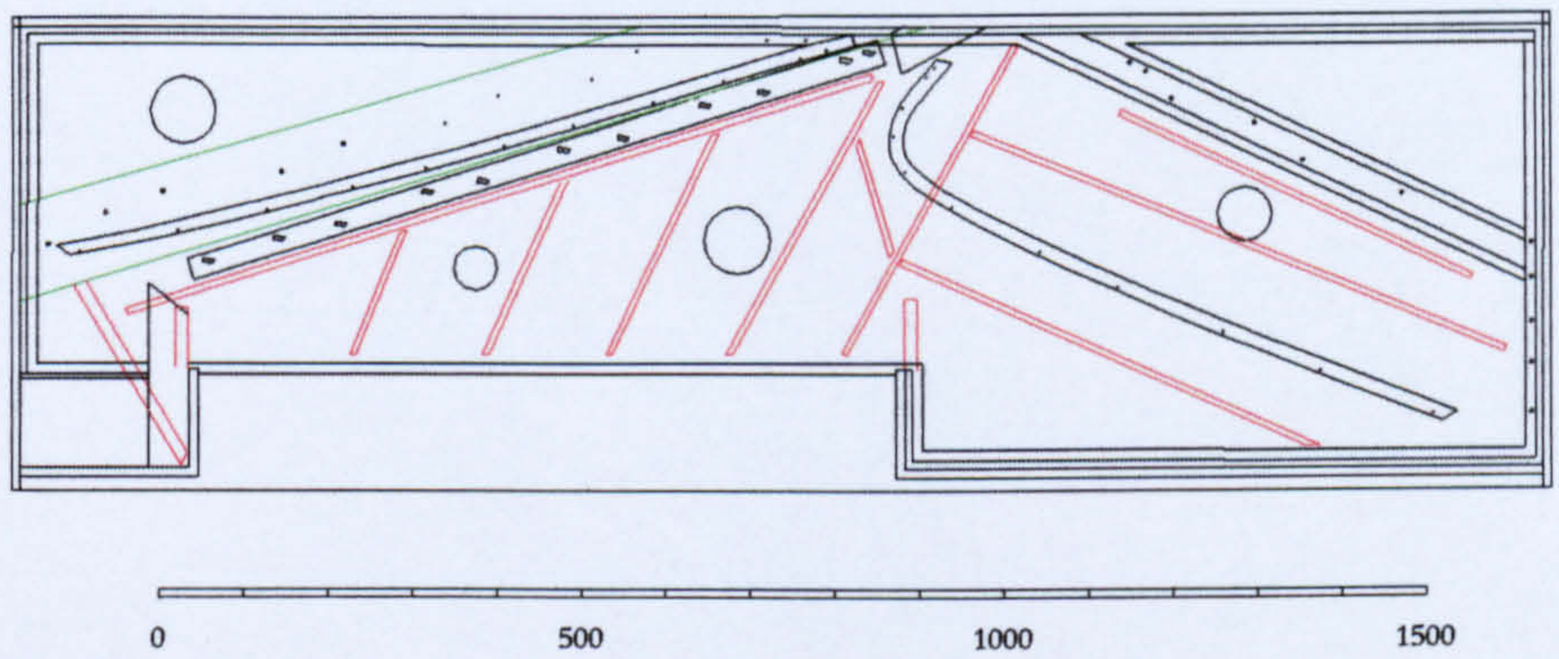
GD3 & GD4 No. 8; B1 & B2 English virginal table No. 12, B1 & B2 Keene, No. 1, B3 No. KEENE, S. 1668. Russell (1959), Napier (1986), Raymond (1987), O'Brien (1990).

Inscriptions

Signed "Stephanus Keene Londini Fecit 1668" on the front of the jackrail. The last digit of the date has been altered from a 7, almost certainly before the instrument was delivered to its customer. Repair inscription "Repaired by Leslie Ward Haslemere 1950".

Construction

Figure 1668SK.1 – Plan view of the 1668 SK virginal.



OVERALL INSTRUMENT DIMENSIONS: 1820 x 552 x 248.

BASEBOARD: Deal, two planks, the front plank 402 wide. 12.8 – 16.9 – 13.6 thick at front.

SPINE: Deal, 1821 – 1820 - 1821 long, 248 – 246 high, 11.2 – 13.0 thick. The spine sits on top of the baseboard. There are small strips on the top and bottom of the spine which are not original. The height measurements above include the baseboard.

CASE ENDS: Oak, left case end 547 - 551½ long, 248½ - 549 – 548 high, 8.5 – 9.4 – 9.0 thick; the right case end 551 – 552 long, 248½ - 249 - 248 high, 8,8 – 8.2 – 8.1 thick. The case ends overlap, and are nailed to, the baseboard. The faceboards are morticed into the case sides.

FACEBOARDS: Glued to the top of the baseboard. Left faceboard of deal, 211 long, 224 - 221½ - 224 high and 11.2 thick. Right faceboard of deal, 767½ long, 225½ - 222 - 224 high and 11.0 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Walnut, 125 (left and right) long, 10.2 (left) and 11.0 (right) thick. Slots for the nameboard have been cut into the keywell sides 108 - 116 (left and right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 835½ - 831½ long, 170 – 167 - 168 high, and 11.7 – 8.0 thick.

KEYWELL LINER: Deal, 93½ – 91½ high, 12.3 – 13.6 thick.

OTHER LINERS: Deal, c. 40 x c. 10. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Oak, ‡35 thick. There are separate wrestplanks for the bass and treble tuning pins.

BASEBOARD FRAMES: Deal, 80 (left and right) high. The inner edges form a continuation of the keywell sides. The frames are 18.0 (left) and 17.1 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 34 high, set 105½ - 102½ from the back of the faceboard. Toolbox lid of deal, 135 – 138 long and 114 – 111 wide and 11.1 thick. The toolbox lid hinges at the front with iron rod hinges, 2.9 diameter. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 872 long (front), 908 long (back). It is 48.6 wide, and 15.2 thick. The bottom of the jackrail is 31.6 (bass) and 32.8 (treble) above the top of the soundboard. The bass jackrail support is of deal, 48.2 wide. The left side is 212 long, the right side 176 long. The treble jackrail support is triangular in section, the front edge 115.6 long and 48.8 wide on the front face. The back corner is 656½ from the right case end, and the front edge of the support is 152° to the spine.

LID: Oak, coffered in three pieces. The planks are 184, 204 and 184 wide on the inside, and the front thickness is 8.4 – 9.1 – 8.1. There were originally wire hinges to

the spine. The end battens are 23.6 (left) and 23.7 (right) thick and the interior coffer height is 59.6 (left) and 65.0 (right). There is no indication about how the lid was originally held open. There are decorative mouldings on the top of the lids at the ends, plus other mouldings dividing the length of the lid, and along the front and rear edges and over the joints.

KEYWELL FLAP: Oak, 236 – 238 – 238 wide, and 6.9 – 8.8 – 8.3 thick. There are strap hinges made of cast iron, maximum 2.3 thick. The keywell flap was originally attached to the baseboard with wire hinges.

LOWER GUIDE BOARD: Deal, 66 wide and 4.0 thick. Nailed to the top of the frames. Leather guide glued underneath. There are strengthening bars either side of the register, the front one 18 high and 4 wide.

SOUNDBOARD: Coniferous wood, 2.7 – 3.5 – 2.8 thick at the keywell liner. The top of the soundboard is approximately 58 below the top of the case. Four gilded roses, 77.1, 51.6, 78.6 and 64.3 diameter, (of wood glued on top of parchment), supported by small bars underneath. The soundboard wood is bevelled around each rose.

SOUNDBOARD REGISTER: Leather, 865 long, 27.5 – 26.5 wide and 1.4 thick. Slots typically 13.0 x 4.9. There are string-guiding marks on the register leather between the wide pairs of strings positioned under the rear string of each pair.

SOUNDBOARD BARRING: Deal. The cut-off bar is c. 30 deep, and the other bars are c. 20 deep. The bars are 8 – 6 thick.

WRESTPLANK CAPPING PIECE: Oak, 4.5 thick. For the treble wrestpins, 28.2 wide without, and 52.6 wide with applied mouldings.

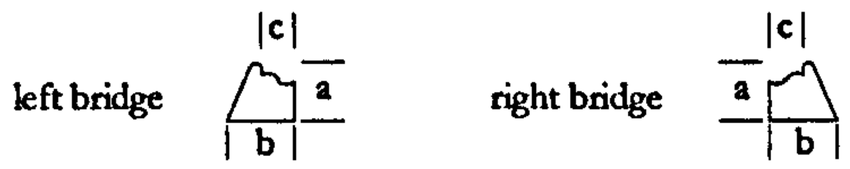
SOUNDBOARD MOULDINGS: Cedar, 4.2 thick. Left case end and spine 12.0, other mouldings 11.1 wide. The hitchpins on the right side go into an oak strip 8.5 wide, set 5.0 above the top of the soundboard moulding.

OTHER MOULDINGS: All other mouldings are of conifer wood. The faceboard mouldings are 3.5 thick. The moulding on top of the faceboards, keywell sides and nameboard are 16.4 wide. The soundwell top edge mouldings are 15.6 and 5.0 thick.

HITCHPINS AND TUNING PINS: The hitchpins are brass, 1.7 diameter. The bass tuning pins are 4.4 diameter and protrude 36 from the top of the soundboard. The treble tuning pins are 4.0 diameter, and protrude 32 from the wrestplank capping piece. The tuning pins are of iron. The tuning pins have been divided so that the notes up to $G^{\#}$ are on the soundboard behind the left bridge, and notes A to d^3 are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. There is a scribed line on the crest of the left bridge. There are positioning holes at the front of both bridges. The bridgepins are of brass, the pins from FF – d^1 1.5 diameter, and from e^{b1} – d^3 1.24 diameter. The right bridge is backpinned from FF – $g^{\#}$.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	10.0	9.7	9.5	9.3	9.4
b	15.6	15.8	16.0	16.4	15.9
c	5.1	5.4	5.5	5.2	5.0

right bridge	C	c	c^1	c^2	c^3
a	9.7	9.9	8.8	8.9	8.2
b	16.7	17.0	16.7	16.6	16.7
c	6.1	5.6	6.2	5.7	6.3

String Lengths and (Plucking Points)

		f^1	**395½ (61)**	**F**	**1142 (91)**
		e^1	431	E	1202
		e^{b1}	438	E^b	1216
d^3	131½ (49½)	d^1	484	D	1280
$c^{\#3}$	133½	$c^{\#1}$	492½	$C^{\#}$	1295
c^3	**151½ (51½)**	**c^1**	**535½ (68½)**	**C**	**1361 (112)**
b^2	153	b	545½	BB	1377
b^{b2}	169½	b^b	592	BB^b	1446½
a^2	171½	a	602½	AA	1463
$g^{\#2}$	190½	$g^{\#}$	654	$GG^{\#}$	1536
g^2	192	g	664	GG	1555
$f^{\#2}$	213½	$f^{\#}$	721	**FF**	**1624 (151)**
f^2	**215½ (48)**	**f**	**732 (69½)**		
e^2	235½	e	786		
e^{b2}	238	e^b	797		
d^2	260	d	849		
$c^{\#2}$	263	$c^{\#}$	859		
c^2	**287 (58½)**	**c**	**912½ (82½)**		
b^1	291½	B	925½		
b^{b1}	317½	B^b	986		
a^1	321	A	999		
$g^{\#1}$	349	$G^{\#}$	1055		
g^1	356	G	1069½		
$f^{\#1}$	389½	$F^{\#}$	1126½		

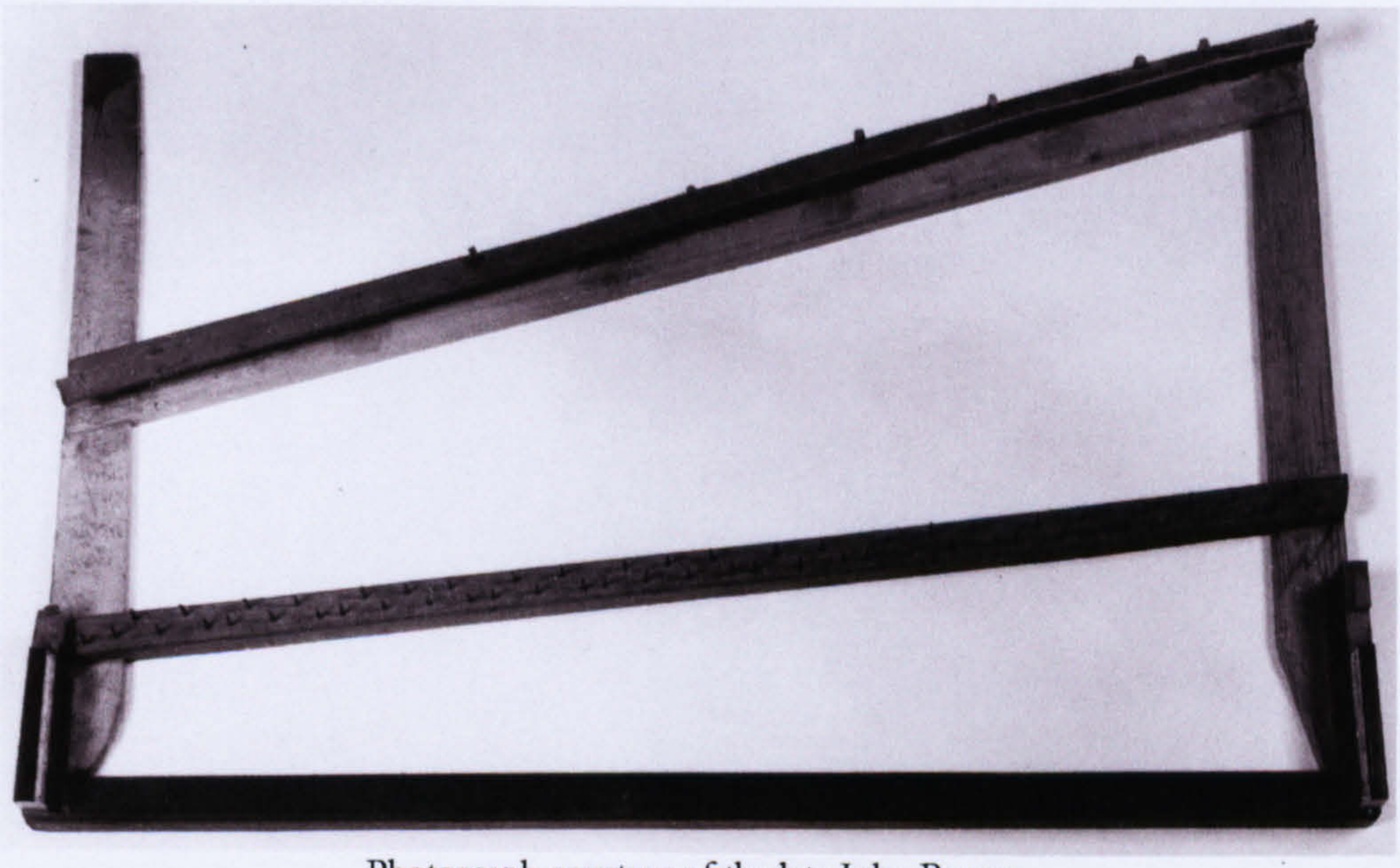
Keyboard and Action

COMPASS: FF,GG – d^3.

BALANCE RAIL: The balance rail is oak, 25.3 wide and 28 deep. The balance pins are iron, 1.35 diameter, and protruding 18 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, tapering in thickness from the front to the rear (the widest part at the front, see Plate 1668SK.2). The backrail is deal, 49.4 wide and 17.2 thick.

Plate 1668SK.2 – Top view of the 1668 SK keyframe.



Photograph courtesy of the late John Barnes.

RACK: Poplar, attached to the top surface of the backrail. The rack is 3.6 thick, 37.6 high. There are scribed lines along its length at the top and bottom of the rackslots.

FRONTRAIL: Deal, 29.0 wide and 12.8 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 34.2 high and 4.1 thick.

ENDBLOCKS: Sycamore. The left endblock is 127 long, 17.4 wide and 44.0 – 40.5 high. The right endblock is 153 long, 16.1 wide and 44.0 – 42.5 high. There is a "dustcatcher" which fits into slots in the endblocks and sits under the nameboard.

KEYBOARD WIDTH: Overall width between the keywell sides 825, and between the endblocks 789. The overall width of the keyboard is 785½, and the three-octave span is 486.

KEYLEVERS: Deal, 15.1 thick at the front, tapering to 12.3 at the rear. The rackpins are of deal, rectangular in shape. The lowest keylever is 263 long and the balance point is 107½ from the front of the touchplate. The top keylever is 502 long, and the balance point is 192 from the front. The accidental keylevers are balanced 10.0 behind the line of the naturals.

NATURAL TOUCHPLATES: Snakewood, generally c. 108 long, but not consistent, and tapering in thickness from 2.6 at the front to 1.4 at the rear. There are four scribed lines on the front section, 23.8, 26.2, 29.9 and 32.3 from the front edge. The touchplates overhang the keylevers by 2.9.

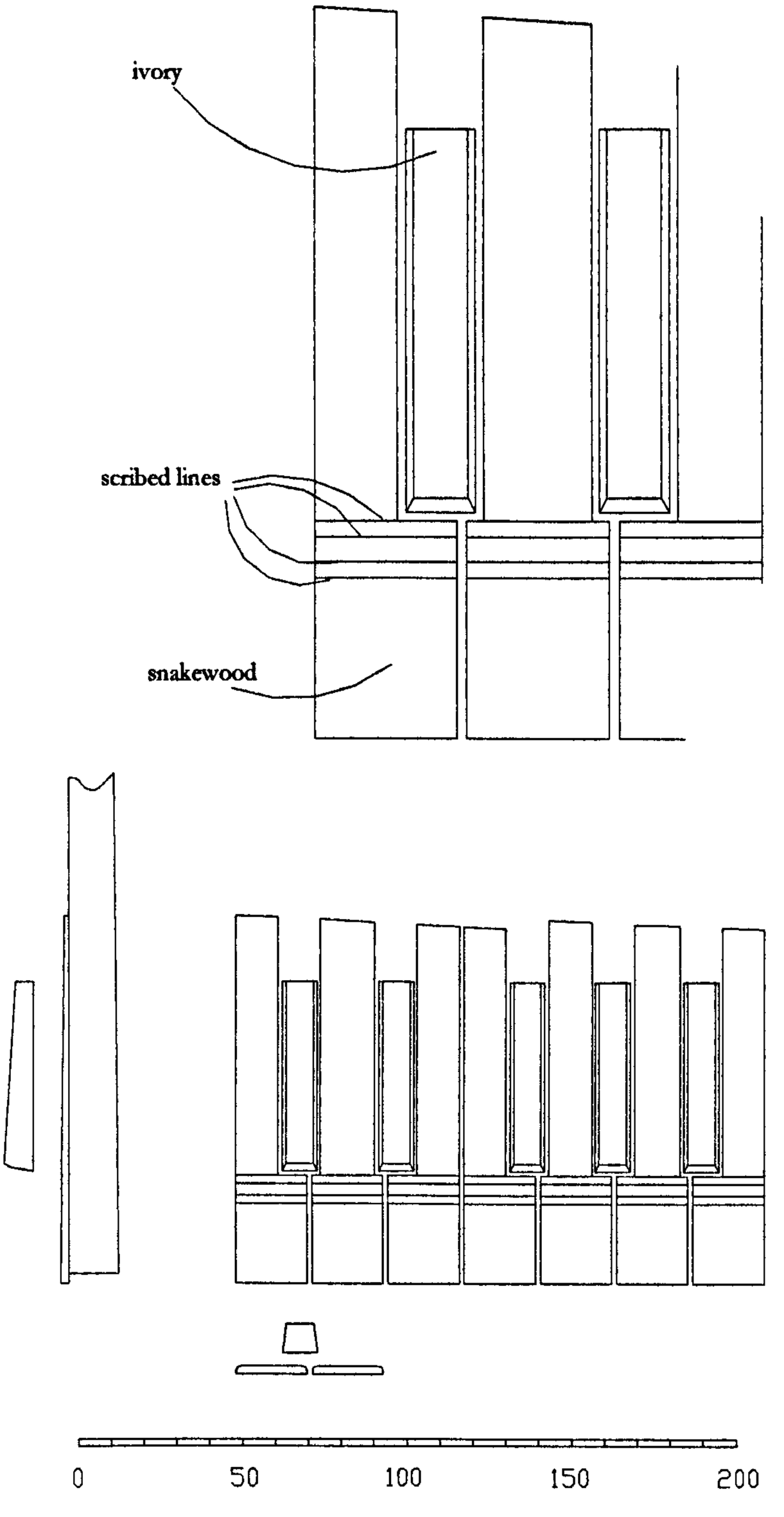
The natural touchplate widths in between the accidentals are:-

		e^2	13.3	e^1	12.3	e	12.8	E	12.2
d^3	17.8	d^2	16.6	d^1	16.3	d	16.4	D	16.0
c^3	13.4	c^2	12.6	c^1	12.6	c	12.7	C	12.9
b^2	12.1	b^1	13.1	b	12.4	B	12.5	BB	13.8
a^2	13.8	a^1	13.8	a	13.3	A	13.8	AA	17.3
g^2	13.3	g^1	13.2	g	13.2	G	13.2	GG	12.5
f^2	12.4	f^1	13.7	f	12.4	F	12.6	FF	22.7

ACCIDENTAL TOUCHPLATES: Solid ivory. The overall length is typically 57.1, and total height 8.6 (front) – 5.2 (rear). They taper in width from 10.6 at the bottom to 8.3 at the top.

There are no original jacks or action cloths.

Figure 1668SK.2 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise was decorated only by the ironwork strap hinges and lockplates. Both the lid and the keywell flap were originally attached to the corpus of the instrument with wire hinges. There are strap hasps between the lid and the keywell flap, the two outer hasps attaching to turnbuckles on the keywell flap, and the central hasp attaching to a lockplate.

The soundboard is decorated with border patterns, flowers and birds. There are four roses of geometric designs. In each of the roses the top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1671 PJ and 1675 SK instruments.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by gilt pressed papers. The flat part of the bands have painted floral-work in red and white around the outer part of the faceboards and the keywell. The outer gilt papers on the faceboards, keywell sides and nameboard are of the "Carolus shield" design, and the inner bands (plus the papers around the soundwell), are of the "monkey" design. The arcades are of the "sunflower" design. In the centre of the nameboard and right faceboard there is an octagonal plaque with flowers painted over a gilded background.

The lid interior has a typical landscape painting with figures in front of trees and a building. The keywell flap interior has a similar painted scene, somewhat damaged. There are flat black borders around both paintings.

Condition

The 1668 SK is in playing condition, having been (most recently) restored by John Barnes. Musically it is in fine condition, although a non-original soundbar under the right bridge must have an acoustical effect.

Decoratively the instrument is in a fragile state, with the gold lifting from the plaques on the nameboard and the right faceboard, and with abrasive wear to the landscaped painting on the keywell flap. A number of the pressed papers are not

original, dating from a restoration by Leslie Ward in 1950. These papers are identical to papers he used in the restoration of the 1664 RH.

Commentary

The 1668 SK is the largest, and one of the best known, surviving English virginals. It formed part of Raymond Russell's Collection, and was given to the University of Edinburgh following his death in 1964. It has been used as an illustrated example of a typical English virginal in Russell (1959).

The 57-note compass - FF,GG – d^3 - is the largest of any extant virginal, and this instrument is one of three with chromatic basses – all dating from the mid-1660s. The scaling-design note (c^3) string length is 151½ mm (six inches) implying that its pitch level was V.

Aside from its compass, this virginal has several features which are different from the 1675 SK and the 1671 PJ (an instrument of very similar design to the 1675 SK) virginals. The mouldings are of natural wood, rather than the green colour of the 1675 SK and 1671 PJ instruments; and there are added pieces, approximately 6 mm thick, around the soundwell, on top of which is a moulding topped with ivory buttons. This is also found on the 1684 TB (another instrument in the Keene workshop tradition), but is otherwise unknown in England. The general effect is similar to an Italian "false inner-outer" instrument.

The wrestplanks are separated, the "bass" wrestplank being behind the left bridge, with the "treble" wrestplank in its normal position placed diagonally from the spine to the right case end. The 1675 SK and 1671 PJ also have wrestplanks divided in this manner.

There are gauge markings from the tenor part of the compass to the treble as follows:-

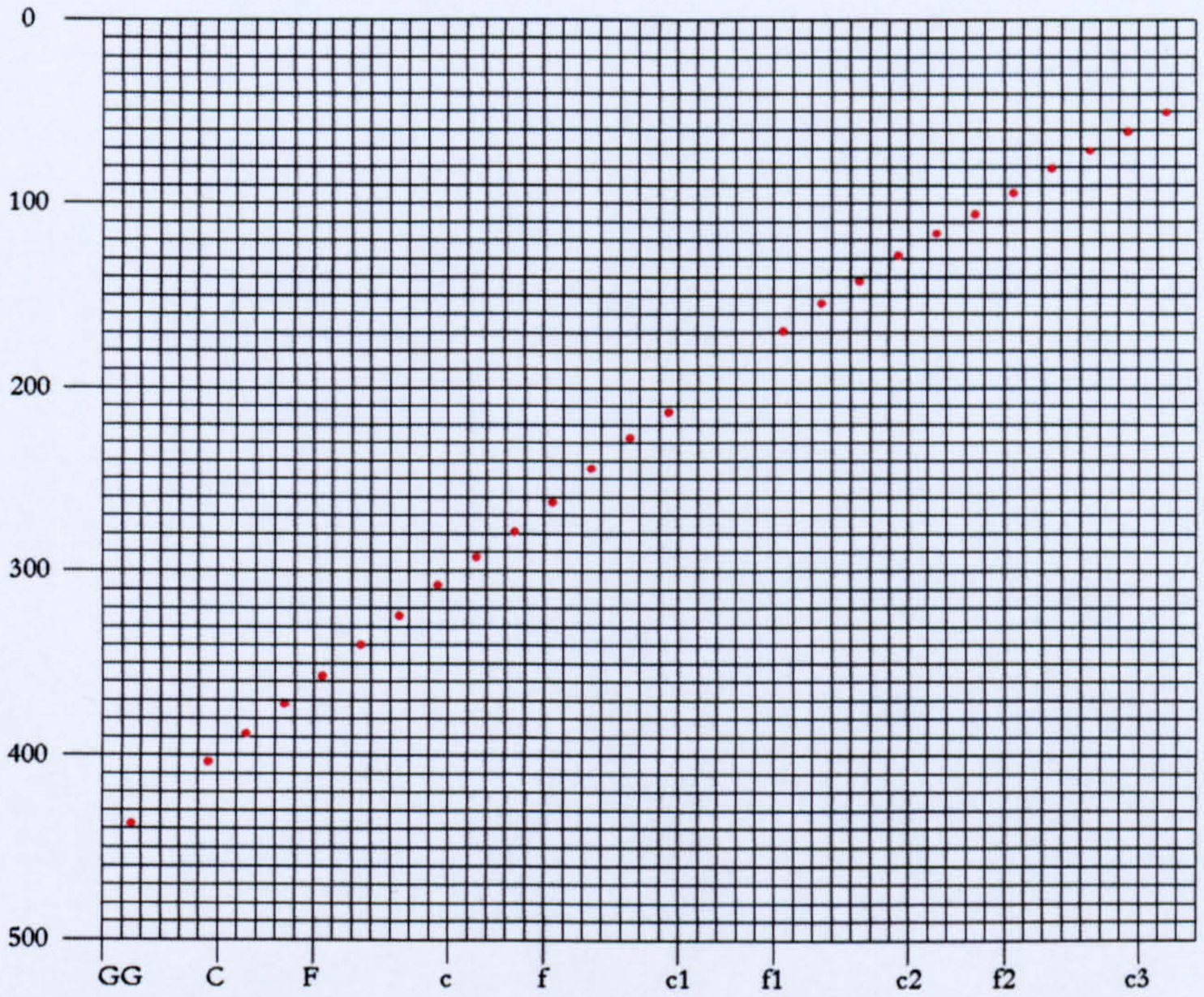
Table 1668SK.1 – Gauge numbers found on the 1668 SK virginal.

Gauge 1	$g^{1} - d^{3}$
Gauge 2	$a - f^{\#1}$
Gauge 3	$c^{\#} - g^{\#}$
Gauge 4	G# - c
Gauge 5	-
Gauge 6	E - G

The numbers are written in a nineteenth-century hand, and probably refer to Birmingham wire gauge sizes. It is possible that they have significance for the original stringing, given the absence of any obvious eighteenth-century repair work carried out on the instrument. Gauge 5 is missing, and no gauge numbers are visible below E, despite the note names being visible by the tuning pins.

There are scribed lines on the bridge to act as guides for the bridge pins. They are parallel to the spine, and have been graphed below. Some of the lines are no longer visible. The marks are not spaced in a consistent manner. The missing marks make it impossible to determine the likely pin groupings.

Graph 1668SK.1 – Graph of the bridge marks in relation to the spine.



1675 SK

Plate 1675SK.1 – Three-quarter view of the 1675 SK virginal.



Ownership and Provenance

Private Ownership, Cheshire. Believed to have always been in the same family's possession.

References

B1 & B2 English virginal table No. 16, B2 Keene No. 1a, B3 No. KEENE, S. 1675.

Inscriptions

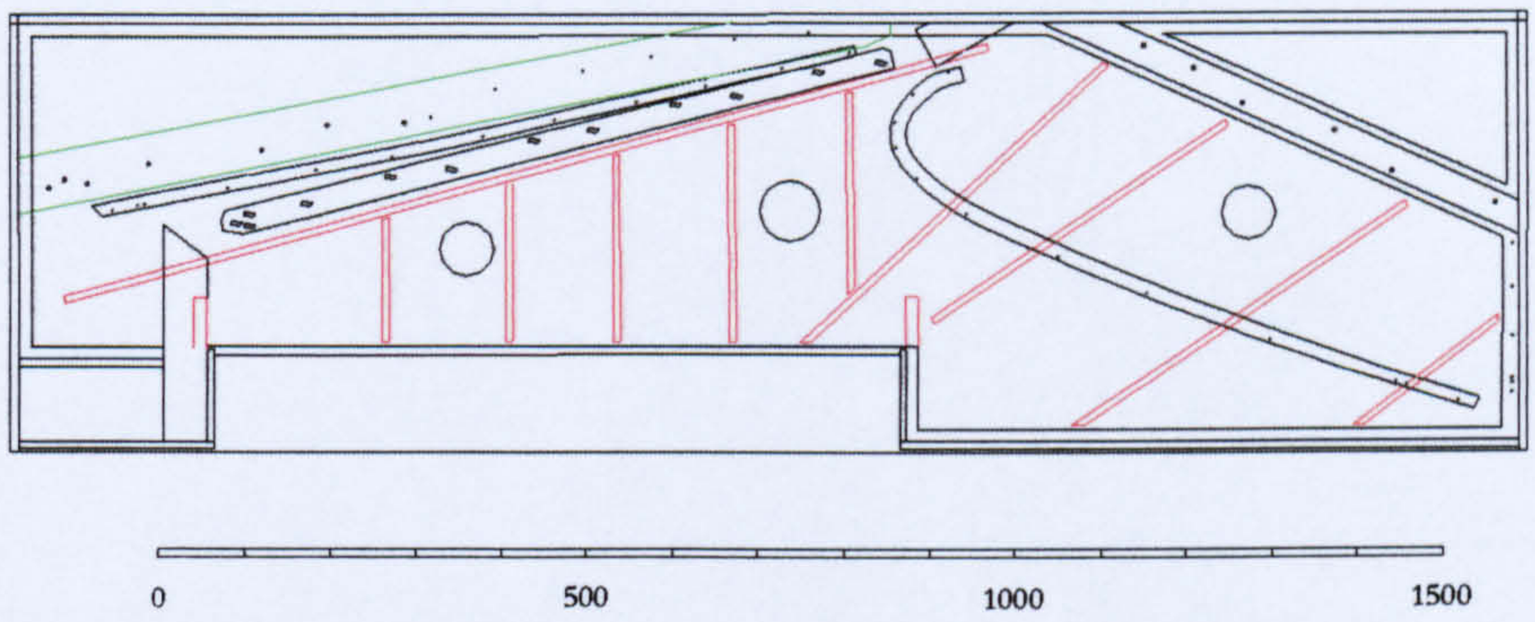
Signed "Stephanus Keene Fecit 1675" on the front of the jackrail.

Plate 1675SK.2 – Signature on the front of the jackrail.



Construction

Figure 1675SK.1 – Plan view of the 1675 SK virginal.



OVERALL INSTRUMENT DIMENSIONS: 1777 x 516 x 225.

BASEBOARD: Deal, two planks, the rear plank 248 wide. 12.3 - 11.9 – 12.6 thick at front. The baseboard is not rectangular, the total length of the case at the front is 1777, and 1773 at the spine.

SPINE: Deal, 1773 long, 225↔ high, 10.5 – 10.0 – 11.1 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 515↔ long, 225 high, 10.4 – 9.7 thick; the right case end 516 - 517 long, 224 high, 10.6 – 10.0 thick. The spine and case ends overlap the baseboard. The case ends are nailed to the baseboard.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 229 long, 207↔ high and 8.4 thick. Right faceboard 725 long, 208 – 205 – 207 high and 9.8 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 117 (left) and 119 (right) long, 7.7 (left) and 7.8 (right) thick. Slots for the nameboard have been cut into the keywell sides 100½ – 105½ (left and right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 812 – 808 long, 157 - 159 high, and 9.9 – 7.8 thick.

KEYWELL LINER: Deal, 73 – 74½ high, 11.3 – 11.0 thick.

OTHER LINERS: Deal, c. 35 – c. 40 high. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard. These protrusions extend about 70 past the keywell-back liner.

WRESTPLANKS: Beech, ‡40 thick. There are separate wrestplanks for the bass and treble tuning pins.

BASEBOARD FRAMES: Deal, 80 high. The inner edges form a continuation of the keywell sides. The frames are 30.4 (left) and 31.3 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 32 high, set 89 - 89½ from the back of the faceboard. Toolbox lid of varnished oak (original?), 167 - 166 long, 100 – 97 wide and 9.5 – 8.5 thick. Iron rod hinges, 2.05 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 882 long (front), 908 long (back). It is 48.0 wide, and 15.3 thick. The bottom of the jackrail is 20.5 (bass) and 24.4 (treble) above the top of the soundboard. There are three layers of woven woollen cloth, with a total (uncompressed) thickness of 5.6 (each 0.9 tightly compressed) attached to the underside of the jackrail. These cloths are old, probably original. The bass jackrail support is of deal, 51.5 wide. The left side is 255 long, the right side 215 long. The treble jackrail support is triangular in shape, 104 long at the front, and 49.7 at the end where it meets the jackrail. The back corner is 590 from the right case end.

LID: Oak, originally coffered in three pieces but now flat. The planks are 169, 174 and 181 wide on the inside, and the front thickness is 8.2 – 9.0. The hinges to the spine are not original, the instrument originally having wire hinges. The lid was probably originally held open by a lid cord on the right side.

KEYWELL FLAP: Oak, 219 – 226 wide, and 11.4 – 10.9 thick. The hinges are not original. The keywell flap is made of two pieces, glued lengthwise (see Plate 1675SK.3). The staining from the original hinges shows this is original.

LOWER GUIDE BOARD: Deal, 87 wide and c. 4.5 thick. Nailed to the top of the frames. Leather guide glued underneath. There are strengthening bars, each approximately 25 high, either side of the register.

SOUNDBOARD: Coniferous wood, 3.5 – 2.7 – 2.7 thick at the keywell liner. The top of the soundboard is approximately 54 below the top of the case. Three gilded roses, 63, 71 and 71 diameter, (of wood glued on top of parchment), glued under the soundboard and supported by small bars underneath. The soundboard wood is bevelled around each rose.

SOUNDBOARD REGISTER: Leather, 805 long, tapering in width from 33.0 (bass) to 26.3 (treble), and 0.6 thick. Slots typically 12.3 x 4.2. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

SOUNDBOARD BARRING: Deal. There is a large cut-off bar, 35 deep in the centre is 8 thick, in front of the register, the other bars are c. 30 high.

WRESTPLANK CAPPING PIECE: Oak, 4.0 thick. For the treble wrestpins, 37.0 wide without, and 58.4 wide with applied mouldings.

SOUNDBOARD MOULDINGS: Cedar, 4.1 thick. Left case end 15.4, spine 15.3, other mouldings 13.6 wide. The bass hitchpins go into a piece 19½ wide and 3 thick at the right end, and the treble hitchpins into the soundboard wood.[1]

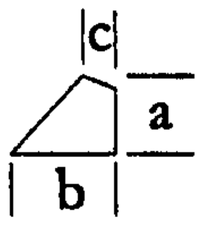
OTHER MOULDINGS: All other mouldings are of conifer wood. The faceboard mouldings are 4.3 thick. The moulding on top of the faceboards, keywell sides and nameboard are 16.0 wide. The soundwell top edge mouldings are 25.8 and 4.3 thick.

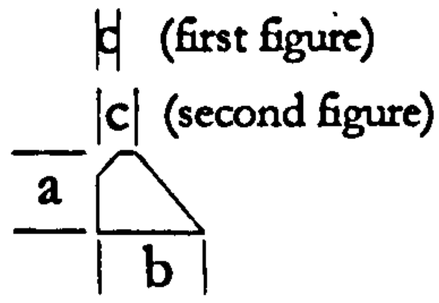
HITCHPINS AND TUNING PINS: The hitchpins are brass, 1.8 diameter. The tuning pins protrude 25 from the top of the wrestplank capping piece, 4.3 diameter, and are of iron. The tuning pins have been divided so that the notes up to b^b are on the soundboard behind the left bridge, and notes b to f^3 are on the treble wrestplank.

[1] Except the top five pins which go into the spine liner as there is no available space on the soundboard.

BRIDGES: Fruitwood, probably pear. There is a scribed line on the left bridge, just to the rear of the bridge pins. On the right bridge there is a flat section at the top of the bridge with a scribed line on the top of the bridge at a constant distance from the front of the bridge, scribed lines either side of the crest of the bridge and a scribed line at the rear of the bridge which marks the chamfer at the bottom of the rear face. The bridge pins are of iron, 1.4 diameter. At the front of the left bridge there is a scribed line to mark its position, and there are positioning holes at the front of the right bridge in front of c^2, c^1 and c.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	10.1	11.5	11.2	11.3	10.2
b	14.6	15.4	14.1	13.9	12.8
c	5.4	5.6	5.5	5.6	5.7

right bridge	C	c	c^1	c^2	c^3
a	10.1	11.3	9.9	9.5	9.0
b	17.2	16.4	17.5	19.5	18.1
c	3.5 / 6.9	3.6 / 6.2	3.9 / 6.2	3.9 / 5.5	4.8 / 7.0

String Lengths and (Plucking Points)

The right bridge has a non-original section from g^2 – e^3 (inclusive).

f^3	**120½ (36½)**	**f^1**	**429 (45)**	**F**	**1231½ (95)**
e^3	130	e^1	467½	E	1296
e^{b3}	130	e^{b1}	478½	E^b	1315
d^3	142	d^1	519½	D	1386
$c^{\#3}$	144	$c^{\#1}$	530½	$C^\#$	1405
c^3	**158 (43½)**	**c^1**	**573½ (62)**	**C**	**1478 (123)**
b^2	161	b	584½	GG/BB	1589½ (130½)
b^{b2}	176	b^b	638	**Ex C**	**1500 (146)**
a^2	179	a	651½		
$g^{\#2}$	197½	$g^\#$	701½		
g^2	200½	g	716		
$f^{\#2}$	220	$f^\#$	772		
f^2	**225 (36)**	**f**	**786½ (67)**		
e^2	247	e	834½		
e^{b2}	251½	e^b	851		
d^2	276	d	908½		
$c^{\#2}$	282½	$c^\#$	924		
c^2	**307½ (45)**	**c**	**979½ (87)**		
b^1	313	B	997½		
b^{b1}	340	B^b	1056½		
a^1	348	A	1073		
$g^{\#1}$	378	$G^\#$	1131½		
g^1	385½	G	1147½		
$f^{\#1}$	419½	$F^\#$	1210		

Keyboard and Action

COMPASS: GG/BB – f^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail is beech, 34.3 wide and 25.9. The balance pins are iron, 2.4 diameter, and protruding 18 above the top of the balance rail. The balance rail is rebated into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 40 wide and 8.7 thick. The backrail is deal, 49.3 wide and 15.3 thick.

RACK: Pear?, attached to the top surface of the backrail. The rack is 4.1 thick, 38.0 high. It is scribed on the rear surfaces for the top and bottom of the slots.

FRONTRAIL: Deal, 28.7 wide and 8.7 thick.

KEYWELL BATTEN: Deal, with a moulded top edge along the front, 32.0 high and 3.9 thick.

ENDBLOCKS: Deal. The left endblock is 123 long, 20.4 wide and 37.0 – 34.5 high. The right endblock is 133 long, 21.6 wide and 35.5 – 34.0 high.

KEYBOARD WIDTH: Overall width between the keywell sides 803, and between the endblocks 758. The overall width of the keyboard is 755, and the three-octave span is 481.

KEYLEVERS: Deal, 14.3 thick at the front, tapering to 12.0 at the rear. The rackpins are deal, 2.9 wide and 4.2 high at the joint with the key. The lowest keylever is 310 long and the balance point is 117 from the front of the touchplate. The top keylever is 471 long, and the balance point is 181 from the front. The accidental keylevers are balanced 14.8 behind the naturals.

NATURAL TOUCHPLATES: Snakewood, generally 106 long, and tapering in thickness from 2.7 at the front to 1.0 at the rear. There are three scribed lines on the front section, 26.6, 29.5 and 34.7 from the front edge. The touchplates overhang the keylevers by 3.7.

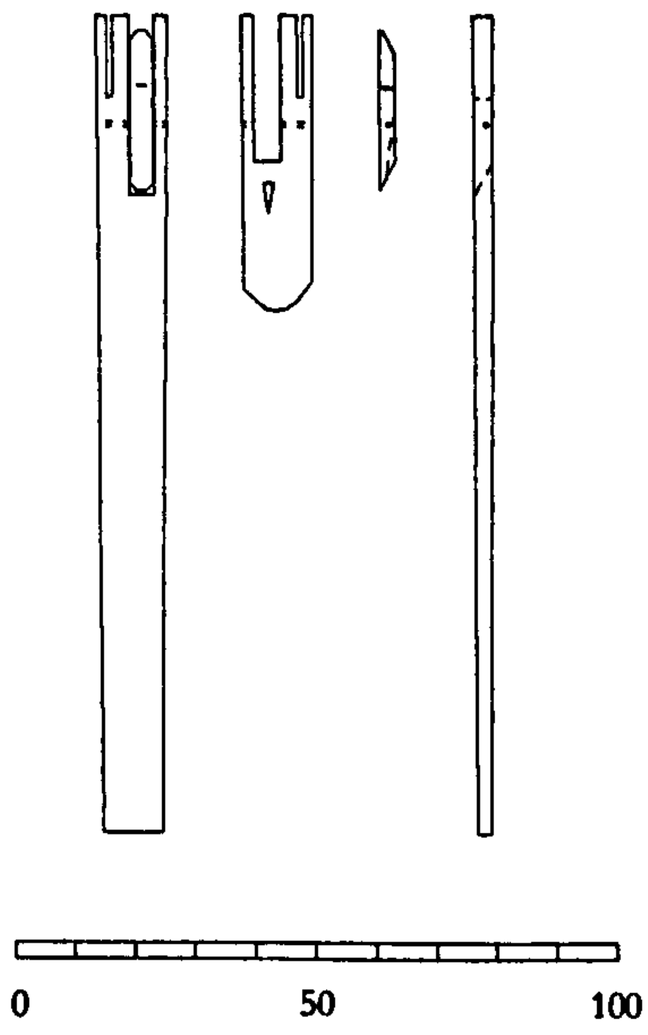
The natural touchplate widths in between the accidentals are:-

f^3	21.2	f^2	12.1	f^1	12.3	f	11.9	F	12.1
e^3	14.9	e^2	13.9	e^1	12.4	e	13.4	E	12.5
d^3	12.9	d^2	13.3	d^1	12.3	d	11.9	D	12.5
c^3	11.7	c^2	12.1	c^1	11.8	c	12.4	C	12.8
b^2	13.7	b^1	13.1	b	13.4	B	12.9	BB	21.2[2]
a^2	10.1	a^1	12.0	a	12.8	A	12.2		
g^2	11.9	g^1	11.7	g	10.8	G	11.5		

ACCIDENTAL TOUCHPLATES: Ivory topped. The overall length is typically 61.8, and total height 7.3 (front) – 3.4 (rear). They taper in width from 12.8 at the bottom to 11.1 at the top.

JACKS: The jacks and tongues are of beech. The total length is typically 133. They taper in width from 11.8 – 9.9, and in thickness from 3.3 to 2.8. The axle pins are positioned 14.9 (63%) from the top of the tongue. The plectrum hole is crescent shaped.

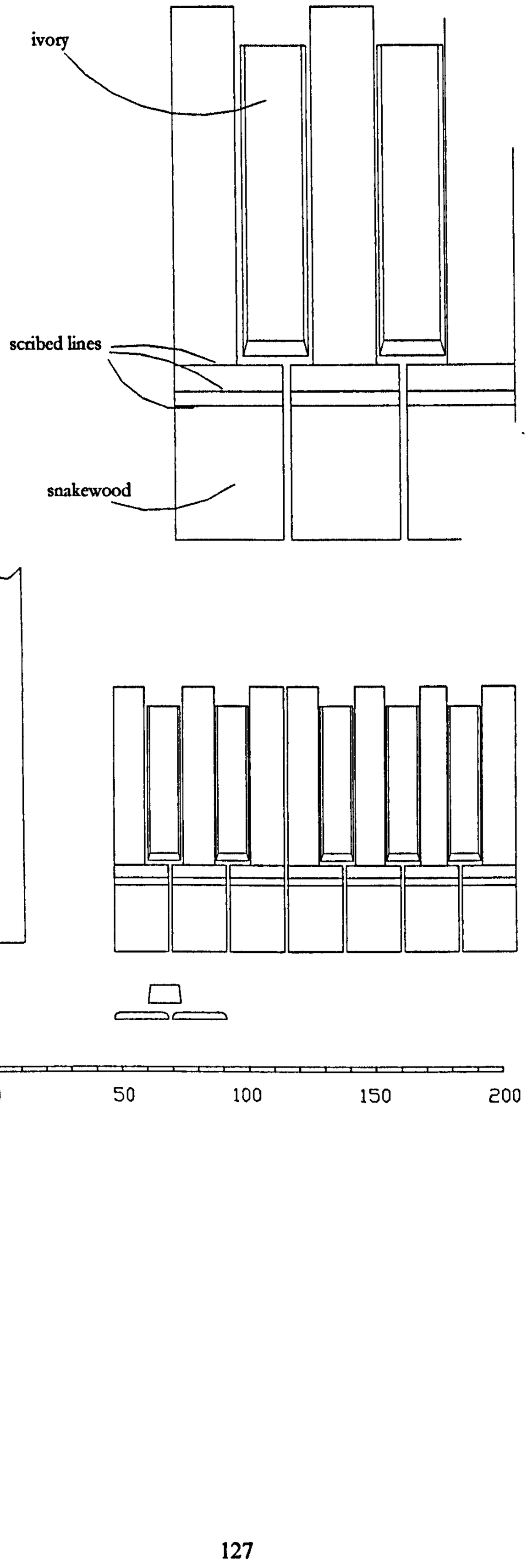
Figure 1675SK.2 – Drawing of a typical jack.



[2] This touchplate has been made of two side-by-side pieces glued together, the wide piece 14.8.

ACTION CLOTHS: There are three layers of woven woollen cloth, with a total (uncompressed) thickness of 5.6 (individual compressed thickness of 0.9) attached to the underside of the jackrail. The backrail is covered of three pieces of cloth, 7.0 total thickness, each 0.7 tightly compressed. The cloth at the back of the keys is 4.0 thick, each strip 23 long. They are glued to the back of the keys along their full length. The balance pins are surrounded by two pieces of backrail cloth 15 x 15, each 2.0 uncompressed. The frontrail is covered with silk wadding of uncertain origin (small possibility of originality). There are two layers of cloth tacked under the fronts of the accidental keys.

Figure 1675SK.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise was decorated only by strap hinges and lockplates. The present hinges are brass, not original, but traces of the original hinges can be seen on the keywell flap.

The soundboard is decorated with border patterns, flowers and birds. The roses are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1668 SK and 1671 PJ instruments.

The keywell, faceboards, soundwell and jackrail are decorated with deal moulded bands separated by embossed papers. The mouldings are painted or stained a green colour. The flat part of the bands have painted scrollwork in red and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Carolus Shield" design, and the arcades are of the "sunflower" design. In the centre of the inner faceboard, keywell sides and nameboard mouldings there is black painted areas with white scrollwork. In the centre of the nameboard there is an octagonal panel with a flower painted on it.

The lid interior has a typical landscape painting with figures in front of a building and trees. Surrounding the painting is a blue border. There is also an added batten, approximately two-thirds of the way along the lid which is painted in the same blue. The keywell flap interior has been painted in the same colour.

Condition

The instrument has received a thorough attempt at restoration, almost certainly during the late 1840s.[3] This work has included flattening the lid, removing the original hinges and replacing them with brass examples in nineteenth century style, attaching the keywell flap to the front of the lid, adding flat battens to each end of the lid and another approximately 500 mm from the right end, painting these battens and the

[3] The information concerning the restoration work comes from Charles Foster, who has researched the history of the family who own the instrument at the house it is in. The work was carried out by a north-English firm of organ builders.

keywell flap in a flat blue colour, adding some lead weights to the backs of certain keys, and building a new stand in nineteenth-century style.[4]

The instrument is not presently in playing condition, and would require considerable work to be made playable. The stringing on the instrument is nineteenth century. There are some added pieces of wood at the back of the keylevers which have been placed in an attempt to raise the effective height of the back of the keys so that the quills are a suitable height under the strings.

There is evidence of water damage to the central lid panel, and the individual pieces have clearly been reduced in width when the lid was flattened.

A section of the right bridge, from g^2 to e^3 is not original, but has been replaced very competently, and the string lengths in this region must be very close to the originals.

Despite the above mentioned work the instrument is in good structural condition, suffering from a large soundboard crack but little else. There is some isolated old worm damage. It is not certain if the instrument could withstand the tension of a full restringing with historically-based diameters, and the strings used in the nineteenth century are too thick to be pulled to full tension without damaging the virginal.

Commentary

Despite the alterations suffered by this instrument it is one of the most important surviving examples, even in its present condition. Aside from several features (see below), it has the distinction of having been untouched for over 150 years, thus preserving many original or old ephemera which would most likely have been lost otherwise.

During the author's first examination of the instrument (in 1990) a large number of gold gaming tokens were found underneath the keyboard. These tokens

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[4] Information about the stand comes from Charles Foster. A drawing of the stand is in the house

were manufactured in the eighteenth century and bear the head of George III.[5] These, and the thick layer of dust that was found inside the instrument suggest that there had been no access to the interior of the instrument for many years, probably since the attempted restoration of the 1840s. It is clear that this restoration did not succeed,[6] and therefore the instrument could not have been played from that time onwards. Therefore, apart from the nineteenth-century alterations, the instrument remains as it was when last in playing use during the seventeenth or eighteenth century. A future detailed study may be able to determine considerable information concerning aspects of playing technique (from the wear on the keys) and keyboard instrument voicing (from any old quills which survive). This virginal is possibly the only example which still retains this information with reasonable certainty.[7] As a result, the decision not to attempt to restore this instrument in modern times can only be applauded.

The instrument is notable for several unique or unusual original features. The case ends originally were cut flush with the front of the faceboard mouldings at the front. This was probably carried out during construction, but not necessarily as an original intention. A scribed line can still be seen on the faceboards to indicate where they should be cut to, the front edge of the case sides has been painted or stained the same green as the mouldings and the keywell flap spans from the outside edge of the case ends. It is probable some damage occurred during construction which could not be repaired, leaving the cutting of the front of the case sides as the easiest alternative.

This instrument is the latest dated virginal which retains the extra string and jack for C. In this sense it is very old fashioned, built 14 years after the second youngest instrument with this feature. It is not known if this was a special request from the customer or a standard practice by Keene despite the late date.

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archives.

[5] These tokens are now housed separately from the instrument in the owner's possession.

[6] Most of the jacks are too low to be able to pluck the strings and not all of the keylevers have had additional pieces to raise the height. In addition, the stringing was clearly intended to be for exhibition purposes only. It is likely that the repairers concluded that the instrument could not be properly made to play and abandoned the restoration.

[7] The Mar virginal still retains original jacks which have old quills and dampers, and the 1675 CR still has all of its original action cloths. Both of those instruments may have been returned to playing condition in the nineteenth or twentieth centuries, although this is very unlikely in the case of the Mar. The 1675 SK still has many original action cloths, which are missing from the Mar.

This virginal is one of three in which the scaling-design note jack plucks towards the rear, resulting in the scaling-design note string length being comparatively short. There is no obvious reason why Keene may have done this, but it is possible that by the time this virginal was made his workshop was increasingly turning to the production of spinets in which the *c* strings invariably (in Keene's work) pluck the shorter string, and this practice was followed on this virginal. If this is the reason then the scaling-design note string length of 120½ mm can be confidently considered to be the maker's design intention, and the resulting implied pitch – V - 1s – is almost certainly the intended pitch level.

The keywell flap is unique in being made from two pieces, glued lengthways (see Plate 1675SK.3). The original position of one of the strap hinges between the baseboard and the keywell flap can also be seen in the photograph.

Plate 1675SK.3 – Part of the 1675 SK keywell flap.

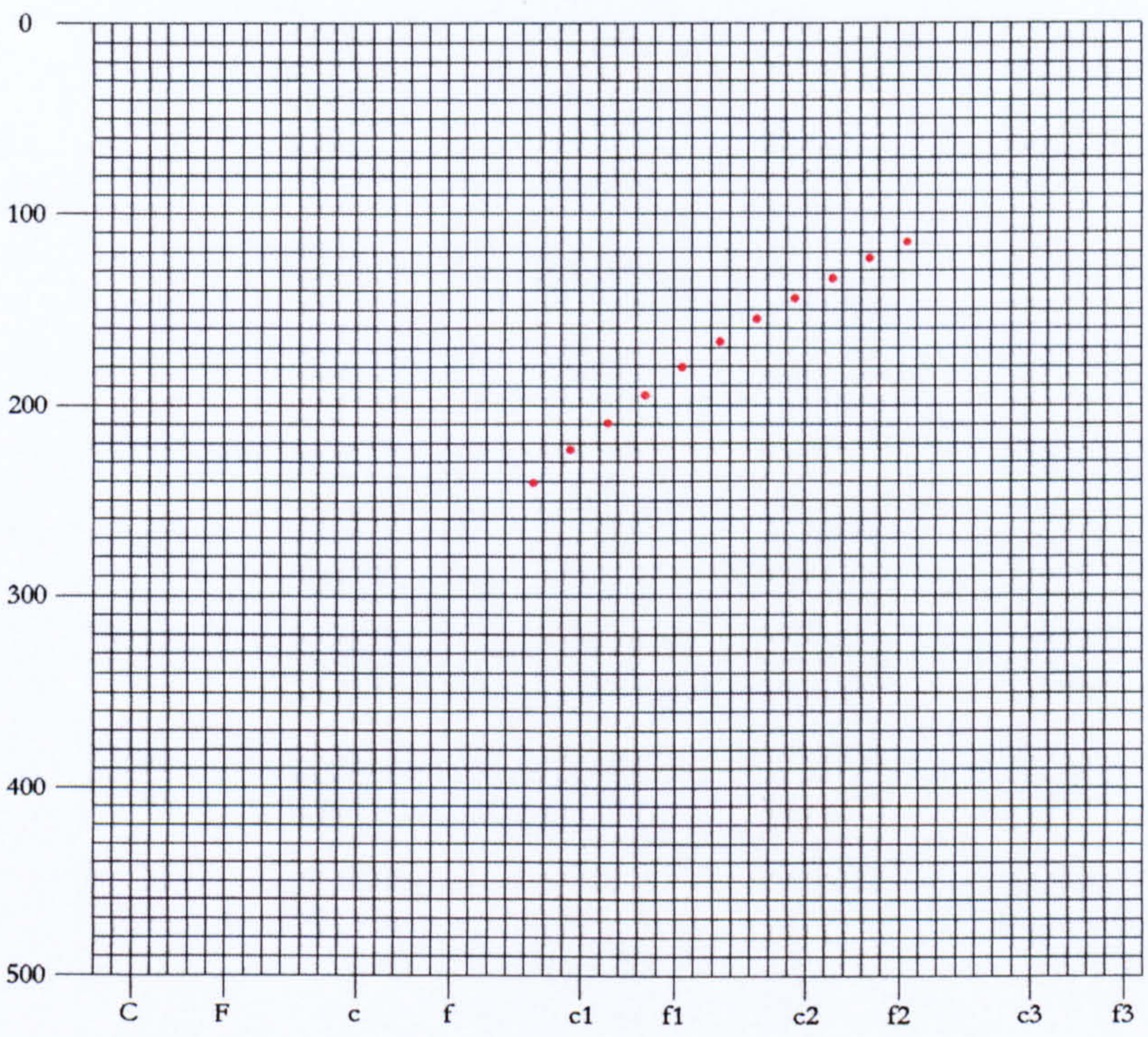


There are a large number of scribed lines on the virginal which were used in construction. There is a line on the baseboard marking the rear of the faceboards, full width lines set 18.7 inside the left keywell side and 17.2 inside the right keywell side, and two other lines – one being 413 from the inside of the left keywell side which is 147 long, and the other 472 from the left keywell side which is 250 long. On the soundboard there are lines at the front of the left bridge; along the back of the register

leather; perpendicular to the spine set 3 to the right of the end of the register; marking the front of the right bridge and extending past it in the treble; a line for the left tuning pins and for the hitchpins. There are also scribed lines on the right wrestplank capping for the tuning pins.

There are scribed lines on the bridge, parallel to the spine, which were used to guide the position of the right bridge pins. These can be seen only in the middle of the compass, and are graphed below.

Graph 1675SK.1 - Graph of the bridge marks in relation to the spine.



Although there are only a small number of visible lines, it can clearly be seen that the space between each of the lines is larger below $g^1/g^{\#1}$. The spaces above there are possibly designed to fit five spaces in two inches, whereas those below give five spaces in 2¾ inches.

It is believed that the instrument has always been in the possession of the family of the present owners. It is situated close to Tabley House, where the 1671 PJ has also been since new. It is certain that the two families would have been social acquaintances, and the relationship between the decoration of the two instruments is probably a reflection of this (see the Further Commentary section, page 134).[8]

[8] As also discussed in the Further Commentary section the construction found in the instruments by Keene and Jones is very similar. It is most likely that Jones worked as a journeyman for Keene before opening his own workshop.

Further Commentary on the Instruments by Keene, Jones and Bolton

The virginals by Keene, Jones and Bolton form a distinctive workshop tradition. The exact workshop relationship is not entirely clear. It is known that Philip Jones did his apprenticeship with John Haward, becoming a Freeman in 1667. It is likely he then commenced working for Stephen Keene as a journeyman, before setting up as a maker on his own account in, or before, 1671. Nothing biographical is known about Thomas Bolton, but several characteristic working methods (discussed below) clearly show he did his apprenticeship, or worked as a journeyman, with Stephen Keene. Three of the instruments, the 1668 SK, 1671 PJ and 1675 SK have divided wrestplanks, so that the tuning pins for the bass strings are to the left of the sounding portions of the strings. They are the only English virginals to have this arrangement. They are also the only surviving instruments which have snakewood naturals and solid ivory accidentals, although it is possible that the original natural touchplates of the 1664 RH were snakewood, rather than ebony as currently found on the instrument. The 1684 TB also has a keyboard with ebony natural touchplates. The 1671 PJ and 1675 SK are both connected by very strong decorative similarities, both having green stained or painted mouldings, and constructional similarities, using an almost identical soundboard barring arrangement. As will be discussed below, there is also a relationship between the original owners of the two instruments. The similarity between these two instruments is so strong that were one of them to be missing its jackrail (and hence signature) an attribution to the same maker would almost certainly be made.

The 1671 PJ and 1675 SK virginals are both believed to be in their original locations, which are geographically very close – within five miles – of each other.[1] It is certain that the original owners knew each other socially, and surely had the opportunity to play each other's instruments. It is very likely that the 1675 SK was ordered after the owners became familiar with the 1671 PJ. A similar decoration was requested. The pitch, however, is different, the 1671 PJ playing at V – 3s, and the 1675 SK at V – 1s. This probably reflects different musical uses. It is known that the 1671 PJ was built for Sir Peter Leycester, and that there was a consort of viols at Tabley

[1] The owners of the 1675 SK have requested that the precise location of the instrument not be divulged.

House. The 1671 PJ plays at the pitch which was defined by Thomas Mace (1676) as "consort pitch", being the usual pitch to which viol consorts were tuned. It is likely the instrument was commissioned specifically with accompanying viol consorts in mind. The 1675 SK was probably intended more for accompanying vocal music, as well as solo playing.

The 1684 TB is now in Warrington Museum, and may originally have belonged to a local family, in a similar geographical location to the 1671 PJ and 1675 SK. Two particularly distinctive features – a cross on the top of the keyplank, and the use of an additional soundwell piece (approximately 6 mm thick) inside the case ends and spine (as also found on the 1668 SK) unquestionably show a relationship to Keene.[2] This instrument differs slightly from Keene in having both wrestplanks in their usual position, to the right of the sounding length of the strings.

One extraordinary feature of the 1671 PJ and 1675 SK virginals is the use of a moulding section which is clearly from the same cutter, even showing an identical flaw.[3] Wraight (1997) has argued that mouldings can be used to positively identify anonymous or falsely inscribed instruments if they match those found in other instruments. On that basis it would suggest that the 1671 PJ and 1675 SK are, in fact, by the same maker. This moulding is found on the jackrail of the 1671 PJ, and on the jackrail and the top of the faceboards, keywell sides and nameboard of the 1675 SK. No other mouldings on these instruments match each other at all, even allowing for the moulding planes to have been re-sharpened. The 1671 PJ has other mouldings with a similar, but not identical, profile to that found on the jackrail, and there is no obvious reason why he could not, or did not, use a single profile throughout. As can be seen from Plate 1671PJ.2 (page 92), the name is painted directly onto the front of the jackrail, rather than onto an applied plaque. This suggests that the jackrail (and bass jackrail support) originated in an instrument by Keene. There is no evidence to suggest that there was originally a plaque, and the decorative work on the front of the jackrail is in a single

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[2] The ivory studs in the top of the soundwell cap moulding are also found on the 1668 SK, but may be attributable to the decorator rather than the maker.

[3] The moulding impressions were made with "Optosil® P plus", as described in this volume, page 2. Plaster casts were made of the mouldings from the casts for comparative purposes, enabling a positive from one instrument to be compared directly to the negative from the other.

hand throughout, which would appear to rule out a fraudulent alteration.[4] The lack of other corresponding mouldings makes it unlikely that Keene was responsible for the entire instrument. It is therefore likely that Jones obtained the jackrail and bass jackrail support – or the mouldings themselves at least – from Keene for use in his instrument.

Philip Jones commenced his apprenticeship with John Haward on 13 July, 1658 (information from B3). Assuming he commenced his apprenticeship at 14, the normal age, he would have been born in 1644. In 1671, when the virginal was made, he would have been 26 or 27 years old, an age where he was allowed to have his own business (see Chapter One, page 13). It is possible that Jones was still working for Keene when the 1671 virginal was made, or (more likely) that they were working as independent businesses, but sharing Keene's workshop. The 1675 SK virginal was ordered by customers who were social friends of the Leycester family (who ordered the 1671 PJ), and it is likely that the Keene was ordered in the same manner as the Jones instrument. Perhaps the simplest explanation is that Keene was originally asked to make a virginal for the Leycester family in 1671, but passed the order to Philip Jones (with the customer's consent). This might have been to assist Jones financially at the beginning of his career. This appears to be in Keene's character – he later jointly signed spinets with Edward Blunt and then Charles Brackley, both former apprentices of his. Assuming Jones was sharing a workshop with Keene it is entirely plausible he picked up the wrong jackrail. When the 1675 virginal was ordered, requesting a similar decorative scheme, Keene was able to carry out the order himself rather than pass it to Jones.

Whatever the precise reason for the identical moulding, the evidence suggests that the signatures on both instruments are correct, and that two different makers (albeit of the same workshop tradition) used mouldings made with the same tool.

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[4] It would also be difficult to suggest a fraudulent alteration as the instrument has always been at Tabley House. There would have been little opportunity to falsify the inscription.

1666 AL

Plate 1666AL.1 – Three-quarter view of the 1666 AL virginal.



Photograph by kind permission of Yale University Musical Instrument Collection.

Ownership and Provenance

Belle Skinner Collection, Yale University, New Haven, Conneticut, Inventory number 4871.60. Previous owners (from the earliest to the most recent) T. Mackinley, E.F. Rimbault, Messrs. Chapell, Arthur F. Hill, Belle Skinner. Galpin (1911) claims that the instrument belonged to Nell Gwynne (mistress of Charles II).

References

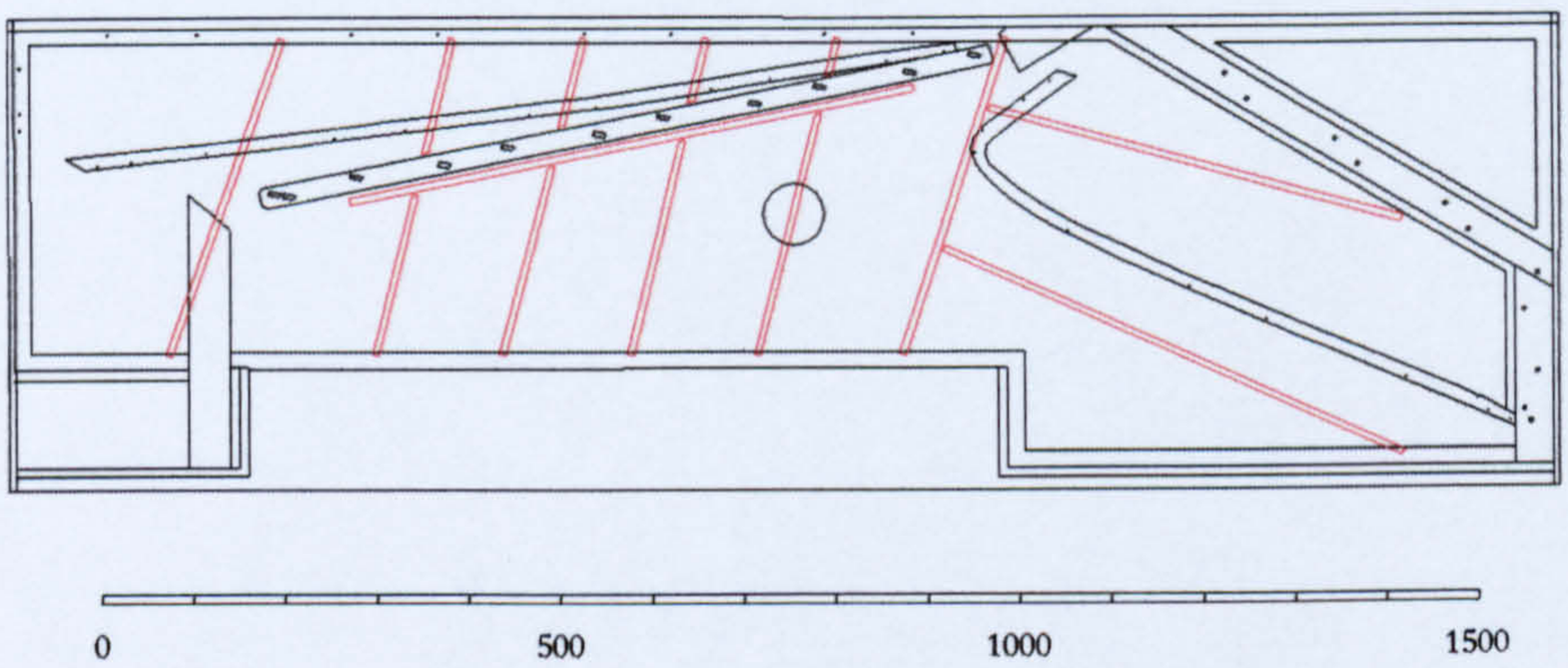
GD3 & GD4 No. 7; B1 & B2 English virginal table No. 11, B1 & B2 Leversidge, Adam No. 1, B3 No. LEVERSIDGE, A. 1666. Skinner (1933), Rimbault (1860), Galpin (1911).

Inscriptions

Signed "Adamus Leuersidge Londini Fecit I666" on the front of the jackrail. On the back of the nameboard is inscribed "Restored by Chickering and Sons under the Direction of Arnold Dolmetsch Boston U.S.A.. 1909"

Construction

Figure 1666AL.1 – Plan view of the 1666 AL virginal.



OVERALL INSTRUMENT DIMENSIONS: 1691 x 515½ x 223.

BASEBOARD: Deal, three planks, the front plank 77, the middle plank 174 wide. 12.0 – 11.9 – 12.5 thick at front.

SPINE: Deal, 1689 – 1692 long, 220 – 225 – 221 high, 12.4 – 11.9 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 517½ - 516 long, 223↔ high, 7.7 – 6.2 thick; the right case end 518 - 515 long, 225 - 223 high, 6.3 – 7.8 – 7.2 thick. The spine and case ends overlap the baseboard. The faceboards are butted to the case ends and have dowels from the faceboards through the case ends. Both case ends are made of two pieces, glued lengthways. On the left end the top piece is 146 - 144 high, and the right hand 166 - 176 high.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 254 long, 209 – 208 high and 9.1 thick. Right faceboard 605 long, 208 – 206 – 210 high and 9.1 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 123 (left) and 122(right) long, 10.3 (left) and 10.2 (right) thick. Slots for the nameboard have been cut into the keywell sides 108 – 113 (left) and 106 – 113 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 827 – 823, 146 - 144 high, and 11.2 – 8.3 thick.

KEYWELL LINER: Deal, 78.5 – 79.5 high, 15.0 – 15.5 thick.

OTHER LINERS: Oak and deal. The keywell-side liners originally extended past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Beech, not original.

BASEBOARD FRAMES: Lime, 80 high. The inner edges form a continuation of the keywell sides. The frames are 16.8 (left) and 16.7 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 29.8 high, set 96 - 96½ from the back of the faceboard. Toolbox lid of oak, 184 - 185 long, 106 - 107 wide and 10.7 thick. Iron rod hinges, 2.1 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 875 long (front), 908 long (back). It is 45.4 wide, and 19.2 thick. The bottom of the jackrail is 20 (bass and treble) above the top of the soundboard. The bass jackrail support is of deal, 45.3 wide. The left side is 295 long, the right side 257 long. The treble jackrail support is triangular in shape, 93.5 at the front, and 46.9 at the end where it meets the jackrail. The back corner is 500 from the right case end, and it is at an angle of 148½° to the spine.

LID: Oak, coffered in three pieces. The planks are 183, 175 and 175 wide on the inside, and the front thickness is 7.0 – 9.7. Applied mouldings along the joins and the ends on the top surface. End battens 16.6 (left) and 18.0 (right) thick, with an inside coffer height of 54 (left) and 57 (right). Strap hinges between the spine and the lid. There are oak prop-sticks to hold to lid open, unlikely to be original.

KEYWELL FLAP: Oak, 210 – 214 – 210 wide, and 7.9 – 9.3 thick. Iron strap hinges, maximum 2.4 thick between the baseboard and the keywell flap.

The lower guide board is not original.

SOUNDBOARD: Coniferous wood, 2.2 – 2.3 – 3.1 thick at the keywell liner. The top of the soundboard is approximately 47½ below the top of the case. Non-original rose, 67.2 diameter, (of wood glued on top of card), glued to the soundboard from underneath.

SOUNDBOARD REGISTER: Leather, 812 long, 23 wide and 1.3 thick. Slots typically 13.3 x 6.6. The register leather is probably not original.

SOUNDBOARD BARRING: Not original, but the original barring is shown by glue remains.

WRESTPLANK CAPPING PIECES: Oak, 4.2 thick. The treble wrestplank capping is 34.8 wide without, and 56.9 wide with applied mouldings; and the bass wrestplank capping is 41.9 (without) and 51.8 (with mouldings).

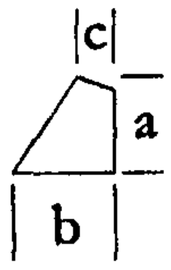
SOUNDBOARD MOULDINGS: 4.0 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 17.7 wide, and the spine moulding is 15.5 wide. The other soundboard mouldings are cedar, 18.0 wide.

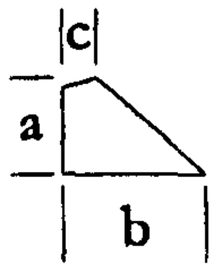
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 3.8 thick. The moulding on top of the faceboards, keywell sides and nameboard are 19.3 wide. The soundwell top edge mouldings are 19.5 and 3.5 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.86 diameter. The tuning pins protrude 28½ from the top of the wrestplank capping piece, 4.2 diameter, and are of iron. The tuning pins have been divided so that the notes up to e are on the bass wrestplank, and notes f to f^3 are on the treble wrestplank.

BRIDGES: Probably walnut. There are scribed lines on both bridges, scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are iron, 1.0 diameter. There are positioning holes, some plugged, at the front of each bridge. There are no positioning holes or scribed lines by either bridge.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	10.1	10.1	10.1	10.1	10.0
b	14.2	14.0	14.2	13.7	11.7
c	3.5	3.8	3.6	4.1	4.1

right bridge	C	c	c^1	c^2	c^3
a	9.8	9.8	10.0	9.2	9.5
b	12.0	14.7	14.2	16.8	16.0
c	5.0	4.5	4.8	4.8	5.2

String Lengths and (Plucking Points)

The left bridge has separated from the soundboard throughout its length. The following table lists the present string lengths and plucking points, with the estimated original string lengths and plucking points for the *c* and *f* notes given in *italics*.

f^3	**120 (35) *115½ (31½)***	b	654½
e^3	121½	b^b	668
e^{b3}	137	a	723
d^3	138½	$g^\#$	735
$c^{\#3}$	154½	g	797
c^3	**155½ (34) *150½ (29)***	$f^\#$	811½
b^2	173½	**f**	**871 (117) *867 (113)***
b^{b2}	174½	e	885½
a^2	192½	e^b	947½
$g^{\#2}$	193½	d	962½
g^2	212½	$c^\#$	1020
$f^{\#2}$	215	**c**	**1034 (130) *1031 (127)***
f^2	**238½ (59) *233½ (54)***	B	1100
e^2	239½	B^b	1117
e^{b2}	525½	A	1178
d^2	265	$G^\#$	1191
$c^{\#2}$	291	G	1254½
c^2	**295 (51) *290 (46)***	$F^\#$	1272½
b^1	331	**F**	**1332½ (171) *1329 (168)***
b^{b1}	331	E	1349½
a^1	335½	E^b	1411
$g^{\#1}$	380½	D	1430
g^1	420	$C^\#$	1489½
$f^{\#1}$	426½	**C**	**1505 (183) *1502 (180)***
f^1	**470 (81) *465 (76)***	GG/BB	1565 (203) *1560 (200)*
e^1	477½		
e^{b1}	525½		
d^1	535		
$c^{\#1}$	588½		
c^1	**599 (79) *594 (74)***		

Keyboard and Action

COMPASS: GG/BB – f^3.

BALANCE RAIL: The balance rail is oak, 25.2 wide and 38.3 high. The balance pins are iron, 2.2 diameter, and protruding 20 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, tapering from 56 – 47 (left) and 57 – 51 (right) wide and are 12.3 thick. The backrail is deal, 46 wide and 23 thick. The rack and key-guiding system is not original.

FRONTRAIL: Oak, 26 wide and 10.5 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 46.8 high and 3.8 thick.

ENDBLOCKS: Deal. The left endblock is 141 long, 17.0 wide and 52.6 – 44.5 high. The right endblock is 128 long, 15.0 wide and 45.8 – 40.0 high.

KEYBOARD WIDTH: Overall width between the keywell sides 818, and between the endblocks 782. The overall width of the keyboard is 779, and the three-octave span is 498.

KEYLEVERS: Lime, 15.1 thick at the front, tapering to 8.2 at the rear. The lowest keylever is 316 long and the balance point is 109 from the front of the touchplate. The top keylever is 468½ long, and the balance point is 160 from the front. The accidental keylevers are balanced 8 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, variable overall length (mostly around 115 – 120), and tapering in thickness from 3.4 at the front to 1.1 at the rear. There are four scribed lines on the front section, 25.9, 27.4, 31.7 and 33.2 from the front edge. The touchplates overhang the keylevers by 3.5 – 4.0.

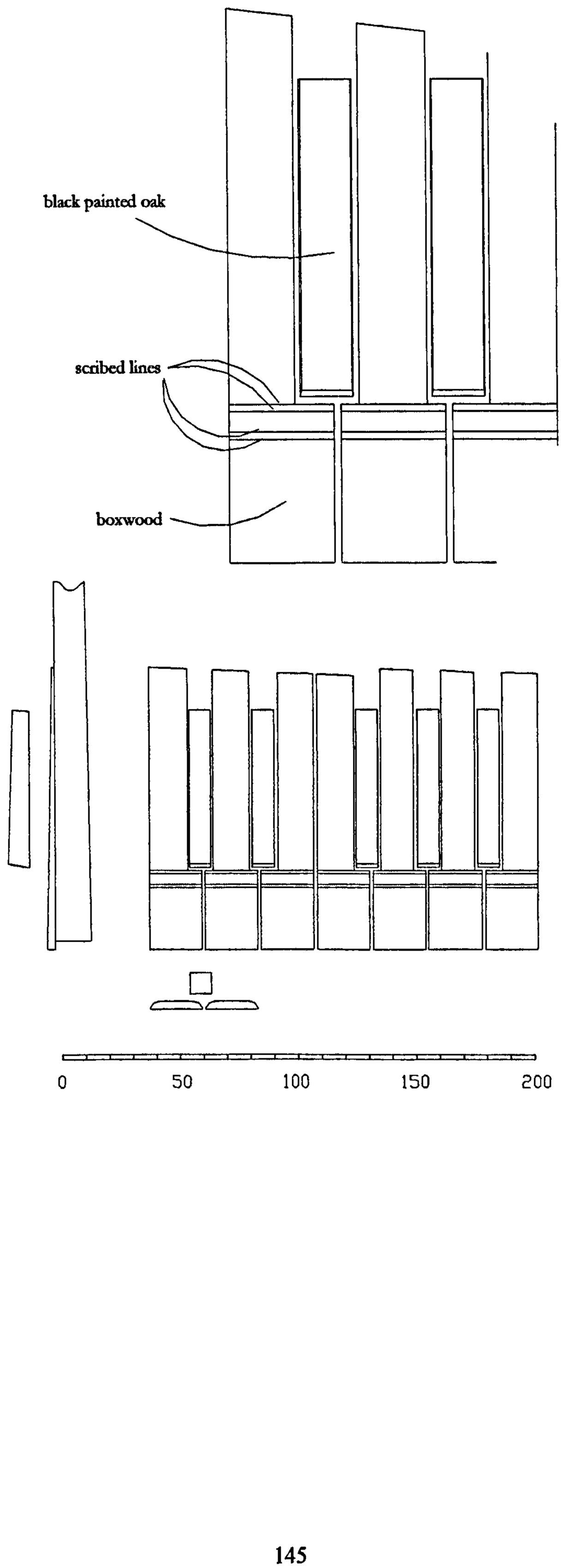
The natural touchplate widths in between the accidentals are:-

f^3	22.9	f^2	15.6	f^1	16.4	f	15.5	F	15.5
e^3	15.1	e^2	15.0	e^1	14.9	e	15.0	E	14.9
d^3	15.5	d^2	15.9	d^1	15.3	d	15.3	D	15.5
c^3	15.8	c^2	16.3	c^1	16.5	c	16.8	C	16.2
b^2	15.3	b^1	14.9	b	14.7	B	15.5	BB	21.9
a^2	14.1	a^1	13.6	a	14.1	A	14.0		
g^2	14.2	g^1	13.8	g	14.1	G	13.7		

ACCIDENTAL TOUCHPLATES: Black painted oak. The overall length is typically 68.0, and total height 9.0 (front) – 6.9 (rear). They taper in width from 9.2 at the bottom to 9.1 at the top.

None of the jacks or action cloths is original.

Figure 1666AL.2 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hinges from the spine to the lid, and three hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose (not original) which is of a geometric design. The top layer is of wood, with a more intricate design cut into card on the lower layer. The decorator appears to be the same artist who painted the 1664 RH and 1664 JP instruments.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in red, black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Moresque" design. Inside the inner faceboard and keywell mouldings is white painted scrollwork over a black background. In the centre of the nameboard is an octagonal plaque with a decorated painted vase of flowers. The arcades are of a "Moorish" design.

The lid and keywell flap are decorated with typical landscape paintings, but of a much higher quality than those found on other examples – even those by the same artist. This is also found in the other Leuersidge virginal, both of which belonged at some time to Arthur F. Hill.

Condition

This instrument is, decoratively, one of the finest preserved examples of an early English virginal, typical in all of its characteristics, but is not in playable condition.

There have been considerable constructional alterations, mostly during the ownership of Arthur F. Hill, and during a 1909 restoration by Arnold Dolmetsch when working for Chickering and Sons, of Boston MA. This work has included replacement of the wrestplanks, replacing the rose, rack and keyguide system, soundboard barring, and jacks.

Both bridges have previously come unglued from the soundboard and have been glued back, using small buttons underneath. The left bridge has become unglued and is lifting again. The soundboard has a crack in the bass section along a glue joint behind the right faceboard. The glue joints between the case ends and faceboards are open in places, clearly showing that they are butt joints held together by dowels or nails.[1]

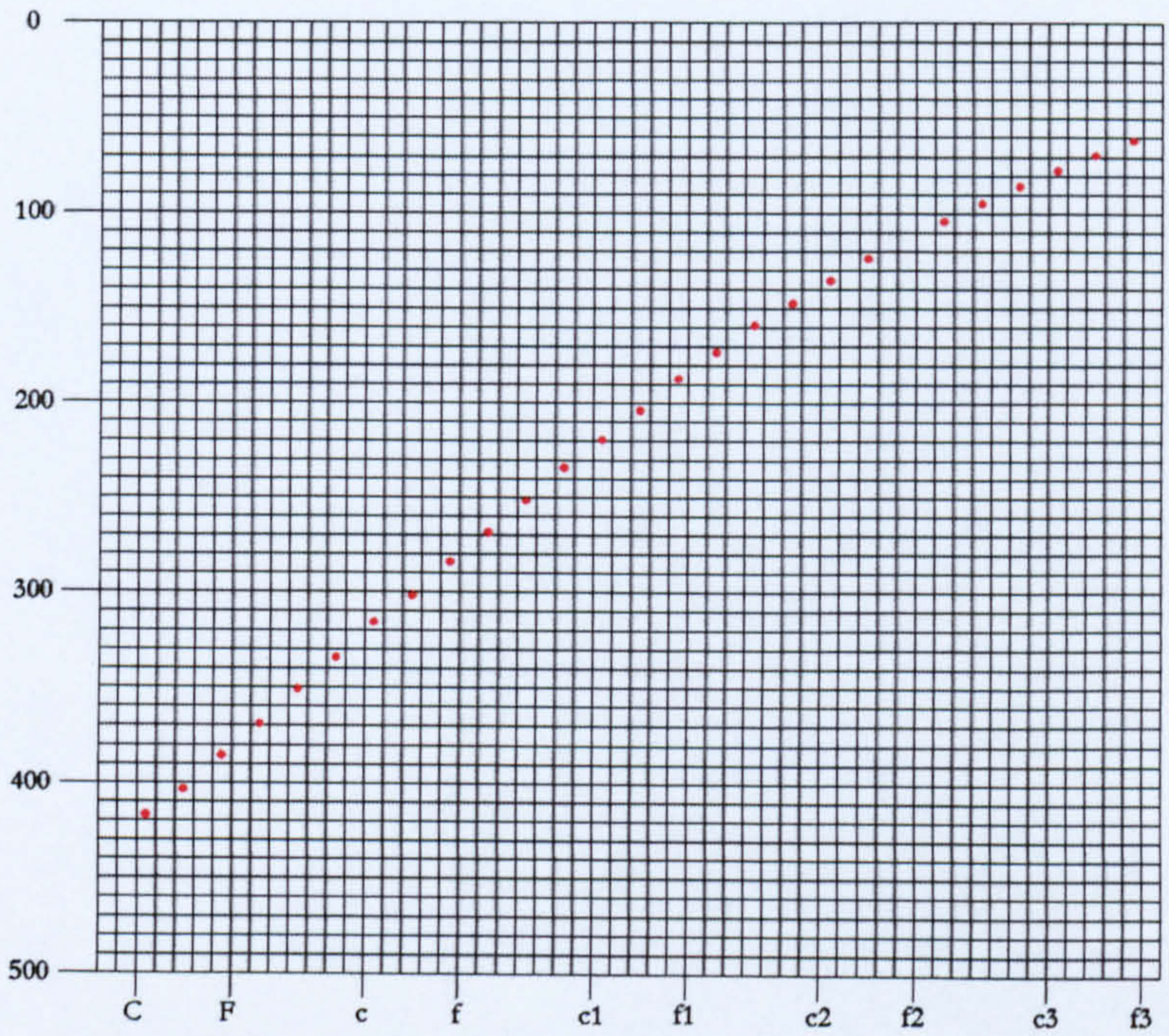
Commentary

The virginal has been restored several times, including a major restoration by Arthur F. Hill, who also owned and restored by 1670 AL virginal. A number of unusual features which are present in both virginals may be attributed to him, and are discussed below in the Further Commentary section, page 160.

The instrument has a 4½" scaling-design note string length, implying a pitch level of V. The bridge template would give Pythagorean scalings if the instrument was pitched at V – 1s and, as a result, the string lengths in the alto slightly exceed those of the scaling design note. This is discussed further in the Further Commentary section, page 161.

There are bridge pin positioning marks on the right bridge which are parallel to the spine. The following graph shows the distances from the bridge pin marks to the spine:

Graph 1666AL.1 - Graph of the bridge marks in relation to the spine.



The bridge pins are possibly arranged so that the top 6 spaces have been divided into two inches,[2] then the next 4 spaces have been divided according to a spacing of 6 into 2¾ inches, the next nine spaces arranged according to a spacing of 6 in 3¾ inches, and the remainder arranged according to the spacing of 6 in 4 inches. Although there is not a consistent use of the number of spaces used in each of the groups, the arrangement of using six spaces into quarter-integrals of the inch in each of the groups suggests that the results are very plausible.

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[1] The technical drawing (by William Debenham) of the 1642 TW implies that the "dowels" are, in fact, individual morticed sections which fit through holes in the case ends. All of the dowels appear to be of oak, rather than deal, which indicates that Debenham cannot be correct.

[2] The bridge positioning mark for the pair of strings e^2/f^2 cannot be seen and has been excluded from the graph.

1670 AL

Plate 1670AL.1 – Three-quarter view of the 1670 AL virginal.



Ownership and Provenance

Possession of the Ashmolean Museum, Oxford, part of the Hill Collection. Boyden no. 43. Previously in the possession of Arthur. F. Hill.

References

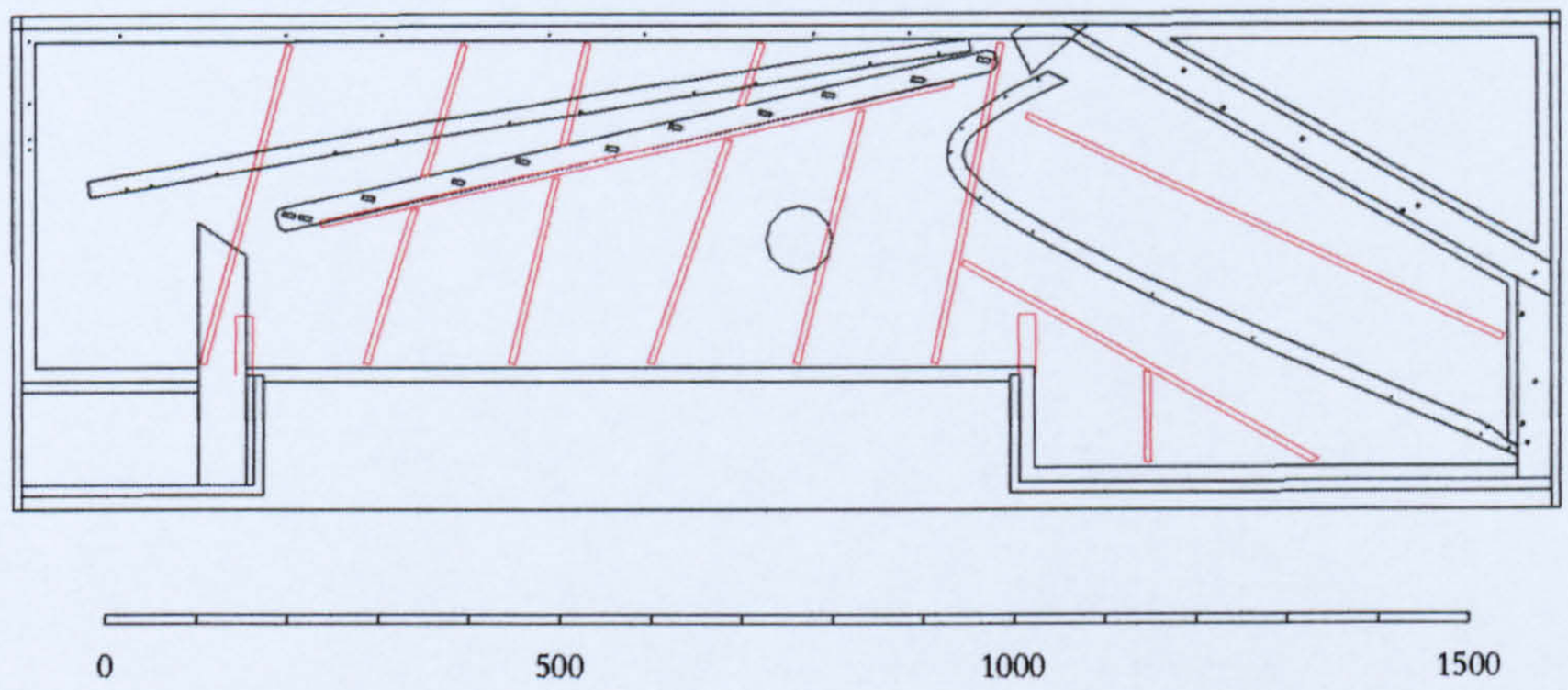
GD3 & GD4 No. 9; B1 & B2 English virginal table No. 13, B1 & B2 Leversidge, Adam No. 2, B3 No. LEVERSIDGE, A. 1670. Boyden (1969).

Inscriptions

Signed "Adamus Leuersidge Londini Fecit I670" on the front of the jackrail.

Construction

Figure 1670AL.1 – Plan view of the 1670 AL virginal.



OVERALL INSTRUMENT DIMENSIONS: 1703 x 542 x 222.

BASEBOARD: Deal, two planks, the front plank 289 wide. 10.8 – 12.8 – 11.8 thick at front. The baseboard is not rectangular, the outside case length 1701 at the front and 1704 at the rear, and the ends are 3 mm different.

SPINE: Deal, 1705 – 1704 long, 220 – 223 high, 12.9 – 13.4 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 547 - 541 long, 222 - 220 high, 9.9 – 10.5 thick; the right case end 547 - 544 long, 222↔ high, 8.6 – 10.1 – 10.0 thick. The spine and case ends overlap the baseboard. There are large dowels, from the case ends into the faceboards. Both case ends are made of two pieces, glued lengthways. On the left end the lower piece is 94 - 100½ high, and the right hand 55½ - 49 high.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 264 long, 208 – 207½ – 208½ high and 11.0 thick. Right faceboard 594 long, 208 – 205 – 206 high and 11.6 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 129½ (left) and 128 (right) long, 11.1 (left) and 10.4 (right) thick. Slots for the nameboard have been cut into the keywell sides 110 – 117½ (left) and 110 – 115 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 832 – 831, 148 - 150 high, and 12.4 – 9.4 thick.

KEYWELL LINER: Deal, 82.0 – 82.7 high, 16.2 – 15.5 thick.

OTHER LINERS: Oak and deal, 21 wide. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Oak, ‡40 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 74.5 – 74.1 high. The inner edges form a continuation of the keywell sides. The frames are 21.1 (left) and 22.4 (right) thick, and cut out at the front to receive the keywell sides. The outer top edge of both frames has been bevelled.

TOOLBOX: The toolbox back piece is made from deal, 31.6 high, set 100½ - 100 from the back of the faceboard. Toolbox lid of oak, 194 - 192½ long, 115 - 114 wide and 9.3 thick. Iron rod hinges, 2.1 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 895 long (front), 920 long (back). It is 49.5 wide, and 19.9 thick. The bottom of the jackrail is 28.5 (bass) and 30.6 (treble) above the top of the soundboard. There is a green baize cloth on the jackrail which is old, 3.0 uncompressed thickness. The bass jackrail support is of deal, 52.5 wide. The left side is 287 long, the right side 251 long. The treble jackrail support is triangular in shape, 70.2 (plus an angled section, parallel to the front 17.9 long at the rear, 82.8 at the front, and 48 at the end where it meets the jackrail. The back corner is 508 from the right case end, and it is at an angle of 141° to the spine.

LID: Oak, coffered in three pieces. The planks are 192, 193 and 193 wide on the inside, and the front thickness is 8.3 – 8.3 – 8.8. Applied mouldings along the joins and the ends on the top surface. End battens 18.4 (left) and 17.2 (right) thick, with an

inside coffer height of 71 (left) and 73 (right). Strap hinges between the spine and the lid. There are oak sticks to hold the lid open, unlikely to be original.

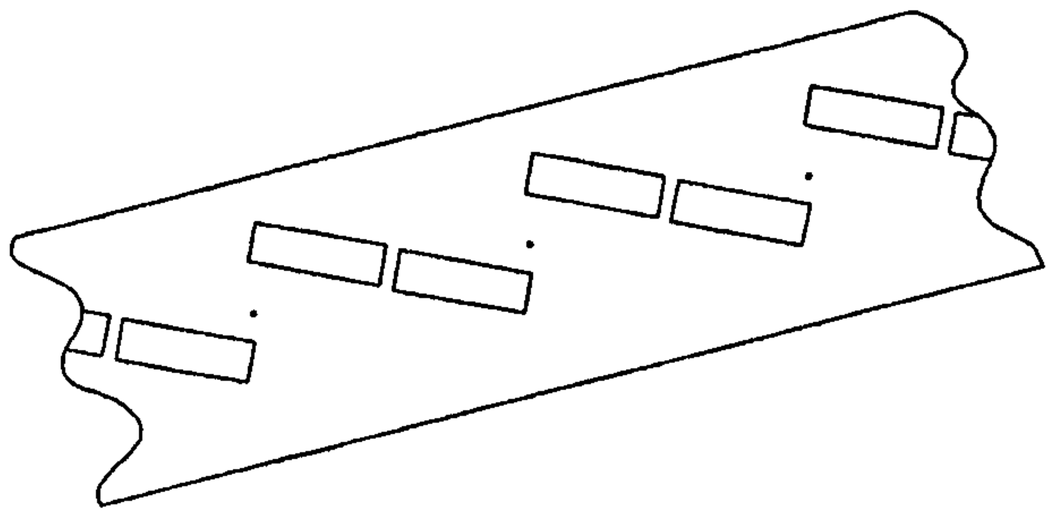
KEYWELL FLAP: Oak, 210 - 209½ wide, and 8.6 – 9.8 thick. Iron strap hinges, maximum 2.0 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 74 wide and 3.5 thick. Glued to the top of the frames. Leather guide glued underneath. There is a full depth cut-off bar of deal, glued in front of the register.

SOUNDBOARD: Coniferous wood, 2.4 – 2.7 thick at the keywell liner. The top of the soundboard is approximately 49 below the top of the case. Rose, 73 diameter, (of wood glued on top of parchment), glued to the soundboard from underneath.

SOUNDBOARD REGISTER: Leather, 812 long, tapering slightly in width from 25.3 (bass) to 23.4 (treble), and 1.1 thick. Slots typically 13.6 x 4.5. There are string-guiding marks on the register leather, directly below the longer strings between the wide jacks.

Figure 1670AL.2 – Schematic drawing of the register slots and string-guiding marks.



SOUNDBOARD BARRING: Deal, 19 high in the keywell area and 27 high behind the right faceboard, and 6.9 – 4.0 wide (top to bottom).

WRESTPLANK CAPPING PIECES: Oak, 5.8 thick. The treble wrestplank capping is 32.7 wide without, and 54.3 wide with applied mouldings; and the bass wrestplank capping is 38.0 (without) and 48.3 (with mouldings).

SOUNDBOARD MOULDINGS: 3.4 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 16.0 wide, and the spine moulding is 15.5 wide. The other soundboard mouldings are cedar, 15.6 wide.

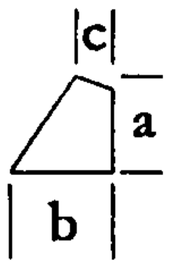
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 3.7 thick. The moulding on top of the faceboards, keywell sides and nameboard are 19.1 wide. The soundwell top edge mouldings are 17.9 and 3.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are brass, 1.7 diameter. The tuning pins protrude 30 from the top of the wrestplank capping piece, 4.0 diameter, and are of iron. The tuning pins have been divided so that the notes up to d are on the bass wrestplank, and notes e^{b} to f^{3} are on the treble wrestplank.

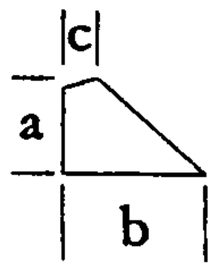
BRIDGES: Fruitwood, probably pear. There are no scribed lines on either bridge. The bridge pins are of brass, 1.4 diameter. There are positioning holes, some plugged, at the front of each bridge. There is a plugged hole by the apex, but set a quarter-inch inside the bridge. It is possible this was intended for a previous bridge position.

Bridge Dimensions:

left bridge



right bridge



left bridge	C	c	c^{1}	c^{2}	c^{3}
a	9.1	9.0	8.8	9.0	8.8
b	17.7	17.8	17.6	17.4	15.5
c	3.6	3.5	3.7	3.7	3.9

right bridge	C	c	c^{1}	c^{2}	c^{3}
a	8.7	9.0	8.6	8.8	8.8
b	18.7	17.1	16.5	18.8	17.3
c	5.6	6.0	6.0	5.4	5.3

String Lengths and (Plucking Points)

f^3	**112½ (47)**	**f^1**	**450½ (105)**	**F**	**1316 (169)**
e^3	117	e^1	459	E	1335
e^{b3}	131	e^{b1}	503	E^b	1394
d^3	133½	d^1	517½	D	1416½
$c^{\#3}$	150½	$c^{\#1}$	567½	$C^\#$	1466½
c^3	**153 (48)**	**c^1**	**582 (106½)**	**C**	**1488½ (169½)**
b^2	171½	b	633½	GG/BB	1548 (182)
b^{b2}	173	b^b	648		
a^2	188	a	704½		
$g^{\#2}$	191	$g^\#$	720½		
g^2	210½	g	777½		
$f^{\#2}$	213½	$f^\#$	793½		
f^2	**231½ (78)**	**f**	**848 (139)**		
e^2	235½	e	867½		
e^{b2}	256½	e^b	931½		
d^2	260	d	949½		
$c^{\#2}$	284	$c^\#$	1013		
c^2	**290 (77)**	**c**	**1030½ (137)**		
b^1	317	B	1090		
b^{b1}	324	B^b	1105½		
a^1	356	A	1163½		
$g^{\#1}$	361½	$G^\#$	1179½		
g^1	400	G	1242½		
$f^{\#1}$	408	$F^\#$	1261		

Keyboard and Action

COMPASS: GG/BB – f^3.

BALANCE RAIL: The balance rail is oak, 29.2 wide and 29.1 high. The balance pins are iron, 2.6 diameter, and protruding 19½ above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, tapering from 47 - 39 wide and are 13.2 thick. The backrail is deal, 48.0 wide and 24.0 thick.

The rack and keyguiding system is not original.

FRONTRAIL: Lime, 31.5 – 24.4 wide and 9.2 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 43.4 high and 3.1 thick.

ENDBLOCKS: Oak. The left endblock is 119 long, 16.7 wide and 46.5 – 43.5 high. The right endblock is 126 long, 16.8 wide and 50.8 – 46.4 high.

KEYBOARD WIDTH: Overall width between the keywell sides 821, and between the endblocks 787. The overall width of the keyboard is 782, and the three-octave span is 495½.

KEYLEVERS: Deal, 12.7 thick at the front, tapering to 8.7 at the rear. The lowest keylever is 317 long and the balance point is 114 from the front of the touchplate. The top keylever is 487 long, and the balance point is 169 from the front. The accidental keylevers are balanced 8.6 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, variable overall length, and tapering in thickness from 2.7 at the front to 2.3 at the rear. There are four scribed lines on the front section, 25.6, 27.6, 31.3 and 33.0 from the front edge. The touchplates overhang the keylevers by 2.1.

The natural touchplate widths in between the accidentals are:-

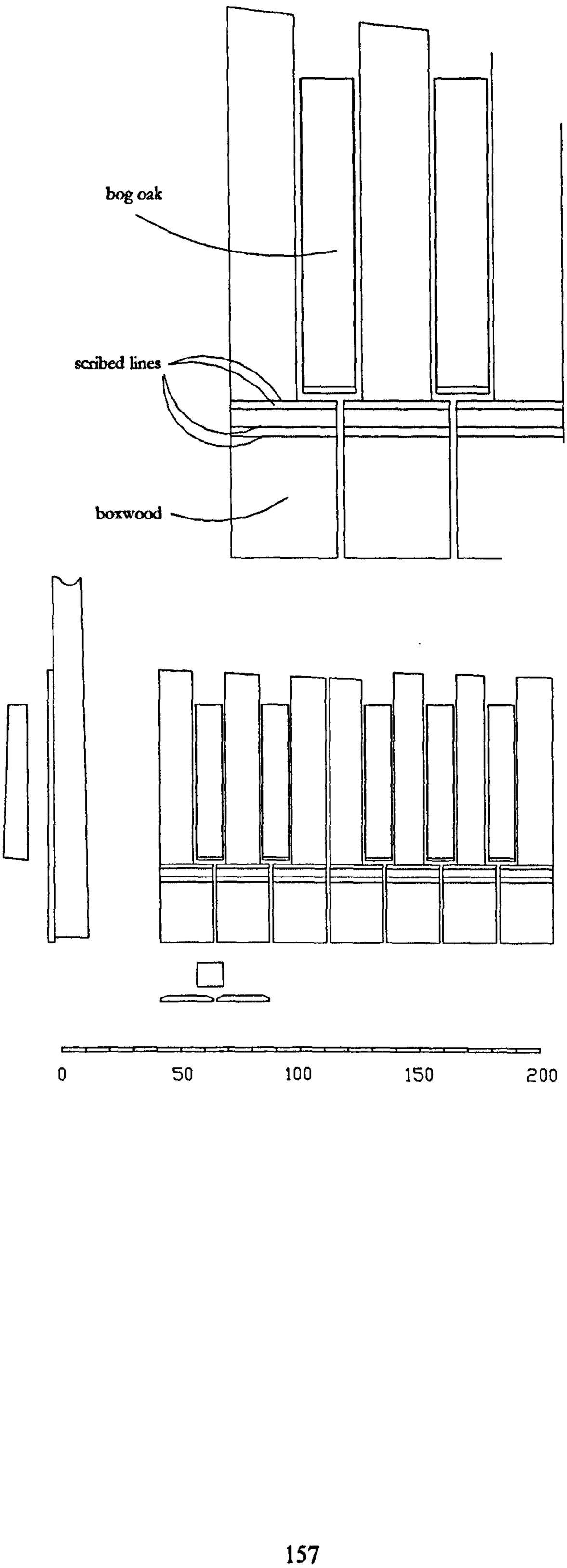
f^3	22.8	f^2	13.8	f^1	13.4	f	13.4	F	14.0
e^3	14.1	e^2	14.1	e^1	14.5	e	14.3	E	14.3
d^3	14.5	d^2	14.3	d^1	13.8	d	14.4	D	14.0
c^3	14.1	c^2	14.0	c^1	13.6	c	13.6	C	13.0
b^2	15.0	b^1	14.9	b	14.9	B	14.5	BB	21.7
a^2	13.3	a^1	11.6	a	11.3	A	11.3		
g^2	13.0	g^1	12.3	g	12.5	G	11.7		

ACCIDENTAL TOUCHPLATES: Bog oak. The overall length is typically 66.4, and total height 10.2 (front) – 7.9 (rear). They taper in width from 11.2 at the bottom to 10.7 at the top.

JACKS: The jacks are probably not original, of pear with holly tongues. The total length is typically 140. They taper in width from 12.1 – 10.0, and in thickness from 4.0 – 3.3. The axle pins are positioned 21.8 (69%) from the top of the tongue. All but one of the jacks survive. The jacks have two lead weights, each 6.0 diameter.

ACTION CLOTHS: There are possibly (although unlikely) original action cloths. On the keybacks are 4 strips of a green baise cloth, each 0.5 compressed thickness. The same cloth is found cut into 10 mm squares on the balance rail and under the jackrail.

Figure 1670AL.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hinges from the spine to the lid, and three hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1664 RH and 1664 JP instruments.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in red, black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Moresque" design. Inside the inner faceboard and keywell mouldings is white painted scrollwork over a black background. In the centre of the nameboard is an octagonal plaque with a decorated painted vase of flowers. The arcades are of the "trefoil" design.

The lid and keywell flap are decorated with typical landscape paintings, but of a much higher quality than those found on other examples – even those by the same artist. This is also found in the other Leuersidge virginal, both of which belonged at some time to Arthur F. Hill. This is discussed more fully in the Further Commentary section below, page 160.

Condition

This instrument is, decoratively, one of the finest preserved examples of an early English virginal, typical in all of its characteristics. The instrument has been repaired to playing condition by David Law in 2002.

The only major alteration the instrument has had involves the replacement of the original rack and keyguide system. The jacks are quite possibly not original.

Commentary

The 1670 AL is one of the best known English virginals, primarily due to its position in the Hill Collection, housed at the Ashmolean Museum, Oxford. It represents a standard design of virginal as found after the Restoration.

The instrument has a 4½" scaling-design note string length, implying a pitch level of V. The bridge template would give Pythagorean scalings if the instrument was pitched at V – 1s and, as a result, the string lengths in the alto slightly exceed those of the scaling-design note. This is discussed further in the Further Commentary section, page 161.

Further Commentary on the Instruments by Leuersidge

The virginals by Leuersidge are both well known, and often considered to be excellent examples of virginal decoration. Both instruments have the same compass and pitch, although any simple comparison between the two instruments is made a little difficult as the left bridge of the 1666 AL has lifted along most of its length.

An added complication when considering the Leuersidge instruments is the fact that both virginals were owned by Arthur F. Hill. Therefore, some of the work which is found in these two instruments may be the work of Hill, rather than Leuersidge.

Both instruments have the appearance of being in wonderful visual condition, something which is almost certainly the work of Hill, rather than the original decorator. Despite that, it is clear that Leuersidge was unusual in using small decorative features such as scallops on the bass end of the right bridge, something which clearly could not be the work of Hill. This contrasts with the actual basic workmanship of the instruments. Although the lifting of the 1666 AL's left bridge is not necessarily in any way the fault of the maker, his case dimensions show large variations in plank length, found especially in the 1670 AL. In that instrument the length of the case ends differs by 6 mm (left) and 3 mm (right case end) from top to bottom. This certainly reflects the working methods used by Leuersidge, showing that he could not have used a square and scribed the case end length over the entire plank. It also is possible that cutting the case wood to length was a job entrusted to an apprentice who was not sufficiently experienced for that job.

Another unusual feature found in both Leuersidge instruments is the use of two pieces, glued side-by-side for the case ends (see Plate Leuersidge.1). This implies an economical use of wood. The other major oak pieces – the lid and keywell flap – are full width in both instruments, showing that he did have access to wide wood, but was sparing in its use.

Plate Leuersidge.1 – The case end of the 1670 AL, showing the oak pieces glued side-by-side.



Leuersidge is the only maker of whose surviving instruments both have the same compass and play at the same pitch. However, it is clear that the virginals should not be considered "models" built to specific measurements. The overall case lengths differ by approximately half an inch, and the widths by nearly one-and-a-quarter inches. Although the string lengths of the 1666 AL are a little uncertain because of the lifting of the left bridge, the string lengths are close enough to suggest that they are nominally the same.

Of particular interest with both instruments is the relative lengthening of the f^2 string lengths when compared to f^3. In both instruments it amounts to less than a semitone (49 cents in the 1670 AL). This probably reflects the use of a right bridge template which was designed for V – 1s rather than V. A comparison of the right-bridge shapes shows that, although they are not identical, they are close enough to suggest they were both made from the same bridge template.

The stands of both instruments are almost certainly the work of Arthur F. Hill.

1655 JL

Plate 1655JL.1 – Front view of the 1655 JL virginal.



Ownership and Provenance

Victoria and Albert Museum, London, Mus. No. 813-1873. The instrument was purchased by the museum for £52 10s 0d. in 1873.

References

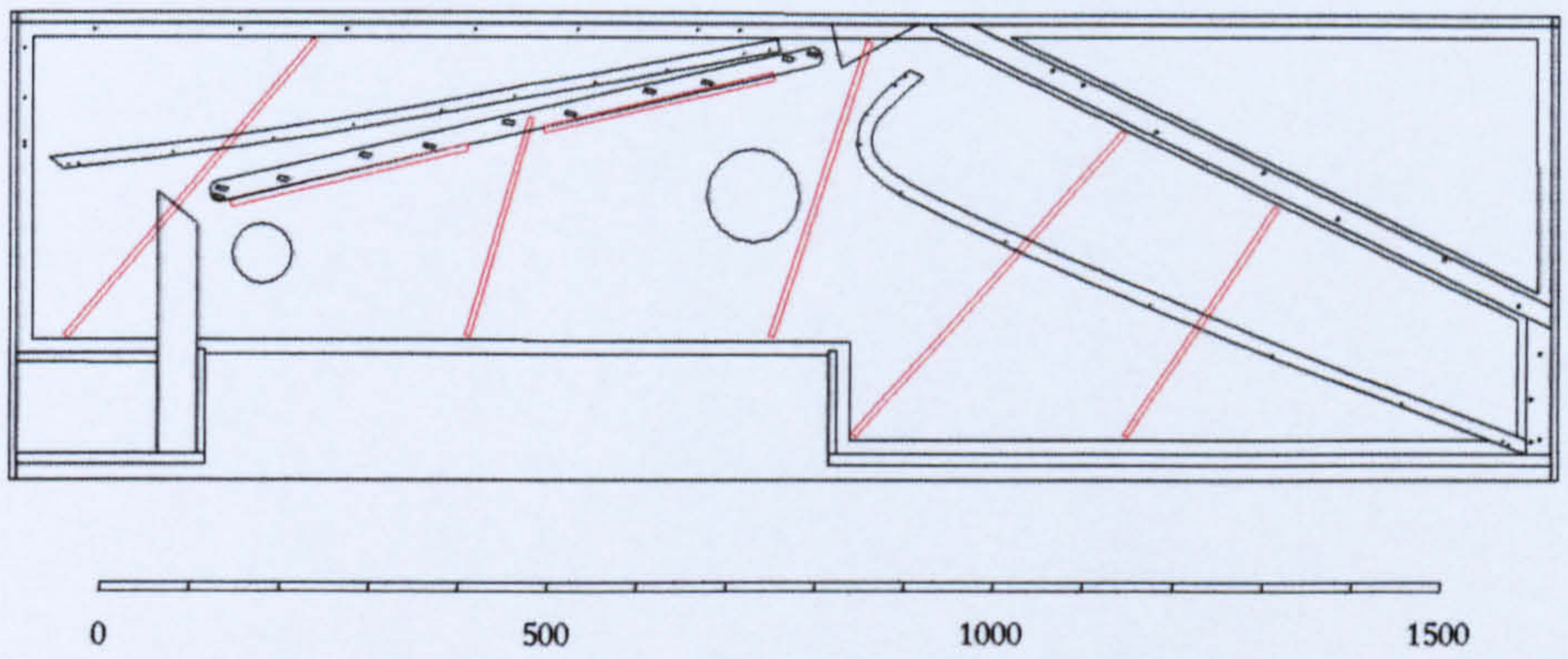
GD3 & GD4 No. 4; B1 & B2 English virginal table No. 6, B1 & B2 Loosemore, John., B3 No. LOOSEMORE, J. 1655., Schott (1985)

Inscriptions

Signed "JOHN LOOSEMORE FECIT 1655" on the front of the jackrail. There is an inked number "2" on the keyboard and the rack.

Construction

Figure 1655JL.1 – Plan view of the 1655 JL virginal.



OVERALL INSTRUMENT DIMENSIONS: 1732 x 521 x 225.

BASEBOARD: Deal, two planks, the front plank 277 wide. 13.0 – 13.8 thick at front.

SPINE: Deal, 1733 long, 11.0 – 10.4 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 517 - 521 long, 225 - 225½ - 225 high, 8.1 – 7.6 thick; the right case end 514 - 520 long, 226 - 225 high, 8.1 – 8.3 thick. The spine and case ends overlap the baseboard. There are nails from the case ends into the faceboards.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 210 long, 204 – 201 – 202½ high and 12.0 thick. Right faceboard 807½ long, 202 – 200 – 204 high and 12.1 thick. The keywell sides butt up to the faceboards.

KEYWELL SIDES: Oak, 116½ (left and right) long (not including the overlapping faceboards), 8.8 (left) and 8.7 (right) thick. Slots for the nameboard have been cut into the keywell sides 106 - 110 (left and right) from the front of the keywell sides, not including the faceboards.

NAMEBOARD: Deal, total length 703 – 701, 149 - 147 high, and 13½ - 13 thick.

KEYWELL LINER: Deal, 78½ – 78 high, 12.6 – 12.5 thick.

OTHER LINERS: Deal, c. 30 x c. 15.

WRESTPLANKS: Oak, ‡35 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 78 high. The inner edges form a continuation of the keywell sides. The frames are 15.7 (left) and 16.5 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 33 high, set 102½ - 99½ from the back of the faceboard. Toolbox lid of oak, 148↔ long, 110↔ wide and 8.3 thick. Iron rod hinges, c. 2.5 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 753 long (front), 784½ long (back). It is 44.5 wide, and 16.7 thick. The bottom of the jackrail is 27.2 (bass and treble) above the top of the soundboard. The bass jackrail support is of deal, 46.3 wide. The left side is 293 long, the right side 257 long. The treble jackrail support is triangular in shape, 98 long at the rear, 100 at the front, and 47 at the end where it meets the jackrail. The back corner is 707 from the right case end, and it is at an angle of 150° to the spine.

LID: Oak, coffered in three pieces. The planks are 177, 173 and 179 wide on the inside, and the front thickness is 6.6 – 6.4. Applied mouldings along the joins and the ends on the top surface. End battens 18.0 (left) and 17.5 (right) thick, with an inside coffer height of 46.1 (left) and 45.6 (right). Originally had wire hinges between the spine and lid. There is no evidence about how the lid was originally held open.

KEYWELL FLAP: Oak, 211 – 212 – 210 wide, and 7.2 – 6.8 – 7.0 thick. Iron strap hinges, maximum 2.5 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Poplar (?), 75 wide and c. 2.5 thick. Nailed to the top of the frames. Leather guide glued underneath. There is a full depth cut-off bar of deal, glued in front of the register.

SOUNDBOARD: Coniferous wood, 4.3 – 4.0 thick at the keywell liner. The top of the soundboard is approximately 50 below the top of the case. Two roses, 66.5 and 102.7 diameter, (of wood glued on top of parchment), let into the soundboard and supported by small bars glued underneath.

SOUNDBOARD REGISTER: Leather, 700 long, tapering slightly in width from 21.9 (bass) to 20.8 (treble), 1.1 thick. Slots typically 12.0 x 4.0.

SOUNDBOARD BARRING: Deal, c. 40 deep and 7.4 – 4.4 wide (top to bottom).

WRESTPLANK CAPPING PIECES: Oak, 4.0 thick. The treble wrestplank capping is 23.0 wide without, and 37.2 wide with applied mouldings; and the bass wrestplank capping is 27.4 (without) and 47.0 (with mouldings).

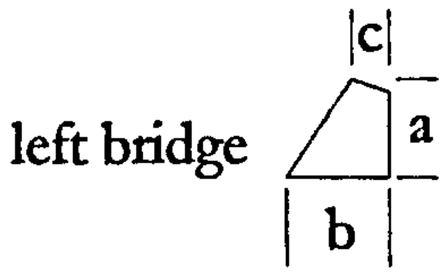
SOUNDBOARD MOULDINGS: 4.0 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) are of oak, act as hitchpin rails. The left case end moulding is 17.0 wide, and the spine moulding is 16.4 wide. The other soundboard mouldings are cedar, 15.2 wide.

OTHER MOULDINGS: All other mouldings are of oak. The faceboard mouldings are 3.6 thick. The moulding on top of the faceboards, keywell sides and nameboard are 18.7 wide. The soundwell top edge mouldings are 21.9 and 3.5 thick.

HITCHPINS AND TUNING PINS: The hitchpins are 1.9 diameter. The tuning pins protrude 25 from the top of the wrestplank capping piece, 3.4 diameter, and are of iron. The tuning pins have been divided so that the notes up to e are on the bass wrestplank, and notes f - d^3 are on the treble wrestplank. Unlike most virginals which have a single scribed line for the position of the tuning pins (from the edges of the wrestplank capping pieces), this instrument has two closely-space lines for each row.

BRIDGES: Fruitwood, probably pear. The right bridge has been spliced (original) in the treble and the bass. There are scribed lines on both bridges along their length for the bridge pins. The bridge pins are of brass, 1.3 diameter.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	9.6	9.6	9.4	9.5	10.4
b	13.6	13.6	13.6	13.6	13.4
c	5.3	5.0	4.8	5.0	5.0

right bridge	C	c	c^1	c^2	c^3
a	8.8	9.2	9.9	10.3	8.6
b	16.5	16.2	15.8	16.4	16.3
c	4.6	4.3	3.9	3.7	4.3

String Lengths and (Plucking Points)

		f^1	**445 (56)**	**F**	**1403½ (121½)**
		e^1	495½	E	1466
		e^{b1}	509½	E^b	1483½
d^3	155 (49)	d^1	570	D	1544½
$c^{\#3}$	158½	$c^{\#1}$	584½	$C^{\#}$	1564½
c^3	**172½ (47½)**	**c^1**	**646½ (71)**	**C**	**1624½ (165)**
b^2	175	b	662	**Ex C**	**1643 (174)**
b^{b2}	190	b^b	732		
a^2	192½	a	746		
$g^{\#2}$	206½	$g^{\#}$	811½		
g^2	210½	g	828½		
$f^{\#2}$	227	$f^{\#}$	895		
f^2	**231½ (45)**	**f**	**913 (78)**		
e^2	249½	e	980		
e^{b2}	254½	e^b	995		
d^2	274½	d	1060½		
$c^{\#2}$	281	$c^{\#}$	1072		
c^2	**304½ (57)**	**c**	**1142½ (101)**		
b^1	310	B	1159		
b^{b1}	338	B^b	1227		
a^1	346½	A	1243		
$g^{\#1}$	381½	$G^{\#}$	1307½		
g^1	391½	G	1324½		
$f^{\#1}$	433½	$F^{\#}$	1386½		

Keyboard and Action

COMPASS: C – d^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail is oak, 41.7 wide, and tapering in height from 30.1 at the front to 26.9 at the rear. The balance pins are iron, 2.1 diameter, and protruding 18 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are oak, generally 35 (left) and 37 (right) wide and 5.0 thick. The backrail is oak, 50 wide and 16.1 thick.

RACK: Probably of some type of mahogany, attached to the top surface of the backrail. The rack is 4.4 thick, 51.9 high. There is no top capping on the rack, giving it the appearance of an upturned comb.

FRONTRAIL: Softwood on oak, the softwood 4.4 and the oak 10.2 thick, the softwood 57.2 and the oak 29.7 wide.

KEYWELL BATTEN: Oak, with a moulded top edge along the front, 39.4 high and 4.0 thick.

ENDBLOCKS: Deal. The left endblock is 130½ long, 7.5 wide and 49.0 – 39.3 high. The right endblock is 140½ long, 10.2 wide and 47.0 – 40.0 high.

KEYBOARD WIDTH: Overall width between the keywell sides 697, and between the endblocks 678. The overall width of the keyboard is 675, and the three-octave span is 474.

KEYLEVERS: Deal, 13.8 thick at the front, tapering to 9.9 at the rear. The lowest keylever is 337 long and the balance point is 113 from the front of the touchplate. The top keylever is 463 long, and the balance point is 158 from the front. The accidental keylevers are balanced 14.9 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, generally 115 long, and tapering in thickness from 3.0 at the front to 1.1 at the rear. There are four scribed lines on the front

section, 24.2, 26.4, 29.3 and 31.7 from the front edge. The touchplates overhang the keylevers by 1.6.

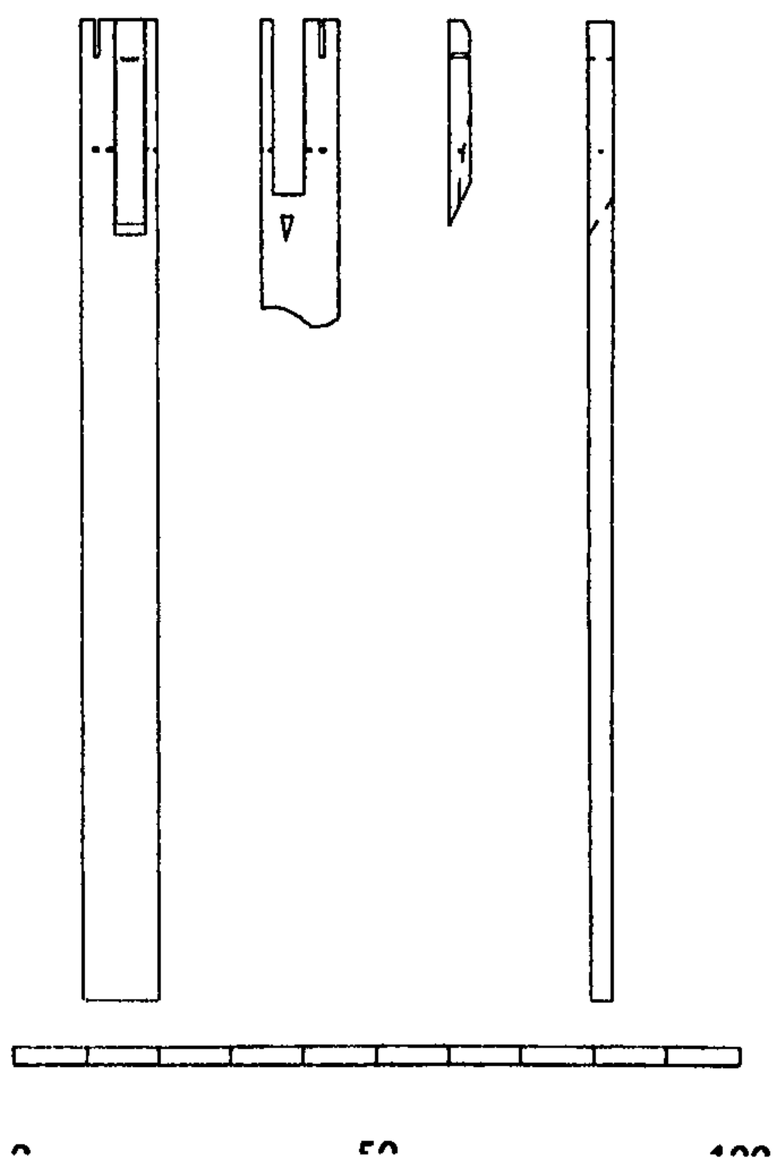
The natural touchplate widths in between the accidentals are:-

		f^2	14.2	f^1	14.0	f	14.1	F	12.6
		e^2	13.5	e^1	14.0	e	14.5	E	14.9
d^3	15.3	d^2	12.7	d^1	14.1	d	12.6	D	12.4
c^3	15.1	c^2	14.3	c^1	14.4	c	14.5	C	13.9
b^2	14.6	b^1	13.5	b	14.1	B	14.2		
a^2	11.8	a^1	12.1	a	13.1	A	11.6		
g^2	12.4	g^1	12.9	g	11.9	G	11.6		

ACCIDENTAL TOUCHPLATES: Oak. The overall length is typically 67.0, and total height 9.5 (front) – 5.0 (rear). They taper in width from 10.2 at the bottom to 10.1 at the top.

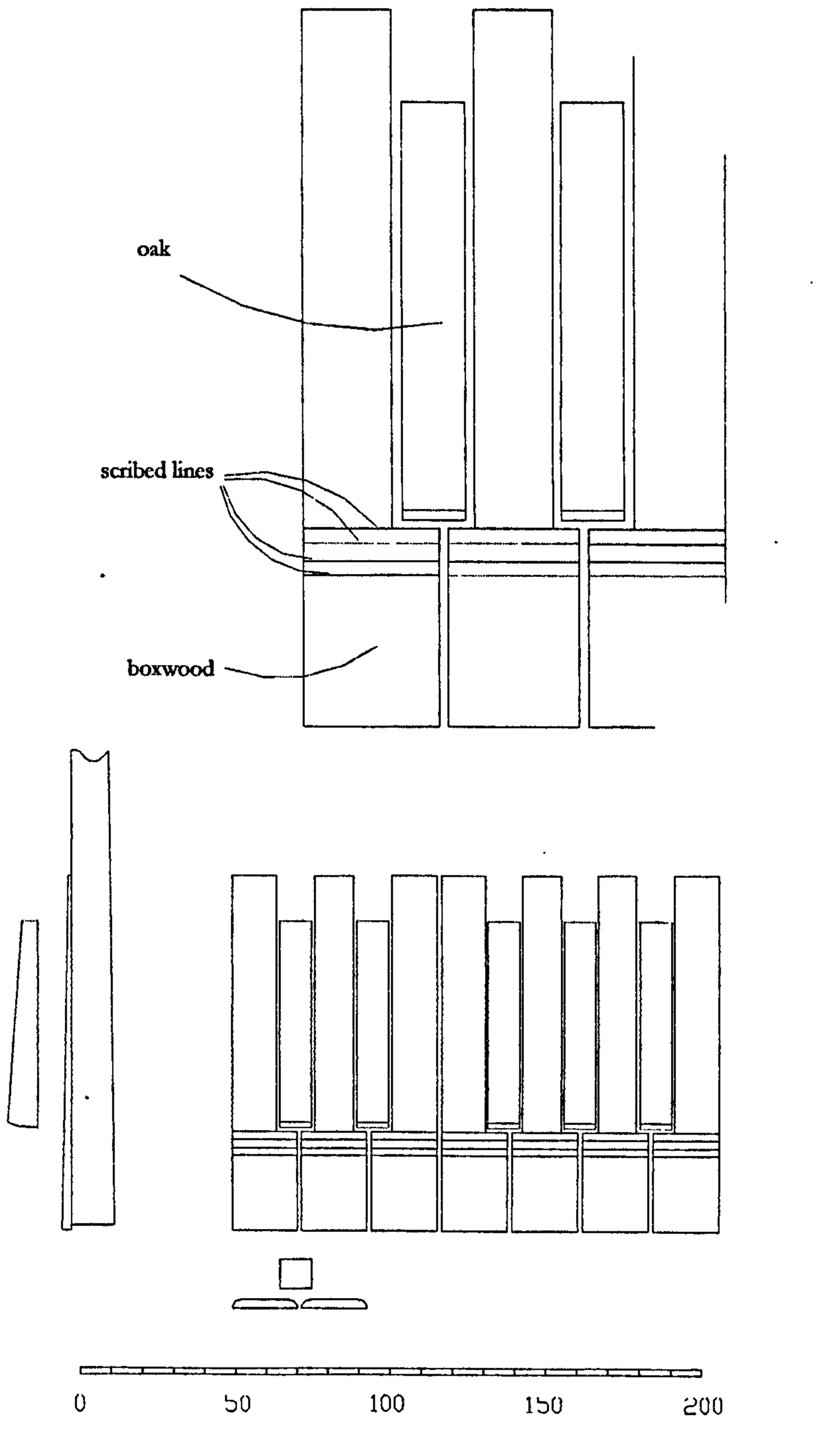
JACKS: The jacks are of pear, and the tongues are possibly holly. The total length is typically 135. The width is consistently 10.6, and they taper in thickness from 3.6 – 2.8.

Figure 1655JL.2 – Drawing of a typical jack.



There are no original action cloths.

Figure 1655JL.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There are two roses which are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer.

The keywell, faceboards, soundwell and jackrail are decorated with oak moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are the "Vinework" design. In the centres of the inner faceboard, keywell sides and nameboard mouldings there are black painted areas with white scrollwork. In the centre of the nameboard there is a square panel with a piece of mirror-glass in it.

The lid and keywell flap interiors have typical landscape paintings. The centre of the main lid has a shipping scene, with an image of Adam and Eve on the right bank. Around Adam and Eve are various animals, reminiscent of various images of Orpheus. The left bank has as stag-hunt scene. The keywell flap is decorated with human and bird figures in a landscape, the birds being larger than the human figures.

Condition

This instrument is, decoratively, a finely preserved example of an early English virginal, typical in all of its characteristics. Although the instrument is not in playing condition it is structurally sound. The only obvious visible damage is to the mirror-glass which has cracked in several places.

The virginal is now securely displayed behind glass in the Victoria and Albert Museum's British Galleries.

Commentary

John Loosemore is best known as the maker of the organ in Exeter Cathedral. This is his only known virginal, but an inked number "2" which appears on the keylevers and on the rack suggests that this may have been the second instrument of a batch. Other makers of virginals are also associated with organ building as well (Thomas Body, Charles Rewallin and James White) and it would appear that the connection between virginal and organ making in England is, in some ways, similar to that between clavichord and organ making in Germany.

Although the instrument is not made in London, the decoration and design are entirely similar to the instruments made in the capital. The paintings on the lid and keywell flap have been painted directly on the wood rather than on a gessoed background, and consequently have dulled in comparison to other instruments. Applying the decorative paint directly onto the oak surface is not unique to this instrument, also being found on the Mar and 1664 RH, as well as several other virginals. The possibility that the 1655 JL was sent to London for decoration cannot be excluded.[1]

There is nothing about the design of the virginal to suggest that Loosemore was unsure of virginal making. Although the construction is crude in its execution,[2] the actual design is well considered. The scaling-design note string length (172½ mm) suggests a pitch of V – 2s, and the string length at C (1624½ mm) can be compared with the C length of other instruments at the same pitch – 1453/1469 mm (1644 TW), 1475 (1662 TB) and 1501 (1641 GT). This instrument can therefore be shown to have a bass note approximately 1½ semitones closer to their breaking point.[3] The right bridge shape is such that no instrument made using the template could have Pythagorean-scaled string lengths over the top two octaves, and that the notes around c^2 were purposely designed to be comparatively shorter than those at c^3 and c^1. The

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[1] The decorative features are entirely consistent with London-made virginals, whereas the instruments by Rewallin (also of Exeter) have differences in several respects.

[2] This can be seen in a comparison of the case end dimensions. It should be emphasised that some other makers were equally poor in their handicrafts.

[3] In absolute terms, the C string of the 1655 JL, when converted to its scaling-design note (c^3) equivalent is scaled 905 cents below the scaling-design note itself (1624½ / 16 = 101.5. 101.5 / 171.3 = 0.5926. log 0.5926 x 3986.3137 = 905). The C string of the 1641 GT is scaled 1043 cents below the scaling-design note.

reasons why Loosemore (and other makers) did this is uncertain, but it is possible that it was done for tonal reasons.[4]

The apparent use of c^3 as the scaling-design note (plus the evidence of the instruments by Rewallin) shows that the same design principles were used in virginals from Exeter as those from London.

[4] The c^2 right bridge pin is often near the apex of the bridge curve and may have produced too prominent a sound when the top half of the compass was Pythagorean – and was reduced to help balance the sound over the treble.

1664 JP

Plate 1664JP.1 – Three-quarter view of the 1664 JP virginal.



Ownership and Provenance

Cobbe Collection, Hatchlands, East Clandon, Surrey, purchased 1991. Previously belonged to the Haags Gemeentemuseum, and before that to Raymond Russell. He purchased it at auction from Captain Lane of Wanstead in November 1955. The "WP" branding on the left faceboard suggests it may have come from Whitehall Palace.

References

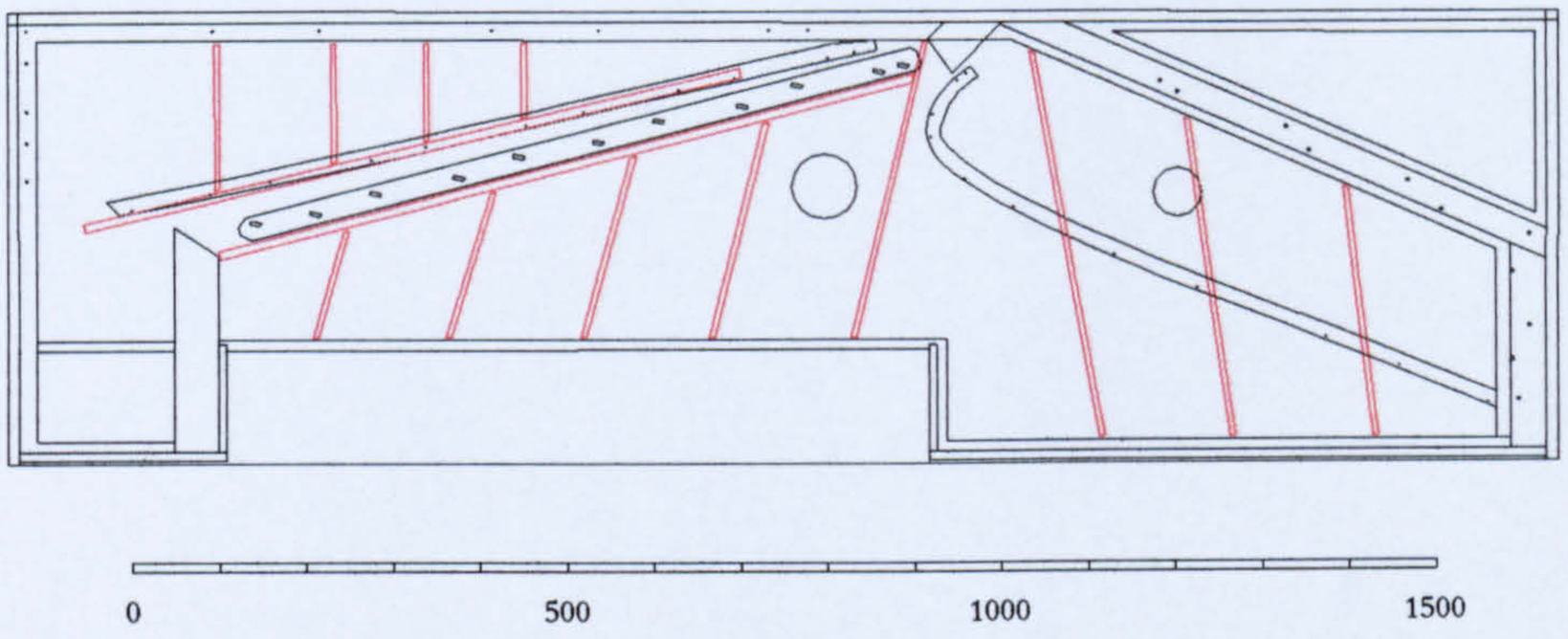
B1 & B2 English virginal table No. 10, B1 & B2 Player, John No. 3, B3 No. PLAYER, J. 1664. von Gleich (1989), Cobbe and Luckett (1992).

Inscriptions

Signed "Iohannis Player Londini Me Fecit I664" on the front of the jackrail. "WP" is branded on the left faceboard.

Construction

Figure 1664JP.1 – Plan view of the 1664 JP virginal.



OVERALL INSTRUMENT DIMENSIONS: 1784 x 528 x 218.

BASEBOARD: Deal, two original planks plus a small (30 wide) non-original section at the rear. The front plank 254 wide. 10.7 – 10.8 – 9.7 thick at front.

SPINE: Not original. Deal, 1783 – 1785 long, 219 – 222 – 218 high, 12.5 – 11.8 – 12.3 thick, morticed to the case ends.

CASE ENDS: Not original. Oak, left case end 525 – 529 long, 220 - 219 high, 12.4 – 12.8 – 12.2 thick; the right case end 525 - 527 long, 215 - 216 high, 13.6 – 13.3 – 13.6 thick. The spine and case ends overlap the baseboard. The faceboards are morticed into the case ends.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 238 long, 210 – 207½ – 209 high and 10.6 thick. Right faceboard 711 long, 210 – 207 – 208½ high and 11.0 thick. Butted to the keywell sides.

KEYWELL SIDES: Oak, 126 (left) and 125 (right) long (not including the overlapping faceboards), 8.8 (left) and 8.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 106½ – 113 (left) and 108 – 115 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 818 – 813, 153 - 150 high, and 12.9 – 9.9 thick.

KEYWELL LINER: Not original, Deal. 75↔ high, 13.6 – 14.0 thick.

OTHER LINERS: Not original, Deal. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Not original, Beech.

BASEBOARD FRAMES: Deal, 81 – 80 high. The inner edges form a continuation of the keywell sides. The frames are 18.7 (left) and 19.8 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: No longer present. There is no firm evidence to suggest there ever was one. There is a flower painting on the soundboard on the piece which normally acts as the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 870 long (front), 897 long (back). It is 51.2 wide, and 21.3 thick. The bottom of the jackrail is 27.0 (bass) and 33.2 (treble) above the top of the soundboard. The bass jackrail support is of deal, 51.0 wide. The left side is 264 long, the right side 230 long. The treble jackrail support is triangular in shape, 78 at the front, and 51 at the end where it meets the jackrail. The back corner is 629 from the right case end, and it is at an angle of 134° to the spine.

LID: Not original, Oak, coffered in seven pieces.

KEYWELL FLAP: Not original, Oak.

LOWER GUIDE BOARD: Not original, Deal.

SOUNDBOARD: Coniferous wood, 2.9 – 2.1 – 2.4 thick at the keywell liner. The top of the soundboard is ↕55 below the top of the case. Two gilded roses (of which only the right one is almost certainly original), 75 and 57 diameter, (of wood glued on top of parchment), glued from underneath the soundboard.

SOUNDBOARD REGISTER: Not original. Leather, 810 long. Marks on the soundboard show that the original register leather had spike marks between the wide pair of strings.

SOUNDBOARD BARRING: Not original, although the present barring is in the position of the original bars.

WRESTPLANK CAPPING PIECES: Oak, 5.0 thick. The treble wrestplank capping is 31.8 wide without, and 55.5 wide with applied mouldings; and the bass wrestplank capping is 41.9 (without) and 57.6 (with mouldings).

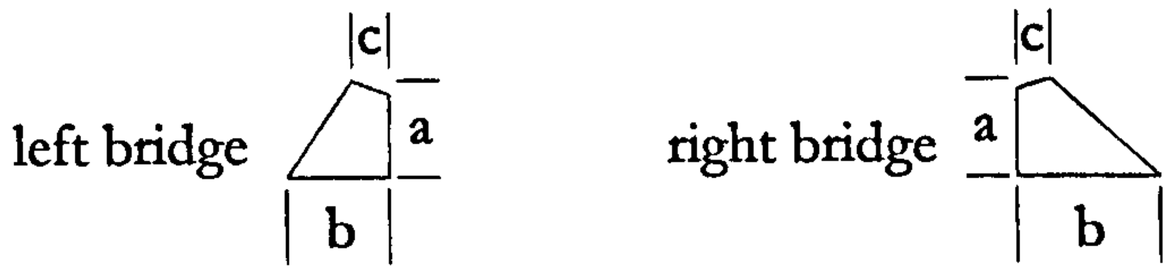
SOUNDBOARD MOULDINGS: Oak, 4.0 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. Both mouldings are 21 wide. The other soundboard mouldings are 12.0 wide.

OTHER MOULDINGS: All other mouldings are of deal. The faceboard mouldings are 3.8 thick. The moulding on top of the faceboards, keywell sides and nameboard are 20.1 wide. The soundwell top edge mouldings are 25.6 and 3.8 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 2.1 diameter. The tuning pins are not original, of iron. The tuning pins have been divided so that the notes up to d are on the bass wrestplank, and notes e^{b} to d^{3} are on the treble wrestplank.

BRIDGES: The left bridge is fruitwood, probably pear. There are scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.32 diameter. The right bridge is not original, of walnut. There are positioning holes at the front edge of each bridge, scribed lines on either side of the original right bridge position, and scribed lines at the front edge of the left bridge – the bridge itself being placed approximately 10 behind this line in the bass. There are also lines at the ends of the left bridge to mark its correct position.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	11.1	10.4	10.8	10.1	10.2
b	17.8	17.7	18.5	17.6	18.4
c	5.1	4.5	5.2	5.5	4.7

right bridge[1]	C	c	c^1	c^2	c^3
a					
b	17.4	17.4	18.1	18.7	15.0
c					

[1] The right bridge is not original, but the width of the original bridge can be determined by the scribed lines.

String Lengths and (Plucking Points)

As the right bridge is not original the string lengths do not necessarily reflect the intentions of the maker. However, the right bridge is positioned closely to the scribed line and therefore the quoted figures must be very close in the treble. The figures in the tenor and bass are probably a fairly accurate estimate of the original strings.

		f^{1}	**445 (81)**	**F**	**1230 (121½)**
		e^{1}	454½	E	1249
		e^{b1}	500	E^{b}	1302½
d^{3}	131 (54)	d^{1}	511	D	1317½
$c^{\#3}$	148½	$c^{\#1}$	557½	$C^{\#}$	1369
c^{3}	**151½ (53)**	**c^{1}**	**569 (80)**	**C**	**1383½ (119)**
b^{2}	170	b	612½	BB	1438
b^{b2}	·173	b^{b}	625	BB^{b}	1452½
a^{2}	194½	a	679	AA	1506½
$g^{\#2}$	197½	$g^{\#}$	692½	$GG^{\#}$	1519½
g^{2}	208½	g	744½	GG	1578 (140)
$f^{\#2}$	212	$f^{\#}$	758		
f^{2}	**231 (72)**	**f**	**813½ (102½)**		
e^{2}	235½	e	825½		
e^{b2}	256	e^{b}	878½		
d^{2}	262½	d	891½		
$c^{\#2}$	288	$c^{\#}$	948		
c^{2}	**295 (66)**	**c**	**962½ (95)**		
b^{1}	319	B	1024½		
b^{b1}	327	B^{b}	1039½		
a^{1}	357	A	1095		
$g^{\#1}$	365	$G^{\#}$	1109		
g^{1}	397½	G	1163		
$f^{\#1}$	406½	$F^{\#}$	1177		

Keyboard and Action

COMPASS: GG – d^3.

BALANCE RAIL: Not original, of beech. 35.3 wide and 28.8 high. The balance pins are not original, of brass. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, the left tapering from 31 – 13, and the right from 30 – 28 wide and 12.2 thick. The backrail is deal, 52.2 – 48.2 wide and 16.3 thick.

RACK: Lime, attached to the top surface of the backrail. The rack is 5.6 thick, 40.4 high.

FRONTRAIL: Lime, 29.8 – 28.8 wide and 10.0 thick.

KEYWELL BATTEN: Not original. There is (now) a batten which overlaps the front of the faceboards, but it is possible that there never was one originally.

ENDBLOCKS: Deal. The left endblock is 157 long, 18.7 wide and 43.8 – 40.7 high. The right endblock is 173 long, 18.5 wide and 43.0 – 41.6 high. There is a non-original dustcatcher, the ends of which are let into the endblocks.

KEYBOARD WIDTH: Overall width between the keywell sides 808, and between the endblocks 769. The overall width of the keyboard is 764, and the three-octave span is 484½.

KEYLEVERS: Deal, 14.7 thick at the front, tapering to 11.1 at the rear. The rackpins are not original. The lowest keylever is 303 long and the balance point is 124 from the front of the touchplate. The top keylever is 478 long, and the balance point is 176 from the front. The accidental keylevers are balanced 13.9 – 13.2 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, 108 – 111 long, and tapering in thickness from 2.5 at the front to 1.5 at the rear. There are four scribed lines on the front section, 24.9, 27.0, 31.0 and 33.0 from the front edge. The touchplates overhang the keylevers by 2.4.

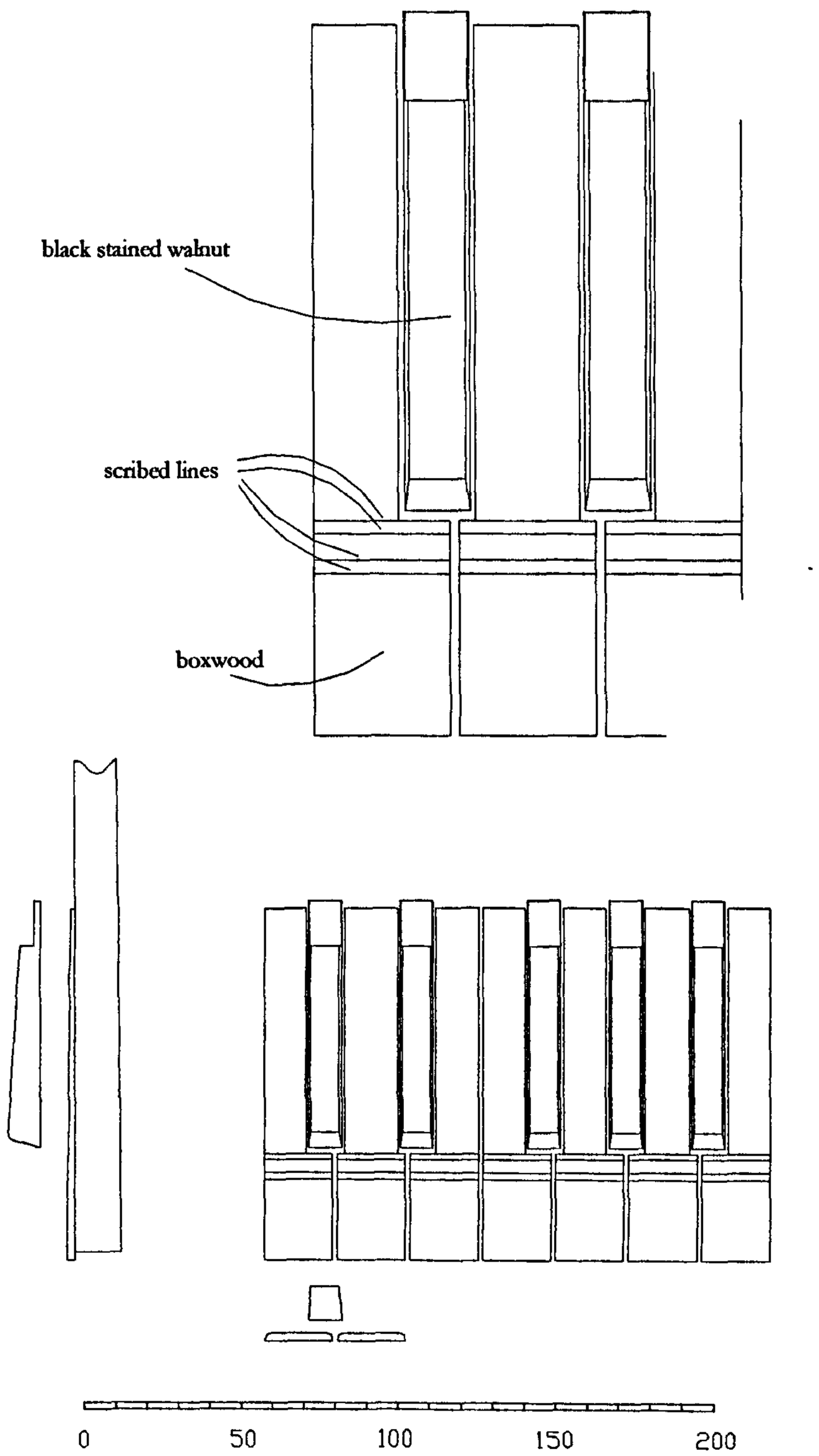
The natural touchplate widths in between the accidentals are:-

		f^2	13.2	f^1	13.2	f	13.2	F	13.0
		e^2	13.5	e^1	13.8	e	13.6	E	13.9
d^3	19.7	d^2	17.2	d^1	16.9	d	16.4	D	16.1
c^3	12.9	c^2	13.2	c^1	13.6	c	12.9	C	13.1
b^2	13.7	b^1	13.2	b	13.1	B	13.1	BB	13.6
a^2	14.5	a^1	14.0	a	13.5	A	14.0	AA	15.7
g^2	13.7	g^1	13.2	g	13.4	G	13.5	GG	14.0

ACCIDENTAL TOUCHPLATES: Black stained walnut. The overall length is typically 77, of which only 63.2 is visible, the remainder is reduced in height and below and behind the nameboard, and total height 10.5 (front) – 6.5 (rear). They taper in width from 10.4 at the bottom to 9.0 at the top.

None of the jacks or action cloths is original.

Figure 1664JP.2 – Drawing of major keyboard details.



Decoration

As all of the visible exterior is non-original, it has only a limited resemblance to what would have been there originally. The outside of the case has been varnished, but is a lighter colour than those found on other instruments, and the lid is coffered from seven pieces rather than the usual three.

The soundboard is decorated with border patterns, flowers and birds. There are two roses which are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer.

The keywell, faceboards, soundwell and jackrail are decorated with deal moulded bands separated by embossed papers. The moulded sections are stained a green colour. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are not original, made by the author based on the "Carolus Shield" design found on the 1675 SK. Inside the inner faceboard and keywell mouldings is white painted scrollwork over a black background. In the centre of the nameboard is an octagonal plaque with a decorated painted vase of flowers. The arcades are of the "sunflower" design.

The lid and keywell flap interiors have landscape paintings, loosely based on original designs. The keywell flap is divided into four sections by applied mouldings. It is likely that the painting on the keywell flap is a single scene which has been divided, rather than separate images. The paintings on both the lid and keywell flap are mostly unclear.

Condition

Although now in playing condition, the virginal has had several major restorations over the past 120 years. For unknown reasons the instrument was re-cased, probably in the late-nineteenth or early-twentieth century.[2] This work included a new spine, case ends, lid, keywell flap, wrestplank and liners. The former "embossed papers" were probably added to the virginal at this time. In the mid-twentieth century another restoration took place (probably shortly after the instrument's acquisition by

[2] This is based on an analysis of the pigments from samples taken from the lid and keywell flap.

the Gemeentemuseum). This work probably included making a new right bridge, register leather and lower guide. In 1991-2 it was restored by the author and Christopher Nobbs, during which the pressed papers were replaced with those of a historical design, new jacks, lower guide, register leather and soundboard barring was introduced, and the soundboard had numerous cracks repaired.

The instrument is now in a condition which is structurally sound and imitates the original as closely as possible, given the replacement parts.

Commentary

The 1664 JP is unusual, although not unique, in several ways. It is one of the three "long bass" virginals dating from the mid-1660s,[3] one of three instruments with green stained mouldings,[4] and one of three in which the scaling-design note is the "short" string.[5]

The compass is 56 notes, GG – d^3, and it is probable that Player divided his register into 28 pairs, rather than 27 pairs plus two individual jackslots at the ends. Unlike the 1656 JW,[6] where the maker probably reduced his scaling-design note string length to compensate for the fact that it was the short string, it is probable that Player used his intended scaling-design note regardless of the fact it was comparatively short. It is possible that the intended pitch was V – 1s rather than V, but there is no evidence that the instrument was altered during construction. It is therefore likely that the scaling-design note reflects the intended pitch, the string lengths of the other *c* strings being similar to those found on other virginals at V.

The soundboard is a little thinner than many other examples, although the soundboard barring is similar to many other virginals from after the Restoration. It is likely that the use of the thin soundboard is a deliberate choice by the maker.

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[3] The other two are the 1664 RH with a FF,GG – c^3 compass, and the 1668 SK with a FF,GG – d^3 compass.
[4] The other two being the 1671 PJ and 1675 SK virginals.
[5] The others being the 1656 JW and the 1675 SK virginals.
[6] See the Catalogue entry, page 245.

The appearance of the branded "WP" initials on the left faceboard has led the owner to speculate that the instrument came from Whitehall Palace.[7] Many other chattels from royal palaces have been absorbed into other collections, including many pieces from Whitehall Palace which are now at Knole Park. These pieces also are inscribed with the initials "WP". Although the attribution of provenance to Whitehall Palace is plausible, it must remain uncertain until further documentary evidence or a piece of proven provenance with an identical brand is found.[8]

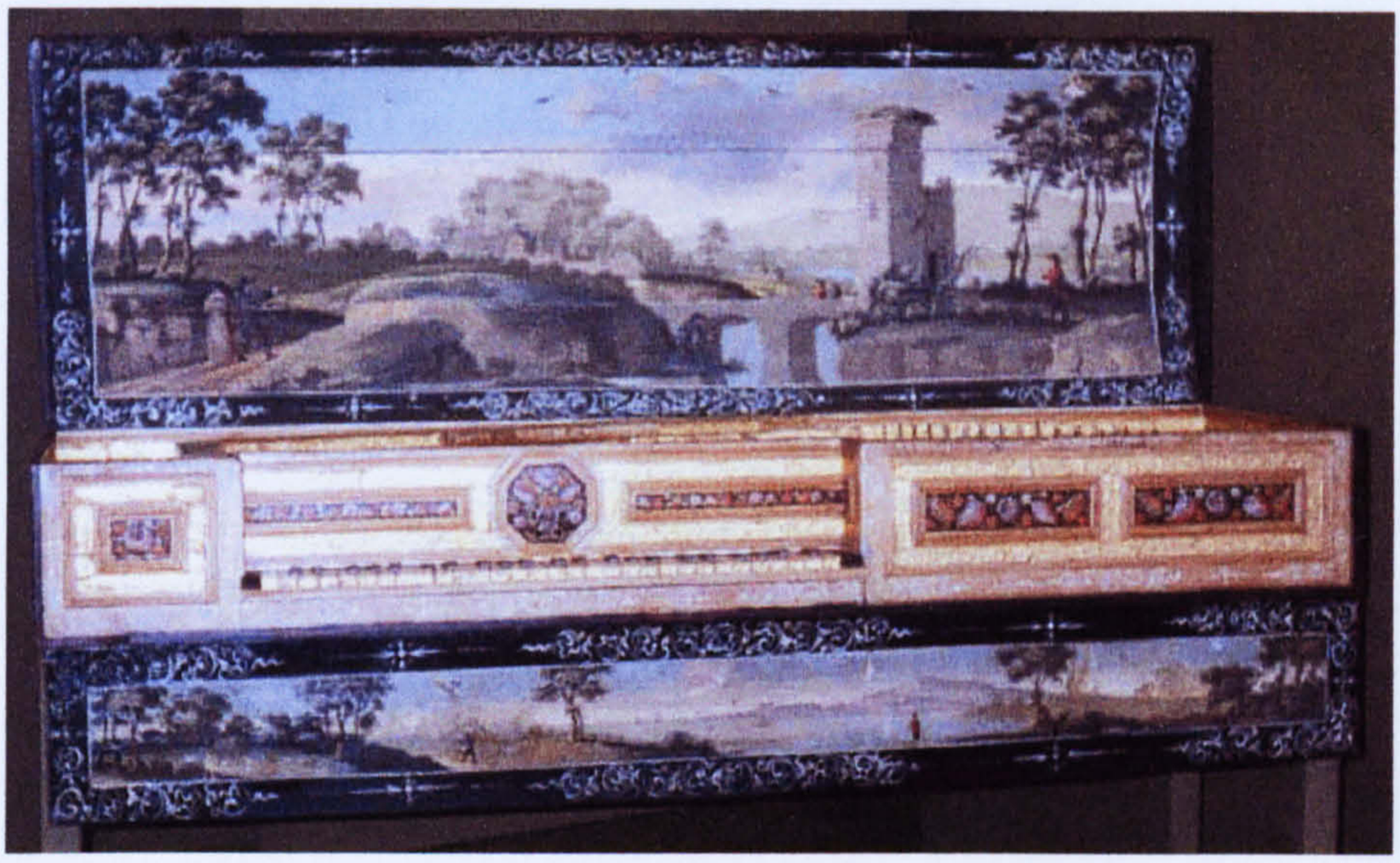
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[7] See Cobbe and Luckett (1992).

[8] This would require the brand to have come from the same tool. As already noted, furniture inscribed "WP" is already known, but its existence cannot prove the Player virginal is likewise from Whitehall Palace.

1675 CR

Plate 1675CR.1 - Full front view photograph of instrument.



Ownership and Provenance

Somerset County Museum, Taunton Castle, Taunton. On loan from Chard Museum.

Formerly belonged to Arthur Hull, Chard.

References

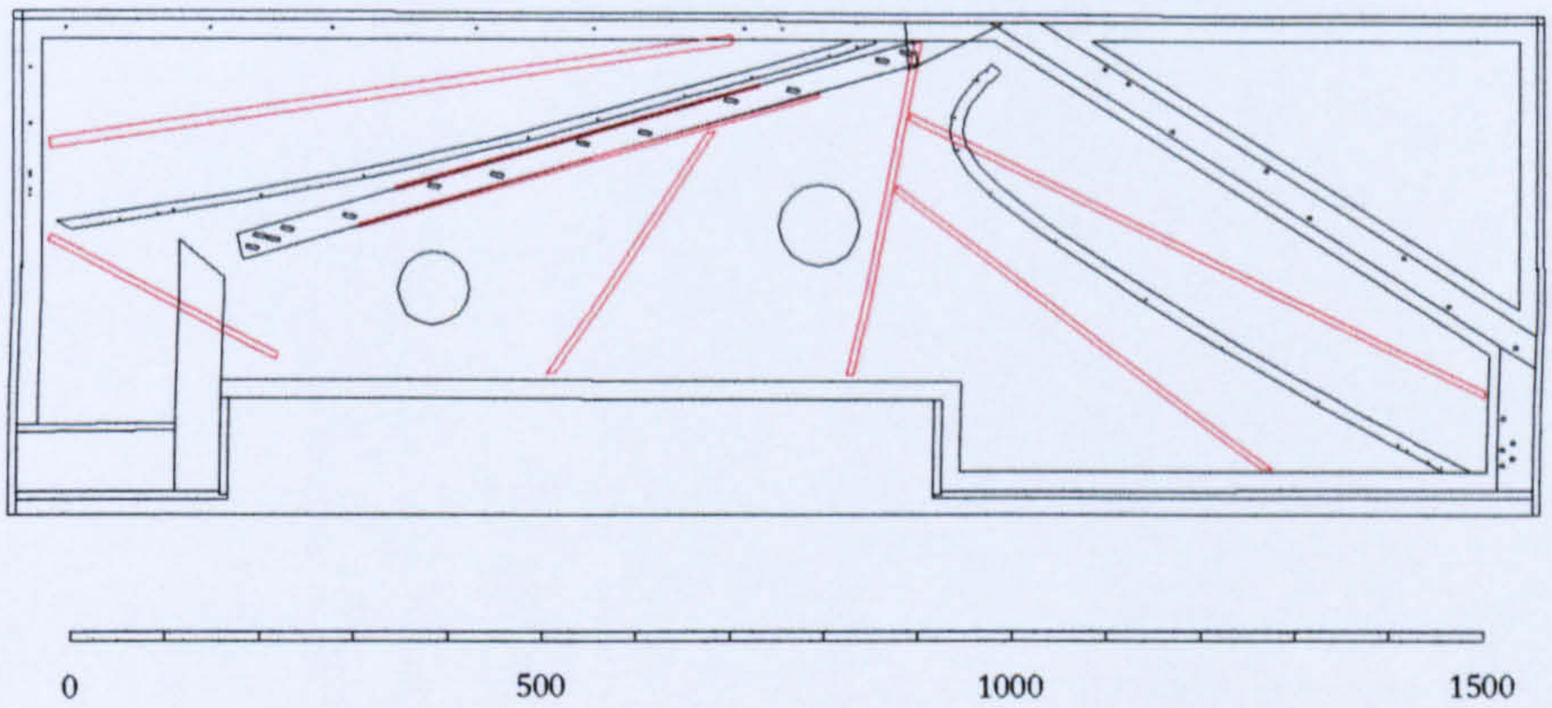
GD3 & GD4 No. 11. B1 & B2 English virginal table No. 15. B2 Rewallin, No. 1; B3 No. REWALLIN, C. 1675. Gray (1916).

Inscriptions

Signed "CHARLES REWALLIN MADE IT XON 75" on the front of the jackrail.

Construction

Figure 1675CR.1 - Plan view of the 1675 CR virginal.



OVERALL INSTRUMENT DIMENSIONS: 1627 x 526 x 217.

BASEBOARD: Deal. 13.7 - 13.8 - 11.0 thick at front.

SPINE: Deal, 1627 - 1628 - 1626 long, 215↔ high, 8.8 - 9.8 - 7.8 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 526 - 528 long, 218 - 215 high, 8.9 - 9.9 thick; the right case end 526↔ long, 216 - 215 high, 8.2 - 7.3 thick. The spine and case ends overlap, and are nailed to, the baseboard.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 224 long, 199 - 198 - 199 high and 8.3 thick. Right faceboard 636 long, 197 - 196 - 198 high and c. 8 thick. Morticed to the keywell sides.

KEYWELL SIDES: Oak, 111 (left) and 109 (right) long; 8.3 (left and right) thick. Slots for the nameboard have been cut into the keywell sides 98 - 101 (left) and 98½ - 101½ (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 756½ - 755, 139↔ high, and 8½ - 7 thick.

KEYWELL LINER: Deal, 74 - 73½ high, 18.8 - 18.9 thick.

OTHER LINERS: Oak, c. 30 x c. 10.

WRESTPLANKS: Oak, ‡26 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 82 high. The inner edges form a continuation of the keywell sides. The frames are 19.6 (left) and 20.0 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 32 high, set 63 (left) to 65 (right) from the back of the faceboard. Toolbox lid is missing, but an iron rod hinge remains, tapering from 3.0 to a sharp point. The lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 771 long (front), 816½ long (back). It is 49.5 wide, and 14.0 thick. The bottom of the jackrail is 26.3 (bass) and 25.8 (treble) above the top of the soundboard. There are two layers of cloth, sewn together giving a total thickness of 3.1 attached to the underside of the jackrail. These cloths are almost certainly contemporary with the instrument. The bass jackrail support is of deal, 47.9 wide. The left side is 265 long, the right side 226 long. The treble jackrail support is triangular in shape, 101 long at the rear, 110 at the front, and 50 at the end where it meets the jackrail. The back corner is 570 from the right case end, and it is at an angle of 152° to the spine.

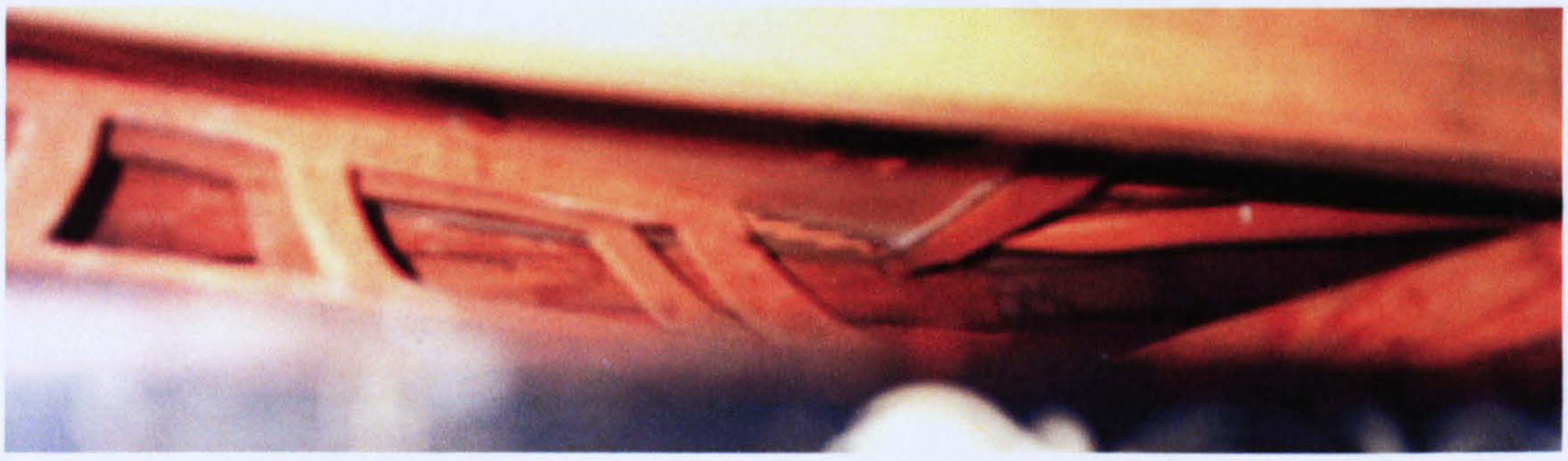
LID: Oak, coffered in three pieces. The planks are 175, 207 and 169 wide on the inside, and the front thickness is 6.8 - 6.5 - 6.5. Applied mouldings along the joins and the ends on the top surface. End battens 16.4 (left) and 14.2 (right) thick, with an inside coffer height of 53.2 (left) and 53.5 (right). Wire hinges (1.9 diameter) between the spine and lid. The lid was probably held open by a cord attached to the left case side and lid batten, as there are old iron hooks (2.9 diameter) remaining.

KEYWELL FLAP: Deal, 203 - 214 - 205 wide, and 9.6 - 9.2 thick. Iron strap hinges, maximum 3.0 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Oak, 88 wide and 3.0 thick. Nailed to the top of the frames. Leather guide glued underneath. There are full depth cut-off bars, c. 3½ thick, glued either side of the register. They are longer at the lower guide than where they

attach to the soundboard, and have three "windows", leaving wood c. 25 wide at the top and bottom and c. 32 wide forming the sides of the window.

Plate 1675CR.2 - Internal view, showing the front and back cut-off bars, and several soundbars.



SOUNDBOARD: Coniferous wood, 2.8 - 2.0 - 2.4 thick at the keywell liner, and 2.5 thick behind the left rose. The top of the soundboard is approximately 45 below the top of the case. Two gilded roses (of wood glued on top of parchment), supported underneath by small bars. The rose diameters are 76.4 (left) and 85.7 (right).

SOUNDBOARD REGISTER: Leather, approximately 745 long, tapering slightly in width from 25.8 (bass) to 25.6 (treble), and 0.8 thick. Slots typically 12.8 x 3.8. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

SOUNDBOARD BARRING: Deal, 19 high and 7 wide (where they are glued to the soundboard.

WRESTPLANK CAPPING PIECES: Oak, 4.5 thick. The treble wrestplank capping is 28.0 wide without, and 54.8 wide with applied mouldings; and the bass wrestplank capping is 37.7 (without) and 48.3 (with mouldings).

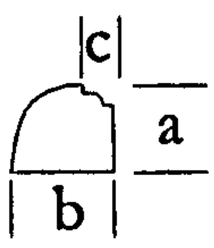
SOUNDBOARD MOULDINGS: Oak, 4.5 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 21.0 wide, and the spine moulding is 19.9 wide. The other soundboard mouldings are oak, 19.5 wide.

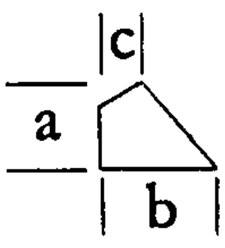
OTHER MOULDINGS: All other mouldings are of deal. The faceboard mouldings are 4.5 thick. The moulding on top of the faceboards, keywell sides and nameboard are 14.1 wide and 3.9 thick. The soundwell top edge mouldings are 18.8 and 4.3 thick.

HITCHPINS AND TUNING PINS: The hitchpins are of brass, 1.7 diameter. The tuning pins protrude 27 from the top of the wrestplank capping piece, 3.7 diameter, and are of iron.

BRIDGES: Fruitwood, probably pear. There are no scribed lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of brass, 0.95 diameter. The left bridge has been backpinned from c to the bass.

Bridge Dimensions:





left bridge	C	c	c^1	c^2	c^3
a	11.8	12.1	12.3	11.9	11.6
b	9.8	10.6	10.8	10.0	9.1
c	2.9	3.0	3.4	3.3	3.0

right bridge	C	c	c^1	c^2	c^3
a	10.6	10.6	10.8	10.7	10.9
b	13.4	13.2	12.7	13.1	13.2
c	4.3	4.2	4.1	4.1	4.1

String Lengths and (Plucking Points)

A number of the bridge pins have been repositioned. Often there are three bridge pins in a set rather than the required two. The extra bridge pins are the same diameter as the original pins suggesting it is the work of Rewallin. The following table lists the original string lengths. In the cases where there are altered string lengths they are given in *italics.*

		f^{1}	**424½ (52)**	**F**	**1147½ (94½)**
		e^{1}	460½ *463½*	E	1192
		e^{b1}	474	E^{b}	1213
d^{3}	141 (52)	d^{1}	513½ *516½*	D	1260
$c^{\#3}$	145½	$c^{\#1}$	528½	$C^{\#}$	1282½ *1279*
c^{3}	**159½ (54½)**	**c^{1}**	**570 (59½) *572½***	**C**	**1330 (123)**
b^{2}	165½	b	587	**Ex C**	**1356½ (126)**
b^{b2}	176	b^{b}	628 *631*	GG/BB	1406½ (139)
a^{2}	182	a	646	Ex GG/BB	1433 (141½)
$g^{\#2}$	194½	$g^{\#}$	687 *690*		
g^{2}	200	g	705		
$f^{\#2}$	213	$f^{\#}$	747 *750*		
f^{2}	**219½ (46½)**	**f**	**763 (60)**		
e^{2}	237	e	806 *808*		
e^{b2}	245	e^{b}	824½		
d^{2}	263½ *266½*	d	868 *871*		
$c^{\#2}$	273	$c^{\#}$	884½		
c^{2}	**295 (51) *299***	**c**	**927½ (78) *931***		
b^{1}	305½	B	950½		
b^{b1}	330½	B^{b}	991½		
a^{1}	341	A	1013		
$g^{\#1}$	368½ *372½*	$G^{\#}$	1054 *1057½*		
g^{1}	381½	G	1078		
$f^{\#1}$	410 *414½*	$F^{\#}$	1122½		

Keyboard and Action

COMPASS: GG/BB - d3, with an extra string and jack for GG/BB and C.

BALANCE RAIL: Oak, 27.5 wide and 38.6 thick. The balance pins are iron, 2.4 diameter, and protruding 17 above the top of the balance rail. The balance rail is rebated to the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are ash (?), the left side 89 and right side 86 wide. They are generally 9.2 thick. The backrail is deal, 38.6 wide and 31.5 thick.

RACK: Mahogany, attached to the rear surface of the backrail. The rack is 3.3 thick, 61.7 high.

FRONTRAIL: Walnut, 47.5 wide and 13.0 thick.

KEYWELL BATTEN: Deal, with a moulded top edge along the front, 45.2 - 46.1 high and 3.2 thick.

ENDBLOCKS: Deal. The left endblock is 111 long, 21.6 wide and 51.7 - 45.6 high. The right endblock is 112 long, 24.4 wide and 50.4 - 46.4 high.

KEYBOARD WIDTH: Overall width between the keywell sides 748, and between the endblocks 701. The overall width of the keyboard is 699, and the three-octave span is 473½.

KEYLEVERS: Deal, 14.7 thick at the front, tapering to 8.6 at the rear. The rackpins are deal, tapering from 4.0 diameter. The lowest keylever is 303 long and the balance point is 102 from the front of the touchplate. The top keylever is 489 long, and the balance point is 180 from the front. The accidental keylevers are balanced 10½ behind the naturals.

NATURAL TOUCHPLATES: Boxwood, generally 105 long, and tapering in thickness from 2.9 at the front to 1.3 at the rear. The boxwood for the natural touchplates has been applied in two sections, and is separated by a long strip of snakewood, 6.5 wide.

The touchplates overhang the keylevers by 2.7. The note names are written on the natural touchplates with black ink.

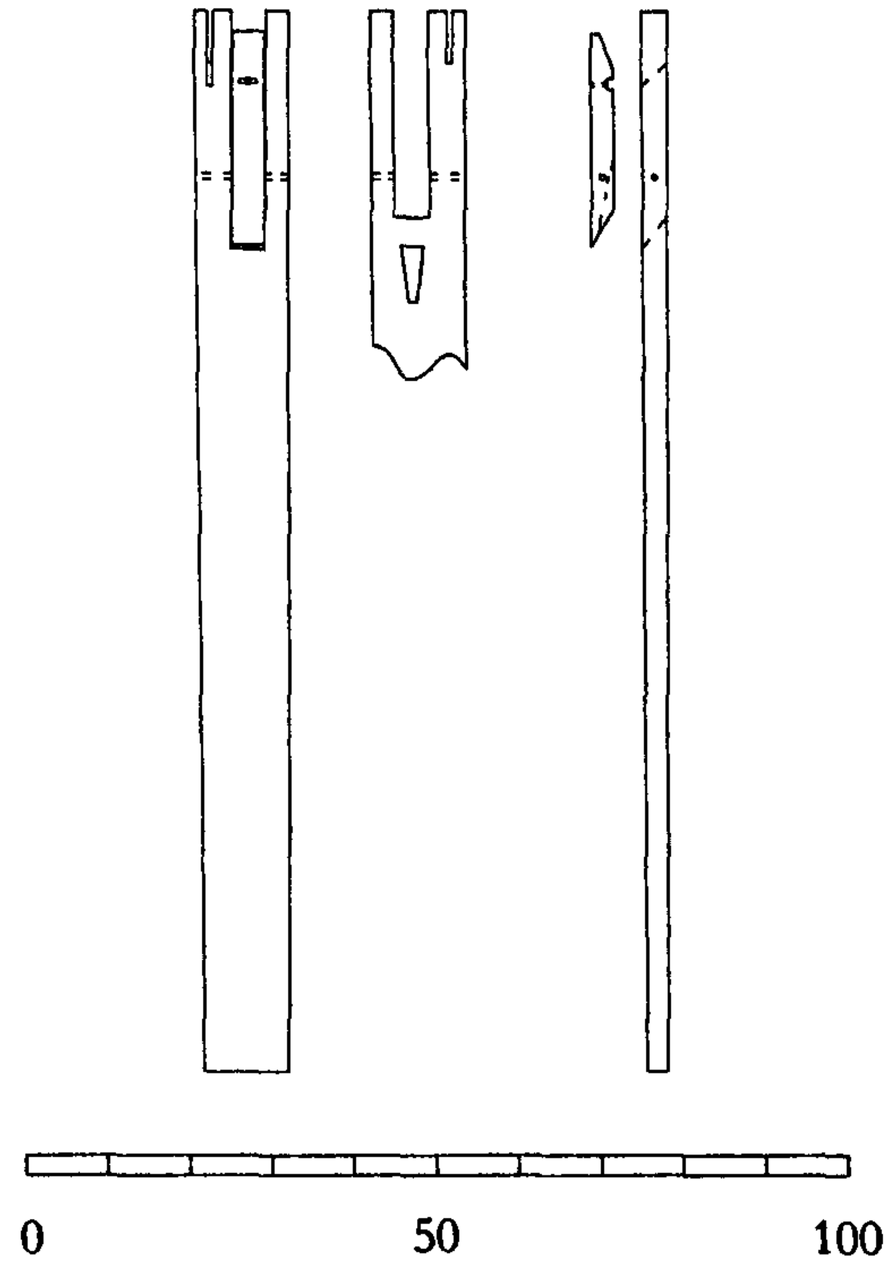
The natural touchplate widths in between the accidentals are:-

		f^2	11.6	f^1	12.6	f	12.6	F	12.7
		e^2	12.7	e^1	12.7	e	12.7	E	13.2
d^3	17.6	d^2	12.8	d^1	12.7	d	13.0	D	12.7
c^3	12.3	c^2	12.7	c^1	12.7	c	12.7	C	12.8
b^2	12.6	b^1	12.5	b	12.6	B	12.8	GG/BB	21.6
a^2	12.4	a^1	12.8	a	12.6	A	12.5		
g^2	12.7	g^1	12.0	g	12.6	G	12.6		

ACCIDENTAL TOUCHPLATES: Snakewood. The overall length is typically 56.6, and total height 10.1 (front) - 6.1 (rear). They taper in width from 11.5 at the bottom to 11.4 at the top. The top front edge of the touchplate is noticeably rounded, having a radius of approximately 3 mm. The arcades are gilded paper in various floral designs.

JACKS: The jacks are of an unusual wood, probably plane, tongues of holly. The total length is typically 127, although a number of the jacks have had orange sealing wax added to the bottom to increase the height. They taper in width from 11.6 - 10.3, and in thickness from 3.2 - 2.5. The axle pins are positioned 17.4 (68%) from the top of the tongue. The diameter of the axle pin is 0.68. All except four original jacks survive.

Figure 1675CR.2 - Drawing of a typical jack.



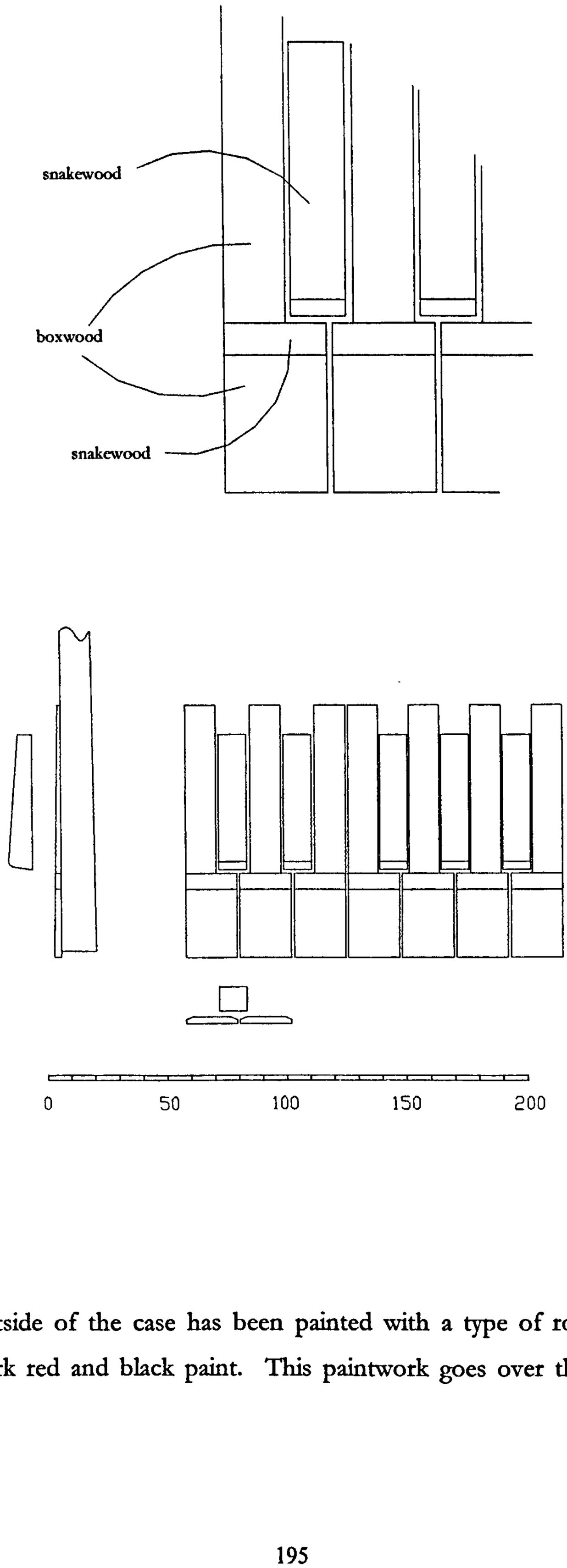
ACTION CLOTHS: All of the original action cloths survive. The cloth on the back on the keylevers is a type of woven wool, 3.2 thick, now quite hard, glued along its length. The backrail has two layers of woven wool cloth, 1.7 thick, giving a total effective height of 4.0. The balance rail has strips of leather behind the balance pins with a thickness of 2.7. The front rail has six layers of woven coarse cloth, giving a total uncompressed thickness of 21½. The jackrail has two layers of thin coarse cloth sewn together, giving a total thickness of 3.1.

It has been possible to measure the depth of touch across the instrument's compass. The depth increases where the frontrail cloth is tacked between GG/BB and C, at c^1, and between c^3 and d^3. The measurements, taken to where the bottom of the key first touches the frontrail cloth, are listed below.

Table 1675CR.1 – Depth of touch measurements.

E	6.0	e	5.4	e^1	6.2	e^2	6.0
A	6.0	a	6.6	a^1	6.4	a^2	6.2
c	5.6	c^1	8.0	c^2	6.8	c^3	8.6

Figure 1675CR.3 - Drawing of major keyboard details.



Decoration

The outside of the case has been painted with a type of rosewood graining effect using dark red and black paint. This paintwork goes over the entire exterior

the strap hinges and lockplates, and is almost certainly not original. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

Plate 1675CR.3 - View showing painted graining effect, lid mouldings and strapwork hinges.



The soundboard is decorated with border patterns, flowers and birds. The paint has been thickly applied to the instrument. There are two roses which are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The support bars under the roses have also been gilded, which suggests that this was carried out with the roses already glued in the instrument.

The keywell, faceboards, soundwell and jackrail are decorated with natural deal moulded bands separated by embossed papers. The flat part of the bands have painted white vinework decoration. The deal is untreated apart from a thin coat of some type of sealer, possibly gluesize. The gilt papers are unique to Rewallin and are used in both of his instruments, consisting of a flower and wreath design. In the centre of the nameboard there is an octagonal plaque, with a painting of a vase and flowers on a black background. Similar paintings of flowers on a black background appear in the panels on

either side of the nameboard, extending onto the keywell sides, and on the left and right faceboards.

The lid and keywell flap have typical landscape paintings. The lid painting shows a tower, a bridge over water, and rolling hills with trees at the side. There are various figures on the bridge and on the bank of the river. The keywell flap scene has water in the centre, with hills and trees to the sides, there are two figures, one of whom is fishing. There is a wide black border around the paintings which is decorated with white painted arabesques.

Plate 1675CR.4 - Close up view showing the deal mouldings, gilt papers, painted panels, and the inlaid naturals.



Condition

This instrument is finely preserved, showing little evidence of use, but has been subjected to conditions which have caused some structural damage.

Of particular interest is the preservation of all of the instrument's action cloths. This is the only English virginal which has retained all of its original cloths.

The stand is not original, and appears to be an addition from the present location.

The soundboard has various long cracks, which in some instances have not been impeded by the right bridge or the soundboard barring. These cracks have discoloured and match the colour of the top of the soundboard, suggesting the instrument has been in this condition for many years.

There is some separation in between the front two lid panels. This is only visible on the inside where it has damaged the lid painting. The outside has imitation graining and mouldings over the joins which covers any damage.

The right lid hook which attaches to the hasp on the keywell flap has broken off, but is still retained with the instrument.

The toolbox lid is now missing.

There is some slight worm damage, which may have even been present in the wood before the instrument was built.

Commentary

This instrument is particularly important due to the survival of all of its action cloths. It also, when compared with the other surviving instrument by Charles Rewallin, provides interesting evidence about original constructional practices. It is clear, however, that there are various elements of these instruments which are outside the usual English virginal making tradition, no doubt a consequence of being built in Exeter, rather than London.

One aspect of this instrument worth specific comment is the overpainting of the exterior. This is the only extant instrument which no longer has a natural varnished finish. It is clear, however, that this painting was carried out after the instrument was completed as the painting goes over the various hinges and lockplates. It cannot be ruled out that the decoration is from the workshop. There is no evidence that the oak casework was ever varnished, judging from the places it can now be seen where damage

has occurred. The decoration appears to be in imitation of woodgrain, possibly rosewood that, although comparatively rarely used, was known to European craftsmen before the instrument was made in 1675. The use of a variety of mahogany for some of the inner case parts and keywell parts suggests that Rewallin did have ready access to woods from the New World (where rosewood would also have originated).

Unlike the later Rewallin instrument, this virginal has natural moulding bands. Although the wood is likely to have darkened slightly, these bands are still very pale and do not highlight the gilt paper decoration very well. The impression given is actually of a reversal from the normal decoration scheme in which the mouldings are always darker than the papers. The major contrast on the faceboards and keywell comes from the central plaques which have paintings of flowers over a black background.

The instrument appears to have moved structurally soon after it was built. Various extra right bridge pins have been added, almost always in between the original closely spaced pairs of pins. The result is that the "long" strings (plucking towards the player) can be moved to the new pins, thus allowing the plectra to be returned to something approaching their original lengths. As the pins are the same diameter, and have been cut in the same way as the original ones, they are almost certainly the work of Rewallin. The soundboard is comparatively thin (measuring as little as 2.0 at the keywell liner and 2.3 - 2.5 at the front of the register. This, along with the acute angle between the left bridge and the soundboard grain is probably responsible for the movement of the bridge.

Also worthy of mention are two small unplugged holes in the soundboard, one situated 212 from the left case end and 267 from the spine, and the other 977 from the left case end and 45 from the spine. These holes are likely to be from a register template which was nailed to the soundboard.

The left bridge has been backpinned from the bass up to c. Backpinning is found in the other Rewallin virginal as well, but only for the bottom 3 pairs of strings. This backpinning appears to be original or contemporary with the early repinning of the left bridge, possibly carried out to stop the bridge from rolling further.

1679 CR

Plate 1679CR.1 – Three-quarter view of the 1679 CR virginal.



Ownership and Provenance

Royal Albert Memorial Museum, Exeter. Bequeathed to the Museum in 1953 by Mrs. Edith Ponsford, Puddicombe House, Drewsteignton, Devon. It had been there for several generations.

References

B1 & B2 English virginal table No. 17. B2 Rewallin, No. 2; B3 No. REWALLIN, C. 1679.

Inscriptions

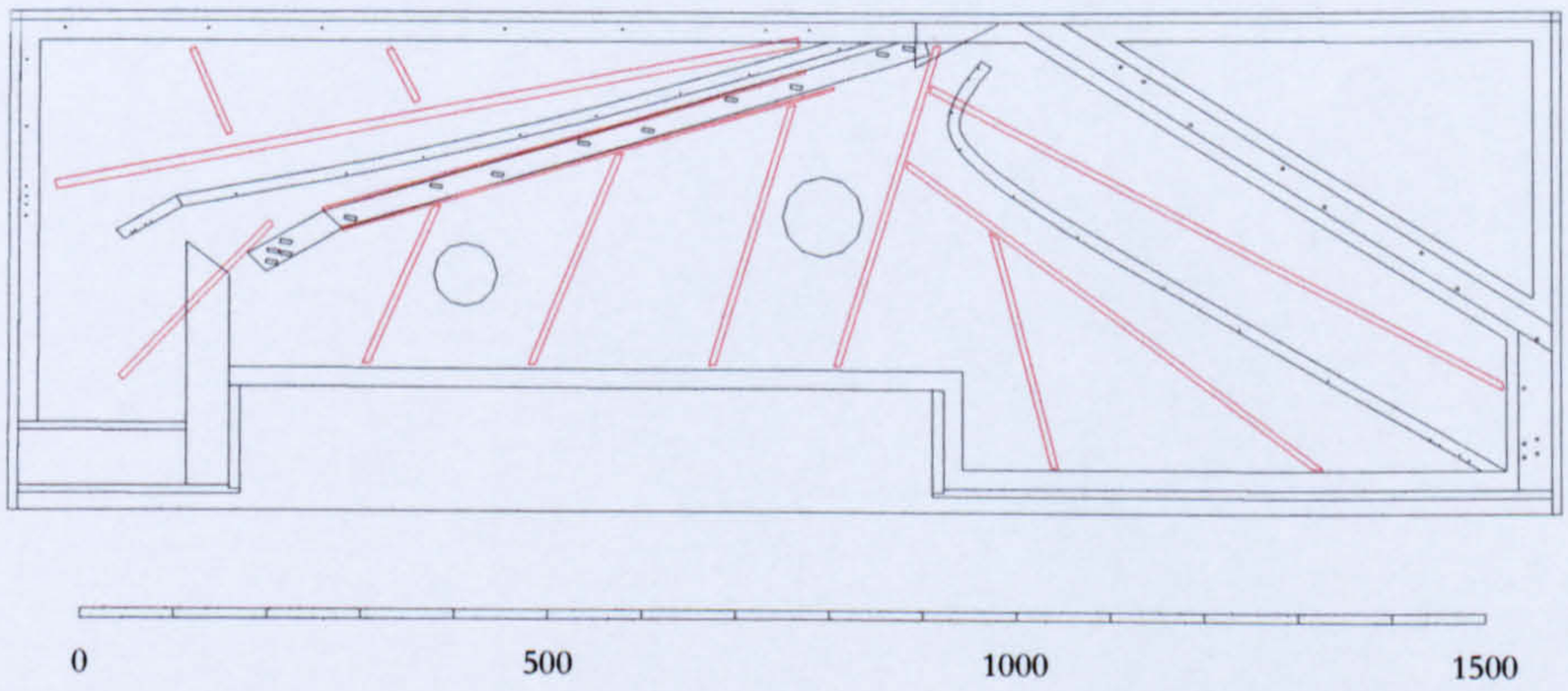
Signed "CHARLES REWALLIN MADE IT IN XON 1679" on the front of the jackrail. Various modern inscriptions recording repair work on paper glued to the front of the keywell liner.

Plate 1679CR.2 - View of the jackrail showing the maker's signature.



Construction

Figure 1679CR.1 - Plan view of the 1679 CR virginal.



OVERALL INSTRUMENT DIMENSIONS: 1658 x 528 x 219.

BASEBOARD: Deal; two planks, the rear 304 wide. 13.8 - 14.8 - 13.6 thick at front.

SPINE: Deal, 1656 - 1657 - 1656 long, 219 - 220 - 218 high, 9.8 - 10.6 - 9.2 thick, dovetailed to the case ends.

CASE ENDS: Deal, left case end 528 - 529 long, 219 - 218 high, 10.4 - 11.2 - 10.6 thick; the right case end 528↔ long, 219 - 218 high, 10.0 - 9.9 thick. The spine and case ends overlap, and are nailed to, the baseboard.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 237 long, 204 - 206 high and 8.2 thick. Right faceboard 661 long, 205 - 203½ - 205 high and 8.2 thick. Morticed to the keywell sides.

KEYWELL SIDES: Deal, 117 (left) and 118 (right) long; 11.4 (left) and 11.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 104 - 108 (left) and 103 - 107½ (right) from the front of the keywell sides. The scribed lines, used to guide the chisel, extend to the bottom of the keywell sides.

NAMEBOARD: Deal, total length 748 - 744½, 144 - 145 high, and 10½ - 9 thick.

KEYWELL LINER: Deal, 16.8 - 17.0 thick, 80½↔ high.

OTHER LINERS: Deal, c. 30 x c. 8, with chamfered lower edges.

WRESTPLANKS: Oak, ‡30 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 92 (left) and 90 (right) high. The inner edges form a continuation of the keywell sides. The frames are 17.1 (left) and 16.6 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 31 high, set 57½ from the back of the faceboard. Toolbox lid of pear, 174½ - 173½ long, 69 - 70 wide, and 9.8 thick. It hinges at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 770 long (front), 819 long (back). It is 46.9 wide, and 13.5 thick. The bottom of the jackrail is 29.2 (bass) and 32.5 (treble) above the top of the soundboard. The bass jackrail support is of deal, 45.5 wide. The left side is 257 long, the right side 222 long. The treble jackrail support is triangular in shape, 87 long at the rear, 100 at the front, and 48 at the end where it meets the jackrail. The back corner is 592 from the right case end, and it is at an angle of 151½° to the spine.

LID: Deal, coffered in three pieces. The planks are 177, 199 and 185 wide on the inside, and the front thickness is 6.0 - 7.2 - 7.5. Applied mouldings along the joins and

the ends on the top surface. End battens 19.9 (left) and 20.5 (right) thick, with an inside coffer height of 51.6 (left) and 51.4 (right). Wire hinges (1.7 diameter) between the spine and lid.

KEYWELL FLAP: Deal, 209 - 216 - 209 wide, and 12.0 - 11.0 - 10.1 thick. Iron strap hinges, maximum 2.6 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 65 wide and 3.0 thick. Nailed to the top of the frames. Leather guide glued underneath. There are full depth cut-off bars, c. 3½ thick, glued either side of the register. They are longer at the lower guide than where they attach to the soundboard, and have three "windows".

SOUNDBOARD: Coniferous wood, 3.0 - 2.9 thick at the keywell liner. The top of the soundboard is approximately 43 below the top of the case. Two gilded roses (of wood glued on top of parchment), supported underneath by small bars. The rose diameters are 67.7 (left) and 85.1 (right).

SOUNDBOARD REGISTER: Leather, the main section 654 long with added (bass) section 93 long. It tapers from 27.6 (bass) - 22.5 (treble) wide, and is 1.5 thick. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

SOUNDBOARD BARRING: Deal, 19 high and 7 wide (where they are glued to the soundboard.

WRESTPLANK CAPPING PIECES: Oak, 4.0 thick. The treble wrestplank capping is 23.4 wide without, and 51.3 wide with applied mouldings; and the bass wrestplank capping is 36.1 (without) and 49.0 (with mouldings).

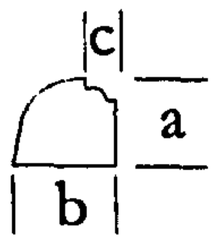
SOUNDBOARD MOULDINGS: Oak, 4.1 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. Both are 21.2 wide. The other soundboard mouldings are 20.0 wide.

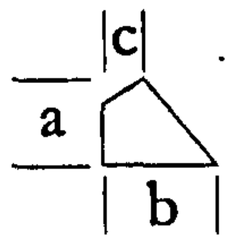
OTHER MOULDINGS: All other mouldings are of deal. The faceboard mouldings are 3.8 thick. The moulding on top of the faceboards, keywell sides and nameboard are 14.5 wide and 4.3 thick. The soundwell top edge mouldings are 20.0 and 4.3 thick.

HITCHPINS AND TUNING PINS: The hitchpins are of brass, 1.7 diameter. The tuning pins are not original.

BRIDGES: Fruitwood, probably pear. There are no scribed lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of brass, 1.26 diameter. The left bridge has been backpinned for the three lowest pairs of strings in the bass, and is of two parts, the inside edge of the join occurring 177 from the left case end and 197 from the spine.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	11.2	11.5	11.4	11.3	10.8
b	10.0	11.3	11.9	11.2	10.9
c	3.6	4.2	4.6	4.1	3.7

right bridge	C	c	c^1	c^2	c^3
a	10.1	9.9	10.4	10.5	10.4
b	12.5	12.0	12.8	12.3	12.8
c	3.9	4.2	3.6	3.9	4.1

String Lengths and (Plucking Points)

The left bridge has separated from the soundboard and has been reglued (unsuccessfully) on the soundboard. This separation occurs from $c^{\#}$ upwards. The following table lists the present string lengths and plucking points, with the estimated original string lengths and plucking points for the *c* and *f* notes, and the top note (d3) given in *italics*.

d^{3}	136 (56) *130 (52)*	b^{b}	670
$c^{\#3}$	136½	a	681½
c^{3}	**145 (52½) *142½ (46)***	$g^{\#}$	728½
b^{2}	152½	g	743
b^{b2}	170	$f^{\#}$	786
a^{2}	173½	**f**	**800½ (77½) *802 (81)***
$g^{\#2}$	194	e	846
g^{2}	195½	e^{b}	860
$f^{\#2}$	217	d	906½
f^{2}	**222 (49) *220½ (52½)***	$c^{\#}$	922½
e^{2}	244½	**c**	**968½ (98)**
e^{b2}	249	B	988
d^{2}	*275*	B^{b}	1029
$c^{\#2}$	281½	A	1049
c^{2}	**311½ (60) *304½ (55)***	$G^{\#}$	1094
b^{1}	317½	G	1115
b^{b1}	350½	$F^{\#}$	1163½
a^{1}	359½	**F**	**1183 (125)**
$g^{\#1}$	397	E	1233½
g^{1}	404	E^{b}	1253
$f^{\#1}$	445½	D	1296½
f^{1}	**453 (57½) *451 (56)***	Ex D	1308
e^{1}	496½	$C^{\#}$	1341
e^{b1}	510½	Ex $C^{\#}$	1354½
d^{1}	551½	**C**	**1388 (145½)**
$c^{\#1}$	561½	**Ex C**	**1401½ (154)**
c^{1}	**611 (73) *605 (69)***	GG/BB	1435 (147)
b	624	Ex GG/BB	1449 (153)

Keyboard and Action

COMPASS: GG/BB - d3, with an extra string and jack for GG/BB, C, C# and D.

BALANCE RAIL: Poplar (?), 21.6 wide and 35.4 thick. The balance pins are iron, 2.1 diameter, and protruding 19½ above the top of the balance rail. The balance rail is half-lapped to the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are oak, the left side 86 and right side 83 wide. They are generally 7.4 thick. The backrail is deal, 38.4 wide and 28.1 thick.

RACK: Mahogany, attached to the rear surface of the backrail. The rack is 3.8 thick, 51.6 high, and is topped with a piece of non-original deal.

FRONTRAIL: Deal, 41.0 wide and c. 10 thick, glued to the top of the keyframe sides.

KEYWELL BATTEN: Deal, with a moulded top edge along the front, 47.6 high and 4.1 thick.

ENDBLOCKS: Deal. The left endblock is 113 long, 21.0 wide and 47.2 - 42.9 high. The right endblock is 112 long, 21.9 wide and 47.7 - 44.5 high.

KEYBOARD WIDTH: Overall width between the keywell sides 739, and between the endblocks 695. The overall width of the keyboard is 693, and the three-octave span is 471.

KEYLEVERS: Deal, 14.7 thick at the front, tapering to 9.6 at the rear. The rackpins are deal, tapering from 2.5 diameter. The lowest keylever is 299 long and the balance point is 104 from the front of the touchplate. The top keylever is 493 long, and the balance point is 179 from the front. The accidental keylevers are balanced 8 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, of an inconsistent length, tapering in thickness from 3.0 at the front to 1.8 at the rear. The boxwood for the natural

touchplates has been applied in two sections, and is separated by a long strip of snakewood, 5.4 wide. The touchplates overhang the keylevers by 3.0.

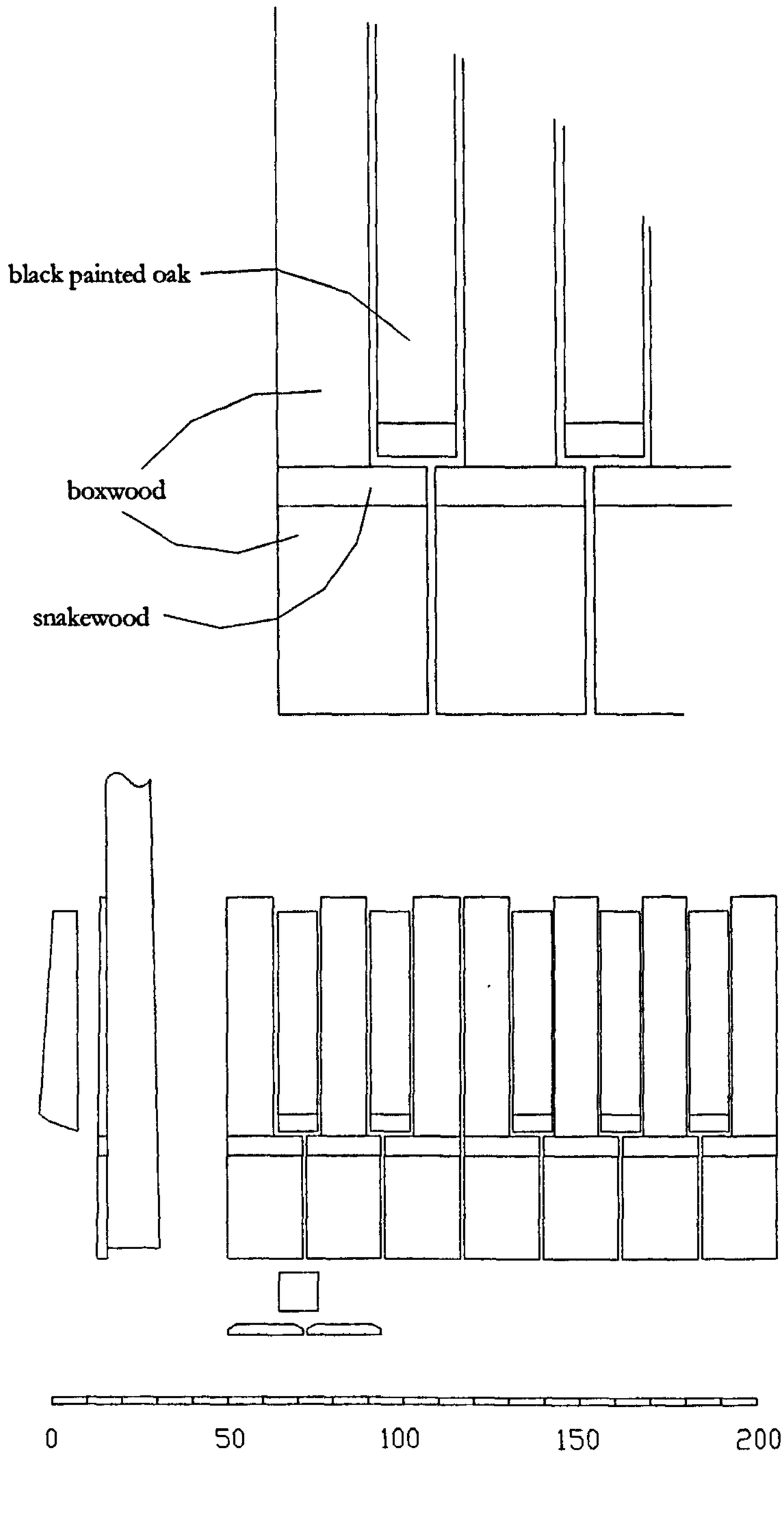
The natural touchplate widths in between the accidentals are:-

		f^2	13.0	f^1	12.8	f	12.4	F	12.8
		e^2	13.2	e^1	13.1	e	12.8	E	13.2
d^3	17.6	d^2	12.8	d^1	13.2	d	12.8	D	13.3
c^3	13.2	c^2	13.1	c^1	13.2	c	13.0	C	13.2
b^2	13.3	b^1	12.5	b	13.0	B	12.7	GG/BB	21.5
a^2	12.1	a^1	12.5	a	12.6	A	12.4		
g^2	12.8	g^1	12.5	g	12.5	G	12.0		

ACCIDENTAL TOUCHPLATES: Black painted oak. The overall length is typically 62.0, and total height 10.9 (front) - 6.8 (rear). They taper in width from 11.2 at the bottom to 11.1 at the top. The arcades are gilded paper in various floral designs.

None of the action cloths or jacks is original.

Figure 1679CR.2 - Drawing of major keyboard details.



Decoration

The outside of the case is of varnished deal. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are two strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

Plate 1679CR.3 - View showing exterior of the case with the varnished deal casework and the ironwork.



The soundboard is decorated with border patterns, flowers and birds. Much of the soundboard decoration has now disappeared. There are two roses which are of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into a parchment lower layer.

The keywell, faceboards, soundwell and jackrail are decorated with painted deal moulded bands separated by embossed papers. The paint is a maroon colour. The flat part of the bands have painted yellow ochre vinework decoration. The gilt papers are unique to Rewallin and used in both of his instruments, consisting of a flower and wreath design. In the centre of the nameboard there is an octagonal plaque, with a painting of a vase and flowers on a black background. Similar paintings of flowers on a black background appear in the panels on either side of the nameboard, extending onto the keywell sides, and on the left and right faceboards.

The lid and keywell flap have typical landscape paintings. The lid painting shows a castle on the right with water to the left. There are various figures in the foreground of the castle and at the water's edge. The keywell flap scene has water in the centre, with hills and trees to the sides, and various human figures on the banks. There are wide black borders around the paintings which are decorated with white painted arabesques.

Condition

This instrument is visually in good condition, but has been subjected to various restorations over the years. Although the instrument is not in playing condition it is structurally sound.

The soundboard is in excellent condition, although much of the painted decoration has disappeared or is now unclear. The soundwell papers have been removed or have become unglued at some time, and have been nailed in place at their corners in places along the spine. They have also lost all of their lustre in this area.

There is separation in between the soundboard and the left bridge. This obviously occurred many years ago, and various restorations have attempted to re-glue the bridge to the soundboard. This has been unsuccessful, and the bridge is now leaning back towards the spine for the top three octaves.

Commentary

This instrument is unique in having the case sides, lid and keywell flap of deal rather than hardwood. There is no reason to assume it was ever painted (like the 1675 CR now is) although it is possible that it was originally intended to be. It also, when compared with the other surviving instrument by Charles Rewallin, provides interesting evidence about original constructional practices. It is clear, however, that there are various features of these instruments which are outwith the usual English virginal making tradition, a consequence, no doubt, of being built in Exeter, rather than London.

One aspect of the instrument's decoration worth specific comment is the maroon coloured moulding bands on the keywell, faceboards and soundwell. There is no reason to doubt the originality of this work as the arabesques clearly match those on the 1675 CR. The present effect is somewhat unoriginal as the bandings have been covered with a gloss varnish, rather than remaining in a matt or satin finish. Although three other instruments also have painted moulding bands, they are green rather than maroon.

This instrument is unusual in having the lowest four notes (GG/BB, C, C#, and D) double strung. Most virginals have the C double strung, and the 1675 CR has the C and the GG/BB double strung, this virginal is one of two in which the double stringing carries on above C. The string lengths in the bass are too long to allow the second strings to be tuned an octave higher, and no acceptable alternate bass tuning system can be proposed, so the only reasonable solution is that the strings were tuned in unison. Rewallin had to divide the left bridge and register, and adding a wide-V shaped piece to the front of the jackrail as a result of adding the extra strings.

It has been suggested that the left bridge is not original.[1] However, a moulding impression of the left bridge is identical to the left bridge of the 1675 CR in Taunton. Furthermore, the left and right bridge pins of this instrument match each other for size and workmanship.

[1] Notes held in the museum file.

Further Commentary on the Instruments by Rewallin

The two instruments by Charles Rewallin allow significant insights into the design concepts and construction methods used by an individual maker. The two virginals are constructed close to one another in date, and are different models, unlike the 1642, 1651 and 1653 virginals by Thomas White, which are essentially of the same basic design (albeit with a larger compass on the 1651 TW), or the 1666 and 1670 instruments by Adam Leuersidge, which are also of the same design.

Charles Rewallin worked in Exeter in the Parish of St. Sidwell's. In 1657 he married Hester Gosticke. He died in 1697. An Inventory taken following his death[1] does not list any tools, but does include lumber and organ pipes. This suggests that he made, or at the very least repaired, organs as well as making virginals.

The two virginals have a number of unusual features in common. Both have double strings for notes in the bass (other than C). They have both been backpinned in the bass. Both make use of mahogany for various internal parts, despite the wood not becoming common in Britain until the early eighteenth century. Other features which are unusual, but part of Rewallin's standard practice, are the keyboards which have strips of snakewood at the rear of the natural front touchplates, rather than the usual scribed lines; the racks which are attached to the back of the keyframe rather than the top; the pressed papers which have been made from a white pulp rather than brown laminated paper; unusual case exteriors; and toolboxes which do not extend as far back as the keywell.

[1] Published in Gray (1916), and in Portman (1966). Reproduced here as Appendix Six.

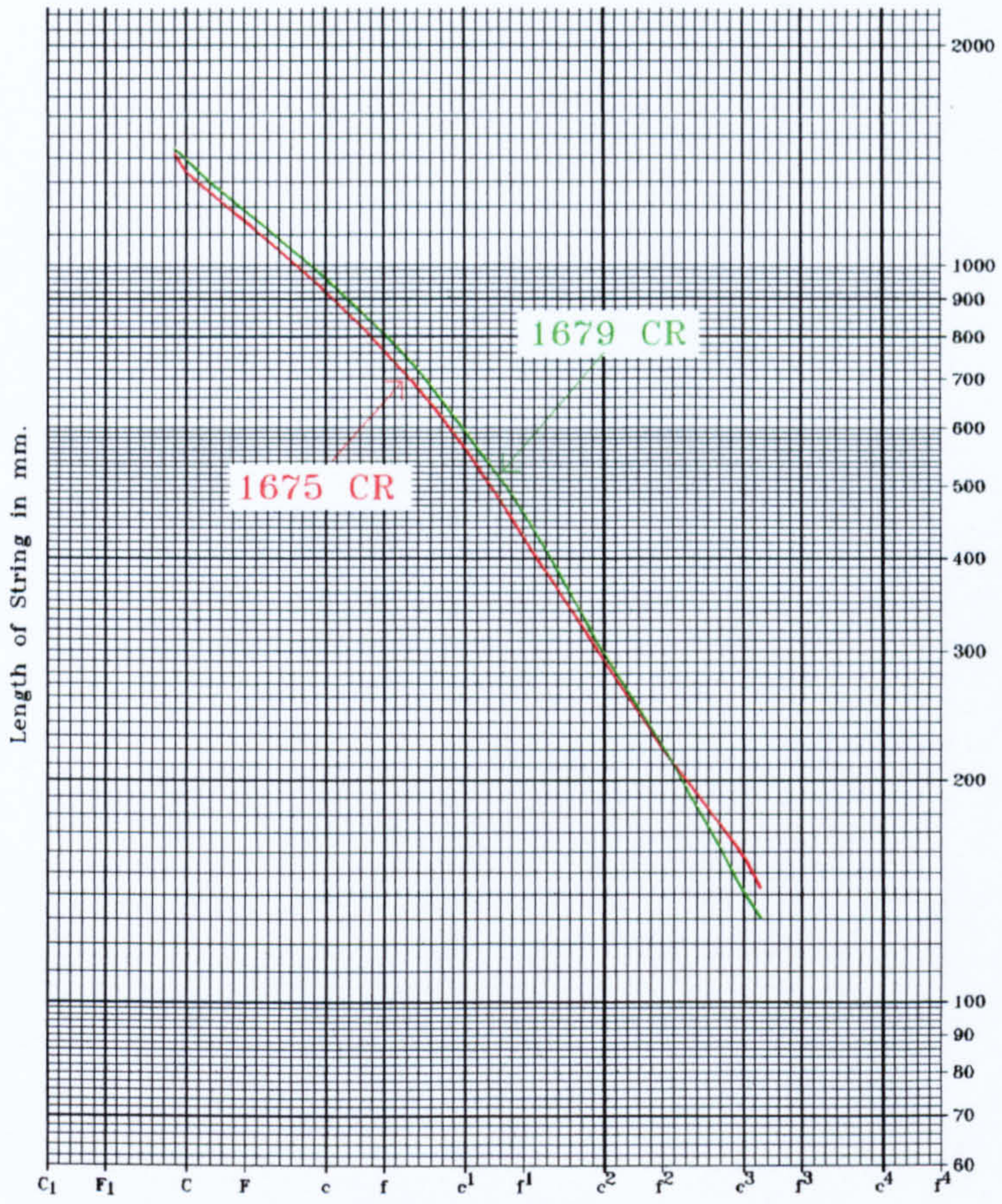
Perhaps the most remarkable feature discernible by comparing the two Rewallin instruments is the string lengths, as shown in the following table:-

Table Rewallin.1 – String lengths of the 1675 CR and 1679 CR virginals.

Note	1675 CR	1679 CR
d^3	141	130
c^3	159½	142½
f^2	219½	220½
c^2	295	304½
f^1	424½	453
c^1	570	605
f	763	802
c	927½	968½
F	1147½	1183
C	1330, 1356½	1388, 1401½
GG/BB	1406½, 1433	1435, 1449

As can be seen, the string lengths in the treble of the 1679 CR are shorter, and the bass string lengths longer, than the 1675 CR.[2]. This situation is unique in surviving English virginals by the same maker. It is also noticeable that the 1679 CR uses c^2 as the design-scale note, rather than the otherwise universal c^3 (or f^3 in instruments which extend that high). These features can be seen on the following graph:-

Graph Rewallin.1 – Semi-logarithmic graph showing the string lengths of the 1675 CR (in red) and 1679 CR (in green).



This graph is different from that found with other virginals (for example the Keene and Jones instruments, illustrated in Chapter Two), where the lines are essentially offset from each other. As has been argued in Chapter Two, the string lengths for instruments built at different pitches are strongly correlated, and this excludes the possibility that some virginals were strung in iron and others in brass. This argument would be considerably weakened if an explanation for the divergent string lengths (and the use of c^2 as the design-scale note of the 1679 CR) cannot be found.

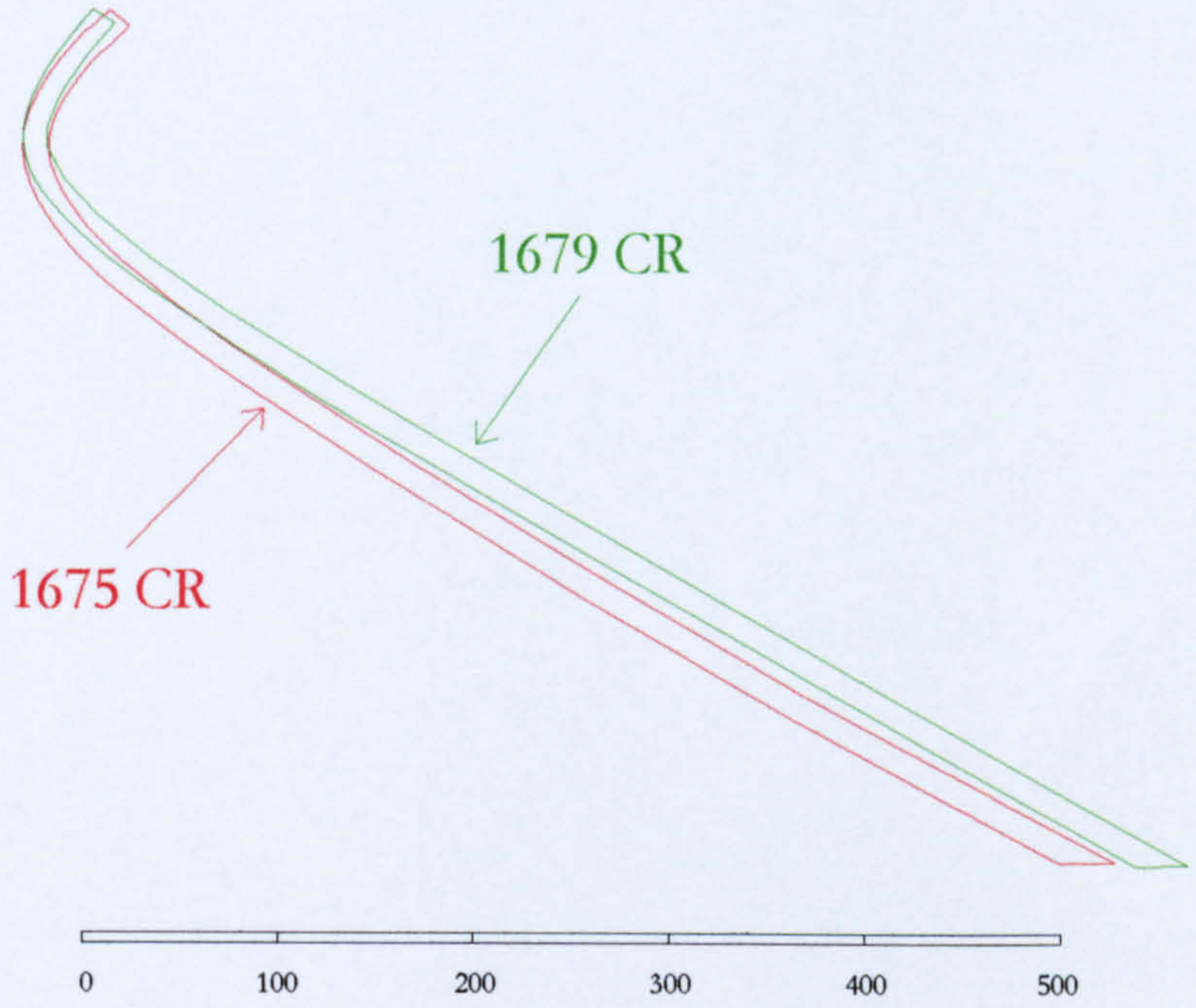
One obvious possibility is that Rewallin used the same right bridge template, but angled it differently in the instruments so that the straight section was at a more

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[2] The string lengths quoted are original for both instruments. The figures for the 1679 CR have been taken from the computer-generated drawing which corrects for the separation of the bridge as now found on the instrument.

acute angle to the front of the case in the 1679 CR. This can be considered by superimposing the two bridges.

Figure Rewallin.1 – The right bridges of the 1675 CR (in red) and 1679 CR (in green), superimposed.



Although the bridges have not been rotated in the illustration, it is clear that different bridge templates have been used, and that altering the angle of the 1679 CR bridge would not allow it to coincide with that of the 1675 CR.[3]

As has been shown in Chapter Two, it is probable that English virginal makers designed their bridge templates to often give Pythagorean scales at a particular pitch standard. However, it appears obvious that makers used the same template for pitches other than what was intended, resulting in non-Pythagorean string lengths. The indiscriminate use of bridge templates can explain both the use of c^2 as the scaling-design note on the 1679 CR, and the divergent string lengths.

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[3] Although not illustrated, an attempt to rotate the 1679 CR was made, and it was equally clear that they did not align. As the above illustration effectively makes the point, it was preferred as it retains the original rotational relationship between the instruments and has a greater clarity. Aligning the treble results in the bass end of the bridge being at a less acute angle to the front of the case.

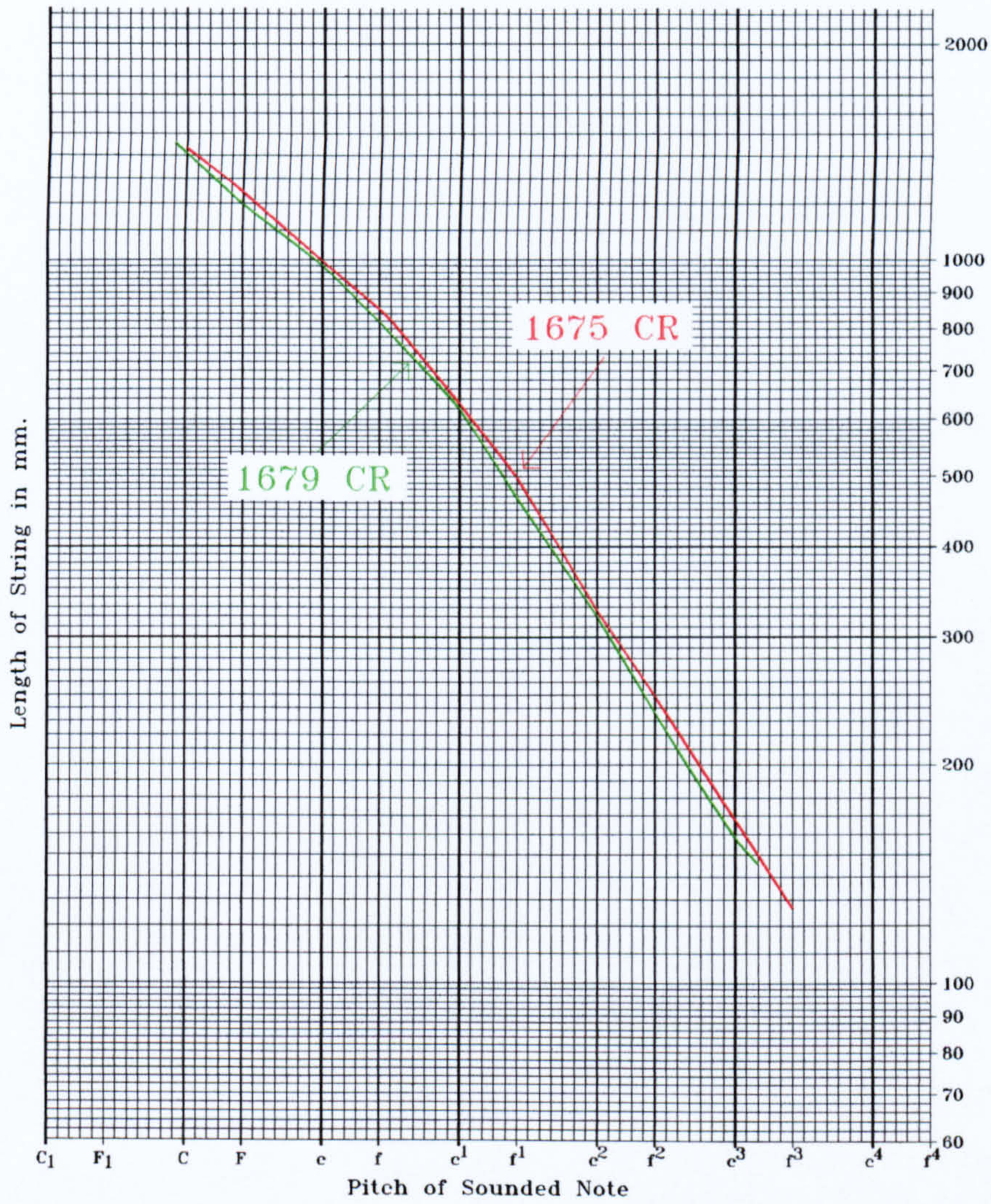
With the instruments as built, the 1675 CR plays at a pitch of V – 1s, and the 1679 CR plays at V, both with a GG/BB – d^3 compass. The 1675 CR has a bridge template which would give Pythagorean string lengths at a pitch of V – 2s with a compass that extends to the usual f^3 in the treble.[4] The 1679 CR would have Pythagorean string lengths at a pitch of V – 1s, with a c^3 string length of 159 mm (6¼ inches), still with the GG/BB – d^3 compass.[5]

Using these hypothetical string lengths and compasses the two instruments can be graphed as below:-

[4] The f^3 string length would be 126 mm (5 inches) long. GG/BB – f^3 was the most common English virginal compass after 1660. The present compass, GG/BB – d^3, with extra strings for GG/BB and C, has 54 notes. The normal GG/BB – f^3 compass has 55 notes. It would present no problems for Rewallin to alter his design to have one less note.

[5] The original scalings of the surviving 1679 CR would be more Pythagorean if Rewallin used a 6 inch c^3 scaling-design note string length rather than the 12 inch c^2 scale. It is not certain why Rewallin decided on c^2 as the design-scale note, but it may reflect the use of c^2 as the scaling-design note in contemporary spinets.

Graph Rewallin.2 – Semi-logarithmic graph of the 1675 CR and 1679 CR with hypothetical compass and pitch levels.



As can be seen, the two instruments with the proposed original compasses, pitch levels and string lengths produce offset lines on the semi-logarithmic graph.

Two, possibly related, features that can be found in both Rewallin instruments are the use of backpinning, and constructional problems with the left bridge. The left bridge of the 1675 CR has "rolled" towards the bass soon after the instrument was built, resulting in additional bridge pins being added to the left bridge in between some of the original pins to allow longer plectrum lengths. These pins are the same diameter, and cut in the same way, as the original pins, which makes it certain that Rewallin did the work himself. It is possible that the backpinning was carried out at the same time

in an effort to avoid further stability problems. The 1679 CR also has backpinning, but for fewer notes than the 1675 CR. The left bridge of the later instrument has also had structural problems, and has separated from the instrument at least once. The soundboard barring on the 1679 CR is noticeably heavier near the left bridge, which may have stopped much of the bridge movement.[6]

Another constructional feature of note is the width of the keywell flap. In both instruments the keywell flap is wider in the centre than at the edges. The likely reason for this is that Rewallin made his lid first and positioned it on the instrument, and then planed the keywell flap to height ensuring a close fit with the lid over the entire length. If the lid had warped during construction it would result in a keywell flap of uneven height. The other possible method of construction, planning the keywell flap so that the top and bottom edges were straight, using heights measured only at the ends would have produced keywell flaps of constant width.

Several constructional features are worthy of note although they represent nothing more than the maker's personal preferences. Rewallin has used a strip of snakewood at the rear of the natural touchplates instead of scribed lines as found on other English virginals. The strip was cut to width and then glued along the entire wide of the keyboard before the keyplank was sawn apart. The boxwood that is used for the front of the natural touchplates, and for the rear natural touchplates, was applied to the keyboard in individual pieces, probably also before the keyplank was sawn apart.[7] The keyframes are unusual in having high balance rails and backrails. The 1675 CR has original action cloths, and the thickness and number of cloths applied to the frontrail suggests that it was Rewallin's intention to control the depth of touch either by simultaneous use of the jackrail and frontrail, or exclusively by the frontrail. The racks are glued to the rear of the keyframe, rather than on the top of the backrail, which is also unique to Rewallin. The rack of the 1675 CR is made of mahogany, as are the full depth cut-off bars between the soundboard and the lower guide. These are the only occasions of mahogany appearing in any instruments built in England prior to the

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[6] There is no reason to assume that the left bridge of the 1679 CR came adrift soon after construction. There is other evidence, including damage to the soundboard decoration, and the embossed soundwell papers on the spine being nailed in place, which strongly implies that the instrument has been subjected to conditions of high humidity or had water damage.

[7] There is no evidence of any touchplates overhanging the sides of the keylevers to suggest that they were applied afterwards.

eighteenth century.[8] In other English virginals the soundboard moulding behind the nameboard continues in a straight line to the left case end, and the rear surface of the toolbox capping piece (forming the back surface of the toolbox) butts against the moulding creating a toolbox with a front-to-back distance comparable to the keywell. In the Rewallin virginals the toolbox does not extend so far back, and the moulding behind the nameboard is mitred to a small piece which is positioned alongside the left keywell side to the rear of the toolbox capping piece.

The pressed papers – although probably not actually made by Rewallin himself – have been made by a method that is very different from all of the other examples. The common method, as detailed in Chapter Five is to laminate thin pieces of brown paper by pressing into a negative mould on the front side with cloth against the rear surface. The papers on the Rewallin instruments have been made from white paper, which appears to have been a pulp rather than sheets. It is clear that the papers used on both instruments are from the same mould.[9] The keyfront arcades are of at least six different floral designs, applied randomly, and have been made in the same manner. The use of a different manufacturing method suggests that the papers were not purchased from a specialised maker in London, and may have been made locally. The painted decorations on the soundboard, lid, keywell flap, faceboards, and keywell are clearly the work of the same artist on both instruments. It is possible that this decoration (and the papers) is by Rewallin or his workshop rather than by an independent decorator.

One final unusual feature of both instruments is the case exterior. The 1675 CR has a painted finish, probably in imitation of rosewood, and the 1679 CR has a plain varnish finish, but the case ends, lid and keywell flap are of deal, rather than oak. The painted decoration on the 1675 CR is almost certainly not original, as it is applied over the ironwork hinges, hasps and lockplates, but may have been added soon after the instrument was finished. The case ends, lid and keywell flap are all made of oak, which

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[8] The mahogany was identified only by eye; however, the attribution is fairly certain. There is no doubt it is original to both instruments. Exeter was a major town in the south-west of England, and as such may well have had mahogany available from ships returning from the New World. Timber was frequently used as ballast on return journeys from the Americas.

[9] As discussed in Chapter Five, even though many designs are superficially the same, a close examination shows that different moulds were used. This suggests that only one, or else very few, individuals were responsible for designing and making the embossed papers.

would be expected for a instrument with a varnished finish, although no traces of varnish can be seen where the oak has been exposed. It is possible this work was carried out soon after the instrument was built, and that Rewallin then offered painted finishes as options or as standard. It would be reasonable to use deal as a case material if it was not going to be seen, which might explain its use on the 1679 CR. There is no evidence to suggest that the 1679 CR ever received a painted finish, and the varnish is a light colour, making no attempt to resemble the dark colours found on other English virginals.

1641 GT

Plate 1641GT.1 – Three-quarter view of the 1641 GT virginal.



Photographs by Anne Meurant, reproduced by the kind permission of the Musical Instrument Museum, Brussels.

Ownership and Provenance

Possession of the Musical Instrument Museum, Brussels. Inventory number M 1591. The instrument has been rumoured to have originally belonged to Elizabeth of Bohemia, the sister of Charles I of England. There is no firm evidence to confirm this claim, which probably originated with a note from Peter Williams to Donald Boalch making the connection between the papers and Elizabeth of Bohemia. This connection can be seen in a handwritten annotation in a copy of the Mahallion Catalogue in the Edinburgh University library.

References

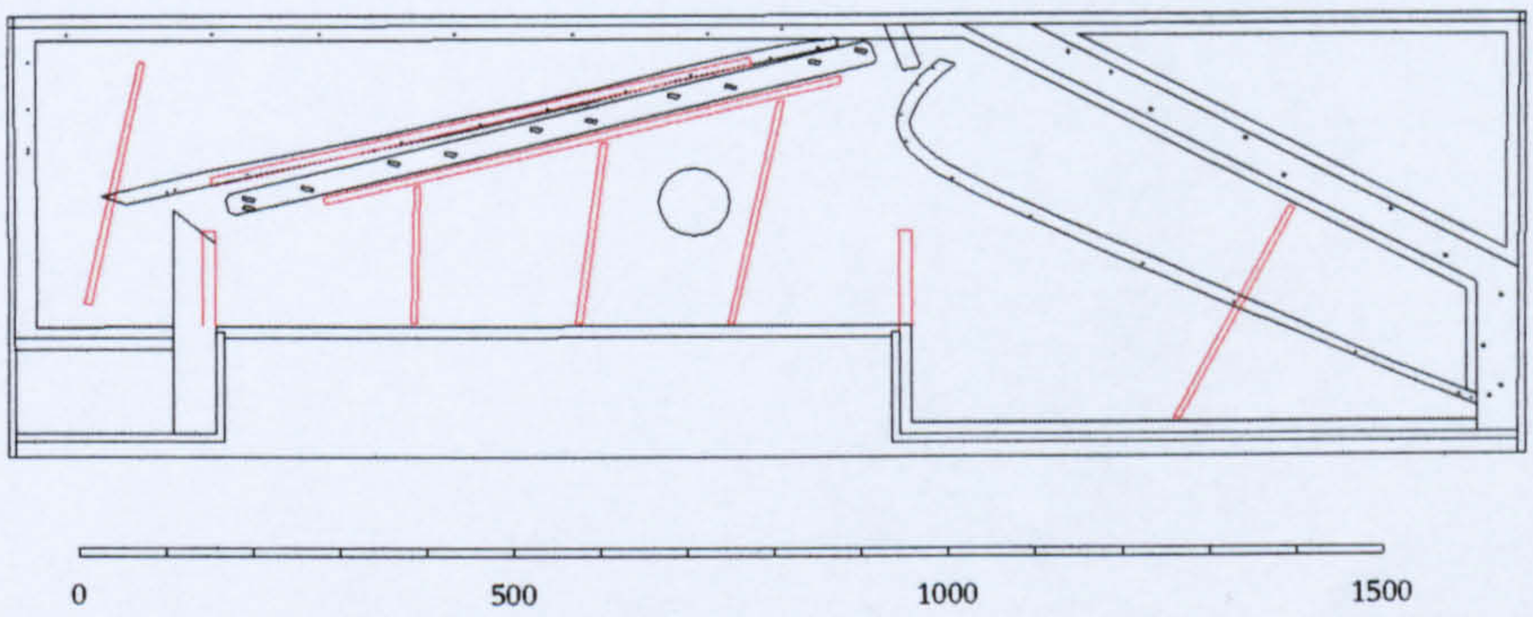
GD3 & GD4 No. 1; B1 & B2 English virginal table No. 1, B1 & B2 Townsend, Gabriel, B3 No. TOWNSEND, G. 1641. Mahillion (1900). Cobbe and Luckett (1992).

Inscriptions

Signed "Gabriell Townsend Fecit 1641" on the front of the jackrail.

Construction

Figure 1641GT.1 – Plan view of the 1641 GT virginal.



OVERALL INSTRUMENT DIMENSIONS: 1747 x 541 x 220.

BASEBOARD: Deal, three planks. 11.5 thick at front. The baseboard is not rectangular as the total front length is 1745 and the rear 1748½.

SPINE: Not original, lime, 1747½ - 1747 - 1748½ long, 219 – 221 high, 12.2 – 12.7 – 11.9 thick, dovetailed to the case ends.

CASE ENDS: Walnut, left case end 542½ - 540 long, 220 - 219½ - 220 high, 7.8 – 7.3 thick; the right case end 541½ - 542 long, 220↔ high, 8.3 – 8.6 – 7.0 thick. The spine and case ends overlap the baseboard. The faceboards are butted to the case ends and there are dowels from the faceboards into the case ends.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 240 long, 207 – 204 – 205½ high and 10.0 thick. Right faceboard 720 long, 205½ – 203 – 209 high and 10.0 thick. The faceboards / keywell sides joints cannot be determined.

KEYWELL SIDES: Walnut, 134½ (left) and 135 (right) long, 8.7 (left) and 9.0 (right) thick. Slots for the nameboard have been cut into the keywell sides 114 - 120 (left) and 116 – 122 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 785 – 782, 160 - 155½ high, and 10.3 – 8.3 thick.

KEYWELL LINER: Deal, 67.5 – 64.7 high, 12.8 – 10.5 thick.

OTHER LINERS: Deal. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Walnut. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 86.5 high. The inner edges form a continuation of the keywell sides. The frames are 26.3 (left) and 29.0 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 35 high, 103 - 99 from the back of the faceboard. The toolbox lid is missing. It originally hinged at the front, holes diameter 2.1 remain for the hinges. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 818 long (front), 844 long (back). It is 49.5 wide, and 21.0 thick. The bottom of the jackrail is 30.5 (bass) and 28.0 (treble) above the top of the soundboard. The bass jackrail support is of deal, 49.5 wide. The left side is 275 long, the right side 234 long. The treble jackrail support is parallel sided, 21.5 wide, the front edge 64 long and the rear edge 53.1 long. The back corner is 758 from the right case end.

LID: Walnut, coffered in three pieces. The planks are 185, 196 and 175½ wide on the inside, and the front thickness is 8.5 – 9.5 – 8.0. Applied mouldings along the joins and the ends on the top surface. End battens 18.5 (left and right) thick, with an inside coffer height of 55 (left) and 53 (right). There were originally four wire hinges between the spine and lid, positioned 83 and 586 or 611 from the left end, and 83 and 644 or

659 from the right end. There are now cords to hold the lid open at each end, which may have been the original method.

KEYWELL FLAP: Oak, 207 – 205 wide, and 9.5 – 9.0 – 9.5 thick. Iron strap hinges, maximum 2.3 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Lime. Leather guide glued underneath. There are full depth cut-off bars glued in front of the register, and another bar glued in front of the forward cut-off bar.

SOUNDBOARD: Coniferous wood. The top of the soundboard varies from 50 to 53 below the top of the case. Gilded rose, 83 diameter, (of wood glued on top of parchment), let into the soundboard and supported by half-thickness sections of the soundboard with strips removed.

SOUNDBOARD REGISTER: Leather, 770 long, tapering in width from 30 (bass) to 27 (treble), and 1.0 thick. Slots typically 12.9 x 4.6. There are string-guiding marks on the register leather between the wide pairs of strings positioned directly below the lowest of the strings.

SOUNDBOARD BARRING: Deal.

WRESTPLANK CAPPING PIECES: Walnut, 45.6 thick. The treble wrestplank capping is 39.0 wide without, and 65.5 wide with applied mouldings; and the bass wrestplank capping is 47.0 (without) and 58.7 (with mouldings).

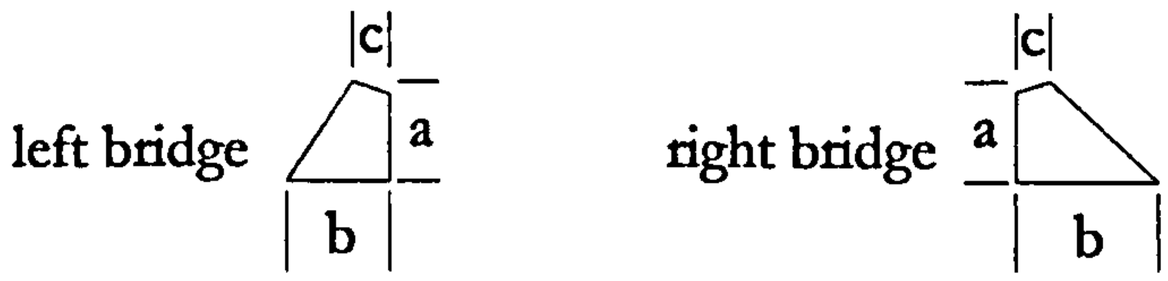
SOUNDBOARD MOULDINGS: 5.0 to 5.5 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is cedar, probably not original, 25.5 wide, and the spine moulding is walnut, 17.5 wide. The other soundboard mouldings are cedar, 14.0 wide.

OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 5.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 21.8 wide. The soundwell top edge mouldings are 14.0 and 4.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.5 diameter. The tuning pins protrude 25 from the top of the wrestplank capping piece, 3.5 diameter, and are of iron. The tuning pins have been divided so that the notes up to c are on the bass wrestplank, $c^{\#}$ is on the dividing line between the two wrestplanks, and notes d to e^3 are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. There are scribed lines on either side of the crest of both bridges. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.22 diameter. There are marking out lines parallel to the strings on the top surface of the right bridge, placed under the rear string of each pair. There are scribed lines in front of the right bridge, the bridge following the line most of the way with the exception of the bass where they are about 10 mm behind, plus another scribed line marking the bass end of the bridge. There are also positioning holes at the front of both bridges. There is a scribed line marking the treble end of the right bridge.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	12.2	10.9	10.3	9.9	9.9
b	18.8	16.3	16.3	15.8	15.9
c	5.8	5.9	5.4	5.4	5.8

right bridge	C	c	c^1	c^2	c^3
a	10.4	10.8	10.6	10.1	10.7
b	11.8	14.4	16.1	17.2	17.2
c	6.0	4.7	5.2	4.8	5.4

String Lengths and (Plucking Points)

		f^1	**474½ (51)**	**F**	**1296 (73)**
e^3	136 (53)	e^1	520½	E	1350½
e^{b3}	140½	e^{b1}	534½	E^b	1372½
d^3	154	d^1	585½	D	1430
$c^{\#3}$	159	$c^{\#1}$	597½	$C^{\#}$	1452
c^3	**172½ (53)**	**c^1**	**644½ (60)**	**C**	**1501 (88½)**
b^2	177	b	659	**Ex C**	**1524½ (97)**
b^{b2}	191½	b^b	712½		
a^2	197	a	729		
$g^{\#2}$	215½	$g^{\#}$	779½		
g^2	221	g	796½		
$f^{\#2}$	240	$f^{\#}$	849		
f^2	**246½ (44½)**	**f**	**866 (56½)**		
e^2	267½	e	915		
e^{b2}	273½	e^b	934½		
d^2	298½	d	985½		
$c^{\#2}$	304½	$c^{\#}$	1005½		
c^2	**328½ (55)**	**c**	**1055½ (69½)**		
b^1	337	B	1072½		
b^{b1}	367½	B^b	1133		
a^1	376½	A	1152½		
$g^{\#1}$	411	$G^{\#}$	1203½		
g^1	422	G	1223½		
$f^{\#1}$	461½	$F^{\#}$	1274½		

Keyboard and Action

COMPASS: C – e^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail is oak, 35.0 wide and 23.9 high. The balance pins are iron, 2.4 diameter, and protruding 18 above the top of the balance rail. The balance rail is half-lapped to the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 41 wide and 12.2 thick. The backrail is deal, 12.2 thick.

RACK: Pear, attached to the top surface of the backrail. It is scribed on the front surface for the top and bottom of the slots, and there are over-run lines for the sides of the slots.

FRONTRAIL: Deal, 28.5 wide and 7.5 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 29.4 high and 5.2 thick.

ENDBLOCKS: Deal. The left endblock is 141 long, 26.0 wide and 34.3 – 32.2 high. The right endblock is 184 long, 28.5 wide and 36.3 – 34.3 high.

KEYBOARD WIDTH: Overall width between the keywell sides 770, and between the endblocks 712. The overall width of the keyboard is 708, and the three-octave span is 478.

KEYLEVERS: Lime, 12.5 thick at the front, tapering to 9.5 at the rear. The rackpins are possibly lime, and are of variable width. The lowest keylever is 348 long and the balance point is 119½ from the front of the touchplate. The top keylever is 486½ long, and the balance point is 174½ from the front. The accidental keylevers are balanced 20 – 23 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, variable overall length, and tapering in thickness from 3.8 at the front to 2.7 at the rear. There are four scribed lines on the front section, 23.3, 26.0, 31.4 and 34.3 from the front edge. The touchplates overhang the keylevers by 2.9.

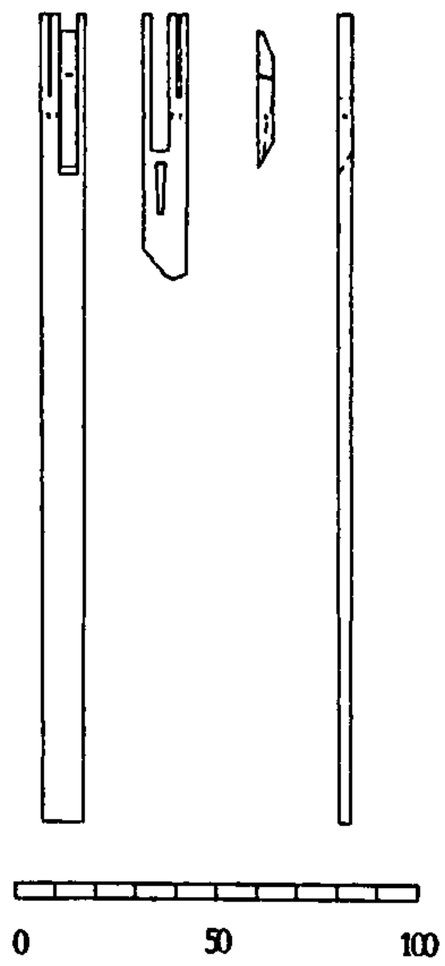
The natural touchplate widths in between the accidentals are:-

		f^2	11.7	f^1	11.9	f	12.3	F	11.9
e^3	11.7	e^2	12.4	e^1	12.4	e	12.3	E	12.1
d^3	16.1	d^2	15.6	d^1	15.6	d	15.2	D	15.4
c^3	12.2	c^2	11.9	c^1	12.6	c	13.3	C	12.4
b^2	12.2	b^1	11.9	b	11.7	B	12.5		
a^2	13.5	a^1	12.3	a	12.6	A	12.6		
g^2	12.4	g^1	12.8	g	12.0	G	12.6		

ACCIDENTAL TOUCHPLATES: Snakewood. The overall length is typically 71.9, and total height 10.5 (front) – 7.8 (rear). They taper in width from 11.5 at the bottom to 10.7 at the top.

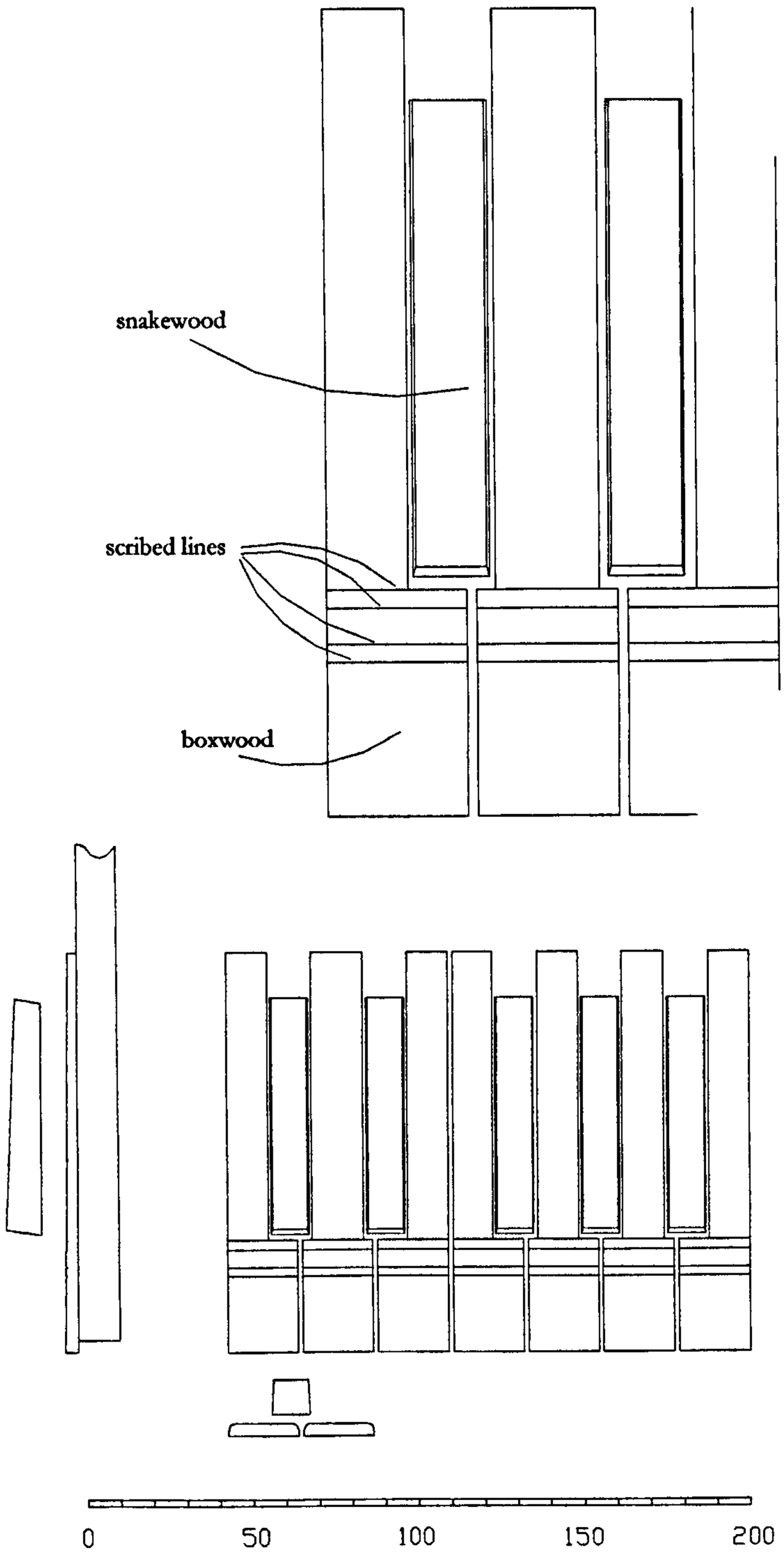
JACKS: The jacks are of pear, and the tongues are holly. The total length is typically 141. They taper in width from 12.0 – 10.0, and in thickness from 3.6 – 3.1. The axle pins are positioned 15.0 (62½%) from the top of the tongue. Thirty two original jacks survive. The jacks have lead weights near the bottom, surrounded by scorch marks, suggesting that they are later additions.

Figure 1641GT.2 – Drawing of a typical jack.



ACTION CLOTHS: The jackrail, keyboard jackrest and backrail cloths survive.

Figure 1641GT.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. All of the hasps attach to turnbuckles on the keywell flap, the centre one originally attached to a (now replaced) lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator is the same artist who worked on the 1638 TW, 1642 TW and 1644 TW.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. Inside the inner mouldings on the faceboards, keywell sides and nameboard have white-painted scrollwork on a black background. The gilt papers are of the "Elizabeth Shield" design, highlighted with green and red. The arcades are of the "trefoil" design, highlighted with red.

The lid and keywell flap interiors have typical landscape paintings. The painting on the lid shows a scene of Orpheus playing to the Beasts. The figure of Orpheus bears a striking similarity to images of Charles I. The keywell flap shows a park scene on the left side with a river and boats on the right. The painted work has been carried out in a water-soluble medium, probably gum-arabic.[1]

Condition

The virginal has recently been restored musically and decoratively, and is on public display in the Musical Instrument Museum, Brussels.

The instrument has certainly been restored once, probably twice previously. The earliest restoration was in the second half on the eighteenth century in which a

number of jacks – taken from an English double-manual harpsichord – were introduced to replace (presumably) damaged or missing ones, the original lockplate in the centre of the keywell flap was removed and replaced with a turnbuckle, with an appropriate alteration to the middle hasp on the lid to enable the turnbuckle toggle to pass through and turn. Other alterations include replacing the spine,[2] and the addition of a frontrail under the accidental touchplates. It cannot be determined when this work was carried out.

The instrument was in playing condition when seen by Hubbard when researching his book *Three Centuries of Harpsichord Making*, where it is described as the finest sounding example he is aware of.[3] It then fell into disrepair prior to its recent restoration.

Commentary

The Townsend virginal is the earliest dated virginal built at a standard pitch.[4] Despite having a large compass (C – e^3) it is a typical early example, albeit with several unique features.

The most obvious variation to normal practice is the use of walnut, rather than oak, for the case ends, lid, keywell flap and wrestplank capping pieces. The wood is of fine quality in grain and colour. The only other instrument that uses a wood other than oak for the case is the 1679 CR, made of deal.[5]

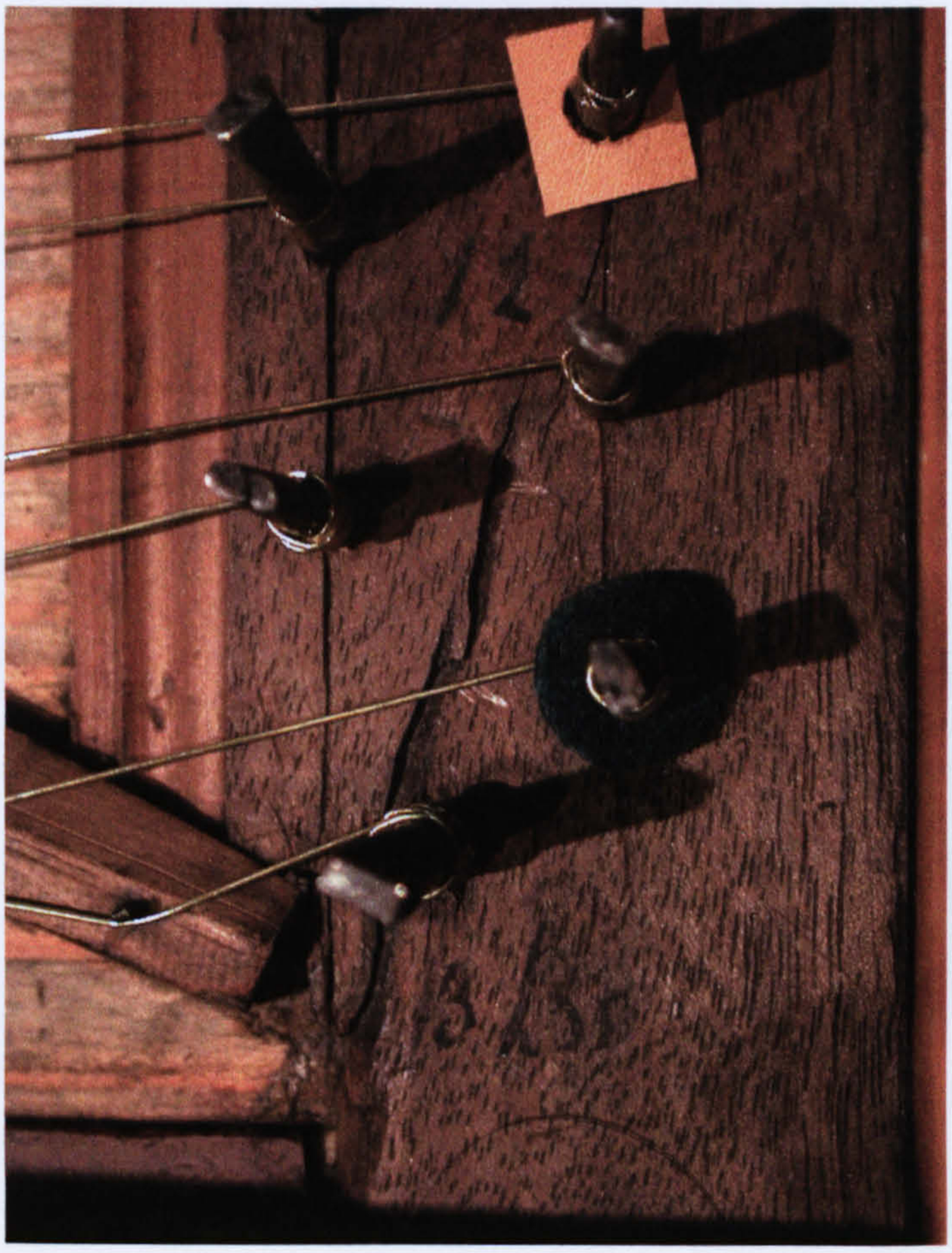
There are gauge numbers, in an eighteenth-century hand on the wrestplank capping pieces. The markings are: *13 brass* Extra C – D, *12* E^b – $F^\#$, 11 G – B^b, *10 Coper* B – d, *9* e^b – $f^\#$, *9* g – b^b, *8* [in pencil over 6] b – d^1, *8* e^{b1} – $f^{\#1}$, *7* g^1 – b^{b1}, *6* b^1 – d^2, *5* e^{b2} – $f^{\#2}$, *4* g^2 – e^3. The placement of the 4 is such that it could refer to $g^{\#2}$ rather than g^2, but throughout the compass the gauge number appears every four notes, making the

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[1] Information from Simon Egan (PC), who restored the decorative work on the instrument.
[2] The lid shows clear evidence of having had wire hinges, and as there is no indication of any damage to the spine it is clear that it must be a replacement.
[3] Hubbard (1965:151).
[4] The 1638 TW is the earliest dated instrument, and the Mar and AH virginals are almost certainly late-sixteenth century but neither has a date on it.
[5] The 1638 TW also has case sides of deal which are covered on the exterior by papers and cedar mouldings. This virginal is the orphan child of a mother-and-child virginal. There is no reason to assume the mother instrument also used deal rather than oak for the case sides, lid and keywell flap.

intention of g^2 to be more likely. As discussed in Chapter Two, there is something amiss with the gauge markings, having copper appearing above brass. The two possibilities are that the words are transposed (so that brass should appear above copper) or that brass should be used between the two written words from the extra C – B^b. It is almost certain that the second possibility is the correct one. In any case, although the gauge markings are plausible and do not resemble any known eighteenth-century English practice, it cannot be assumed that they are necessarily indicative of the original stringing.

Plate 1641GT.2 – Photograph showing gauge numbers in the bass.



There are scribed lines on the right bridge used as a guide for the placement of the right bridge pins. These lines are parallel to the strings, there being a virtual spine at an angle to the rear of the soundboard. The exact angle of the virtual spine must be known before any attempt can be made to determine the relationship of the scribed lines. As the strings are not parallel to each other[6] the exact angle cannot be positively concluded.[7] It is clear that the lines are parallel with the lower part of the compass, but it cannot be visually determined exactly what the angle is. Instead, the only approach that can be used is to try various angles and see if the line-spacings fall into logical units. If both the angle of the virtual spine (expressed as a ratio) and the line-spacings can be expressed in the same unit then the interpretation can be reasonably supposed to be correct.

The following table gives the angles of each of the *c* strings to the spine, and expressed as a ratio:

Table 1641GT.1 – Angles and ratios of the *c* strings to the spine.

Note	Angle (in degrees)	Ratio
c^3	11.5	0.203
c^2	11.0	0.194
c^1	10.3	0.182 (2:11)
c	10.0	0.176 (3:17)
C	9.9	0.175 (3:17)[8]

It is likely that a virtual spine with a 3:17 ratio was used. The spacing of the bridge-pins to a virtual spine with this ratio has not been tested, as it would need to be carried out with the instrument to ensure sufficient accuracy. But the fact that the angle of the lowest strings to the spine can be expressed as a simple ratio, and the common practice of makers to divide their bridge marking-out spacings into groups suggests that such a method was probably used by Townsend.

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[6] See Chapter Three, page 129.
[7] Examining the instrument itself visually cannot determine the angle with enough accuracy.
[8] A 3:17 ratio is achieved by an exact angle of 10°, but the difference of angle between C and c is only 0.1°, a difference more due to mathematical calculation than design by Townsend.

1656 JW

Plate 1656JW.1 – Three-quarter view of the 1656 JW virginal.



Ownership and Provenance

Possession of the Museum of London, purchased in 1959 from Dr Temple-Bourne of Clifton.

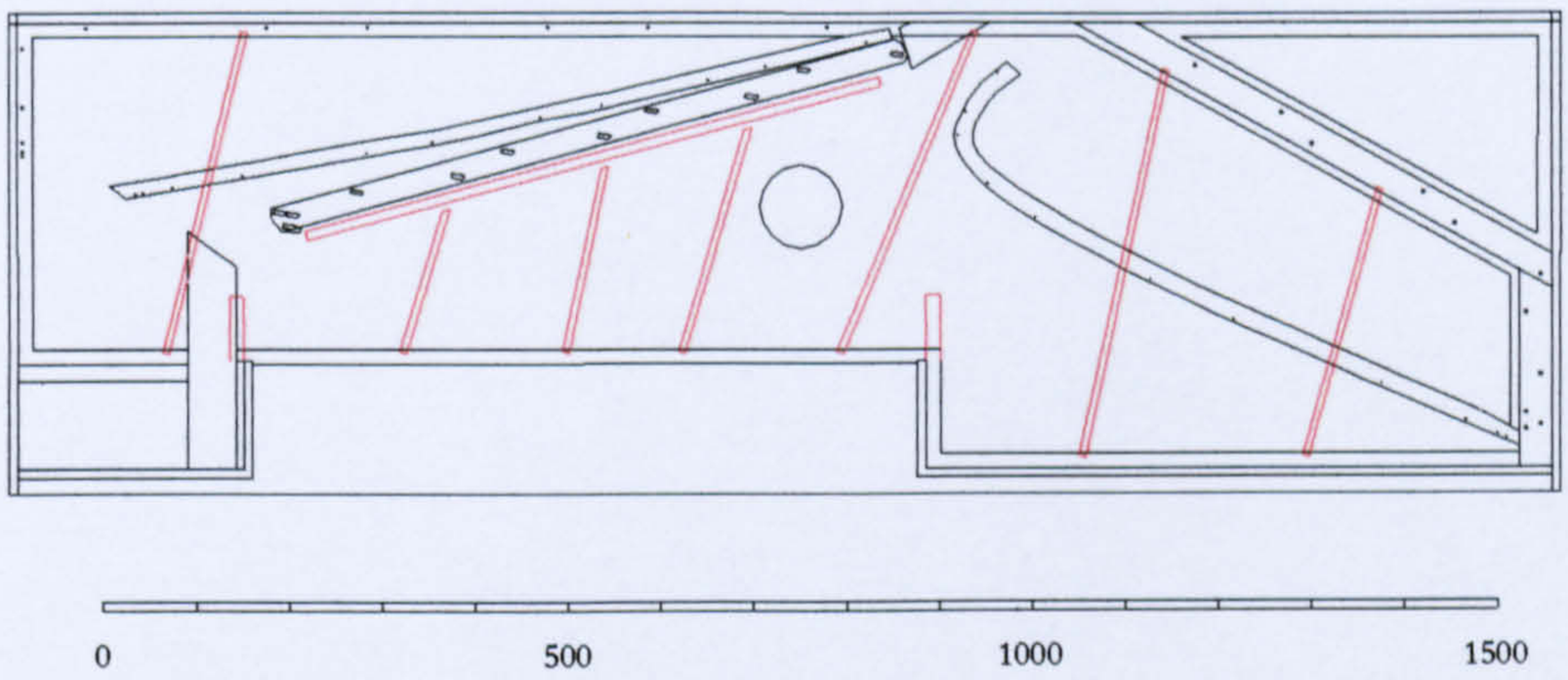
References:

GD3 & GD4 No. 5; B1 & B2 English virginal table No. 7, B1 & B2 White, James No. 1, B3 No. WHITE, J. 1656. Holmes (1959)

Inscriptions: Signed "IACOBVS WHITE FECIT 1656" on the front of the jackrail. Paper labels recording repair by Elgar, Worchester 1880, Loan notice for exhibition at the Worcestershire Exhibition, 1882.

Construction

Figure 1656JW.1 – Plan view of the 1656 JW virginal.



OVERALL INSTRUMENT DIMENSIONS: 1670 x 517 x 221.

BASEBOARD: Deal, of two planks (plus a narrow added piece at the rear), the front plank 235 wide. 9.0 – 9.6 thick at front.

SPINE: Deal, 1672 – 1671 long, 210½ - 208 - 210 high, 10.6 – 9.0 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 517↔ long, 210 - 213 high, 9.7 – 10.0 – 9.5 thick; the right case end 517 – 516 long, 211 – 212 high, 8.9 – 9.4 – 9.4 thick. The spine sits on the baseboard, and case ends overlap the baseboard. There are large dowels from the faceboards into the case ends.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 251 long, 194 – 192 – 193 high and 8.8 thick. Right faceboard 682 long, 196 – 192 – 107 high and 9.3 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 126½ long, 8.0 (left) and 9.8 (right) thick. Slots for the nameboard have been cut into the keywell sides 110 - 116½ (left) and 110 – 116 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 723½ - 720, 141 – 143 – 140 high, and 11½ - 8½ thick.

KEYWELL LINER: Deal, 68½ – 69½ high, 11.3 – 12.1 thick.

OTHER LINERS: Deal, c. 35 x c. 15. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Oak, ‡30 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 78 high. The inner edges form a continuation of the keywell sides. The frames are 16.8 (left) and 21.8 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 30 high, set 96↔ from the back of the faceboard. Toolbox lid of oak, 182 – 184 long, 105 wide and 9.7 thick. Iron rod hinges, 1.6 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 745 long (front), 779 long (back). It is 45.4 wide, and 17.6 thick. The bottom of the jackrail is 28.6 (bass) and 28.1 (treble) above the top of the soundboard. The bass jackrail support is of deal, 53.2 wide. The left side is 257 long, the right side 219 long. The treble jackrail support is triangular in shape, 97 (plus an angled section, parallel to the front c. 15 long at the rear, 97 at the front, and 46 at the end where it meets the jackrail. The back corner is 605 from the right case end, and it is at an angle of 154° to the spine.

LID: Oak, coffered in three pieces. The planks are 177, 181 and 180 wide on the inside, and the front thickness is 8.1 – 8.1 – 8.5. Applied mouldings along the joins and the ends on the top surface. End battens 17.1 (left and right) thick, with an inside coffer height of 52 (left) and 54 (right). The lid originally had four wire hinges (1.56 diameter) between the spine and lid.

KEYWELL FLAP: Oak, 199 – 205 – 200 wide, and 9.9 – 8.8 – 9.5 thick. Iron strap hinges, maximum 2.3 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, c. 3.0 thick. Leather guide glued underneath. There is a full depth cut-off bar of deal glued in front of the register.

SOUNDBOARD: Coniferous wood, 4.2 – 3.8 thick at the keywell liner. The top of the soundboard is approximately 48 below the top of the case. Gilded rose, 88½ diameter, (of wood glued on top of parchment), glued to the soundboard from underneath.

SOUNDBOARD REGISTER: Leather, 707 long, 27 wide[1] and 1.0 thick. Slots typically 13.2 x 4.3. There are string-guiding marks on the register leather between the wide pairs of strings positioned centrally between the wide jacks.

SOUNDBOARD BARRING: Deal, c. 25 high and 6.5 – 3.2 wide (top to bottom). The ends of the bars are rounded in a concave shape.

WRESTPLANK CAPPING PIECES: Oak, 3.8 thick. The treble wrestplank capping is 32 wide without, and 53 wide with applied mouldings; and the bass wrestplank capping is 36 (without) and 45 (with mouldings).

SOUNDBOARD MOULDINGS: Cedar, 3.5 thick. The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 16.0 wide, and the spine moulding is 14.3 wide. The other soundboard mouldings are cedar, 15.7 wide.

OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 20.2 wide. The soundwell top edge mouldings are 18.0 and 3.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 2.1 diameter. The original tuning pins are 43 total length, and 3.7 diameter, and are of iron.[2] The tuning pins have been divided so that the notes up to e are on the bass wrestplank, and notes f to c^3 are on the treble wrestplank.

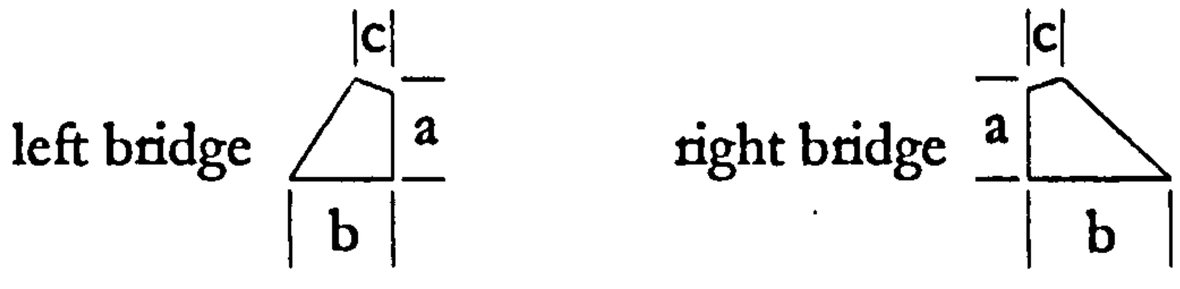
BRIDGES: Fruitwood, probably pear. There are no scribed lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.20 diameter. There are marking out lines

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[1] There is an added piece for the extra C jack in the bass.
[2] The original tuning pins are preserved separately from the instrument.

parallel to the spine on the top surface of the right bridge, placed between the close pairs of strings. There are positioning holes for the right bridge.

Bridge Dimensions:



left bridge	C	c	c^1	c^2	c^3
a	17.7	17.6	17.2	16.0	16.0
b	16.1	16.2	15.2	15.7	11.4
c	4.5	4.4	4.0	4.1	4.0

right bridge	C	c	c^1	c^2	c^3
a	17.2	16.7	17.0	17.0	17.0
b	19.6	21.0	19.6	19.1	20.9
c	6.1	6.1	4.7	6.9	5.4

String Lengths and (Plucking Points)

		f^1	**423 (55)**	**F**	**1246 (121)**
		e^1	433	E	1265
		e^{b1}	473½	E^b	1318
		d^1	485½	D	1335½
		$c^{\#1}$	530	$C^{\#}$	1393½
c^3	**145 (34)**	**c^1**	**542½ (80)**	**C**	**1414 (133)**
b^2	159	b	586	GG/BB	1480 (148)
b^{b2}	162	b^b	601	**Ex C**	**1497 (170)**
a^2	178½	a	651		
$g^{\#2}$	180	$g^{\#}$	665		
g^2	198	g	713		
$f^{\#2}$	201	$f^{\#}$	731		
f^2	**220 (43)**	**f**	**786 (77)**		
e^2	222½	e	802		
e^{b2}	243½	e^b	851		
d^2	246½	d	867½		
$c^{\#2}$	269	$c^{\#}$	930		
c^2	**274 (62)**	**c**	**948 (108)**		
b^1	301	B	1007		
b^{b1}	309½	B^b	1023		
a^1	334	A	1082		
$g^{\#1}$	343	$G^{\#}$	1103		
g^1	378½	G	1163		
$f^{\#1}$	388	$F^{\#}$	1181		

Keyboard and Action

COMPASS: GG/BB – c^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail of oak, 31.8 wide and 31.5 high. The balance pins are iron, 2.3 diameter, and protruding 17 above the top of the balance rail. The balance rail is rebated into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 44 wide and 12.5 thick. The backrail is deal.

RACK: Poplar, attached to the top surface of the backrail. It is scribed on the front and rear surfaces for the top and bottom of the slots. There is a very old, possibly original, cloth attached to the top.

FRONTRAIL: Poplar, 30 wide and 10 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 37.5 high and 3.9 thick.

ENDBLOCKS: Cedar. The left endblock is 126 long, 12.6 wide and 58.1 – 48.0 high. The right endblock is 126 long, 11.8 wide and 57.0 – 50.0 high.

KEYBOARD WIDTH: Overall width between the keywell sides 718, and between the endblocks 691. The overall width of the keyboard is 690, and the three-octave span is 482½.

KEYLEVERS: Poplar, 14.0 thick at the front, tapering to 9.1 at the rear. The rackpins are poplar, 3.2 diameter. The lowest keylever is 304 long and the balance point is 107 from the front of the touchplate. The top keylever is 465 long, and the balance point is 160 from the front. The accidental keylevers are balanced 12 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, variable overall length, and tapering in thickness from 3.0 at the front to 1.6 at the rear. There are four scribed lines on the front section, 25.8, 27.8, 33.4 and 36.0 from the front edge. The touchplates overhang the keylevers by 2.2.

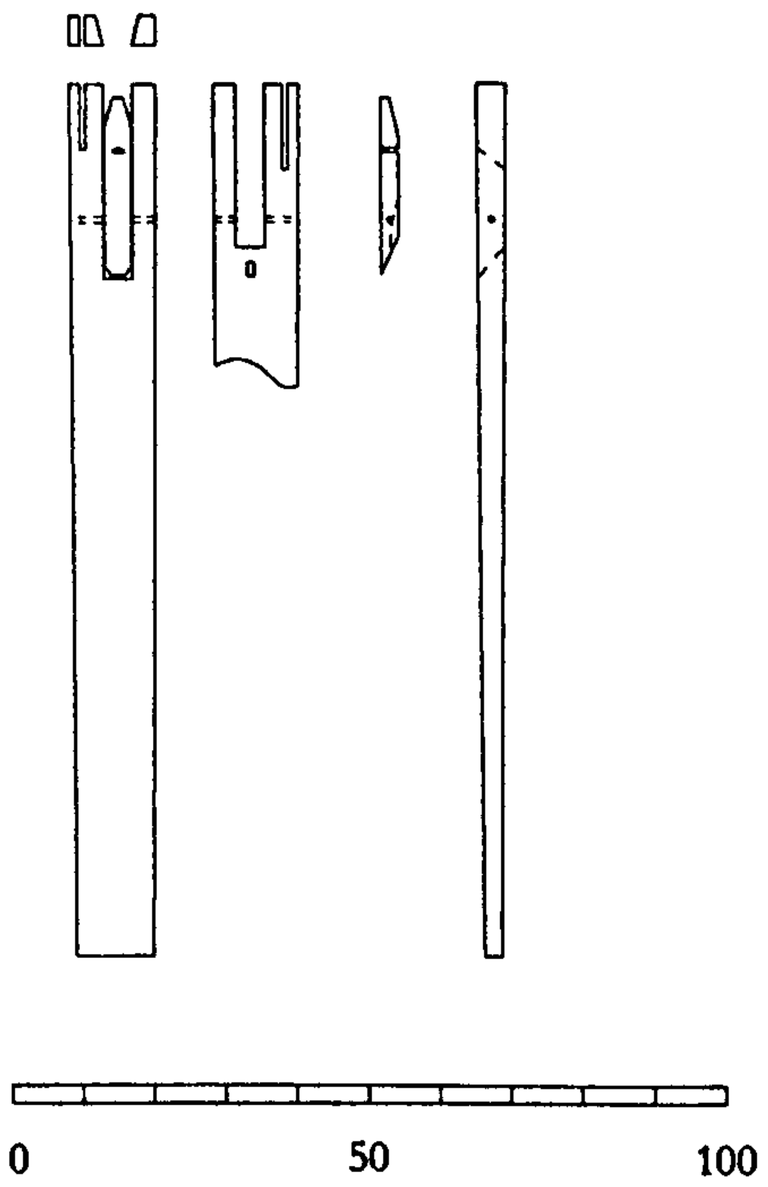
The natural touchplate widths in between the accidentals are:-

		f^2	13.7	f^1	14.1	f	14.1	F	13.7
		e^2	13.2	e^1	13.6	e	12.7	E	13.4
		d^2	14.8	d^1	14.4	d	14.6	D	14.5
c^3	20.7	c^2	13.7	c^1	13.9	c	14.5	C	14.1
b^2	13.6	b^1	13.1	b	12.5	B	13.1	BB	20.9
a^2	12.0	a^1	12.1	a	12.1	A	11.0		
g^2	12.1	g^1	12.2	g	12.2	G	11.2		

ACCIDENTAL TOUCHPLATES: Fruitwood, with inlaid boxwood, walnut, bog oak and ivory. The overall length is typically 65.4, and total height 11.1 (front) – 10.6 (rear). They taper in width from 11.8 at the bottom to 10.8 at the top.

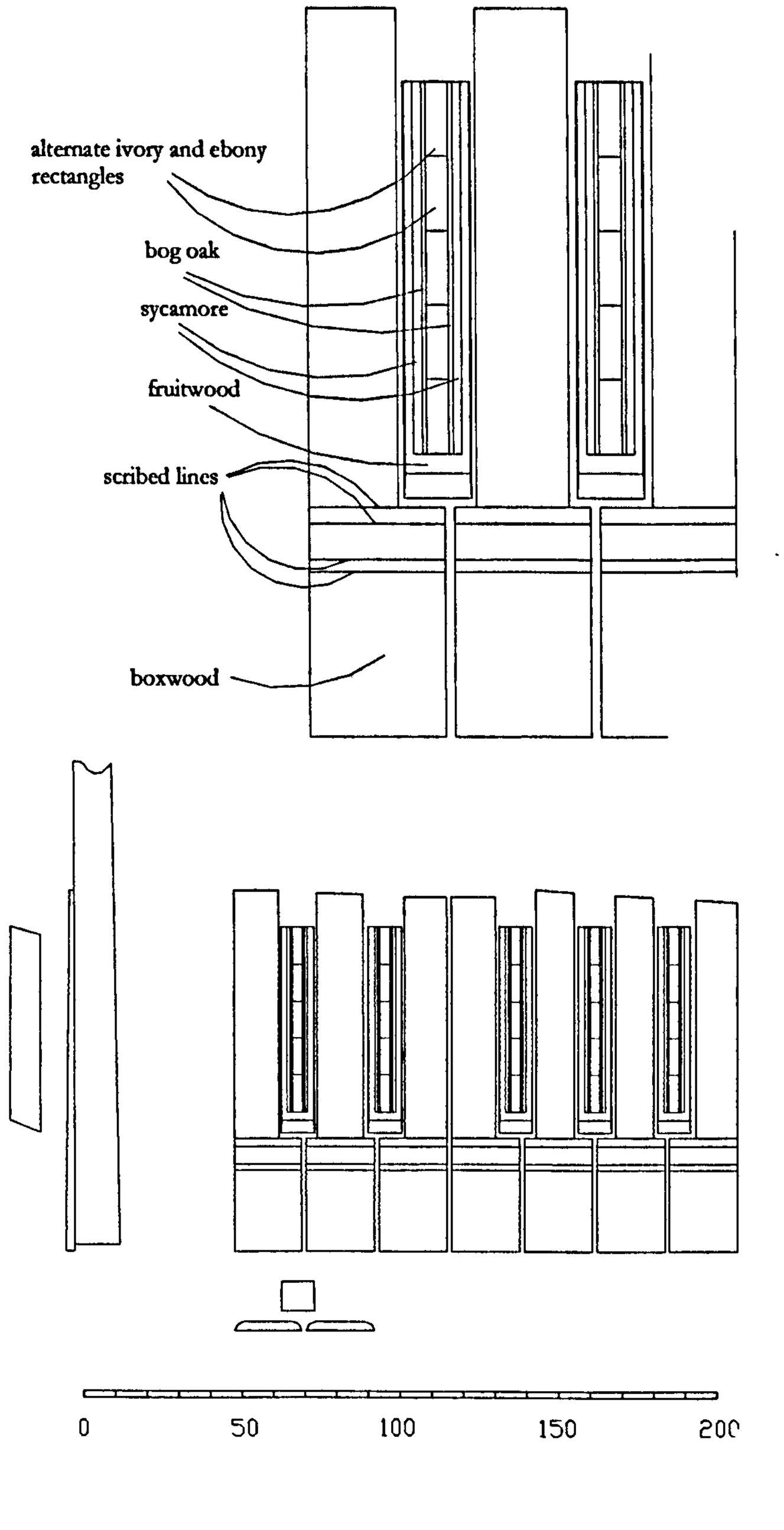
JACKS: Pear bodies with tongues of holly. The total length is typically 123. They taper in width from 12.0 – 10.8, and in thickness from 4.0 – 2.5. The axle pins are positioned 19.3 (76%) from the top of the tongue. The back of the tongue slot has been widened to avoid any risk of the tongue sticking.

Figure 1651TW.2 – Drawing of a typical jack.



There are no original action cloths.

Figure 1651TW.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1662 TB instrument.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Elizabeth shield" design. In the centre of the nameboard there is a painted plaque with an image of a female lutenist on it. This painting is in the same hand as the work on the lid and soundboard.

The lid has a typical contemporary landscape painting. The decoration on the keywell flap interior and part of the lid (see the Condition section, below) has been overpainted with a flat green colour.

Condition

The instrument has, at some stage prior to its possession by the Museum of London, undergone some decorative alterations resulting in the keywell flap and the portion of the lid directly above the keyboard being painted in a flat green colour. At this time the lid was cut and hinged in this section so that the instrument played without opening the entire lid. With those exceptions the instrument is still in fine decorative condition.

The baseboard has been removed at some time and there is a replacement rear baseboard section. This work appears old, and was probably carried out during refurbishment in the 1880s.

The virginal is currently in playing condition, and is regularly used on the museum's premises. As part of the restoration process the original jacks and tuning pins were removed from the instrument and modern substitutes included. The jacks and tuning pins have been securely preserved in the museum store and are available for inspection. The current stringing is all brass and the instrument is tuned to a pitch of c. 392 Hz, two semitones below modern pitch.

Commentary

This instrument is very similar in design to the 1642 TW, 1651 TW and 1653 TW virginals. It has a unique GG/BB – c^3 compass, and, more unusually, the top note is plucked towards the rear. This results in the scaling-design note, and the other *c* strings being comparatively shorter than the *f* notes. This is also found in the 1664 JP and 1675 SK virginals. In doing this, the maker has been obliged to add a small piece of leather to the soundboard register in the bass for the extra C. The other implications – particularly that of the resulting scaling-design note string length and corresponding pitch – must be discussed in some detail.

It must be, firstly, considered whether White made a specific design decision to have the c^3 note plucked towards the rear, or whether it was forced by other circumstances. This cannot be answered definitively. The instrument's compass has 50 notes, and it would, at first sight, be logical to divide them into 25 pairs, rather than 24 pairs plus a single jack at each end.[3] However, the extra C string and jackslot was obviously considered important to the design – as White went to some trouble to add a piece of leather to accommodate it – and it would have been much easier overall to make the register as a normal 49 note (C – c^3) compass and then add an extra jackslot in line with the extra C slot. As a consequence of the present design, the extra C string is longer than the GG/BB. Making a compass with an even number of notes would not have been unusual to White, as the 1651 TW has a GG/BB – d^3 (52 note) compass.

[3] It should be pointed out that the 1664 JP – also having the scaling-design note plucked towards the rear – has 56 notes, which can be arranged in 28 pairs rather than 27 pairs plus two single jackslots.

There are no other logical construction reasons why the maker may have chosen to alter his normal design approach.[4]

The other alternatives are that White was forced to change his normal design approach or that he made a mistake during construction. It is possible that the instrument was intended to have a C – c^3 compass, but was changed during construction to GG/BB in the bass. If the soundboard was under construction, with the right bridge already glued (and possibly with the register slots cut in the soundboard), the only place in which the extra note could be added is in the treble. An identical scenario would result from a mistake should White have inadvertently commenced building the instrument with a C – c^3 compass. The other possibility – that White made an error in cutting his register slots or the lateral placement of the register – can be discounted as too unlikely.

Further evidence to support the suggestion that the design was altered during construction can be seen on the baseboard, where there are parallel scribed lines, 31.5 and 20.0 to the left of the right keywell side. These scribed lines are part of the construction process, and are regularly seen on the baseboard of English virginals. The right endblock is 11.8 wide, essentially the difference between the two scribed lines, and the remaining distance is only slightly smaller than a natural keywidth. It is likely that construction of the case was underway, and the position of these scribed lines marked the original intended edge of the right keywell side and endblock.

Therefore, the most realistic possibility is that the instrument was intended to have a C – c^3 compass which was changed to GG/BB during construction. This then has implications for the scaling-design note string length and pitch level.

As the scaling-design note is comparatively short for the string length it must be considered if there was an attempt to compensate for, rather than directly reflect, the intended pitch. The scaling-design note string length is 145 mm (5¾"), implying a pitch level of V + 1s. This level is possibly also be found in the AH virginal,[5] but is otherwise not seen in virginals, although it is used in English organs of the sixteenth-

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[4] The other parts involved – the left- and right bridges and the wrestplank – have nothing affected by the choice of scaling-design note plucking direction. It is true that the left bridge will have less room to vibrate in the extreme treble, but it cannot be shown that White thought of this as a disadvantage.

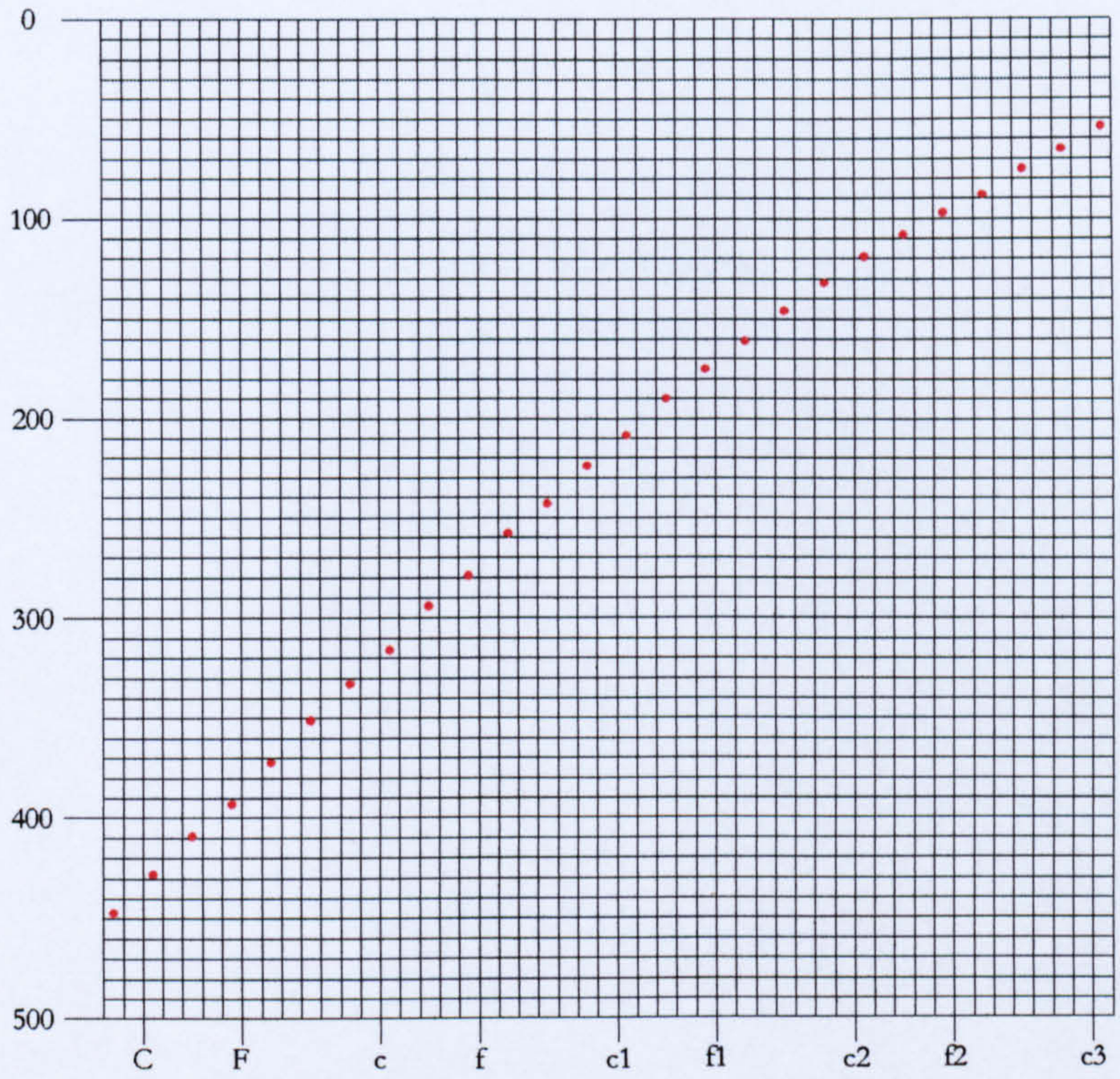
[5] See the Catalogue entry, page 20.

and seventeenth-century. However, White possibly made the scaling-design note string length a quarter-inch shorter to compensate for the fact that it is a "short" string, and that the intended pitch is V. This pitch is found in the 1642 TW, 1651 TW and 1653 TW virginals, as well as many other examples. It is impossible to answer this question conclusively. If it is accepted that the instrument's compass was altered during construction then it is reasonable to assume that the maker would make an attempt to compensate. The bass string lengths are comparable to those of the Thomas White virginals mentioned above, rather than being shorter as might be expected if the instrument was intended to have a higher pitch. The plucking points are slightly shorter on this instrument compared to the 1651 TW. Therefore the distance from the right bridge to the register slot is longer in the 1656 JW virginal, further suggesting that the intended pitch was V.

This instrument, along with the 1651 TW and 1653 TW virginals, show that the bass compass was changing during the first half of the 1650s from the earlier C to GG/BB. If the above conclusions concerning the change of bass compass during construction are correct then this instrument is a probably unique example of an English virginal demonstrating the methods used by a maker when major design alterations needed to be incorporated.

There are scribed lines on the right bridge, perpendicular to the spine. The marks were used as a guide to position the right bridge pins. The distance from the spine of these marks are graphed below.

Graph 1656JW.1 – Distance from the spine of the right bridge pin marks.



As shown by the graph, there are three definite slopes – from the treble to $c^{2}/c^{\#2}$, from there to d^{1}/e^{b1}, and from there to the bass. It is possible that these slopes were designed to be (from the treble) seven spaces in three inches, nine spaces in five inches and eleven spaces in eight inches.

1661 JW

Plate 1661JW.1 – Three-quarter view of the 1661 JW virginal.



Ownership and Provenance

Housed at Bunratty Castle, Eire. Sold at auction, Christie's, 24 January, 1946. It was probably at this time that the instrument was purchased by Lord Gort, who restored and furnished Bunratty Castle in the 1960s.

References

B1 & B2 English virginal table No. 8, B1 & B2 White, James No. 2, B3 No. WHITE, J. 1661.

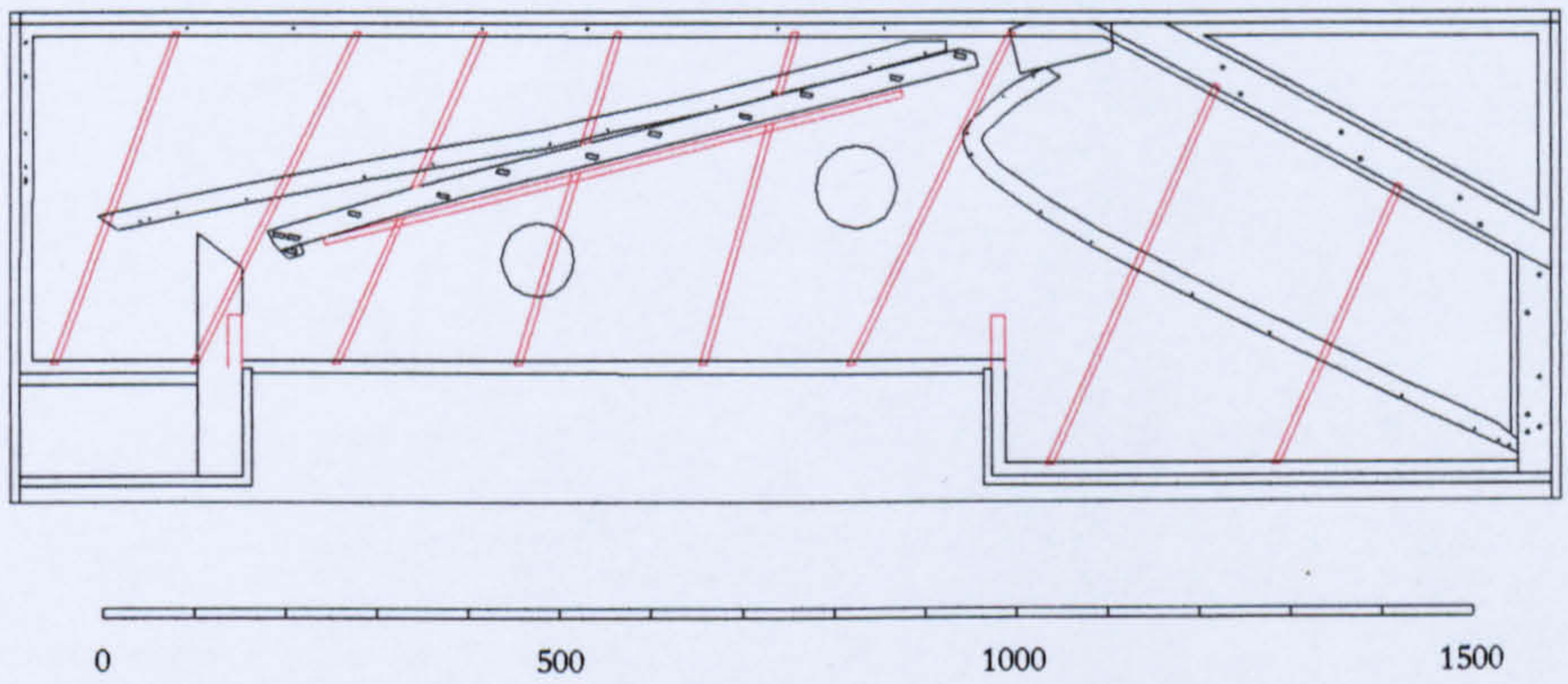
Inscriptions

Signed "Jacobus White Londini Me Fecit 1661" on the front of the jackrail. On the back on the nameboard are repair inscriptions "repaired by Alec Hodsdon Lavenham Suffolk Jan 1948", and "repaired by Alec Hodsdon Lavenham June 1965". The number

"2820" is stamped on the top edge of the right case end and on the top edge of the spine.

Construction

Figure 1661JW.1 – Plan view of the 1661 JW virginal.



OVERALL INSTRUMENT DIMENSIONS: 1697 x 533 x 222.

BASEBOARD: Deal, three planks, the rear plank 62 wide, the other join concealed by the stand.

SPINE: Deal, 1697 long, 222↔ high, 12.6 – 12.8 – 13.1 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 535 – 533 long, 222 - 224 high, 9.6 – 11.2 thick; the right case end 534 – 535 – 533 long, 221 – 223 high, 9.4 – 10.0 thick. The spine and case ends overlap the baseboard, with nails from the case ends into the baseboard. There are large dowels, 8.0 diameter, from the case ends into the faceboards.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 253 long, 206 – 205 – 207 high and 10.5 thick. Right faceboard 620 long, 209 – 206 – 208 high and 9.9 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 128 (left) and 126½ (right) long, 9.9 (left) and 8.9 (right) thick. Slots for the nameboard have been cut into the keywell sides 106 - 112½ (left and right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 809↔, 157 – 160 high, and 10.3 – 8.9 thick.

KEYWELL LINER: Deal, 80 - 80½ high, 12.6↔ thick.

OTHER LINERS: Deal, c. 40 x c. 16. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard. These protrusions extend past the keywell-back liner.

WRESTPLANKS: Oak, ‡40 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 75½ (left and right) high. The inner edges form a continuation of the keywell sides. The frames are 21.1 (left) and 20.4 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 36 - 34½ high, set 99↔ from the back of the faceboard. The toolbox lid is missing. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 887 long (front), 923 long (back). It is 48.2 wide, and 18.1 thick. The bottom of the jackrail is 31.0 (bass) and 29.4 (treble) above the top of the soundboard. The bass jackrail support is of deal, 49.4 wide. The left side is 264 long, the right side 226 long. The treble jackrail support is pentagonal in shape, 92 (plus an angled section, parallel to the front 22 long at the rear, 103 at the front, and 49.5 at the end where it meets the jackrail and 31 at the right end. The back right corner is 481 from the right case end, and it is at an angle of 85° to the spine.

LID: Oak, originally coffered in three pieces, now flattened. The planks are 187, 178 and 183 wide on the inside, and the front thickness is 9.4 – 9.0 – 10.1. There are applied mouldings along the joins and the ends on the top surface, but they are not original.[1] Damage lines indicate the end battens were 16.6 (left) and 14.9 (right) thick.

[1] These mouldings may cover traces of original lid top mouldings.

There are traces of four original wire hinges (1.72 diameter) between the spine and lid. There are two holes in the soundwell top moulding on the left case end, 18 and 39 from the back of the toolbox capping, and 19 below the top of the case, which may have contained lid cord hooks.

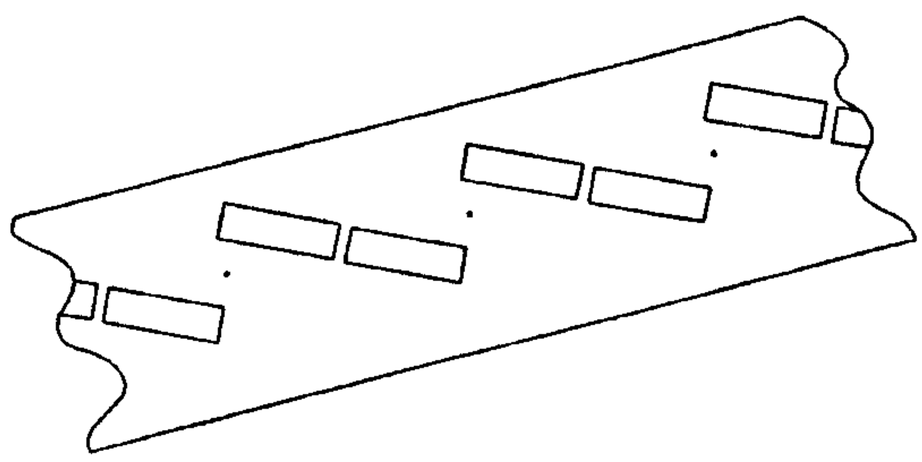
KEYWELL FLAP: Oak, 209 – 213 - 212 wide, and 10.3 – 10.8 – 9.7 thick. Iron strap hinges, maximum 2.3 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 120 - 60 wide. Glued to the top of the frames. Leather guide glued underneath. There is a full depth cut-off bar glued in front of the register, and another bar 30 high and 12 thick glued behind the register.

SOUNDBOARD: Coniferous wood, 3.2 – 4.1 – 3.3 thick at the keywell liner. The top of the soundboard is approximately 54 below the top of the case. Two gilded roses, 80 (left) and 89 right) diameter, (of wood glued on top of parchment), glued to the soundboard from underneath. There is a bevel around each rose, c. 8 diameter.

SOUNDBOARD REGISTER: Leather, 796 long, tapering slightly in width from 23.5 (bass) to 23.9 (treble), and 0.8 thick. Slots typically 12.6 x 4.4. There is an added piece of register leather for the extra C. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

Figure 1661JW.2 – Schematic drawing of the register slots and string-guiding marks.



SOUNDBOARD BARRING: Deal, 25 high and 7.1 – 3.8 wide (top to bottom). The ends of the bars are rounded in a concave shape.

WRESTPLANK CAPPING PIECES: Oak, 3.5 thick. The treble wrestplank capping is 37.4 wide without, and 53.0 wide with applied mouldings; and the bass wrestplank capping is 37.4 (without) and 44.7 (with mouldings).

SOUNDBOARD MOULDINGS: 3.0 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 14.0 wide, and the spine moulding is 14.5 wide. The other soundboard mouldings are cedar, 14.0 wide.

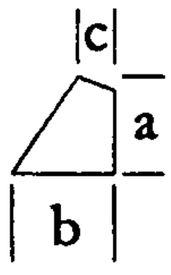
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 3.7 thick. The moulding on top of the faceboards, keywell sides and nameboard are 15.6 wide. The soundwell top edge mouldings are 21.0 and 3.4 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.9 diameter. The tuning pins are not original, 5.4 diameter, and are of iron.

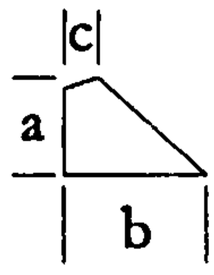
BRIDGES: The left bridge is beech, right bridge of stained fruitwood, probably pear. The treble of the left bridge has been cut away for the top 40 mm to accommodate the soundboard moulding.

Bridge Dimensions:

left bridge



right bridge



left bridge	C	c	c^1	c^2	c^3
a	12.4	11.8	11.9	11.5	11.3
b	21.8	20.1	17.7	20.1	21.9
c	6.4	6.3	6.3	6.4	5.5

right bridge	C	c	c^1	c^2	c^3
a	13.6	14.4	13.4	14.0	13.0
b	20.7	20.3	21.0	22.6	20.6
c	6.0	6.5	7.0	7.2	7.0

String Lengths and (Plucking Points)

f^3	**122 (41)**	**f^1**	**479½ (54)**	**F**	**1283½ (121)**
e^3	124	e^1	491½	E	1298
e^{b3}	136	e^{b1}	542	E^b	1352
d^3	137	d^1	552	D	1365½
$c^{\#3}$	149	$c^{\#1}$	592½	$C^{\#}$	1422½
c^3	**150 (31)**	**c^1**	**602½ (48½)**	**C**	**1439½ (130½)**
b^2	164½	b	655	GG/BB	1496½ (146)
b^{b2}	166	b^b	663½	**Ex C**	**1518½ (168)**
a^2	179½	a	717½		
$g^{\#2}$	182	$g^{\#}$	729½		
g^2	198½	g	784		
$f^{\#2}$	200½	$f^{\#}$	793		
f^2	**218½ (39½)**	**f**	**844½ (79)**		
e^2	220½	e	857		
e^{b2}	246	e^b	922½		
d^2	248½	d	935½		
$c^{\#2}$	280	$c^{\#}$	987		
c^2	**284½ (32)**	**c**	**1006 (88)**		
b^1	318½	B	1063		
b^{b1}	325	B^b	1079		
a^1	361½	A	1134		
$g^{\#1}$	365½	$G^{\#}$	1149½		
g^1	418½	G	1205		
$f^{\#1}$	426½	$F^{\#}$	1220		

Keyboard and Action

COMPASS: GG/BB – f^3, with an extra string and jack for C.

KEYLEVERS: Deal, 12.0 thick at the front, tapering to 8.1 at the rear. The rackpins are deal.

BALANCE RAIL: The balance rail consists is oak, 35.8 wide and 31.6 high. The balance pins are iron, 2.45 diameter, and protruding 16 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, the left side 41 – 32 wide, the right side 39½ - 35 wide. The sides are half-lapped into the backrail. The backrail is deal, 52 wide and 19.1 thick.

RACK: Deal, attached to the top surface of the backrail. The rack is 6.7 thick, 38 high. There are vertical scribed lines 18, 81, 155½, 233, 302, 358, 512, 581½ and 765½ from the bass end of the rack.

FRONTRAIL: Deal, 23.4 wide and 6.6 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 36.8 high and 3.8 thick.

ENDBLOCKS: Deal. The left endblock is 124 long, 18.0 wide and 52.0 – 48.0 high. The right endblock is 121 long, 14.8 wide and 51.4 – 46.4 high.

KEYBOARD WIDTH: Overall width between the keywell sides 803, and between the endblocks 767. The overall width of the keyboard is 764, and the three-octave span is 486.

KEYLEVERS: Deal, 12.0 thick at the front, tapering to 8.1 at the rear. The rackpins are deal. The lowest keylever is 336 long and the balance point is 117 from the front of the touchplate. The top keylever is 484 long, and the balance point is 166 from the front. The accidental keylevers are balanced 17.8 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, generally 115 long, and tapering in thickness from 2.8 at the front to 1.5 at the rear. There are four scribed lines on the front

section, 25.5, 27.6, 33.0 and 35.3 from the front edge. The touchplates overhang the keylevers by 3.4.

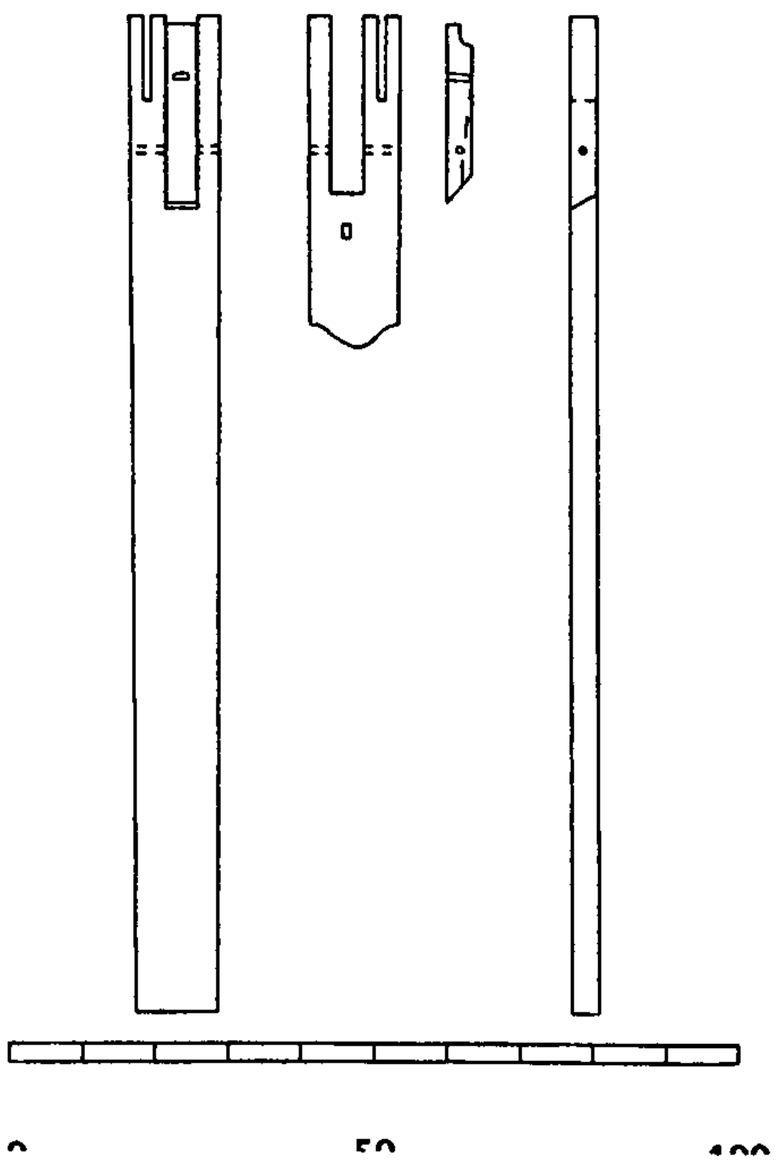
The natural touchplate widths in between the accidentals are:-

f^3	22.35	f^2	13.25	f^1	13.2	f	13.55	F	n.o.
e^3	13.4	e^2	13.5	e^1	n.o.	e	13.5	E	13.2
d^3	15.7	d^2	15.95	d^1	16.2	d	16.2	D	16.0
c^3	13.0	c^2	13.15	c^1	n.o.	c	13.25	C	13.5
b^2	13.0	b^1	13.05	b	13.1	B	12.9	BB	n.o.
a^2	12.7	a^1	13.2	a	13.1	A	12.8		
g^2	12.8	g^1	13.3	g	13.2	G	12.6		

ACCIDENTAL TOUCHPLATES: Stained pear. The overall length is typically 64, and total height 10.0 (front) – 10.1 (rear). They taper in width from 11.3 at the bottom to 9.7 at the top.

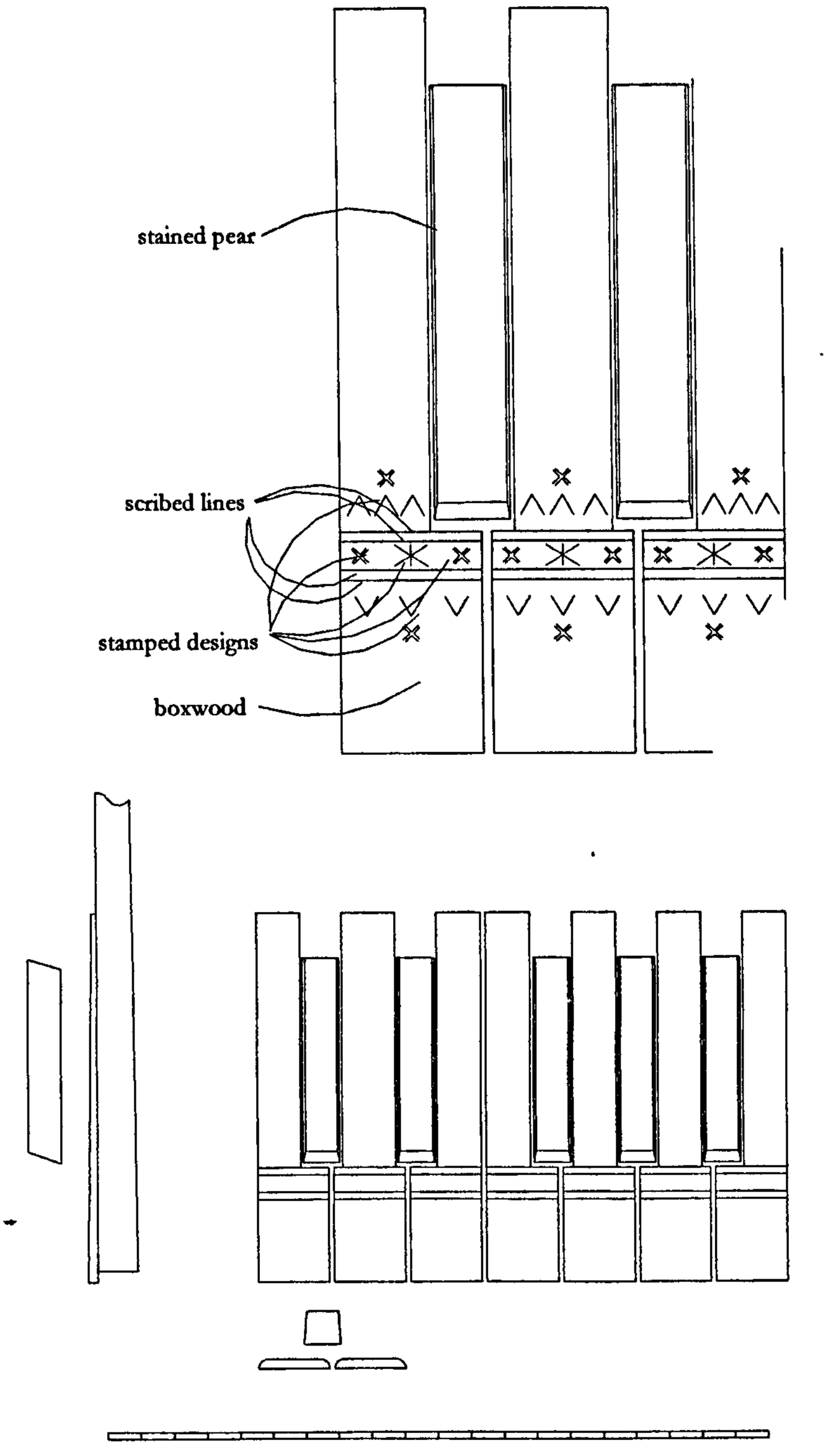
JACKS: The jacks are of pear, with holly tongues. The total length is typically 137. They taper in width from 12.5 – 11.1, and in thickness from 3.7 – 2.7. The axle pins are positioned 17.4 (70%) from the top of the tongue. Forty four original jacks survive.

Figure 1661JW.3 – Drawing of a typical jack.



ACTION CLOTHS: There are (possibly original) pieces of white leather on the backs of the keys, which a hard woollen cloth, 2.3 uncompressed, underneath.

Figure 1661JW.4 – Drawing of major keyboard details.



Decoration

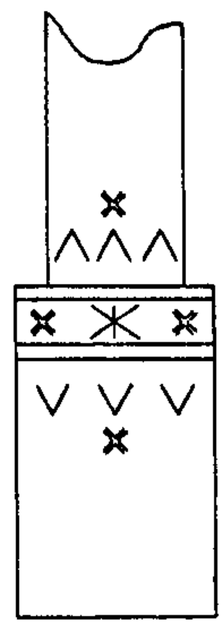
The outside of the case has been thickly varnished (possibly not original), but is otherwise decorated only by the ironwork strap hinges and lockplates. The hinges from the spine to the lid are unoriginal, the instrument originally having wire hinges. There are three strap hasps from the lid to the keywell flap. The two outer hasps (not original, but good replicas of the central hasp) attach to turnbuckles on the keywell flap and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The lid was originally coffered but has been flattened. There are applied oak mouldings on the top of the lid which are not original, but may cover traces of previous mouldings.

The soundboard has been covered with a thick layer of varnish which has largely obliterated the decoration so that only lighter-coloured areas are still visible. There does not appear to be any evidence of border patterns or arabesques.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Elizabeth shield" design. In the centre of the nameboard is a panel of vertically-grained conifer wood, decorated with a painting of a lady playing a lute. The subject matter and style of the painting suggest that this instrument was decorated by the same artist responsible for the decoration on the 1656 JW.

The natural touchplates have stamped decoration as found on several early Thomas White virginals. There are two designs in between the second and third scribed lines, and addition stamps to the front and rear of the lines.

Figure 1661JW.5 – Stamped decoration on the natural touchplates.



The lid is decorated with a scene of Orpheus playing to the Beasts. This example is unusual in having the scene covering the entire lid, rather than being concentrated in one area as occurs on the 1641 GT and 1644 TW virginals, or in one of several panels, as occurs in the Mar and Theewes instruments. The keywell flap picture is of a mythological scene, featuring three people on a water-bank. The central figure has horns or antlers, while the left figure is (Pan?) playing panpipes, and the right figure (Orpheus or Arion?) holds a lyre.

Condition

Despite two twentieth-century restorations this instrument is not in playing condition, and would require considerable work to be made playable again. The instrument has suffered some worm damage, extensive in places. This damage has occurred many years ago, and it cannot be determined if the case has been over-weakened by the damage. The soundboard itself appears to be too fragile to withstand full stringing tension, having several large cracks and some woodworm damage. Most of the soundboard barring has been replaced during one of the Hodsdon restorations, and he has also added a violin-type soundpost in between the baseboard and the soundboard, plus other additional pieces of wood to strengthen it in isolated places.

There has been considerable constructional restoration and alteration work carried out at various stages in the instrument's history. In addition to the work on the soundboard, the lid has been flattened and poor replacement hinges added between the spine and lid. There are a number of replaced bridge pins and jacks, and the tuning pins are not original. Part of the bass jackrail support has been replaced.

Although the instrument retains the stringing of Alec Hodsdon (presumably from his second restoration), the tension has been reduced by the author during the course of examination in 1993. This has removed any risk of further damage (from tension-related causes) occurring to the instrument in future.

Commentary

This is the first virginal of standard design to have a GG/BB – f^3 compass.[2] It is, as a result, the first instrument which uses f^3 rather than c^3 as the scaling-design note. It is also unique to the White family in having no scribed lines on the bridge for either the position of the pins in relation to the crest of the bridge or the spine.

The scaling-design note string length is 122 mm (4¾"), implying a pitch of V – 1s, approximately 450 Hz. Although the right bridge was probably built following a template, it is not certain how the left bridge was placed, even though it is clear that considerable care was taken over its position. The bridge has a slight S-shape, having been curved twice, but there is no obvious design method that appears to have been used. It is possible it may have been personal preference of the maker based on his previous experience.

The natural touchplates have stamped decoration in between the middle scribed lines and in front and behind the lines (see above). This decoration is found on several early Thomas White virginals, but their use in this instrument shows that the stamps were applied by the maker rather than the decorator.

[2] The 1644 TW virginal has the same compass, but is unusual in having the bass double strung from GG/BB – A.

1638 TW

Plate 1638TW.1 - Three quarter view photograph of instrument.



All Photographs by Miles Hellon

Ownership and Provenance

Private Collection, London. Previously recorded (B2) as being in "Private ownership in Paris". The virginal is the "child" of a "mother-and-child" combination. The "mother" instrument is missing.

References

B2 White, Thomas. No. 2a. B3 No. WHITE, T. 1638. Barnes/Galpin (1986) No. 177. Mercier Ythier (1996).

Inscriptions

Signed "THOMAS WHITE Fecit 1638" on the front of the jackrail. "T W 1 6 3 8" scratched on the keywell liner.

Plate 1638TW.2 - Photograph showing the makers signature.



Construction

Figure 1638TW.1 - Plan view of the 1638 TW virginal, showing the original treble bridge position (above) and altered position (below).

OVERALL INSTRUMENT DIMENSIONS: 914 x 441 x 138.

BASEBOARD: Deal, two planks, the front plank 291 wide. 9.6 - 9.8 thick at front. There is a filled slot in the baseboard which originally gave access for the "mother" instrument's jacks to push the keys.

SPINE: Deal, 913 - 913 - 914 long, 138 - 135 high, 8.0 - 8.1 thick, dovetailed to the case ends.

CASE ENDS: Deal, left case end 448 long, 135½ - 135 - 136½ high, 9.4 - 9.7 - 9.4 thick; the right case end 448 long, 138 - 137½ - 138½ high, 8.3 - 8.8 - 8.8 thick. The spine and case ends overlap the baseboard. It is impossible to determine how the case ends have been attached to the faceboards.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 118 long, 124 - 127 high and 8.6 thick. Right faceboard 87 long, 130 - 128 high and 8.4 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 125 (left) and 122 (right) long, 8.5 (left) and 8.2 (right) thick. Slots for the nameboard have been cut into the keywell sides 108 - 112½ (left) and 108 - 112 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 713½ - 712, 96 - 93½ high, and 8½ - 7½ thick.

KEYWELL LINER: Deal, 34 - 34.5 high. The thickness cannot be determined.

OTHER LINERS: Cannot be determined.

WRESTPLANKS: Single wrestplank, positioned along the right case end.

BASEBOARD FRAMES: Lime, 52 (left) and 51 (right) high. The inner edges form a continuation of the keywell sides. The thickness of the frames cannot be determined. There are nails through the baseboard into the frames.

TOOLBOX: The toolbox back piece is made from cedar, 24 high, 105 - 104 from the back of the faceboard. Toolbox lid of cedar, 95 - 94½ long, 108 wide and 8.3 thick. The current lid hinge system is not original, the lid originally hinged at the front.

JACKRAIL AND SUPPORTS: Jackrail of deal, 872 long (front), 862 long (back). It is 37.3 wide, and 14.0 thick. The bottom of the jackrail is 19.5 (bass) and 25.0 (treble) above the top of the soundboard. The bass jackrail support is glued to the left case end, 260 - 219 from the spine, and is 8.4 wide. The treble jackrail support is triangular in section, attached in the back right corner. It is 47 long where it is glued along the spine, and 38 along the right case end.

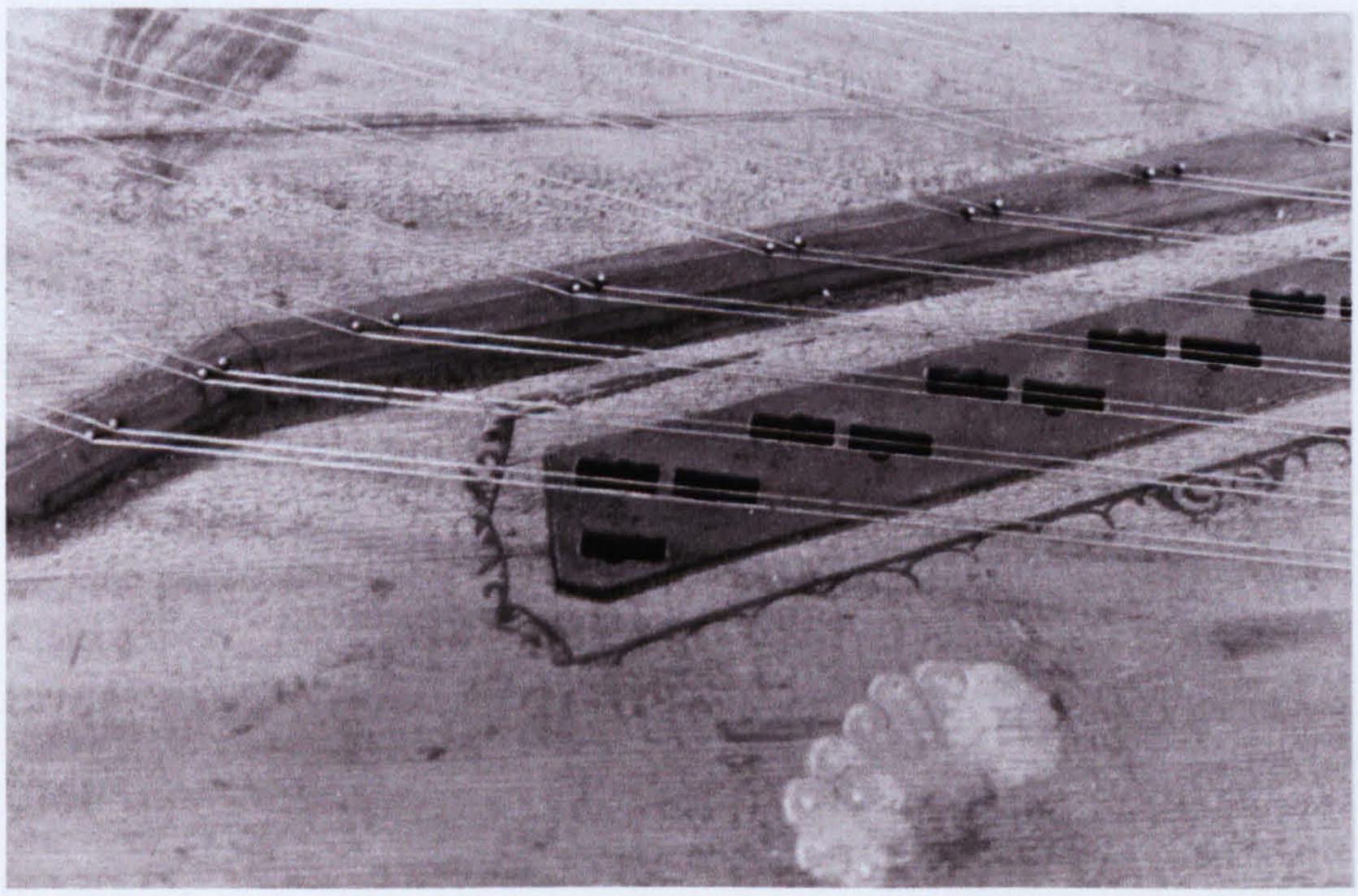
There is no lid or keywell flap.

LOWER GUIDE BOARD: Deal, 5.6 - 5.0 thick. Glued to the top of the frames and underside of the keywell-back liner, covering the entire space between the frames. Leather guide glued underneath.

SOUNDBOARD: Coniferous wood, 3.9 - 3.7 - 2.9 thick at the keywell liner. The top of the soundboard is approximately 40 below the top of the case. Gilded rose, 78 diameter, of wood glued on top of parchment.

SOUNDBOARD REGISTER: Leather, 695 (front) and 693 (back) long, tapering in width from 24.1 (bass) to 22.2 (treble), and 1.6 thick. Slots typically 12.8 x 4.5. There are string-guiding marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

Plate 1638TW.3 - Photograph of the bass part of the register leather, showing the string-guiding marks.



SOUNDBOARD BARRING: Cannot be determined.

WRESTPLANK CAPPING PIECE: Oak, 2.9 thick. It is 29.6 wide without, and 38.5 wide with applied mouldings.

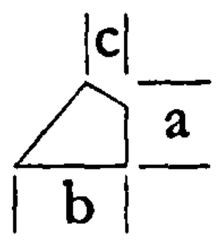
SOUNDBOARD MOULDINGS: The mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. They are oak, 3.4 thick. The left case end moulding is 16.7 wide, and the spine moulding is 17.3 wide. The other soundboard mouldings are cedar, 15.0 wide.

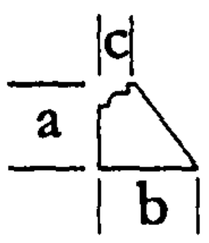
OTHER MOULDINGS: The soundwell top moulding and the case top moulding are identical, of cedar 4.3 thick. The faceboard mouldings are cedar, 4.2 thick.

HITCHPINS AND TUNING PINS: The hitchpins are of brass, 1.48 diameter. The tuning pins protrude 21 from the top of the wrestplank capping piece, 3.0 diameter, and are of iron.

BRIDGES: Fruitwood, probably pear. Both of the bridges are of fruitwood. Both bridges are in two sections, the left bridge having the lowest four strings on an angled section, the right bridge dividing at b^{b1}/b^{1}. The treble of the left bridge has been cut away for the top 30 to free space next to the soundboard moulding. There are no scribed lines on the left bridge but there are positioning holes, used to place the bridge correctly when gluing, at various places on the soundboard. The right bridge has a scribed line on the flat surface at the top. There are light marks on the top surface of the right bridge for positioning the bridge pins. The bridge pins are brass, 1.1 diameter.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	14.5	10.1	10.2	9.3	9.2
b	14.3	13.6	13.6	13.6	13.6
c	4.8	5.0	4.9	4.8	4.6

right bridge	C	c	c^1	c^2	c^3
a	8.2	8.1	8.1	7.7	8.0
b	-	12.0	12.0	2.1	12.1
c	4.1	4.0	4.0	4.0	4.5

String Lengths and (Plucking Points)

The figures from c3 to b1 record the string lengths in the instrument's current (altered) state. The figures in ***italics*** for c3, f2 and c2 are reconstructed original string lengths.

		f^1	**289 (46½)**	**F**	**731½ (76)**
		e^1	317½	E	765
		e^{b1}	324	E^b	773
		d^1	351½	D	797½
		$c^{\#1}$	357	$C^\#$	802½
c^3	**95½ (50)** ***104 (50)***	**c^1**	**387 (56½)**	**C**	**821 (76)**
b^2	95½	b	387	**Ex C**	**824 (80)**
b^{b2}	109	b^b	393½		
a^2	111	a	425		
$g^{\#2}$	122	$g^\#$	430		
g^2	124	g	460		
$f^{\#2}$	137	$f^\#$	466		
f^2	**140 (41)** ***144 (41)***	**f**	**496 (54)**		
e^2	151½	e	535½		
e^{b2}	154	e^b	542		
d^2	167	d	571		
$c^{\#2}$	169½	$c^\#$	577½		
c^2	**186 (51)** ***187 (51)***	**c**	**610 (73)**		
b^1	188½	B	618		
b^{b1}	211	B^b	648		
a^1	217	A	654½		
$g^{\#1}$	246½	$G^\#$	687		
g^1	253½	G	694		
$f^{\#1}$	281½	$F^\#$	726		

Keyboard and Action

COMPASS: C - c3, with an extra string and jack for C.

BALANCE RAIL: The balance rail is oak, 32.3 wide and 14.4 high. The balance pins are iron, 2.4 diameter, and protruding 17 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are lime, generally 31 wide and 5.0 thick. The backrail is lime, 34.1 wide and 4.7 thick.

RACK: Lime, attached to the top surface of the backrail. The rack is 5.1 thick, 38.0 high. It is scribed on the front and rear surfaces for the top and bottom of the slots. There is an added piece of leather attached to the top.

FRONTRAIL: Deal topped with cedar, 23.7 (deal) and 32.8 (cedar) wide, 8.4 total thickness.

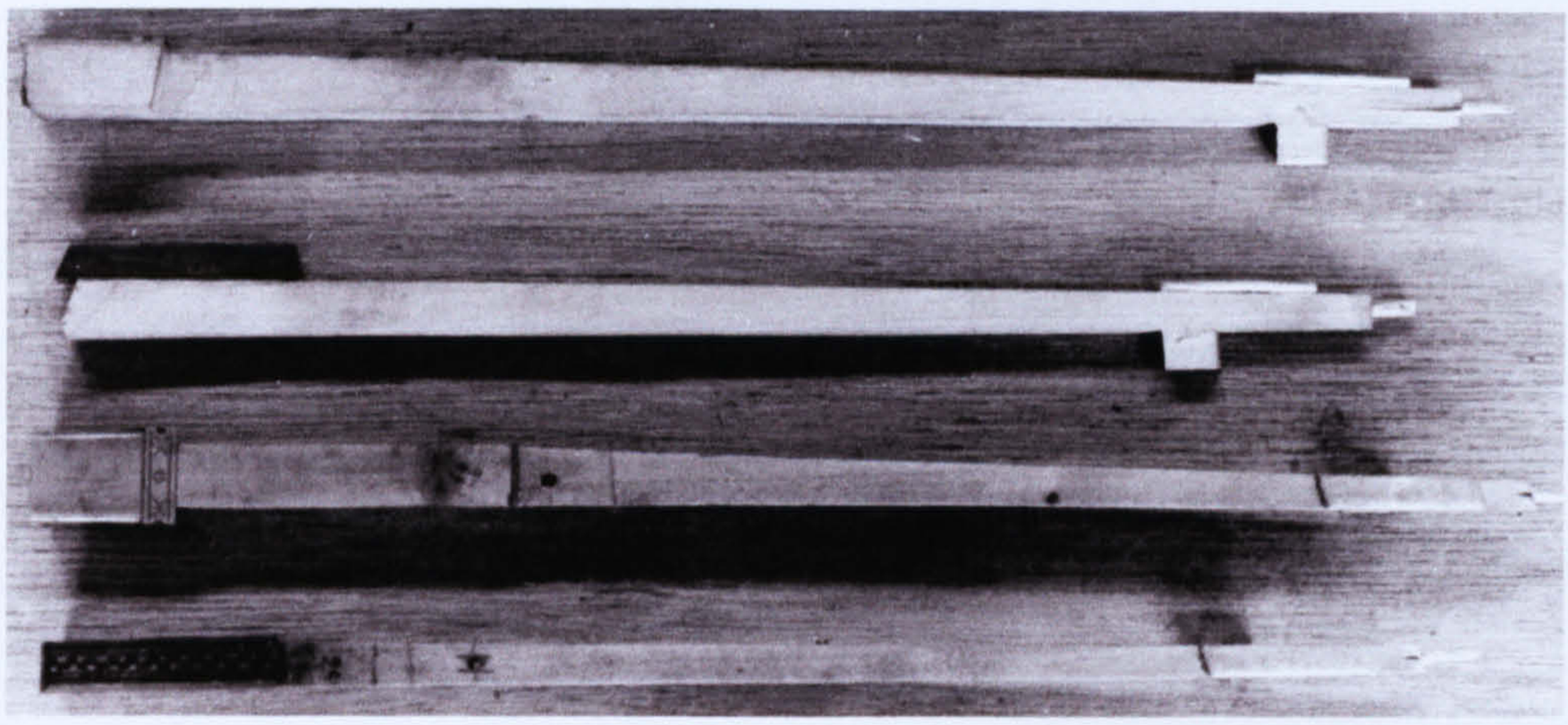
KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 30.0 high.

ENDBLOCKS: Deal. The left endblock is 124 long, 20.1 wide and 29.8 - 20.1 high. The right endblock is 123 long, 18.6 wide and 31.6 - 25.7 high.

KEYBOARD WIDTH: Overall width between the keywell sides 709, and between the endblocks 668. The overall width of the keyboard is 663½, and the three-octave span is 481.

KEYLEVERS: Lime, 14.6 thick at the front, tapering to 8.9 at the rear. The rackpins are not original. The lowest keylever is 262 long and the balance point is 96 from the front of the touchplate. The top keylever is 418 long, and the balance point is 137 from the front. The accidental keylevers are balanced 15 behind the naturals. On the underside of each key is an added piece of lime which extended down to meet the top of the jacks of the mother virginal (see Commentary). These pieces are typically 10 long and 8 thick.

Plate 1638TW.4 - Top and side view of keys.



NATURAL TOUCHPLATES: Boxwood, generally 111 long, and tapering in thickness from 2.9 at the front to 1.5 at the rear. There are four scribed lines on the front section, 26.6, 28.2, 32.7 and 34.1 from the front edge. The touchplates overhang the keylevers by 2.0.

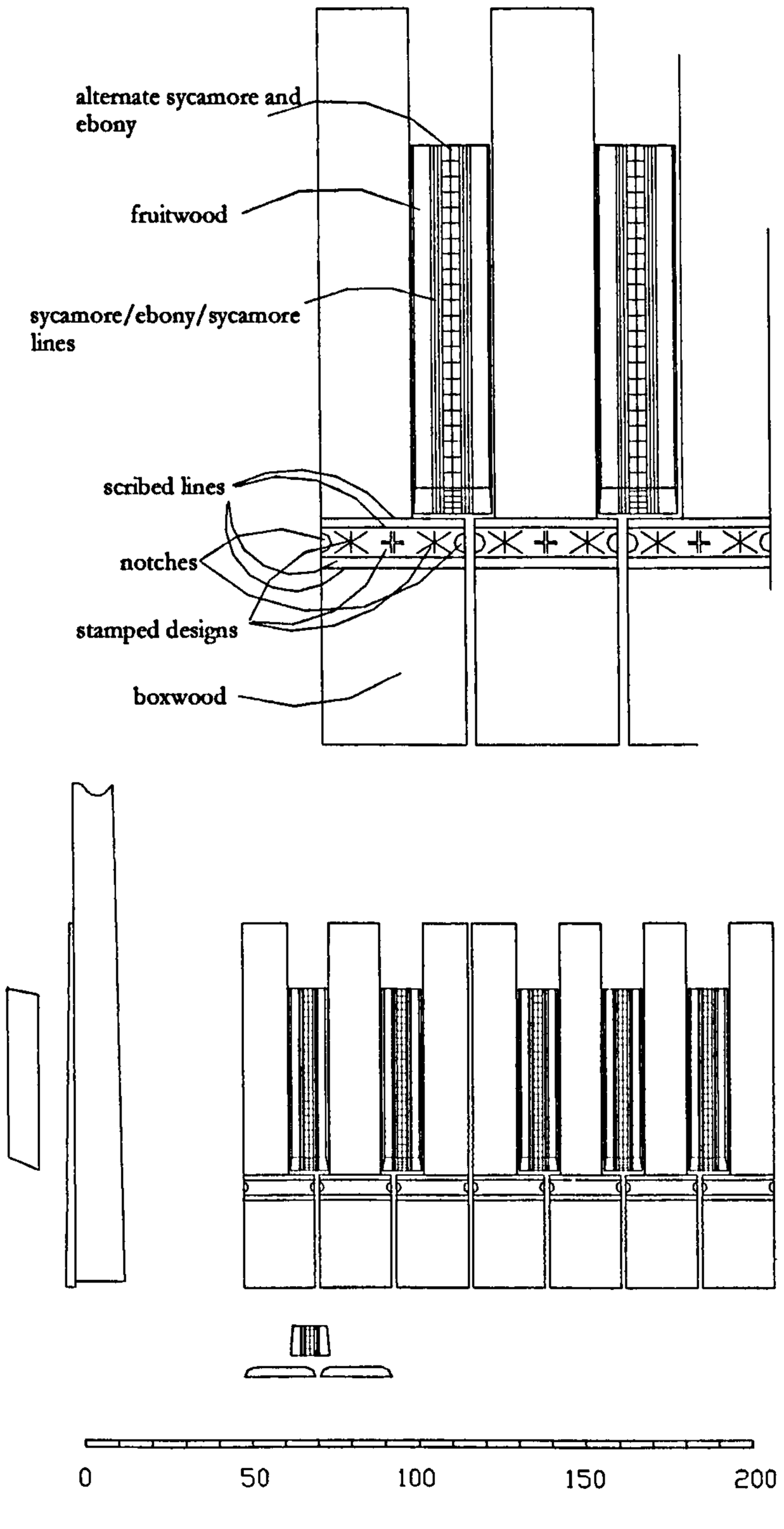
The natural touchplate widths in between the accidentals are:-

		f^2	13.4	f^1	13.3	f	13.2	F	13.8
		e^2	13.2	e^1	13.4	e	13.2	E	13.0
		d^2	14.2	d^1	14.5	d	15.2	D	14.4
c^3	21.5	c^2	13.3	c^1	13.5	c	13.6	C	13.8
b^2	13.1	b^1	13.0	b	13.1	B	13.1		
a^2	12.1	a^1	12.5	a	12.5	A	12.3		
g^2	12.2	g^1	12.6	g	12.4	G	11.8		

ACCIDENTAL TOUCHPLATES: Fruitwood with inlaid ebony and sycamore lines and alternate rectangular pieces. The overall length is typically 55.6, and total height 8.9 tapering to 9.1. They taper in width from 11.7 at the bottom to 10.3 at the top.

The jacks and action cloths are not original.

Figure 1638TW.2 - Drawing of major keyboard details.



Decoration

The case ends, faceboards, keywell sides and nameboard have applied mouldings and embossed papers. The spine is veneered in cedar (from a later date).

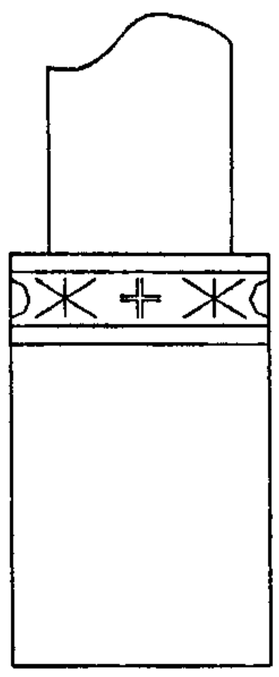
There is white painted scrollwork along the length of each moulding band in the centre, surrounded by a thin green line. The endblocks are painted black and have similar white painted scrollwork decoration. The papers on the faceboards and outside of the case ends are a variant of the "monkey" design. The arcades are the "trefoil" design. There is a cedar moulding on the top edges of the instrument.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1641 GT, 1642 TW and 1644 TW instruments.

The soundwell and jackrail are decorated with cedar mouldings and embossed papers. The soundwell top moulding is of the same design as that used on the top of the sides. The gilt papers are of the "Elizabeth Shield" design. Both the papers around the soundwell and the "monkey" design papers used on the case ends, faceboards, keywell sides and nameboard have been "highlighted" with red and green paint.

The natural keys have been stamped with two designs as a decorative feature. These designs appear between the second and third scribed lines. At the edges of the keys between the second and third scribed lines are filed notches.

Figure 1638TW.3 - The stamped designs and notches on the natural touchplates.



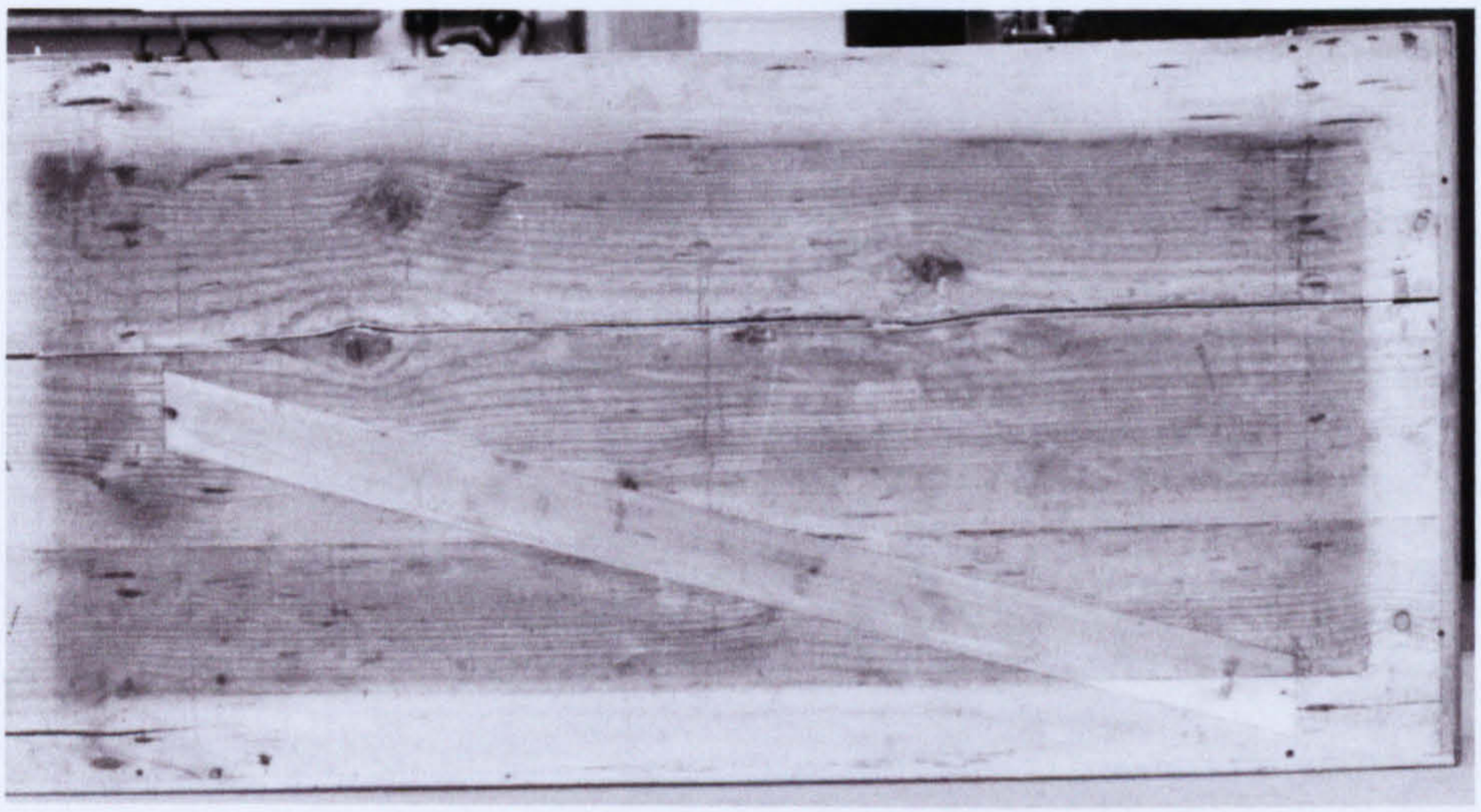
The toolbox has gouged notches along the sides and a moulding along the rear edge. The stamped decoration used on the natural touchplates is repeated on all four sides, and there is a painted floral design in the centre.

Condition

This instrument is finely preserved, showing little evidence of usage.

The "mother" instrument is missing. The slot in the baseboard through which the mother instrument's jacks went has now been filled with a piece of deal. The colouration of this added piece matches the remainder of the baseboard.

Plate 1638TW.5 - Photograph of the underside of the baseboard.



The jacks are replacements.

Commentary

This is the earliest dated English virginal, and the only surviving example of a "mother and child" virginal combination in England. The instrument is also designed for a pitch level quite different from the other surviving virginals.

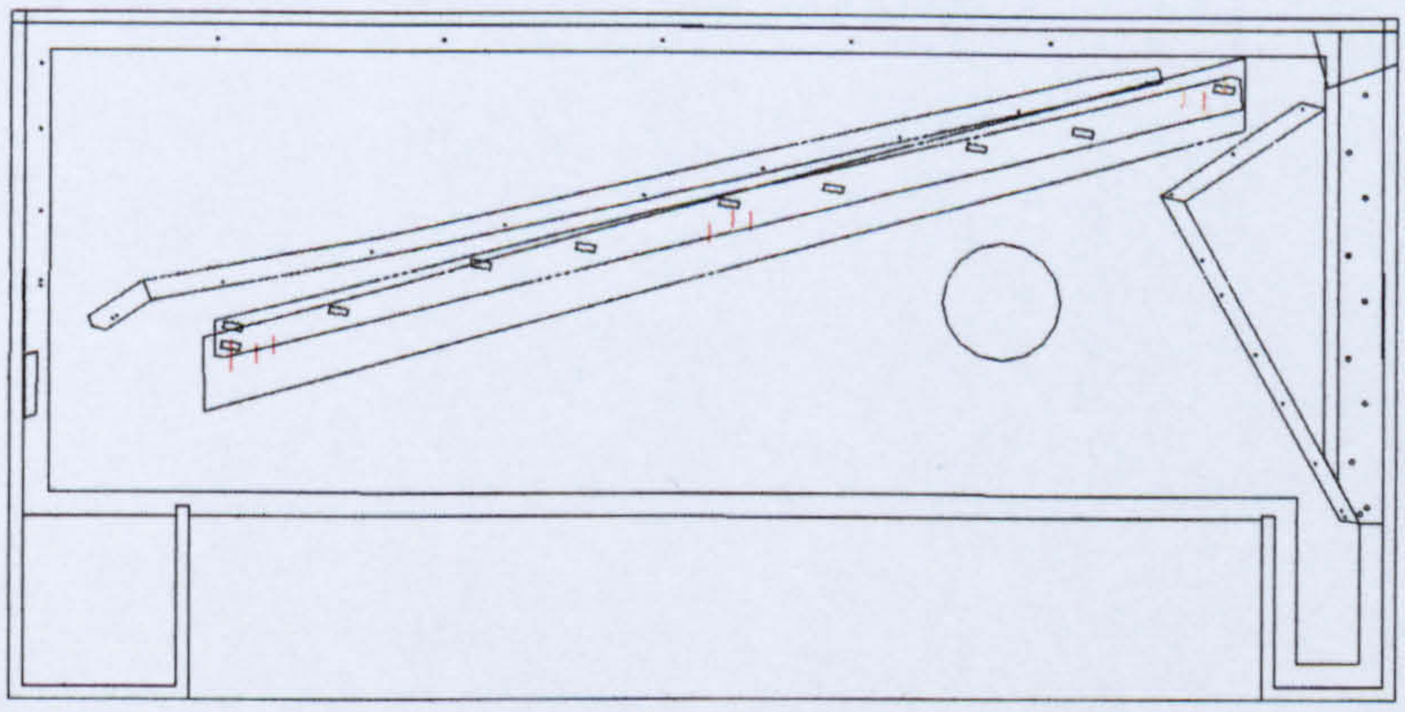
Like all of Thomas White's other instruments which ascend to c3 or d3, the 1638 TW uses c3 as its scaling-design note. In this instrument it was 104 mm long, designed to be 4 inches. The 1642 TW, 1651 TW and 1653 TW all have a c^3 scaling-design note which is 6 inches long. As has been shown in Chapter Two, this suggests that the 1638 TW was designed to play at a pitch a fifth above V (at V + 7s). The "mother" virginal would have played an octave below this, at V - 5s. This transposing pitch relationship to the instruments at V is identical to that found in the transposing double-manual harpsichords built in Antwerp by the Ruckers family. However, unlike

in Flanders, the pitch relationship between the organ and voice in England was such that organ pitch was a fifth below (or fourth above) quire pitch (see Chapter Five). Therefore, this virginal does not play at organ pitch, but at a level a tone higher. The use of the pitch level as found in this instrument is uncertain, but may relate to playing viol consort music on low pitched sets of instruments.

This virginal appears to have been separated from its "mother" instrument at an early period. The slot in the baseboard has been filled very well and the baseboard shows similar darkening over the main section and the filled in piece. It is probable that the separation occurred in the historical era. There is little evidence of wear on the instrument, which implies it was little used.

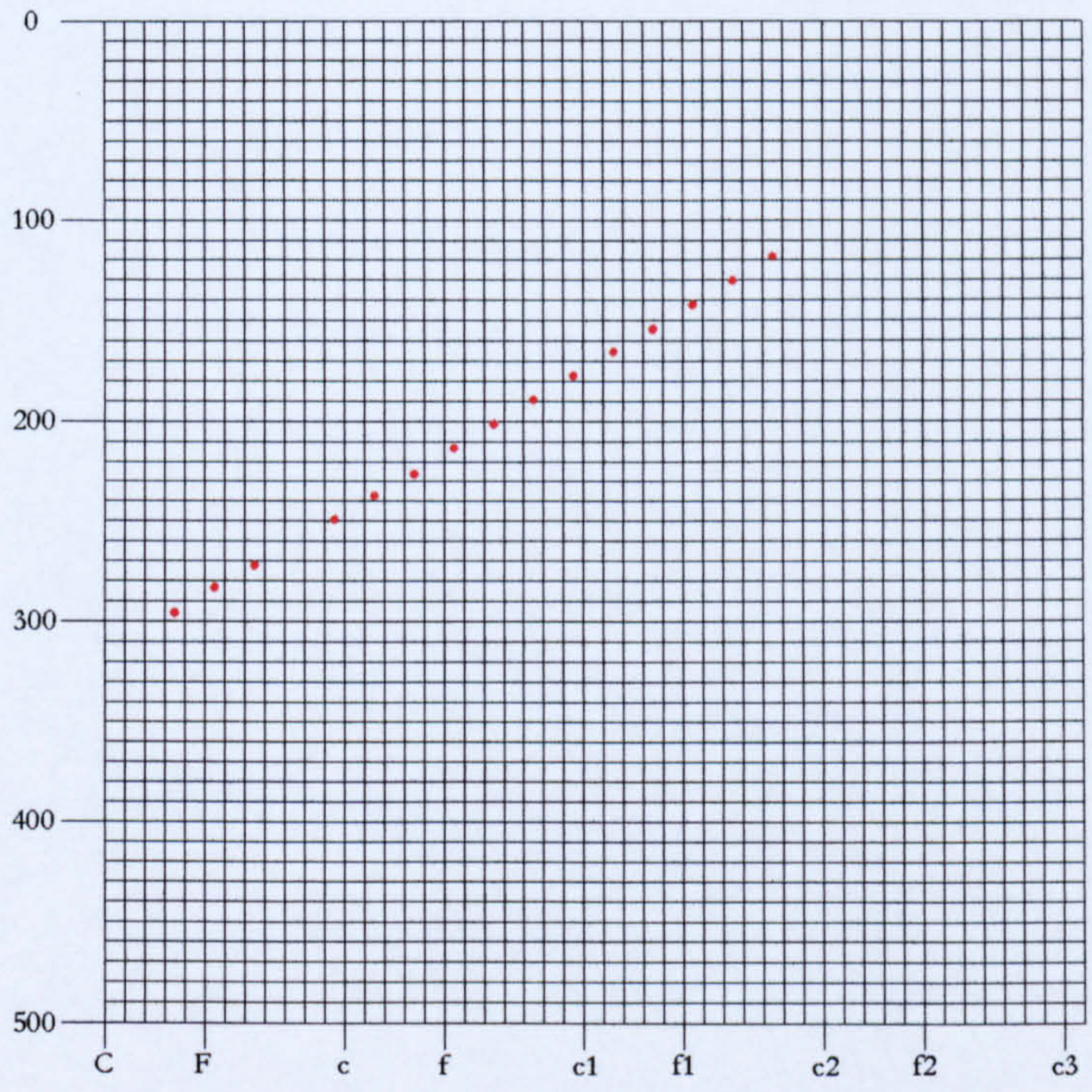
Measuring the blocks under the keys reveals that the "mother" instrument's register was not positioned at the same angle to the spine as that of the "child". As can be seen below (Figure 1638TW.4), the coupler dogs underneath the keys are in front of the "child" virginal's jackslots in the bass, and behind in the treble. Therefore, the "mother" instrument's register is at a less acute angle to the spine than the "child" virginal. This is almost certainly due to the longer strings on the larger instrument, but shows, nevertheless, that White didn't simply use a template with the register slots at a set distance from the spine on both instruments. As the lateral spacing of the jackslots needs to be the same in both the "mother" and "child" instruments, it is unlikely that White would use the same template and alter the angle since this would result in a smaller left-to-right lateral distance in the "mother" instrument.

Figure 1638TW.4 - Plan view drawing of the 1638 TW, showing the position of the coupler dogs (in red) in relation to the jackslots.



There are lightly scribed marks on the top of the right bridge which were used as a guide for the positioning of the bridge pins in relation to the spine. These marks are graphed below.

Graph 1638TW.1 - Graph of the bridge marks in relation to the spine.



Note: Only the scribed lines in the bass section of the bridge have been graphed. The lowest two (Extra C / C, and C# / D), and the sixth (A / Bb) marks are not visible and have therefore not been included on the graph.

The instrument has a lower guide board which covers the entire area behind the keywell liner. This is identical to that found under the MAR and AH instruments. This makes it impossible to get full details of the barring under the soundboard and details of the liners and wrestplank.

The soundboard has been decorated by the artist responsible for the 1641 GT, 1642 TW and 1644 TW virginals. As this instrument predates the 1641 GT, it provides strong evidence that the decorators were not members of the workshop, and that the instruments were decorated independently.

1642 TW

Ownership and Provenance

Possession of the Victoria and Albert Museum, London (No. W11-1933), given by Mrs Ada Deacon.

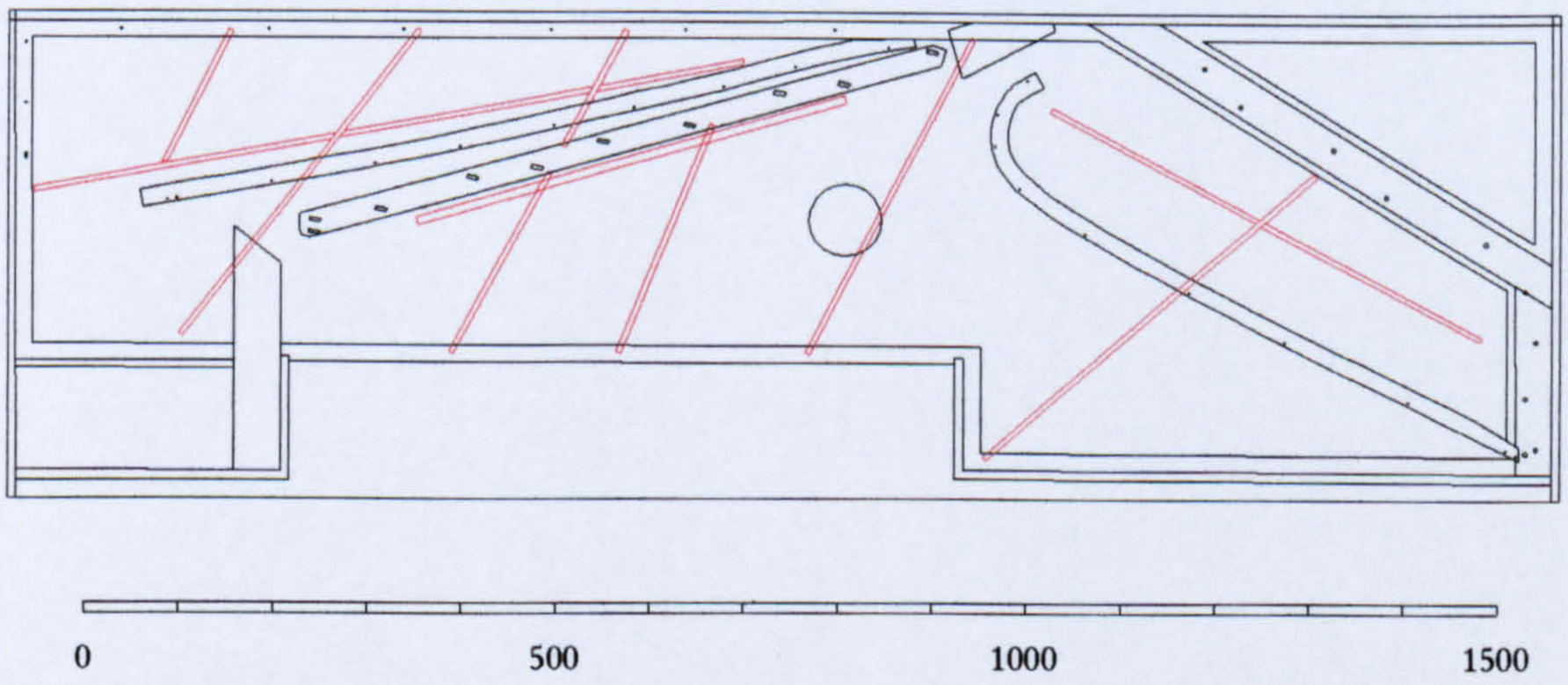
References:

GD4 No. 1b. B1 & B2 English virginal table No. 2, B1 & B2 White, Thomas No. 1, B3 No. WHITE, T. 1642. Schott (1985). Technical drawing by William Debenham.

Inscriptions: Signed "THOMAS WHITE FECIT 1642" on the front of the jackrail. A monogram small C on a large L is on jack 19 and the back of the nameboard, and the letters "AB" appear on jack 45. This is not a restoration mark by the Adlam-Burnett firm who restored the virginal.

Construction

Figure 1642TW.1 – Plan view of the 1642 TW virginal.



OVERALL INSTRUMENT DIMENSIONS: 1647 x 521 x 225.

BASEBOARD: Deal. 8.7 – 9.9 thick at front.

SPINE: Deal, 1647 long, 10.6 – 10.0 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 520 – 521 long, 224 - 226 high, 8.7 – 7.1 thick; the right case end 520 – 522 - 521 long, 226 - 227 high, 8.0- 9.1 thick. The spine and case ends overlap the baseboard. There are dowels from the faceboards into the case ends.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 289 long, 208 – 206 – 207 high and 9 thick. Right faceboard 632½ long, 206 – 204 – 208 high and 9 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, left keywell side 131½ long and 8.5 thick, right keywell side 128 long and 9.0 thick. Slots for the nameboard have been cut into the keywell sides 110½ - 116½ (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 723½ - 720, 141 – 143 – 140 high, and 11½ - 8½ thick.

KEYWELL LINER: Deal, 81 - 83 high, 13.5 – 14.1 thick.

OTHER LINERS: Deal, c. 35 x c. 20. The keywell-side liners extend past the keywell liner forming tapering protrusions, approximately 65 long under the soundboard.

WRESTPLANKS: Oak, 36 thick.

BASEBOARD FRAMES: Deal, 75½ (left) and 72½ high. The inner edges form a continuation of the keywell sides. The frames are 19.5 (left and right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 37.5 high. Toolbox lid of deal, 216½ - 217 long, 106 - 105 wide and 9.9 thick. Iron rod hinges, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 765 long (front), 796 long (back). It is 50.0 wide, and 17.6 thick. The bottom of the jackrail is 27.1 (bass) and 27.6 (treble)

above the top of the soundboard. The bass jackrail support is of deal, 50.1 wide. The left side is 261 long, the right side 221 long. The treble jackrail support is triangular in shape, 86 (plus an angled section, parallel to the front c. 35 long at the rear, 99 at the front, and 51 at the end where it meets the jackrail. The back corner is 528 from the right case end.

LID: Oak, coffered in three pieces. The planks are 180, 177 and 180 wide on the inside. Applied mouldings along the joins and the ends on the top surface. End battens 20.5 (left) an 20.6 (right) thick, with an inside coffer height of 50½ (left) and 53 (right). The lid originally had four wire hinges, 75 and 530 from the left end, and 671 and 81 from the right end, between the spine and lid.

KEYWELL FLAP: Oak, 212 – 217 – 213 wide, and 10.1 – 8.4 – 9.3 thick. Iron strap hinges, maximum 3.5 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 141 wide, c. 3.0 thick. Leather guide glued underneath. There is a full depth cut-off bar of deal glued in front of the register, and a strengthening bar behind the register.

SOUNDBOARD: Coniferous wood. The top of the soundboard is approximately 48 below the top of the case. Gilded rose, 77½ diameter, (of wood glued on top of parchment), glued to the soundboard from underneath.

SOUNDBOARD REGISTER: Leather, 713 long, 28 - 24 wide and c. 1.5 thick. Slots typically 12.0 x 3.6.

SOUNDBOARD BARRING: Deal, c. 25 high and 6.5 – 3.2 wide (top to bottom). The ends of the bars are rounded in a concave shape. There is a full-depth soundpost in front of the register.

WRESTPLANK CAPPING PIECES: Oak, 4.0 thick. The treble wrestplank capping is 41 wide without, and 58 wide with applied mouldings; and the bass wrestplank capping is 38½ (without) and 48 (with) mouldings.

SOUNDBOARD MOULDINGS: The mouldings along the left case end and spine (between the left case end and the treble jackrail support) are of oak, and act as

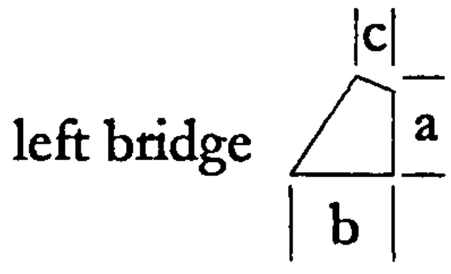
hitchpin rails. Both mouldings are 18.0 wide, and the spine moulding is 14.3 wide. The other soundboard mouldings are cedar, 18.3 wide.

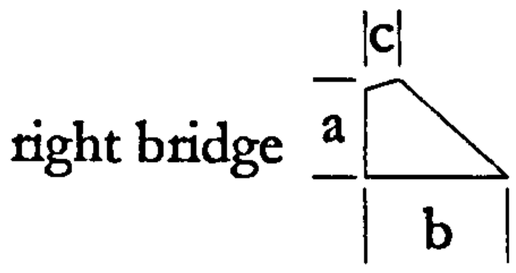
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 17.8 wide. The soundwell top edge mouldings are 21.8 deep and 3.7 thick.

HITCHPINS AND TUNING PINS: The hitchpins are brass, 1.7 diameter. The tuning pins are of iron material. The tuning pins have been divided so that the notes up to e are on the bass wrestplank, and notes f to c^3 are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. There are no scribed lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.34 diameter. There are marking out lines parallel to the spine on the top surface of the right bridge, placed between the close pairs of strings. There are positioning holes for both bridges.

Bridge Dimensions:





left bridge	C	c	c^1	c^2	c^3
a	10.3	10.6	10.9	10.5	10.3
b	18.9	18.6	19.1	18.0	17.0
c	4.0	4.9	4.4	4.4	4.2

right bridge	C	c	c^1	c^2	c^3
a	9.8	9.7	8.6	9.6	10.0
b	18.0	18.0	18.6	18.3	18.4
c	5.0	4.5	4.2	4.1	3.7

String Lengths and (Plucking Points)

		f^1	**419 (55)**	**F**	**1230 (116)**
		e^1	457	E	1288
		e^{b1}	467½	E^b	1308½
		d^1	511	D	1364½
		$c^{\#1}$	521	$C^{\#}$	1380½
c^3	**151 (43)**	**c^1**	**576 (63)**	**C**	**1440 (151)**
b^2	155½	b	586½	**Ex C**	**1457 (157)**
b^{b2}	171	b^b	639		
a^2	176½	a	652½		
$g^{\#2}$	191	$g^{\#}$	701		
g^2	196½	g	721		
$f^{\#2}$	216½	$f^{\#}$	773½		
f^2	**220 (41)**	**f**	**790 (77)**		
e^2	237	e	841½		
e^{b2}	243	e^b	861		
d^2	264	d	916		
$c^{\#2}$	270	$c^{\#}$	932		
c^2	**295 (53)**	**c**	**984½ (99)**		
b^1	301½	B	1003½		
b^{b1}	325½	B^b	1057		
a^1	333½	A	1075		
$g^{\#1}$	365½	$G^{\#}$	1135		
g^1	373½	G	1153		
$f^{\#1}$	410	$F^{\#}$	1212		

Keyboard and Action

COMPASS: C – c^3, with an extra string and jack for C.

BALANCE RAIL: The balance rail of oak. The balance pins are iron, 2.1 diameter, and protruding 16 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: Deal. Keyframe sides 12 thick, and backrail 20½ thick.

RACK: Lime, 4.0 thick, attached to the top surface of the backrail. It is scribed on the front and rear surfaces for the top and bottom of the slots.

FRONTRAIL: Deal, 8 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 38.3 high.

ENDBLOCKS: The left endblock is 130 long, 16.6 wide and 46.2 high at the front. The right endblock is 131½ long, 14.4 wide and 42 - 39 high.

KEYBOARD WIDTH: Overall width between the keywell sides 706½, and between the endblocks 674. The overall width of the keyboard is 669, and the three-octave span is 483.

KEYLEVERS: Lime, 12.5 thick at the front, tapering to 7.5 at the rear. The rackpins are beech(?). The lowest keylever is 298 long and the balance point is 111 from the front of the touchplate. The top keylever is 470 long, and the balance point is 160½ from the front. The accidental keylevers are balanced 10½ behind the naturals.

NATURAL TOUCHPLATES: Boxwood, generally 111 long, and tapering in thickness from 2.8 at the front to 2.2 at the rear. There are four scribed lines on the front section, 25.7, 26.7, 30.2 and 31.5 from the front edge. The touchplates overhang the keylevers by 2.4.

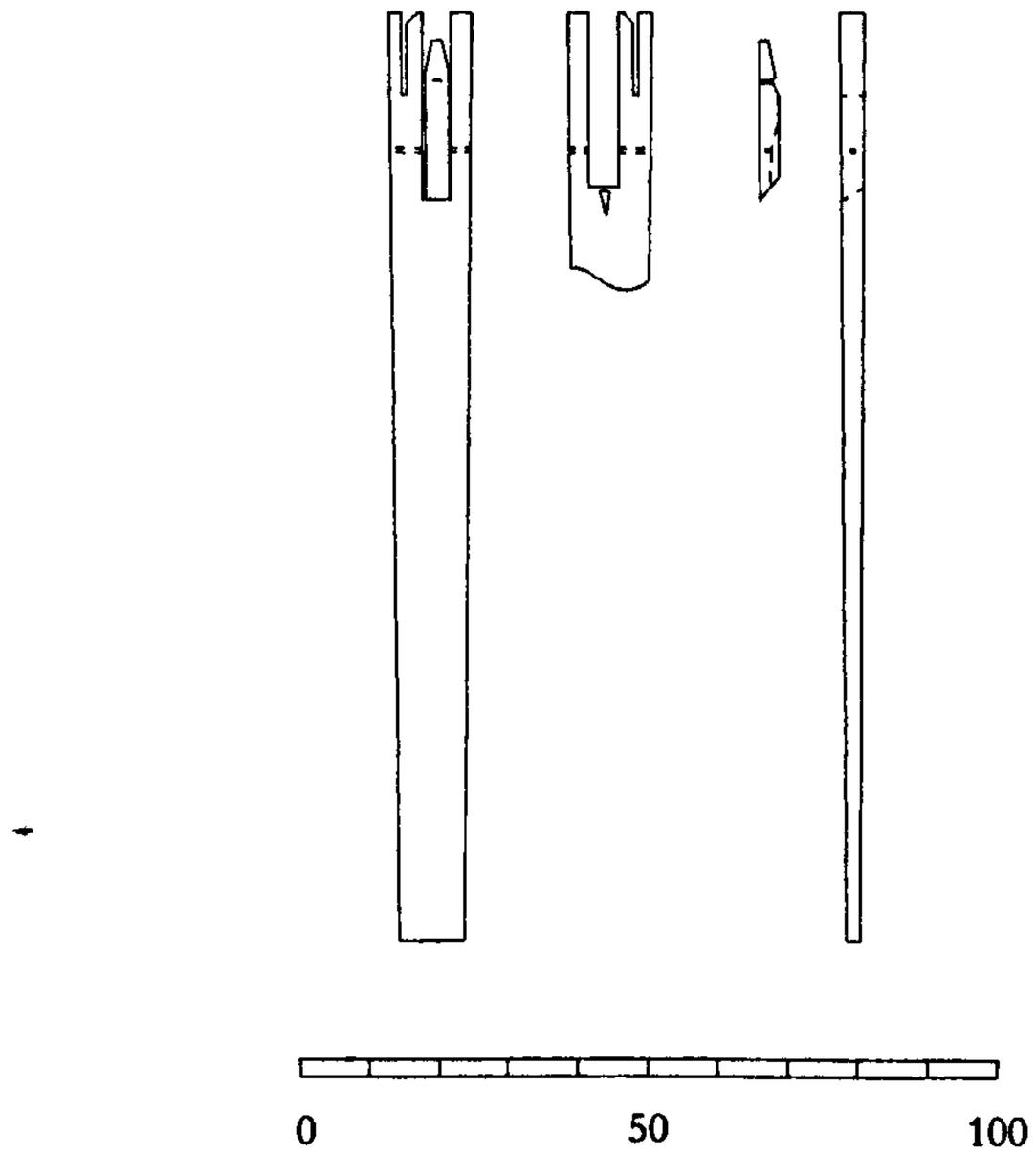
The natural touchplate widths in between the accidentals are:-

		f^2	12.7	f^1	12.8	f	12.8	F	12.8
		e^2	12.1	e^1	12.1	e	12.1	E	12.4
		d^2	16.0	d^1	16.2	d	15.5	D	16.6
c^3	22.5	c^2	12.7	c^1	12.3	c	12.9	C	12.8
b^2	12.5	b^1	12.1	b	12.4	B	12.5		
a^2	12.5	a^1	12.2	a	13.1	A	12.8		
g^2	12.4	g^1	12.3	g	12.8	G	13.1		

ACCIDENTAL TOUCHPLATES: Black stained walnut. The overall length is typically 64.0 at the bottom, and total height 8.5 (front – back). They taper in width from 11.7 at the bottom to 10.9 at the top.

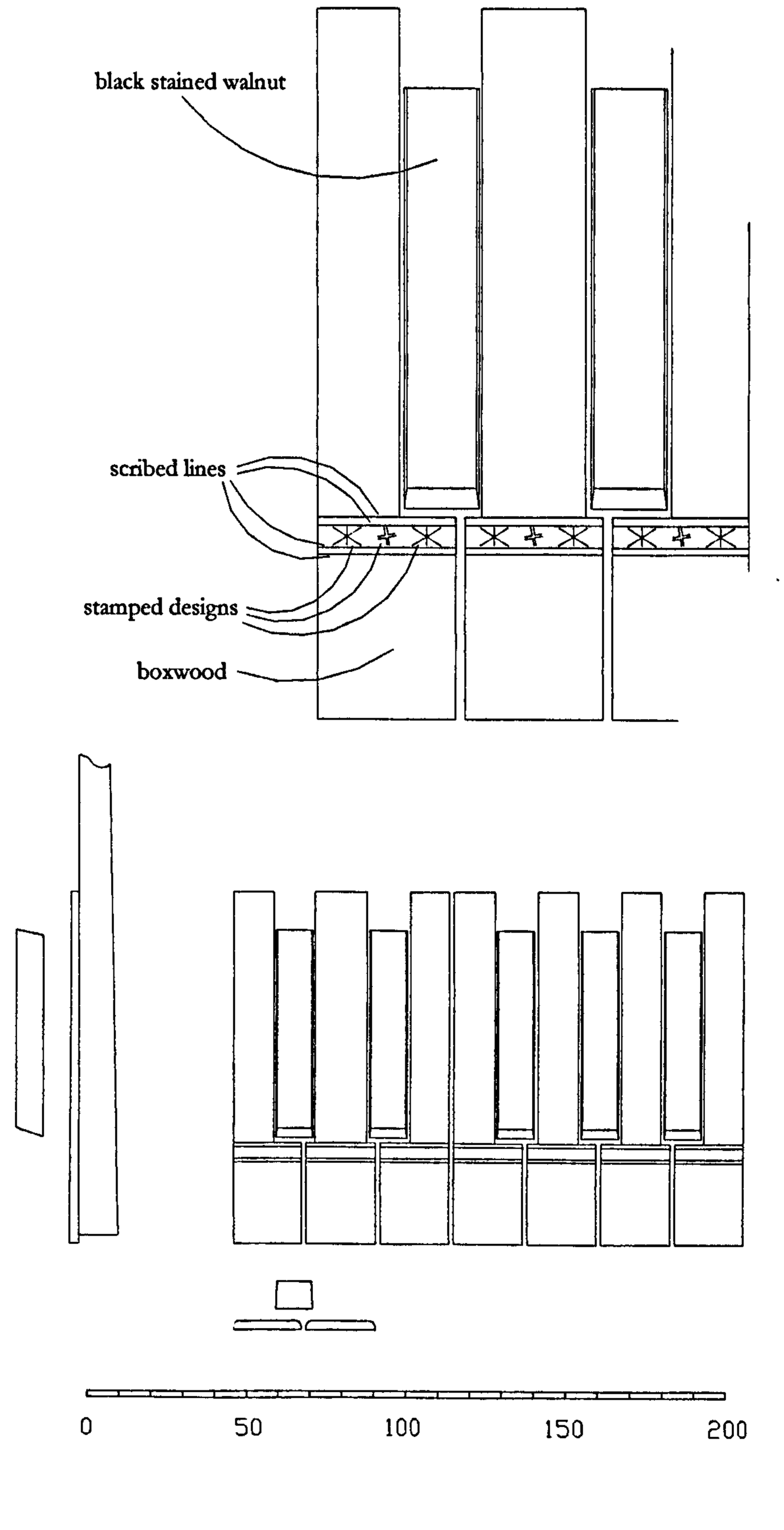
JACKS: Pear bodies with tongues of holly(?). The total length is typically 133½. They taper in width from 12.0 – 9.5, and in thickness from 3.5 – 1.9. The axle pins are positioned 15.8 (69%) from the top of the tongue.

Figure 1642TW.2 – Drawing of a typical jack.



There are no original action cloths.

Figure 1642TW.3 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer strap hasps attach to turnbuckles on the keywell flap and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator is also responsible for the 1638 TW, 1641 GT and 1644 TW instruments.

The keywell, faceboards, soundwell and jackrail are decorated with moulded cedar bands separated by pressed papers. The flat part of the bands have painted geometric patterns in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Moresque" design. Inside the inner faceboard, keywell side and nameboard mouldings is white painted scrollwork on a black background.

The lid and keywell flap both have a stylised landscape with pairs of people walking down paths on either side of farming scenes. The male figures bear a resemblance to Charles I. Surrounding the lid and keywell flap scenes are black borders with painted geometric designs in white and brown.

Condition

The virginal is in excellent decorative and playing condition, having been restored by the Adlam-Burnett firm in 1977. It was reported to have not undergone any major restoration prior to that date. It plays at modern pitch.

Commentary

The 1642 TW virginal is one of the best known English virginals, and highly representative of the earlier instrument. Restored back to playing condition in 1977, it also provides one of the best examples of the typical English virginal sound.

The instrument is of the same general design as the 1651 TW, 1653 TW and 1656 JW instruments, with scalings that are essentially Pythagorean in the treble.

1644 TW

Plate 1644TW.1 – Three-quarter view of the 1644 TW virginal.



Ownership and Provenance

Possession of the Welsh Folk Museum, St Fagan's, Cardiff, No. 49-64. According to museum notes it belonged for many generations (possibly since new) to the Musgrave family of Cumberland. By 1888 it was in the ownership of Henry Boddington of Pownall Hall, Wilanstow. In 1901 it was purchased (for £40) by the grandfather of Col. R. Vaughan Wynn, Rhug, Corwen, Merioneth. On 21 January, 1948 it was spotted in an attic at Boduan Hall, near Pwllheli. It was bought by the National Museum of Wales in early-1949 from Col. Vaughan Wynn.

References

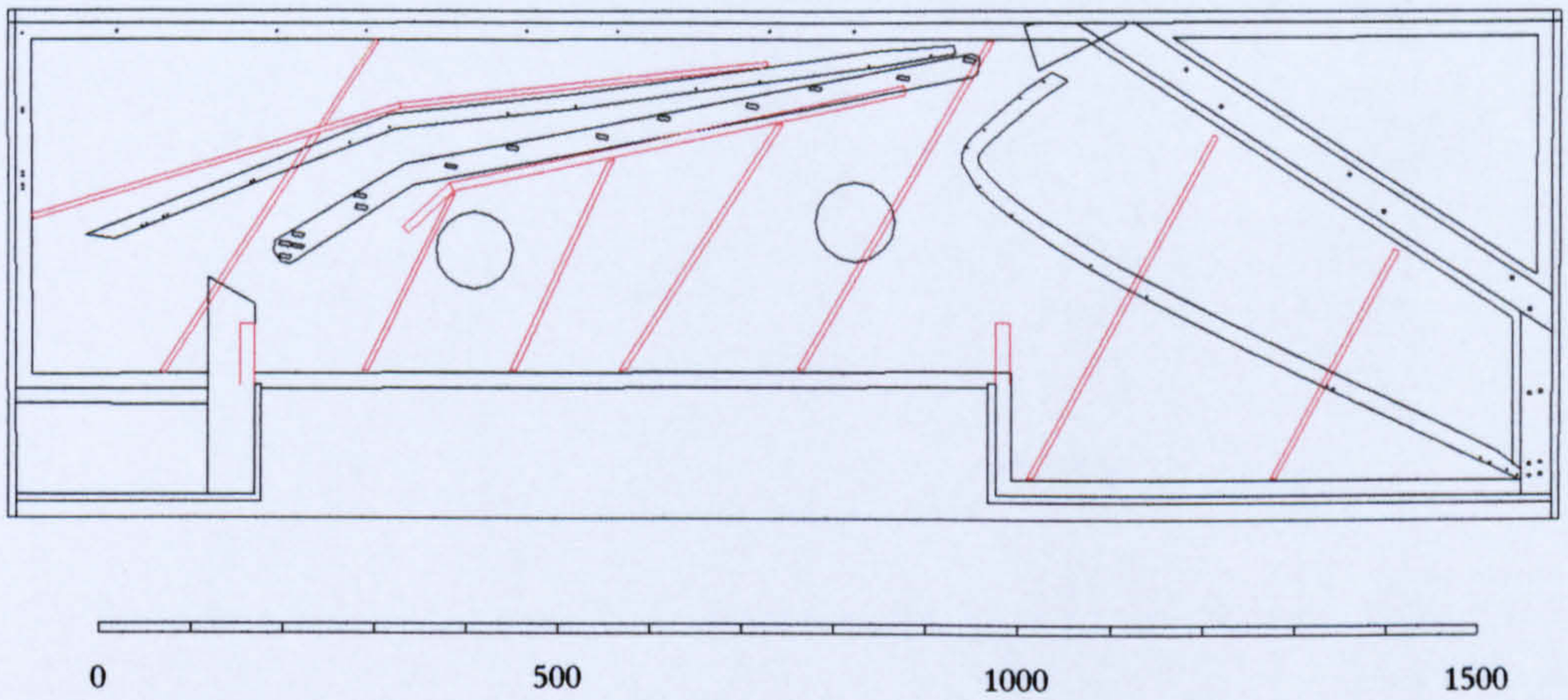
GD3 & GD4 No. 6; B1 & B2 English virginal table No. 5, B1 & B2 White, Thomas No. 3, B3 No. WHITE, T. 1684 (A). Kendrick Pyne (1888)

Inscriptions

Signed "Thomas White Fecit J684" on the front of the jackrail. The third figure of the date has been altered from a still-visible "6". This figure itself must be altered from an earlier digit.[1]

Construction

Figure 1644TW.1 – Plan view of the 1644 TW virginal.



OVERALL INSTRUMENT DIMENSIONS: 1690 x 549 x 225.

BASEBOARD: Deal, two planks, the front plank 278 wide. 12.9 – 12.3 – 12.4 thick at front. The baseboard is not rectangular, being 1670 long at the front, and 1677 at the back, the left end 534 wide and the right end 531 wide.

SPINE: Deal, 1694 - 1693 long, 226 – 228 high, 13.2 – 13.0 – 11.2 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 548½↔ long, 226 - 225 high, 9.1 – 8.0 – 8.1 thick; the right case end 548 - 549 long, 226 - 225 high, 8.3 – 7.6 – 8.6 thick. The spine and

[1] Thomas White was buried on 5 January, 1659/60, and his son Thomas was not admitted free of the Joiner's Company until 1669. Therefore the date of the instrument must be either 1644 or 1654. Although the compass would be more suited to an instrument of 1654 the style of decoration and workmanship supports a 1644 date of manufacture.

case ends overlap - and are nailed to - the baseboard. There are dowels from the case ends into the faceboards.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 265 long, 207½ – 209 high and 8.0 thick. Right faceboard 613 long, 208 – 206½ – 207 high and 8.1 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 127 (left) and 128½ (right) long, 7.0 (left) and 8.5 (right) thick. Slots for the nameboard have been cut into the keywell sides 110 – 115 (left) and 111 – 116 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 797 – 796, 156 - 153 high, and 9 - 7½ thick.

KEYWELL LINER: Deal, 80½ – 79½ high, 10.9 – 13.1 thick.

OTHER LINERS: Deal, c. 35 x c. 20. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard.

WRESTPLANKS: Oak, ‡30 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 77 high. The inner edges form a continuation of the keywell sides. The frames are 19.9 (left) and 19.7 (right) thick, and cut out at the front to receive the keywell sides.

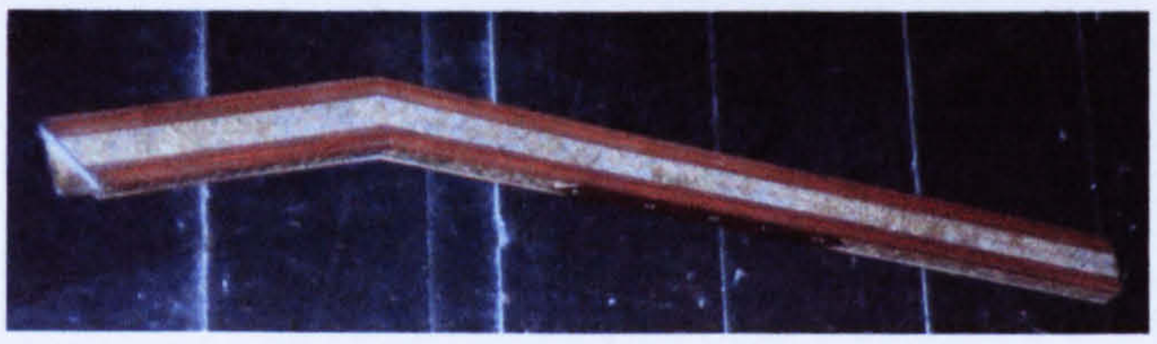
TOOLBOX: The toolbox back piece is made from deal, 35 high, set 99 – 98 from the back of the faceboard. Toolbox lid of cedar, 194 – 195 long, 106½ - 107 wide and 11.6 thick. There were originally rod hinges at the front, the left side one set 40 from the front edge and 12½ from the case top. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, angled and made of two pieces (see Plate 1644TW.2). The main section is 688½ long at the front and 689½ long at the rear, and the added bass section 219 long at the front and 353 long at the rear.[2] The angle between the two pieces is 161°. The jackrail is 49.9 wide, and 21.1 thick. The

[2] The quoted measurements have been taken from the ends of the jackrail to the angle between the two pieces.

bottom of the jackrail is 30.2 (bass) and 33.7 (treble) above the top of the soundboard. The bass jackrail support is of deal, 50.7 wide. The left side is 234 long, the right side 205 long. The treble jackrail support is essentially triangular in shape, 99 (plus an angled section, parallel to the front 13 long at the rear, 107 at the front, and 50 at the end where it meets the jackrail. The back corner is 464½ from the right case end, and it is at an angle of 153° to the spine.

Plate 1644TW.2 – The 1644 TW jackrail.



LID: Oak, coffered in three pieces. The planks are 188, 183 and 189 wide on the inside, and the front thickness is 7.8 – 8.3 – 8.4. Applied mouldings on the top surface. End battens 18.1 (left) and 18.6 (right) thick, with an inside coffer height of 47 (left) and 46½ (right). Five wire hinges (1.91 diameter) between the spine and lid, positioned 87½, 472, 852½, 1231½ and 1608 from the left case end. The lid was probably originally held open by a cord at the right side, attached to the outside of the right lid batten to a hole in the right case end.

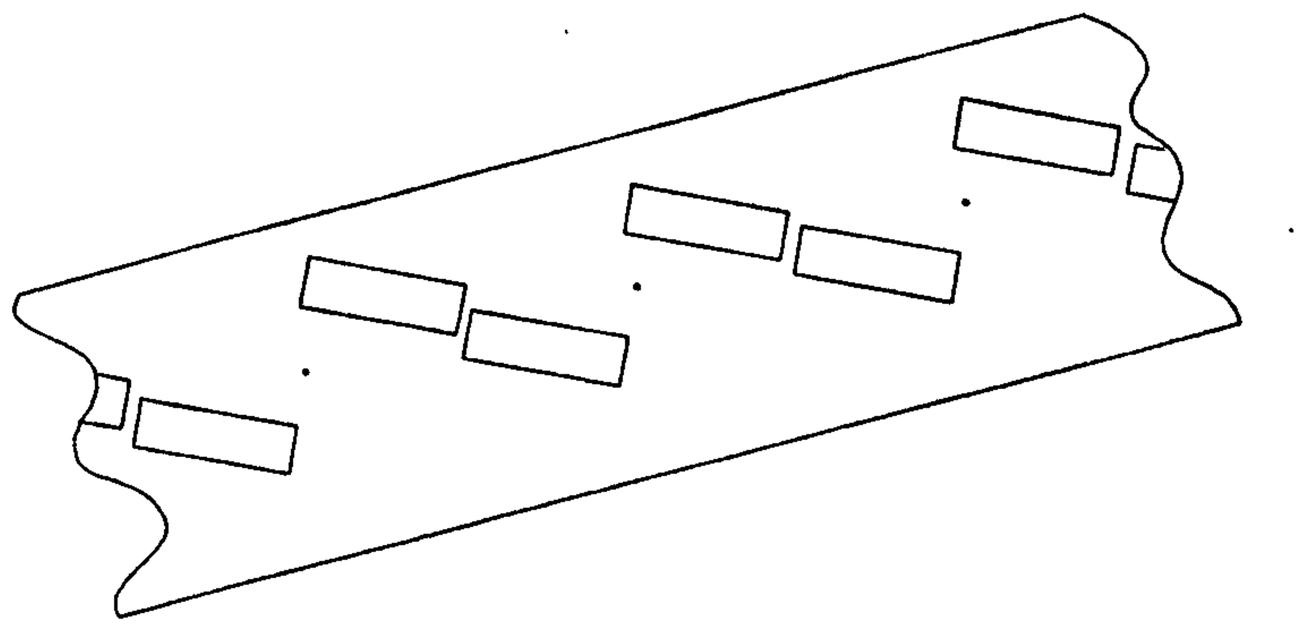
KEYWELL FLAP: Oak, 213 - 214½ - 213 wide, and 9.3 – 9.9 – 9.2 thick. Iron strap hinges, maximum 2.3 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Deal, 275 - 141 wide and c. 5 thick. Leather guide glued underneath. The lower guide board spans from in front of the register to the spine, having an added piece 11.4 wide glued to the spine. There is a full depth cut-off bar, c. 12 thick, of deal, glued in front of the register, and two other tapered bars c. 20 high glued behind the register and 60 in front of the cut-off bar.

SOUNDBOARD: Coniferous wood, 4.1 – 2.4 – 3.1 thick at the keywell liner. The top of the soundboard is approximately 55 below the top of the case. Two gilded roses, 83.2 and 86.3 diameter, (of wood glued on top of parchment), let into the soundboard and supported by half-thickness sections of the soundboard with strips removed.

SOUNDBOARD REGISTER: Leather, 170 (bass) and 634 (treble) long, the bass section tapering in width from 31.2 – 25.2, and the treble section tapering from 24.5 – 25.8. The leather is 1.3 thick. Slots typically 12.5 x 4.1. The register slots have been offset so that there is a maximum possible quill length without making the instrument any wider than it needs be (see Figure 1644TW.2), and string-guiding marks on the register leather between the wide pairs of strings positioned in line with the left end of the rear jacks.

Figure 1644TW.2 – Schematic drawing of the register slots and string-guiding marks.



SOUNDBOARD BARRING: Deal. There is a heavy bar under the left bridge, approximately 25 deep, and other bars typically 20 deep and tapering in width from 5.7 – 2.5.

WRESTPLANK CAPPING PIECES: Oak, 4.0 thick. The treble wrestplank capping is 33.9 wide without, and 53.3 wide with applied mouldings; and the bass wrestplank capping is 32.5 (without) and 41.5 (with mouldings).

SOUNDBOARD MOULDINGS: 4.0 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 17.6 wide, and the spine moulding is 17.8 wide. The other soundboard mouldings are cedar, 16.2 wide.

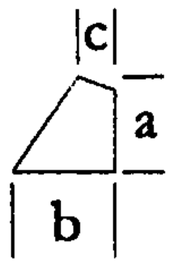
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 20.3 wide. The soundwell top edge mouldings are 24.3 and 4.1 thick.

HITCHPINS AND TUNING PINS: The hitchpins are iron, 1.7 diameter. The tuning pins protrude 27 from the top of the wrestplank capping piece, and are 3.7 diameter, and are of iron. The tuning pins have been divided so that the notes up to B^b are on the bass wrestplank, B is on the join, and the pins for c – f^3 are on the treble wrestplank.

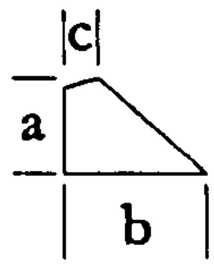
BRIDGES: Fruitwood, probably pear. The treble of the left bridge has been cut away for the top 54 mm to accommodate the soundboard moulding. There are no scribed lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.25 diameter. There are marking-out lines parallel to the spine on the top surface of the right bridge, placed under the front string of each pair. There are three positioning holes, used to place the right bridge correctly when gluing, at the front of the right bridge, plus a scribed line along the front edge of the bridge and a small line marking the top corner of the bridge.

Bridge Dimensions:

left bridge



right bridge



left bridge	C	c	c^1	c^2	c^3
a	10.6	11.1	11.0	10.8	9.9
b	15.9	16.2	16.2	16.2	16.1
c	4.3	5.1	4.7	5.3	4.6

right bridge	C	c	c^1	c^2	c^3
a	10.4	9.8	8.6	9.4	8.9
b	17.6	18.7	18.5	18.1	17.6
c	5.3	4.8	4.6	5.6	5.1

String Lengths and (Plucking Points)

f^3	**126 (41½)**	**f^1**	**448½ (96½)**	G	1082
e^3	129½	e^1	456	G	1092
e^{b3}	146½	e^{b1}	495½	$F^{\#}$	1133½
d^3	148	d^1	505	$F^{\#}$	1146
$c^{\#3}$	165	$c^{\#1}$	548½	**F**	**1189 (117½)**
c^3	**168½ (39½)**	**c^1**	**561 (105½)**	**F**	**1200½ (122½)**
b^2	186½	b	606	E	1242½
b^{b2}	188½	b^b	618½	E	1255½
a^2	205½	a	668½	E^b	1296½
$g^{\#2}$	209	$g^{\#}$	679½	E^b	1308½
g^2	228½	g	730½	D	1348
$f^{\#2}$	230	$f^{\#}$	740½	D	1362
f^2	**250 (62½)**	**f**	**778 (137)**	$C^{\#}$	1399
e^2	252½	e	787½	$C^{\#}$	1412½
e^{b2}	272	e^b	823½	**C**	**1453 (145)**
d^2	275½	d	833½	**C**	**1469 (150)**
$c^{\#2}$	297½	$c^{\#}$	874½	GG/BB	1507 (152)
c^2	**302 (63½)**	**c**	**885 (113)**	GG/BB	1521 (160)
b^1	323½	B	927½		
b^{b1}	328½	B^b	937½		
a^1	358	A	975		
$g^{\#1}$	365	A	986		
g^1	399½	$G^{\#}$	1031		
$f^{\#1}$	407	$G^{\#}$	1042		

Keyboard and Action

COMPASS: GG/BB – f^3, double strung from GG/BB – A.

BALANCE RAIL: The balance rail is oak, 32.8 wide and 32.1 high. The balance pins are iron, 2.36 diameter, and protruding 17 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, the left side 39.5 (at the balance rail – 33.3 (at the rear) wide, and the right side 39.7 – 35.6 wide. They are 11.0 thick. The backrail is deal, 100.0 – 40.3 wide and 19.4 thick.

RACK: Lime, attached to the top surface of the backrail. The rack is 3.6 thick, 38.0 high. It is scribed on the front and rear surfaces for the top and bottom of the slots.

FRONTRAIL: Oak, with a non-original deal piece on top. The oak section is 41 wide and 10.9 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge on the front, 36.7 high and 4.0 thick.

ENDBLOCKS: Cedar. The left endblock is 139½ long, 13.6 wide and 47.6 – 38.0 high. The right endblock is 144 long, 16.0 wide and 48.4 – 39.0 high.

KEYBOARD WIDTH: Overall width between the keywell sides 791½, and between the endblocks 759. The overall width of the keyboard is 755, and the three-octave span is 483½.

KEYLEVERS: Lime, 14.5 thick at the front, tapering to 8.1 at the rear. The rackpins are deal, typically 2.6 diameter. The lowest keylever is 281 long and the balance point is 111 from the front of the touchplate. The G key, at which note the angle at the rear of the keys alters (see Plate 1644TW.3) is 354 long and the balance point is 118½ from the front of the touchplate. The top keylever is 495 long, and the balance point is 173 from the front. The accidental keylevers are balanced 15.4 behind the naturals.

Plate 1644TW.3 – The 1644 TW keyboard.



NATURAL TOUCHPLATES: Boxwood, variable overall length, tapering in thickness from 2.9 at the front to 1.3 at the rear. There are four scribed lines on the front section, 26.6, 28.3, 33.6 and 35.0 from the front edge. The touchplates overhang the keylevers by 2.4.

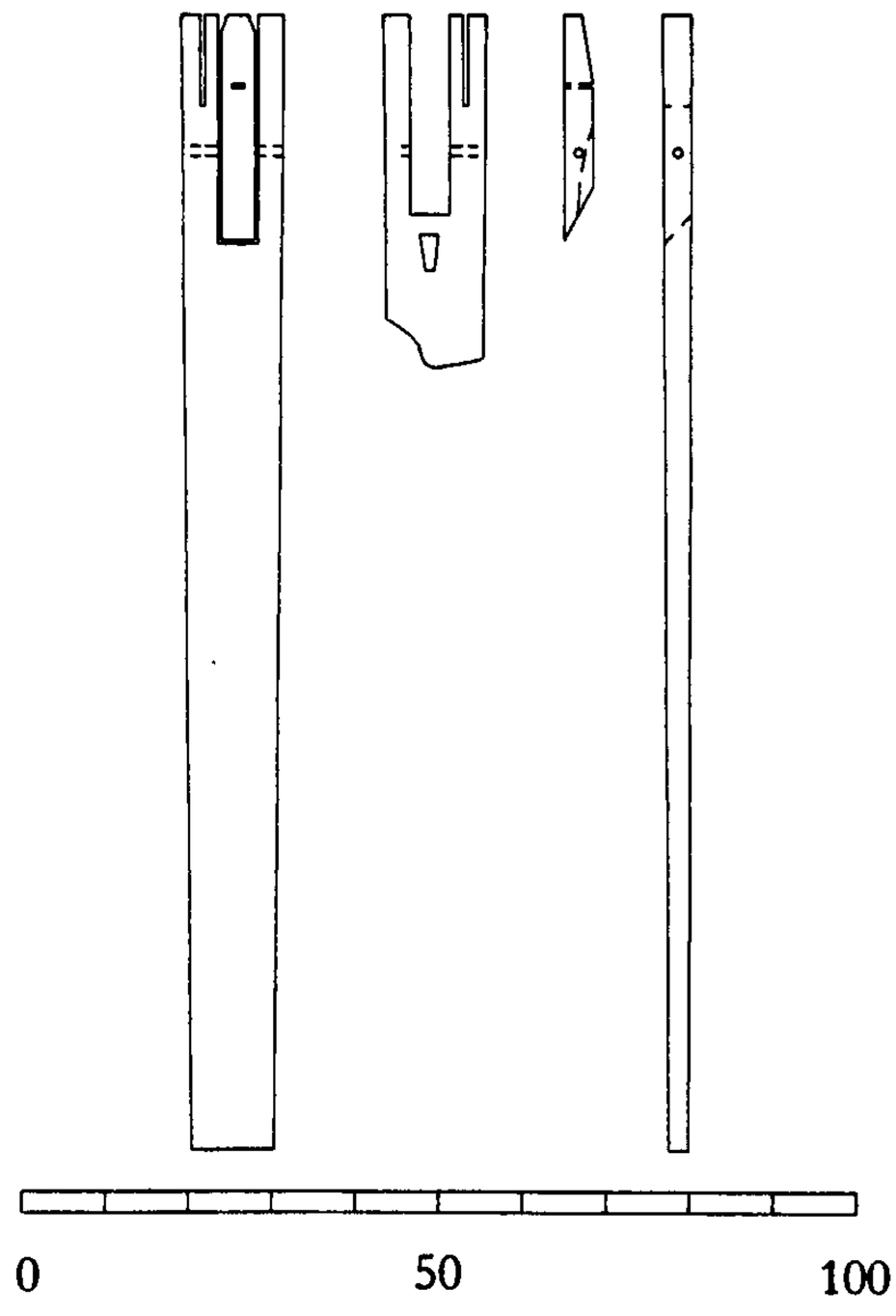
The natural touchplate widths in between the accidentals are:-

f^3	21.6	f^2	13.4	f^1	13.4	f	13.7	F	13.7
e^3	13.3	e^2	13.2	e^1	12.9	e	13.0	E	12.3
d^3	13.5	d^2	14.3	d^1	15.4	d	15.1	D	14.0
c^3	13.5	c^2	13.6	c^1	13.6	c	13.4	C	13.6
b^2	13.2	b^1	12.8	b	12.6	B	12.8	BB	21.4
a^2	12.0	a^1	12.7	a	11.9	A	12.4		
g^2	11.9	g^1	12.5	g	11.8	G	12.0		

ACCIDENTAL TOUCHPLATES: Black stained walnut. The overall length is typically 67.1, and total height 8.6↔. They taper in width from 11.5 at the bottom to 10.6 at the top.

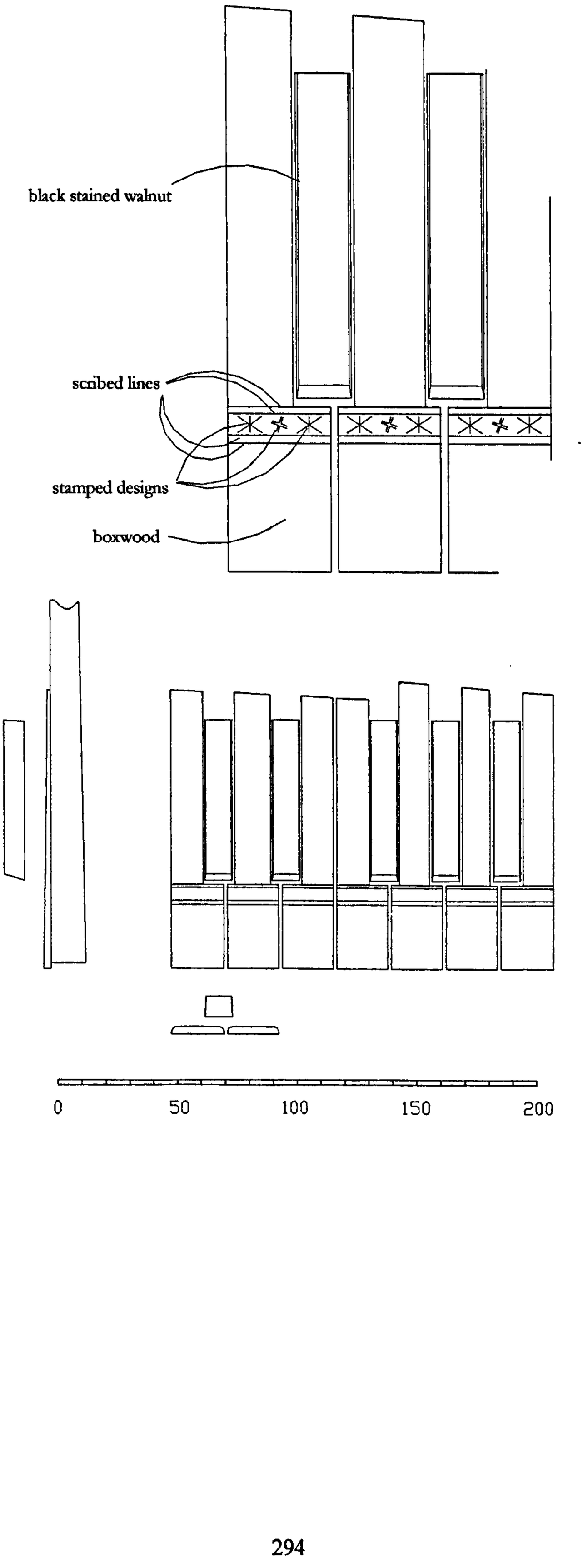
JACKS: The jacks and tongues are of beech. The total length is typically 136. They taper in width from 12.3 – 9.9. The axle pins are positioned 16.5 (60%) from the top of the tongue. Although the jacks appear original and the dimensions appear convincing, there are no scribed lines and there are obvious circular saw marks. It is possible the jacks have been sawn so they fit loosely into the register slots. The possibility that they are new jacks which have been made copying the dimensions of other jacks cannot be excluded.

Figure 1644TW.3 – Drawing of a typical jack.



There are no original action cloths.

Figure 1644TW.4 – Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and dividing the length into three panels, and along the coffer joins. The varnish has a red tinge to it which may be original.

The soundboard is decorated with border patterns, flowers and birds. There are two gilded roses of a geometric design. On both roses the top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator is the same as responsible for the 1638 TW, 1642 TW and 1641 GT virginals.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by embossed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Moresque" design, with the exception of those in the centre of the faceboards which are wider, being a variant of the "monkey" design. In the centre of the nameboard is a wooden plaque, made from a piece of spare soundboard wood on which is painted a flower with typical blue borders.

The lid and keywell flap have paintings covering all of the area with the exception of a narrow edge border. The painting on the lid is of Orpheus playing to the Beasts with (taking up the right third of the lid) a water scene featuring a mermaid riding a whale (also listening to Orpheus) and other fish. The keywell flap painting is now greatly damaged, but appears to be a typical landscape scene showing human figures on a path on the left side. The lid painting has been subject to water damage (particularly above the whale on the right side near the top). It is probable that water damage has affected the painting on the keywell flap as well. Both paintings appear to have been carried out over a gessoed or flat-white painted base.

Condition

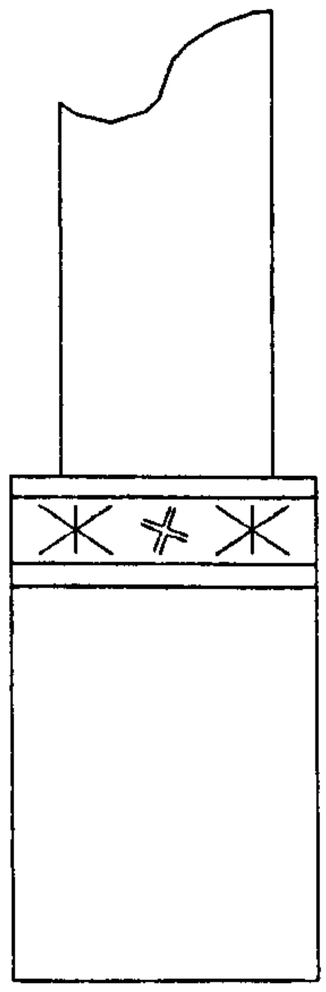
With the exception of some specific physical damage to the top plank of the lid, the water damage to the lid and keywell flap paintings and some work on the action, this instrument stands as one of the best preserved and original of the surviving viginals.

The water damage has been commented on above. The lid damage has resulted in a large crack and this has been stabilised by the addition of an iron plate, approximately 100 mm long and 20 mm wide, which has been applied to the inside of the lid, disfiguring the picture at the top.

The jacks are altered or replacements, and are too loose to have ever functioned satisfactorily in the instrument. Several register slots have been shimmed in at attempt to make the instrument play properly. All of the action cloths were replaced at the same time work was carried out on the jacks.

The natural keys have been stamped with two designs as a decorative feature. These designs appear between the second and third scribed lines.

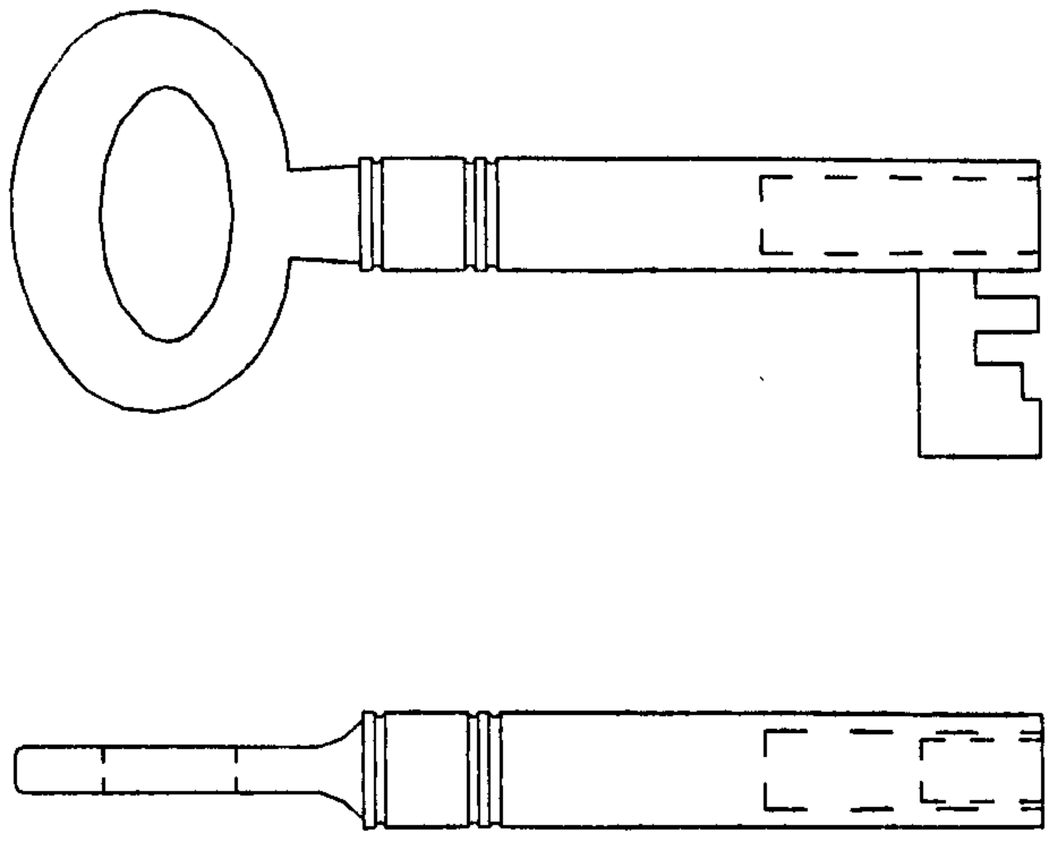
Figure 1644TW.5 – The stamped designs on the natural touchplates.



Commentary

This instrument is one of the most remarkable surviving English virginals. It is the only instrument which can almost certainly be said to retain its original stand, plus a key for the lock (see Figure 1644TW.6). It also has double stringing in the bass from GG/BB – A (discussed in detail in Chapter Five) which helps answer many questions about the stringing of additional strings found in other virginals.

Figure 1644TW.6 – Drawing of the key.



Perhaps the most important feature of this virginal is its compass: GG/BB – f^3. Even though the date is uncertain (see below), it is clear that it is at least 7 (and probably 17 years) ahead of any other English instrument, and is possibly the earliest surviving instrument from any country which can be shown to have originally had this compass.[3] The reason for such a large compass is not known.

[3] The earliest Flemish example is the 1646 IC in the Music Instrument Museum, Brussels, and the earliest French example is an instrument by Louis Denis dated 1648. According to Wraight (1997) the earliest Italian instrument which can be shown to originally have a GG/BB bass compass is a harpsichord by Albana, now in the Metropolitan Museum of Art, New York (W505). Wraight dates the instrument as 1628 – 1643, pointing out that the \2 moulding is identical to that of the W6 Albana harpsichord of 1643.

The date must be either 1644 or 1654.[4] The decorator is the same as responsible for Thomas White instruments of 1638 and 1642 (and for the 1641 GT), but a different artist is responsible for the 1651 and 1653 Thomas White virginals, as well as the instruments dated 1656 and 1661 by James White. The natural touchplates have stamped decoration as found on the 1638 TW and 1642 TW virginals, but this is not necessarily be indicative of the date as the 1661 JW also uses the same stamped decoration. The style of construction is closer to the early White virginals, particularly in the use of the wide lower guide board, a feature otherwise found only on the 1638 TW, AH and Mar virginals. When considered from a negative viewpoint, the only thing to support a 1654 date is the unusual compass. This can be rejected in favour of the evidence supporting the 1644 date.

The virginal is designed so that the f^3 string length is 126 mm, implying a pitch level of V – 2s. This level is also found in two other pre-Restoration virginals – the 1641 GT and the 1655 JL, as well as one virginal (1662 TB) built after the Restoration, and it is also the probable pitch of the Theewes harpsichord.

The instrument shows several refinements which have been introduced as a result of the large number of strings.[5] The jackslots have been staggered which has allowed the maker to keep the instrument at least an inch narrower than would otherwise be the case. The angled bass section of the register allows the rear of the bass keys to go directly backwards, rather than splaying out towards the rear. As the bass of the left bridge is also angled it has allow White to retain both scalings and plucking points which are similar to his other standard instruments.

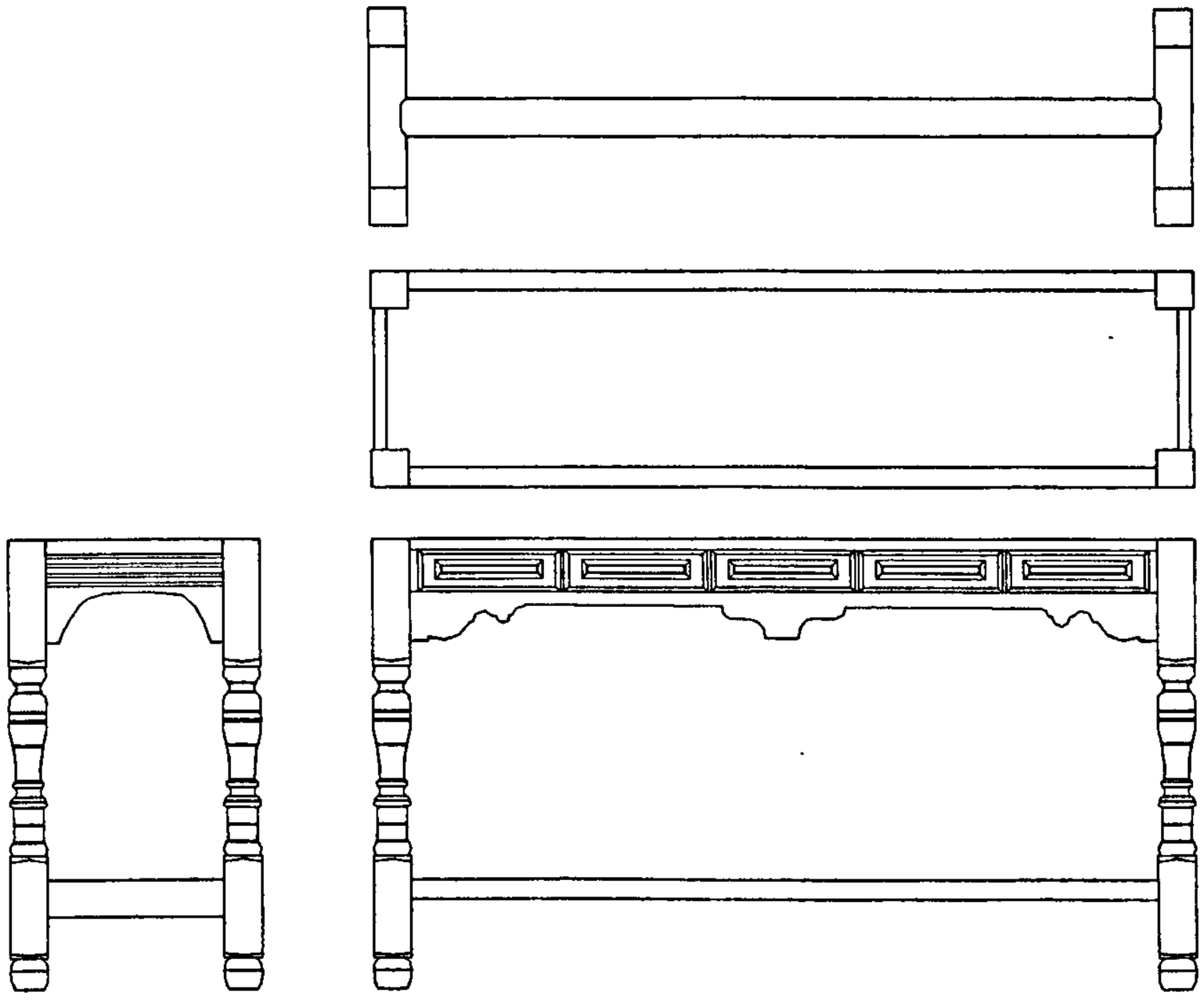
The stand of the instrument (see Plate 1644TW.7) appears original. It is made of lime or cedar rather than oak. The standard of workmanship on it is high, particularly the consistency of the turned section. The instrument, when viewed both open and closed, is the most representative example of an English virginal in its original state. The stand is 875 mm (34½") high, and the top of the keyboard is 928 mm

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[4] Strictly speaking the instrument could date from 1634 or even 1624. The earliest date can be rejected as most unlikely since it would imply that the same decorator was active for nearly 20 years, working in an identical style. The 1634 date cannot be dismissed, but there is no argument that can be made in favour of that date rather than 1644.

(36½") from the floor. At this height the instrument is impossible to play from a normal seated height, and uncomfortable when standing.[6] Instead it seems likely that the player was seated fully or partially on a high stool. This was probably a common practice judging from the evidence from the front of the keywell flaps which generally show little of the damage that would be expected if seating was common.

Figure 1644TW.7- The stand of the 1644 TW virginal.



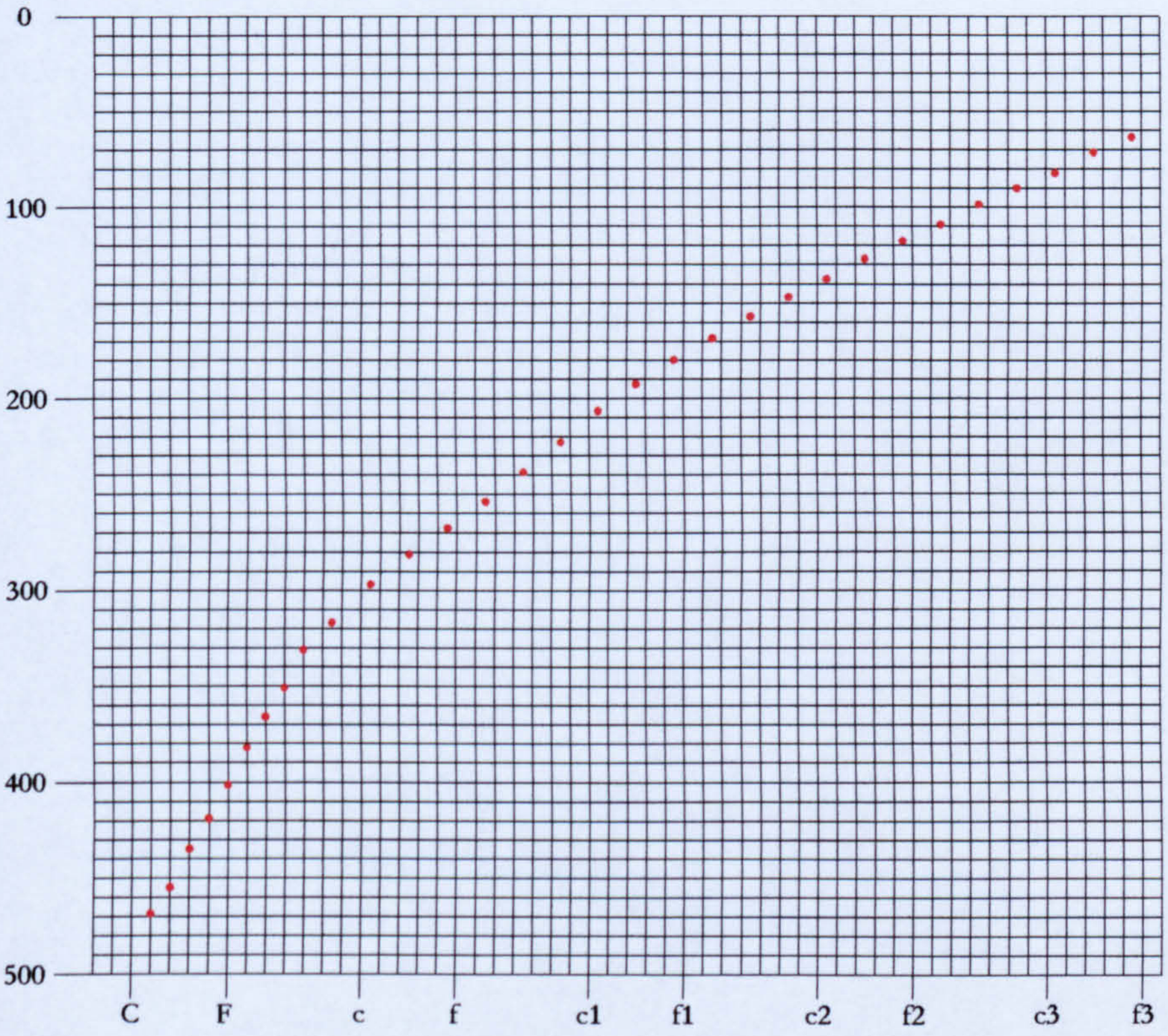
There are scribed lines on the right bridge which were used as guides to place the bridge pins. These can be graphed in relation to the spine as shown below:

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[5] The virginal has 66 strings, including the double strung sections. No other virginal has more than 58 strings (1668 SK, with an FF – d^3 compass, and 1679 CR, GG/BB – d^3 compass with extra GG/BB, C, C# and D).

[6] This is, of course, dependent on the height of the individual. However, the statement is true for any person over about 5' (1525 mm) in height.

Graph 1644TW.1 - Graph of the bridge marks in relation to the spine.



With the exception of the top octave, in which the six spaces have a total width of 53 mm (possibly designed so 10 spaces would equal 3½") and the tenor region (in which seven spaces have a total width of 104.5 (possibly designed so 6 spaces equal 3½"), there is no consistent regular spacing between the bridge pin marks. The marks for the lowest two pairs of strings (GG/BB and C) cannot be seen.

The instrument is also unusual in having a provenance which can possibly be traced back to when the instrument was newly built. The instrument was in the possession of Henry Boddington in 1888, and – accepting the statement that it had been in the ownership of the Musgrave family for "many generations" – the virginal can be surely traced back to the eighteenth century.[7] As it is unlikely that the instrument would be purchased in the eighteenth century when a spinet or harpsichord could be purchased, rather than a second hand outdated virginal, it is likely that the ownership was from the seventeenth century. Although it cannot be shown to have

been newly purchased by the family it is a reasonable possibility. However, the fact that the date has been changed several times leads to speculation that it has been altered to make it a more saleable item with the Musgrave family possibly purchasing it in, or soon after, 1684.

[7] If a "generation" is considered to be 20 – 25 years, then six generations would be traceable to 1750 – 1770. If ten generations then it is traceable to 1640 (ie. new) – 1690. Ten generations is not an unreasonable interpretation of "many generations".

1651 TW

Plate 1651TW.1 – Three-quarter view of the 1651 TW virginal.



Ownership and Provenance

Possession of the Castle Museum, York. Inventory number DA 1731. Previously listed as belonging (GD3) to the York Philosophical Society. Exhibited at the International Inventions Exhibition, 1885.

References

GD3 & GD4 No. 2. B1 & B2 English virginal table No. 3, B1 & B2 White, Thomas No. 3, B3 No. WHITE, T. 1651. Galpin (1910).

Inscriptions

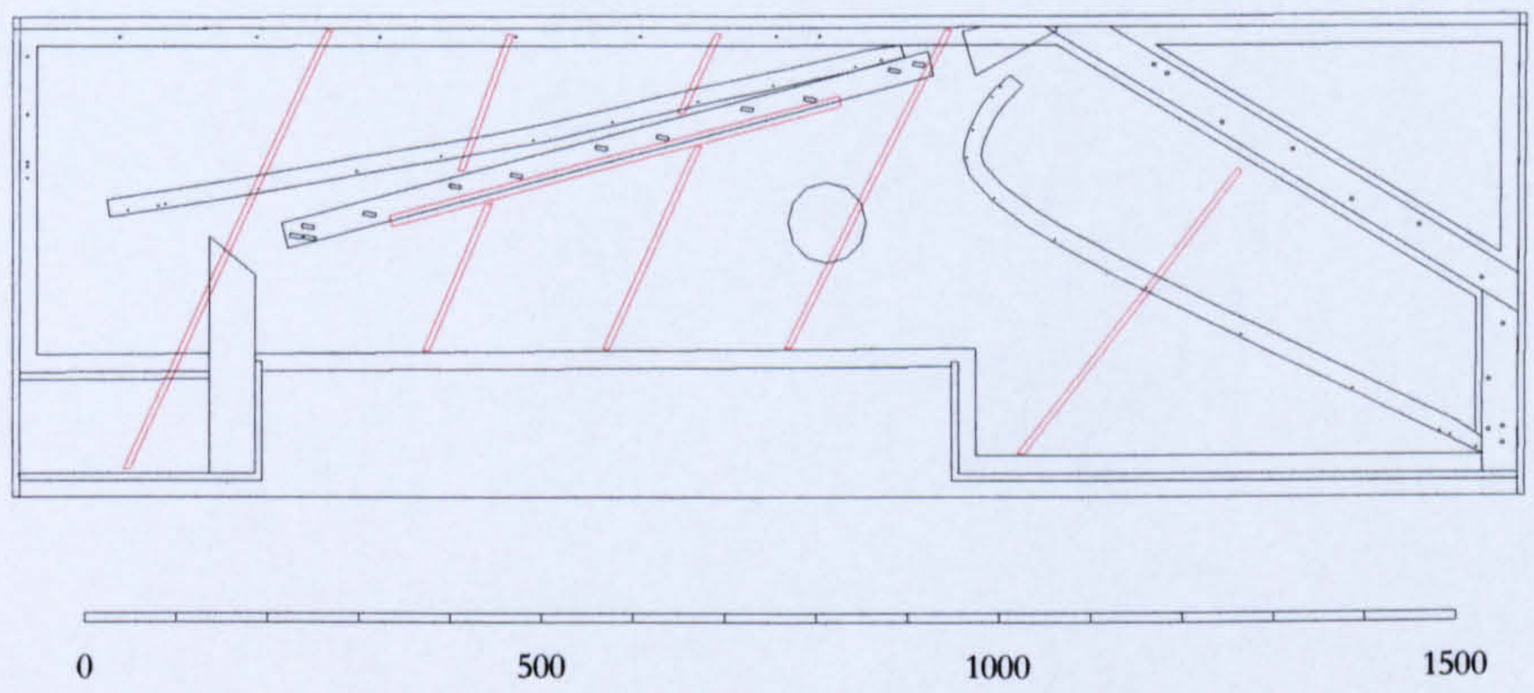
Signed "THOMAS WHITE ME fecit 1651" on the front of the jackrail. "T W 1 6 5 1" scratched boldly on the keywell liner, as is a less bold "TM", which has been scratched underneath the other inscription. On the underside of the jackrail is the inscription "1726 / 1651" and "75". This indicates the likely date that repairwork was carried out on the instrument (by "TM" ?).

Plate 1651TW.2 - Photograph showing the makers signature.



Construction

Figure 1651TW.1 - Plan view of the 1651 TW virginal.



OVERALL INSTRUMENT DIMENSIONS: 1656 x 518 x 223½.

BASEBOARD: Deal, two planks, the front plank 268 wide. 11.9↔ thick at front.

SPINE: Deal, 1656 - 1657 long, 223 - 222 high, 11.5 - 12.5 - 12.1 thick, dovetailed to the case ends.

CASE ENDS: Oak, left case end 517↔ long, 222 - 223½ - 222 high, 8.3 - 7.2 thick; the right case end 518 - 519 long, 223 - 224½ - 222½ high, 7.6 - 7.1 - 7.7 thick. The spine and case ends overlap the baseboard. There are large dowels, 8.5 diameter, from the faceboards into the case ends.

FACEBOARDS: Deal, glued to the top of the baseboard. Left faceboard 266 long, 208 - 204 - 206 high and 7.4 thick. Right faceboard 619 long, 207 - 204 - 207 high and 7.9 thick. Dovetailed to the keywell sides.

KEYWELL SIDES: Oak, 129 (left and right) long, 8.2 (left) and 7.6 (right) thick. Slots for the nameboard have been cut into the keywell sides 108½ - 115 (left) and 109 - 115 (right) from the front of the keywell sides.

NAMEBOARD: Deal, total length 766 - 765, 153½ - 151 high, and 9 - 7½ thick.

KEYWELL LINER: Deal, 79 - 78 high, 12.7 - 11.5 thick.

OTHER LINERS: Deal, c. 35 x c. 15. The keywell-side liners extend past the keywell liner forming tapering protrusions under the soundboard. These protrusions extend about 75 past the keywell-back liner.

WRESTPLANKS: Oak, ‡38 thick. The type of joint between the two sections cannot be determined.

BASEBOARD FRAMES: Deal, 75 high. The inner edges form a continuation of the keywell sides. The frames are 19.4 (left) and 20.0 (right) thick, and cut out at the front to receive the keywell sides.

TOOLBOX: The toolbox back piece is made from deal, 36 high, set 102½↔ from the back of the faceboard. Toolbox lid of lime, 202½ - 200½ long, 110 wide and 9.2 thick. Iron rode hinges, 2.0 diameter, the lid hinged at the front. The top of the soundboard forms the base of the toolbox.

JACKRAIL AND SUPPORTS: Jackrail of deal, 821½ long (front), 855 long (back). It is 48.8 wide, and 18.8 thick. The bottom of the jackrail is 23.0 (bass) and 25.0 (treble) above the top of the soundboard. There are two layers of woven woollen cloth, with a total (uncompressed) thickness of 4.2 attached to the underside of the jackrail. These cloths are old, probably original. The bass jackrail support is of deal, 50.0 wide. The left side is 255 long, the right side 214 long. The treble jackrail support is triangular in shape, 84½ (plus an angled section, parallel to the front 19½ long at the rear, 101 at the front, and 49.7 at the end where it meets the jackrail. The back corner is 505½ from the right case end, and it is at an angle of 148½° to the spine.

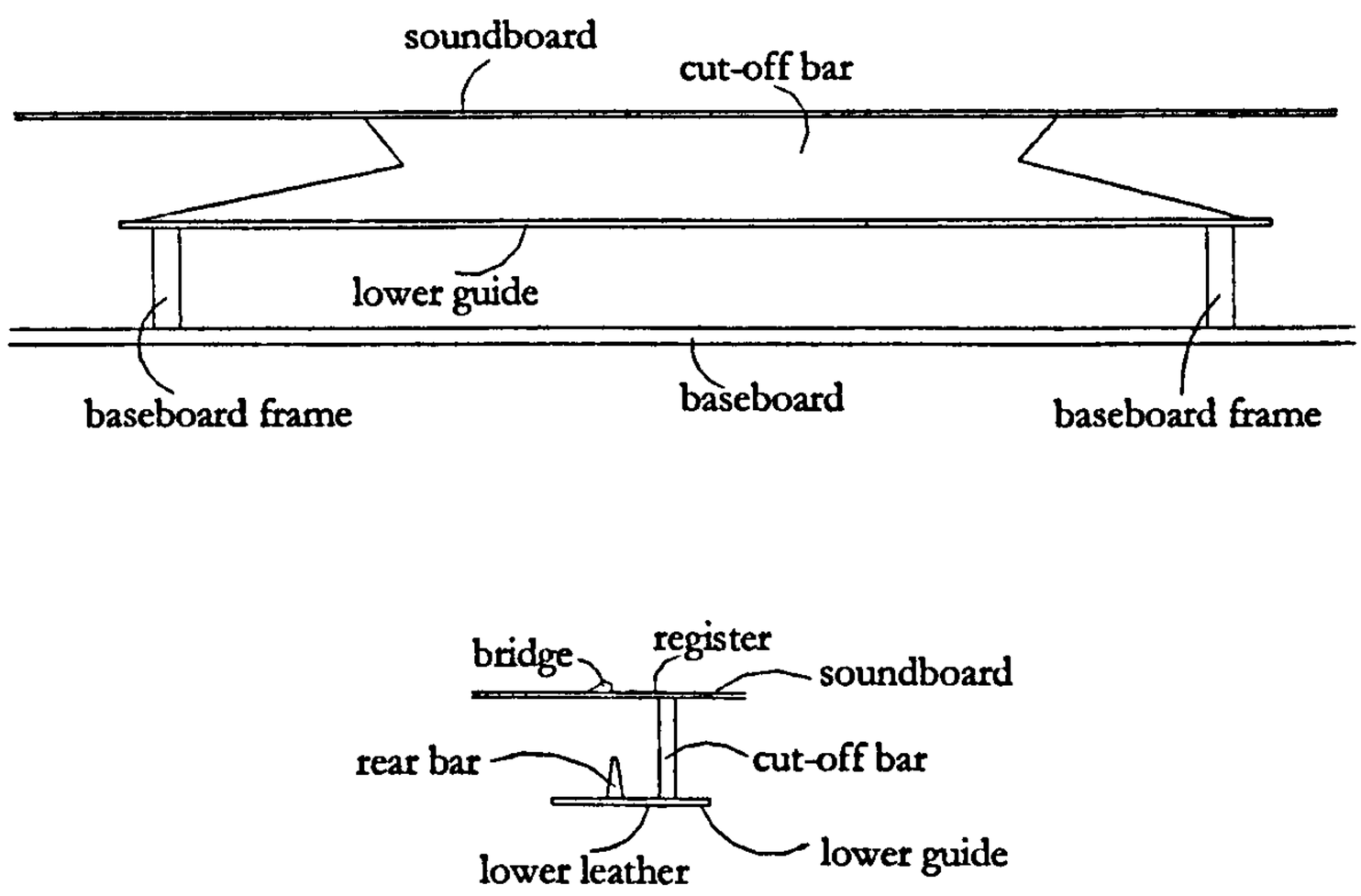
LID: Oak, coffered in three pieces. The planks are 174, 181 and 179 wide on the inside, and the front thickness is 8.7 - 9.1 - 8.1. Applied mouldings along the joins and

the ends on the top surface. End battens 16.8 (left) and 16.6 (right) thick, with an inside coffer height of 55.1 (left) and 58.6 (right). Four wire hinges (1.75 diameter) between the spine and lid, positioned 91 and 597½ from the left end, and 89 and 567 from the right end. There are straps to hold the lid open, attached to the inside of the end battens and case ends which appear old, and may be original.

KEYWELL FLAP: Oak, 210↔ wide, and 8.8 - 8.6 - 8.8 thick. Iron strap hinges, maximum 2.6 thick between the baseboard and the keywell flap.

LOWER GUIDE BOARD: Oak, 120 - 113 wide and 4.5 thick. Glued to the top of the frames. Leather guide glued underneath. There is a full depth cut-off bar, 12 thick, of deal, glued in front of the register, and another bar 30 high and 12 thick glued behind the register.

Figure 1651TW.2 - Drawing showing the shape of the cut-off bar from the front (above) and a section view (below).

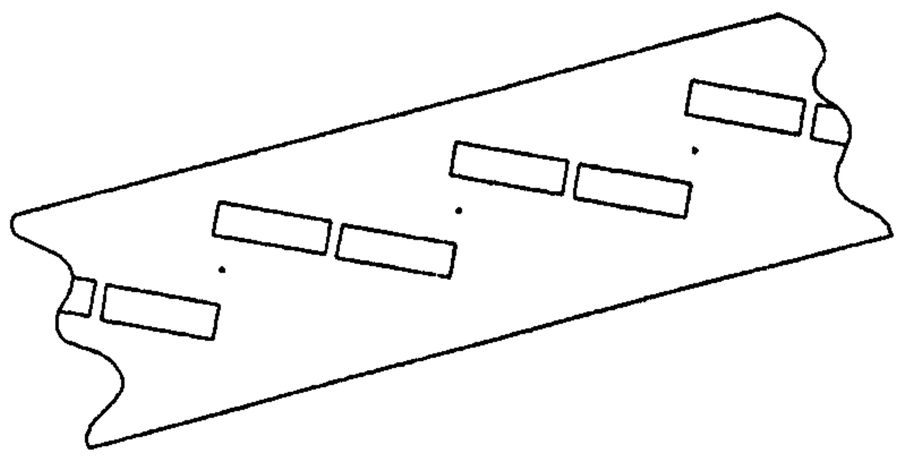


SOUNDBOARD: Coniferous wood, 4.0 thick at the keywell liner. The top of the soundboard is approximately 54 below the top of the case. Gilded rose, 86 diameter, (of wood glued on top of parchment), let into the soundboard and supported by half-thickness sections of the soundboard with strips removed.

SOUNDBOARD REGISTER: Leather, 732 long, tapering slightly in width from 27.7 (bass) to 26.5 (treble), and 0.9 thick. Slots typically 12.9 x 4.3. There are string-guiding

marks on the register leather between the wide pairs of strings positioning centrally between the wide jacks.

Figure 1651TW.3 - Schematic drawing of the register slots and string-guiding marks.



SOUNDBOARD BARRING: Deal, 19 high and 6.5 - 3.2 wide (top to bottom). The ends of the bars are rounded in a concave shape. Full depth soundpost in front of the register.

WRESTPLANK CAPPING PIECES: Oak, 4.0 thick. The treble wrestplank capping is 36.7 wide without, and 55.5 wide with applied mouldings; and the bass wrestplank capping is 39.2 (without) and 46.3 (with mouldings).

SOUNDBOARD MOULDINGS: 4.5 thick. The oak mouldings along the left case end and spine (between the left case end and the treble jackrail support) act as hitchpin rails. The left case end moulding is 19.5 wide, and the spine moulding is 19.0 wide. The other soundboard mouldings are cedar, 19.3 wide.

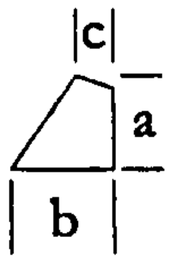
OTHER MOULDINGS: All other mouldings are of cedar. The faceboard mouldings are 4.0 thick. The moulding on top of the faceboards, keywell sides and nameboard are 15.0 wide and 3.8 thick. The soundwell top edge mouldings are 21.4 and 4.2 thick.

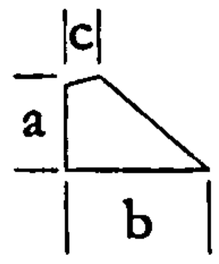
HITCHPINS AND TUNING PINS: The hitchpins are iron, 2.25 diameter. The tuning pins protrude 25 from the top of the wrestplank capping piece, 4.0 diameter, and are of iron. The tuning pins have been divided so that the notes up to d are on the bass wrestplank, and notes e^{b} to d^{3} are on the treble wrestplank.

BRIDGES: Fruitwood, probably pear. The treble of the left bridge has been cut away for the top 40 mm to accommodate the soundboard moulding. There are no scribed

lines on the left bridge, but the right bridge has scribed lines on either side of the crest of the bridge. The scribed line on the angled surface adjacent to the front edge forms the line of the bridge pins. The bridge pins are of iron, 1.55 diameter. There are marking out lines parallel to the strings on the top surface of the right bridge, placed under the front string of each pair. There are positioning holes, used to place the bridge correctly when gluing, at the front of the left bridge by the notes C, c, c^1, c^2, and d^3.

Bridge Dimensions:

left bridge 

right bridge 

left bridge	C	c	c^1	c^2	c^3
a	8.7	8.7	8.7	8.8	8.8
b	18.2	18.0	18.2	18.7	18.4
c	5.2	5.3	5.5	5.6	5.8

right bridge	C	c	c^1	c^2	c^3
a	9.4	9.2	9.0	9.0	8.7
b	20.0	19.6	19.9	20.2	19.6
c	4.8	4.9	5.1	5.5	5.6

String Lengths and (Plucking Points)

		f^1	**426½ (56)**	**F**	**1216 (12½)**
		e^1	466	E	1270
		e^{b1}	475	E^b	1287½
d^3	133 (41)	d^1	520½	D	1345½
$c^{\#3}$	138	$c^{\#1}$	531	$C^{\#}$	1365
c^3	**153½ (41)**	**c^1**	**580½ (72½)**	**C**	**1415½ (152)**
b^2	157½	b	593	**Ex C**	**1497 (193½)**
b^{b2}	174½	b^b	641	GG/BB	1435 (147)
a^2	178½	a	652½		
$g^{\#2}$	198	$g^{\#}$	706		
g^2	201½	g	718½		
$f^{\#2}$	221	$f^{\#}$	773		
f^2	**224 (42)**	**f**	**784½ (81)**		
e^2	244	e	838½		
e^{b2}	249	e^b	854		
d^2	272	d	913		
$c^{\#2}$	276½	$c^{\#}$	929½		
c^2	**300½ (57)**	**c**	**983 (107½)**		
b^1	305½	B	997		
b^{b1}	334½	B^b	1055½		
a^1	341½	A	1071½		
$g^{\#1}$	372	$G^{\#}$	1125½		
g^1	381	G	1141		
$f^{\#1}$	417	$F^{\#}$	1199½		

Keyboard and Action

COMPASS: GG/BB - d3, with an extra string and jack for C.

BALANCE RAIL: The balance rail consists of an oak top, 7.6 thick, glued to a deal bottom, 24.0 thick, giving a total thickness of 31.6. It is 35.8 wide. The balance pins are iron, 2.7 diameter, and protruding 17 above the top of the balance rail. The balance rail is half-lapped into the keyframe sides.

KEYFRAME SIDES and BACKRAIL: The sides are deal, generally 32 wide and 10.3 thick. The backrail is deal, 44.6 wide and 18.5 thick.

RACK: Lime, attached to the top surface of the backrail. The rack is 4.8 thick, 39.3 high. It is scribed on the front and rear surfaces for the top and bottom of the slots. There is a very old, possibly original, cloth attached to the top.

FRONTRAIL: Lime, 30.0 wide and 8.3 thick.

KEYWELL BATTEN: Cedar, with a moulded top edge along the front, 35.2 high and 3.8 thick.

ENDBLOCKS: Deal. The left endblock is 137 long, 20.1 wide and 43.8 - 38.4 high. The right endblock is 135 long, 21.3 wide and 43.5 - 40.4 high.

KEYBOARD WIDTH: Overall width between the keywell sides 755½, and between the endblocks 714. The overall width of the keyboard is 711, and the three-octave span is 482.

KEYLEVERS: Lime, 14.7 thick at the front, tapering to 9.7 at the rear. The rackpins are deal, tapering from 3.4 wide, tapering from 4.3 - 3.3 high. The lowest keylever is 297 long and the balance point is 110½ from the front of the touchplate. The top keylever is 463 long, and the balance point is 154 from the front. The accidental keylevers are balanced 16 behind the naturals.

NATURAL TOUCHPLATES: Boxwood, variable overall length, and tapering in thickness from 2.9 at the front to 1.7 at the rear. There are four scribed lines on the

front section, 25.5, 27.5, 32.4 and 34.5 from the front edge. The touchplates overhang the keylevers by 3.1.

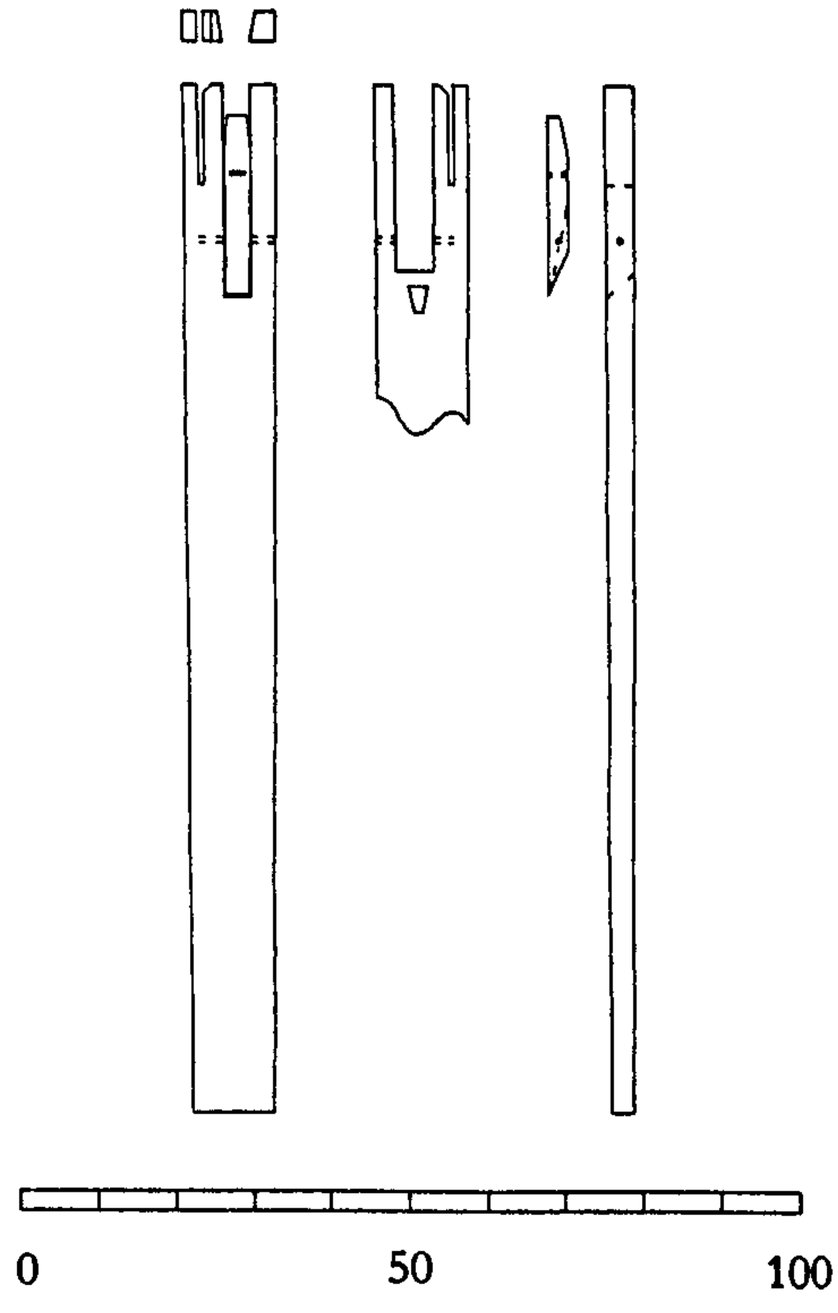
The natural touchplate widths in between the accidentals are:-

		f^2	13.7	f^1	13.4	f	13.6	F	13.4
		e^2	13.9	e^1	13.8	e	13.7	E	13.9
d^3	16.6	d^2	13.6	d^1	13.7	d	14.2	D	13.4
c^3	15.2	c^2	13.6	c^1	13.7	c	13.5	C	13.7
b^2	13.6	b^1	13.8	b	13.6	B	13.7	BB	21.1
a^2	12.2	a^1	11.9	a	11.9	A	12.1		
g^2	11.8	g^1	11.7	g	11.9	G	11.5		

ACCIDENTAL TOUCHPLATES: Black stained pear.. The overall length is typically 65.4, and total height 11.1 (front) - 10.6 (rear). They taper in width from 11.8 at the bottom to 10.8 at the top.

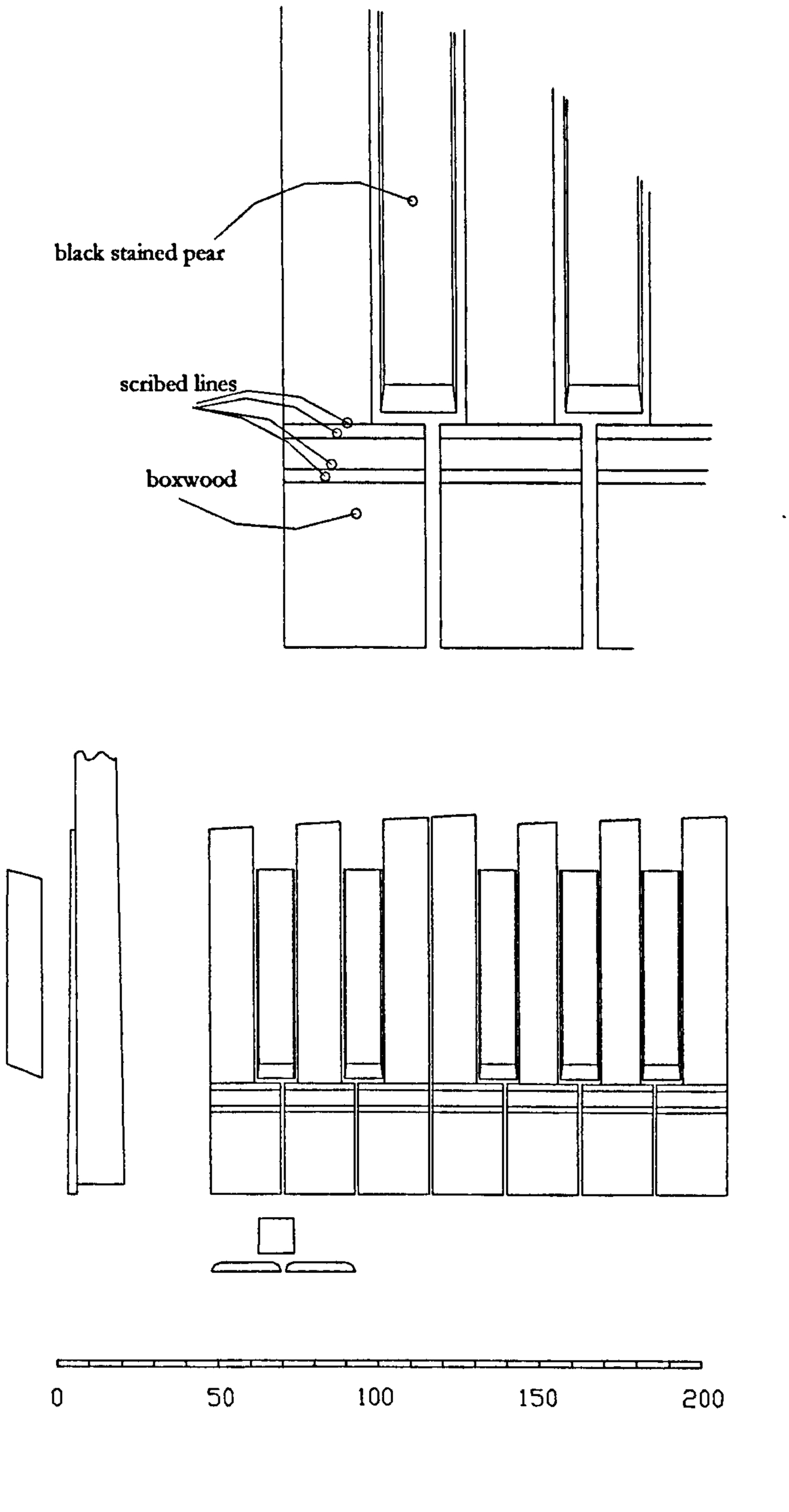
JACKS: The jacks are of pear, and the tongues are possibly boxwood. The total length is typically 131. They taper in width from 11.9 - 10.5, and in thickness from 3.8 - 2.9. The axle pins are positioned 15.9 (70%) from the top of the tongue. Thirty two original jacks survive. Seven of the jacks have a single lead weight added to them and one jack has two added weights.

Figure 1651TW.4 - Drawing of a typical jack.



ACTION CLOTHS: There are two layers of woven woollen cloth, with a total (uncompressed) thickness of 4.2 attached to the underside of the jackrail. These cloths are old, probably original. The cloths on the back of the keys are of the same material as the rack and jackrail, but have been reglued in modern times with an epoxy resin.

Figure 1651TW.5 - Drawing of major keyboard details.



Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges and lockplates. There are three strap hasps from the lid to the keywell flap. The two outer hasps attach to turnbuckles on the keywell flap, and the centre hasp attaches to a lockplate on the keywell flap. There are three strap hinges from the baseboard to the keywell flap. The top surface of the lid has applied oak mouldings at the ends and along the coffer joins.

The soundboard is decorated with border patterns, flowers and birds. There is a single rose which is of a geometric design and gilded. The top layer is of wood, with a more intricate design cut into parchment on the lower layer. The decorator appears to be the same artist who painted the 1662 TB instrument.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by pressed papers. The flat part of the bands have painted vinework in black and white around the outer part of the faceboards and the keywell. The gilt papers are of the "Moresque" design, with the exception of those in the centre of the faceboards which are wider, being a variant of the "monkey" design.

The lid and keywell flap interiors have typical landscape paintings. Both depict scenes from the bible — the lid shows a scene of Christ and the Woman of Samaria (John, IV), and the keywell flap shows Elisha with the Children and Bears (2 Kings, II, 23-4).

Condition

This instrument is, decoratively, a finely preserved example of an early English virginal, typical in all of its characteristics. Although the instrument is not in playing condition it is structurally sound.

The work carried out in 1726 (by TM?) was probably nothing more than general reconditioning to return the instrument to playing condition. There is no evidence of any major alterations carried out at the time, with the possible exception of the added lead weights in some of the jacks.

There has been some water damage on the soundboard which has almost obliterated the greenish border patterns (in particular). This suggests that, like other examples, the artist used a water-soluble medium to paint with, probably Gum Arabic or glue size. The paintings on the lid and keywell flap have been painted onto a white background.

The case itself, although sound, has suffered some damage. There is a large crack in the central panel of the lid, approximately 1 metre long. There is also a broken section of the right case end at the bottom. This missing piece is approximately 20 mm high at the spine, following the grain direction towards the front, ending about 75 mm from the front edge. Evidence of the nails that went through the case end into the baseboard can be seen on the exposed baseboard wood.

Plate 1651TW.2 - Damage to the right case end.



The cloths on the jackrail, back of the keys, and around the top of the rack are similar to those found in other instruments and are probably original.

Commentary

This instrument is essentially built as the same "model" as the 1642 TW, 1653 TW and 1656 JW virginals, although differs from the other Thomas White examples in having a GG/BB - d3 compass, rather than C - c3.

There are note names by the tuning pins on the treble wrestplank capping piece but not on the bass capping piece. Therefore, it has not proven possible to establish the intended tuning of the lowest few notes.

The general workmanship of the instrument is not particularly refined. The total front length differs by 5 mm from top to bottom, and the case ends differ on length by 2 mm.

Of particular interest is the prominence of glue runs of the interior of the case. Amongst the information this reveals is that all of the case gluing processes appear to have been done with the case in its normal position. It also provides clear evidence that the cut-off bar was attached to the lower guide before being placed into the instrument, and these were glued in position before the soundboard was attached.

1653 TW

Plate 1653TW.1 – View of the 1653 TW virginal.



Photograph from the Raymond Russell archive.

Ownership and Provenance

National Trust, Hardwick Hall, Derbyshire. From the Duke of Devonshire. A painted inscription "Mary Byard" records an earlier owner.

References:

GD4 No. 3. B1 & B2 English virginal table No. 4, B1 & B2 White, Thomas No. 3, B3 No. WHITE, T. 1653.

Inscriptions: Signed by Thomas White on the jackrail. A painted inscription "Mary Byard" appears on the nameboard plaque.

Construction

Permission to make a detailed examination of this instrument was not given by the National Trust. The measurements quoted below have kindly been provided by Andrew Garrett. Other comments (by the author) come from a visual examination.

OVERALL INSTRUMENT DIMENSIONS: 1669 x 517 x 212½.

CASE ENDS: Oak.

LID: Oak, originally coffered in three pieces, but now flattened. The planks are 9½ mm thick at the front.

KEYWELL FLAP: Missing.

String Lengths and (Plucking Points)

		f^1	419 (41)	F	1251½ (66½)
		e^1		E	
		e^{b1}		E^b	
		d^1		D	
		$c^{\#1}$		$C^\#$	
c^3	152 (38)	c^1	568 (57)	C	1463½ (84)
b^2		b		Ex C	
b^{b2}		b^b			
a^2		a			
$g^{\#2}$		$g^\#$			
g^2		g			
$f^{\#2}$		$f^\#$			
f^2	227 (33)	f	790 (52½)		
e^2		e			
e^{b2}		e^b			
d^2		d			
$c^{\#2}$		$c^\#$			
c^2	303 (49)	c	999 (68)		
b^1		B			
b^{b1}		B^b			
a^1		A			
$g^{\#1}$		$G^\#$			
g^1		G			
$f^{\#1}$		$F^\#$			

Keyboard and Action

COMPASS: C – c^3, with an extra string and jack for C.

NATURAL TOUCHPLATES: Boxwood, Total width of keyboard 663, three octave span 480½. Natural headlength 33.3 long.

ACCIDENTAL TOUCHPLATES: Inlaid with ebony and boxwood(?). Overall length 68.2.

Decoration

The outside of the case has been varnished, but is otherwise decorated only by the ironwork strap hinges. The soundboard is decorated with border patterns, flowers and birds. The decorator is also responsible for the 1651 TW, 1656 JW, 1661 JW, 1662 TB and 1664 RH virginals.

The keywell, faceboards, soundwell and jackrail are decorated with cedar moulded bands separated by pressed papers of the "Moresque" design. There is white scrollwork decoration inside the inner faceboard, keywell side and nameboard mouldings, and vinework decoration on the flat moulding bands.

The lid painting shows Orpheus playing to the Beasts, in a scene very similar to that used on the 1661 JW.

Condition

The virginal is in display condition, housed at Hardwick Hall, Derbyshire. It has suffered considerable alteration, including the flattening of the lid, and the removal of the keywell flap. The inscription "Mary Byard", which appears on the nameboard plaque is probably not original.

Commentary

The 1653 TW is very similar in design and layout to the 1642 TW. The string lengths are close to the 1642 TW in the treble, and the compass is identical. Despite

the closeness in design and string lengths, the case is nearly one inch longer. The string lengths in the bass are also correspondingly longer, 14½ mm at C, 21½ mm at F, and 23½ mm longer at C. This reflects either a slightly different right bridge shape, or that the bridge is of the same shape, but has been glued to the soundboard at a slightly different angle. It is more likely that the bridge shape is slightly different.

Further Commentary on the Instruments by the White family

Between them, Thomas and James White have left seven instruments, almost one third of the extant English virginals. Thomas White is the only maker who has left more than two instruments, and amongst his instruments are two unique surviving examples - the child of a mother-and-child combination, and an instrument which is double-strung for almost an octave in the bass. This latter virginal - the 1644 TW - is also the earliest surviving instrument with a GG/BB bass, and a treble compass extending to f3. The next GG/BB - f3 virginal is the 1661 JW. Four of the instruments - the 1642 TW, 1651 TW, 1653 TW and 1656 JW - are all very similar in design, and all play at the same (V) pitch. The 1661 JW plays at V – 1s, the 1644 TW at V – 2s, and the 1638 TW plays at V + 7s.

Thomas White lived in Old Jewry, and probably retired from business when his son became a Freeman of the Joiners Company in December 1656. The 1656 JW can be shown to be one of the earliest instruments to be signed by James White rather than his father. The alterations made to the instrument during its construction (see the 1656 JW Catalogue entry for details) suggest the instrument might have been commenced under the direction of his father, and then changed once James assumed complete control of the workshop.

The existence of four instruments which are, to all intents and purposes, nominally built from the same starting point allows a comparison to be made to show the variation in case dimensions and string lengths. These are tabulated below:

Table White.1 – Dimensions of various White virginals.

	1642 TW	1651 TW	1653 TW	1656 JW
Length	1646	1656	1669	1670
Width	521	518	517	517
Height	226	223	212½	212
c^3 string length	151	153½	152	145
f^2	220	224	227	220
c^2	295	300½	303	274
f^1	419	426½	419	423
c^1	576	580½	568	542½
f	790	784½	790	786
c	984½	983	999	948
F	1230	1216	1251½	1246
C	1440	1417½	1463½	1414
Extra C	1457	1499		1497
GG/BB		1437		1480

From the above table it can be seen that the cases get slightly longer as the instruments are later in date, a fact which is not attributable to the GG/BB short octave since the 1651 TW (which has the GG/BB) case length is shorter than the 1653 TW (which descends to C). The case widths are nominally the same, despite the different compasses (ranging from C – c^3, 50 strings including the extra C; to GG/BB – d^3, 53 notes including the extra C). The case heights fall into two groups – the earlier instruments are approximately a half-inch deeper than the later ones.[1] Ignoring, for the present, the 1656 JW, in which the scaling-design note is a comparatively "short" string, it can be seen that the actual string lengths of the instruments are very similar until the bass, where the extra case length of the 1653 TW, and the GG/BB short octave, have an effect. The deviation of absolute string length increases towards the bass, which is the result of the method of marking-out the bridges and its inherent inaccuracy. Adding the 1656 JW to the other figures, it can be seen that the *f* string lengths are entirely comparable to those of the other three virginals in the treble and tenor. In the bass the string lengths are almost identical to the 1651 TW, the other

[1] This may not reflect a general trend. The 1661 JW is essentially the same height as the earlier virginals.

instrument with a GG/BB bass.[2] It is true, in any case, that the marking-out methods employed by a maker would not allow a greater accuracy than shown in the above table. When expressed in cents it can be seen that the effective distance is minimal[3] – 28 cents at c^3, 46 cents at c^2, 38 cents at c^1, 28 cents at c, and 55 cents at C.

Whereas the four above-mentioned virginals probably reflect the "standard" product from the White workshop, as does the post-Restoration 1661 JW with its GG/BB – f^3 compass, the 1638 TW and 1644 TW virginals show that specific requests were also received and catered for. The 1638 TW is the child of a mother-and-child combination – the only recorded English-made example – and the 1644 TW is double strung from GG/BB – A. Both are extraordinary in other ways as well. The 1638 TW is built to play at V + 7s (the missing mother playing at V – 5s), a pitch found otherwise only in the 1622 Hasard harpsichord. The 1644 TW is the earliest recorded GG/BB bass in England and, simultaneously, the earliest recorded extension to f^3 in the treble. The full GG/BB – f^3 compass, which became standard following the Restoration, does not occur again until the 1661 JW. This compass, and the double stringing from GG/BB – A, means the instrument has 66 strings in total, nine strings more than the 1668 SK.

Both of these virginals show that White had complete confidence in his understanding of the instruments' design concepts. Although the 1638 TW mother instrument is missing, it would have been physically larger than any other virginal. Assuming the C string was kept in proportion to the instruments pitched at V it would be c. 1920 mm long. In practice, the scale at C would have probably been foreshortened, but a string length of, perhaps, 1750 – 1800 mm would be likely. The total case length would be approximately 1950 – 2000 mm, 126 – 176 mm (5 – 7 inches) longer than the 1668 SK.[4]

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[2] The difference in absolute string length for the GG/BB is attributable to it being a "long" string in the 1656 JW and a "short" string in the 1651 TW.

[3] These figures do not include the 1656 JW

[4] It could be argued that the string length might have been shorter. The C string at V – 5s is the equivalent to a GG string at V. The three long-bass virginals from the 1660s (1664 JP, 1664 RH and 1668 SK) all descend that low. The respective GG string lengths of those instruments (all of which are at V) are 1578, 1461 and 1555 mm. However, the string lengths of the 1638 TW mother virginal cannot be that short, as there has to be space for the child virginal (914 mm long) to fit inside the mother to the side of its keyboard. Assuming the mother virginal had the same overall width between the keywell sides (709 mm), plus a typical left faceboard length (289 mm, as found in the 1642 TW), and making

In practice the mother 1638 TW virginal would not have presented any major technical problems for White, but the same cannot be said for the 1644 TW. The double stringing in the bass requires the left bridge, register, and keyboard to have two distinct angles so that two jacks and strings can be used for the bass notes, although his right bridge follows the same general curve as a normal bridge.

There are two distinctly different decorators who worked on the surviving White virginals. The first decorator was responsible for the 1638 TW, 1642 TW and 1644 TW instruments, and the second decorator commenced with the 1651 TW. The appearance of the stamped decoration on the keyboard of the 1661 JW instrument shows that this was the work of the maker rather than the decorator, and likewise the mouldings appear to be the work of the maker. Both decorators can be shown to have worked for other makers as well. It is clear, therefore, that there was not enough work in any single workshop to keep a decorator busy on a full-time basis.

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allowances for the case ends and keywell sides, the minimum length of the mother virginal must have been c. 1945 mm.

THEEWES

Plate THEEWES.1 – Three-quarter view of the instrument.



All Photographs by Malcolm Rose, reprinted with his kind permission.

Ownership and Provenance

Possession of the Victoria and Albert Museum, London (No. 125-1890), Previously in the possession of Mrs Luard-Selby where it was housed at Ingtham Mote, Kent since well before 1844, where it is mentioned in a guidebook. It was originally built for Anthony Roper, the second son of William Roper and his wife Margaret More. Following Anthony's death in 1597 the instrument was sold to Sir Edward Hoby and his wife Elizabeth Carey.

References:

B2 THEEUWES, Lodewijk (II), B3 No. THEEUWES, L. 1579, James (1930), Hubbard (1950), Russell (1959), Hubbard (1965), McGeary (1973), Wessel (1977),

Koster (1980), Schott (1985), Barry (1990), O'Brien (1990), Martin (2000/1), Rose (2002/1), Rose (2002/2). Technical drawing commenced by John Koster with additions and modifications by Malcolm Rose.

Inscriptions:

Signed "LODOWICUS THEEWES ME FESIT 1579" on the inside of the lid flap, facing the player when the main lid is down and the lid flap is open.

Plate THEEWES.2 – The maker's signature on the lid flap.



Construction

Figure THEEWES.1 - Plan view of the Theewes harpsichord.

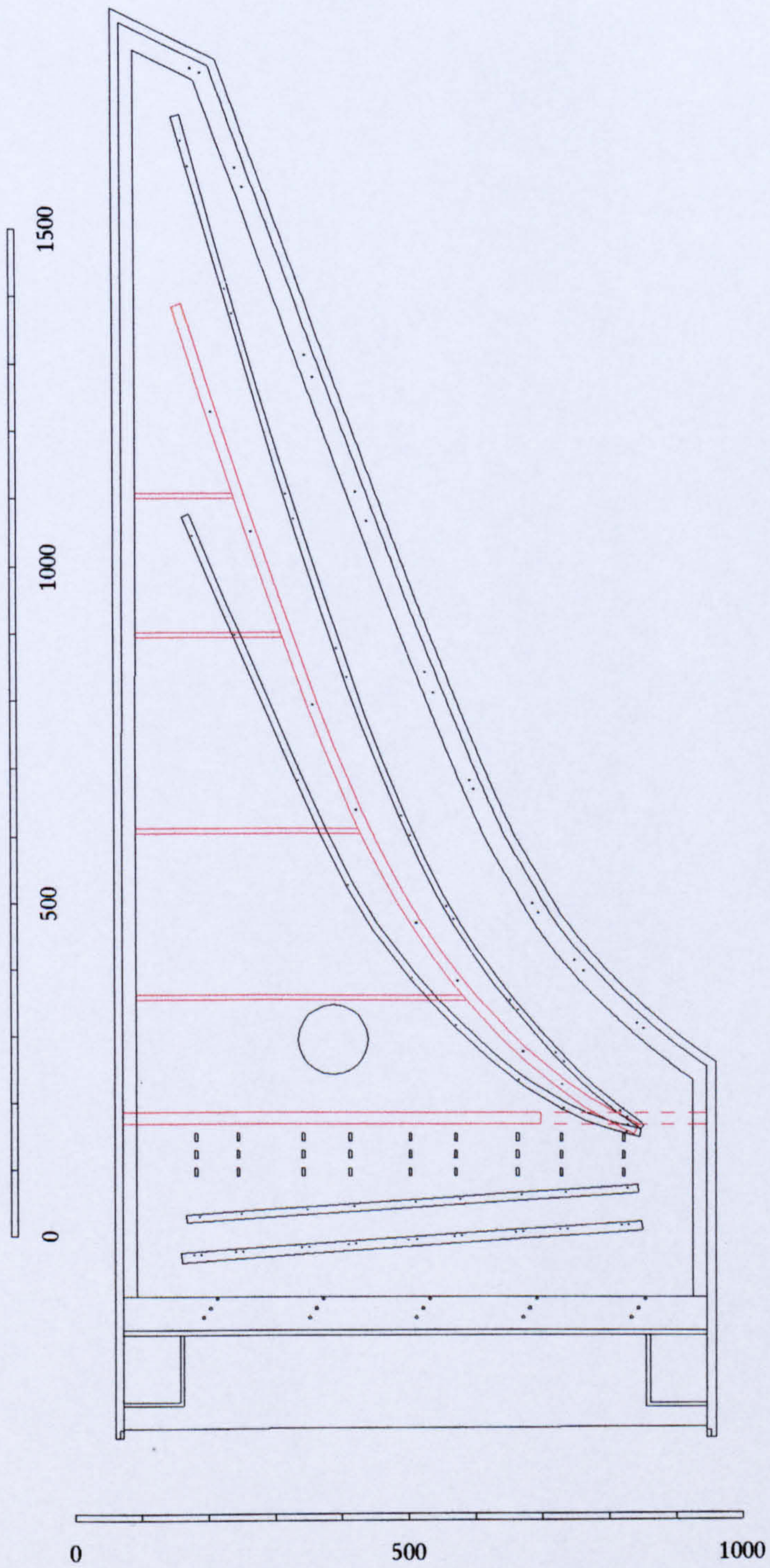
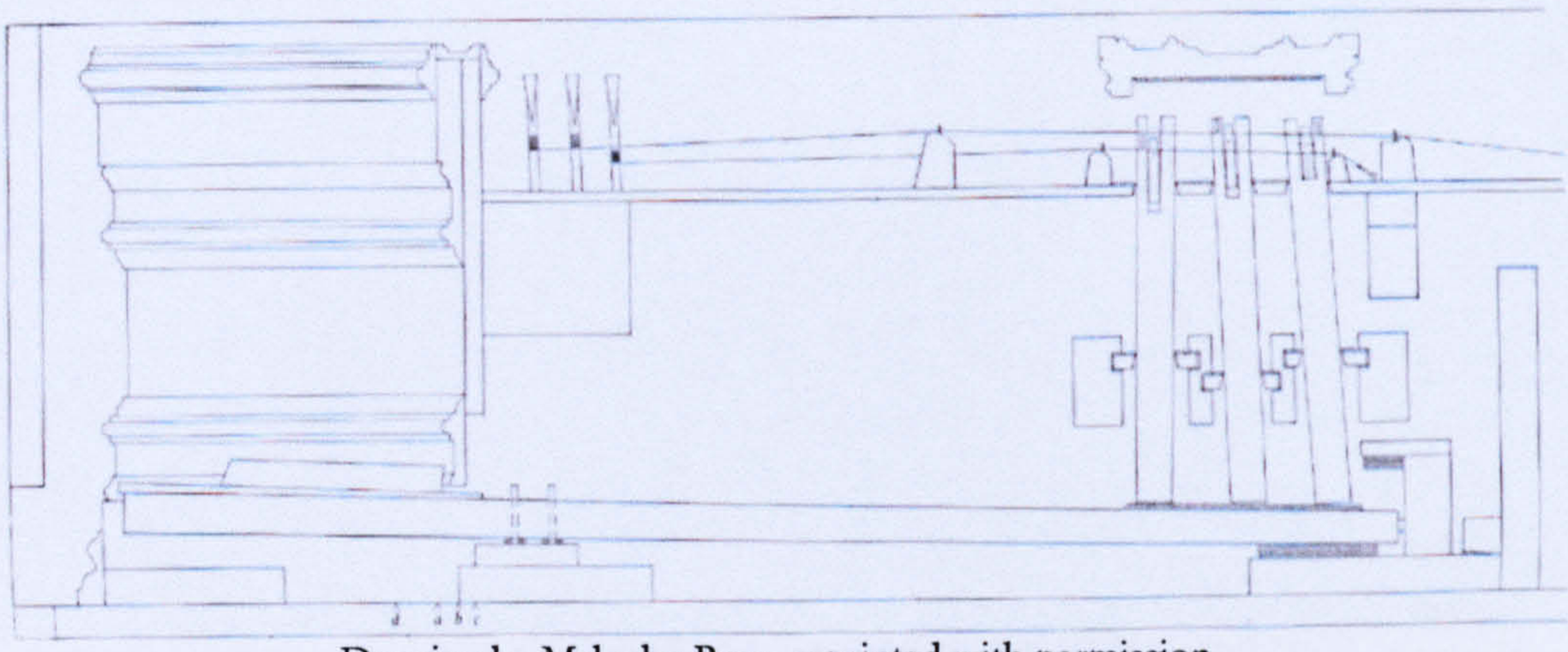
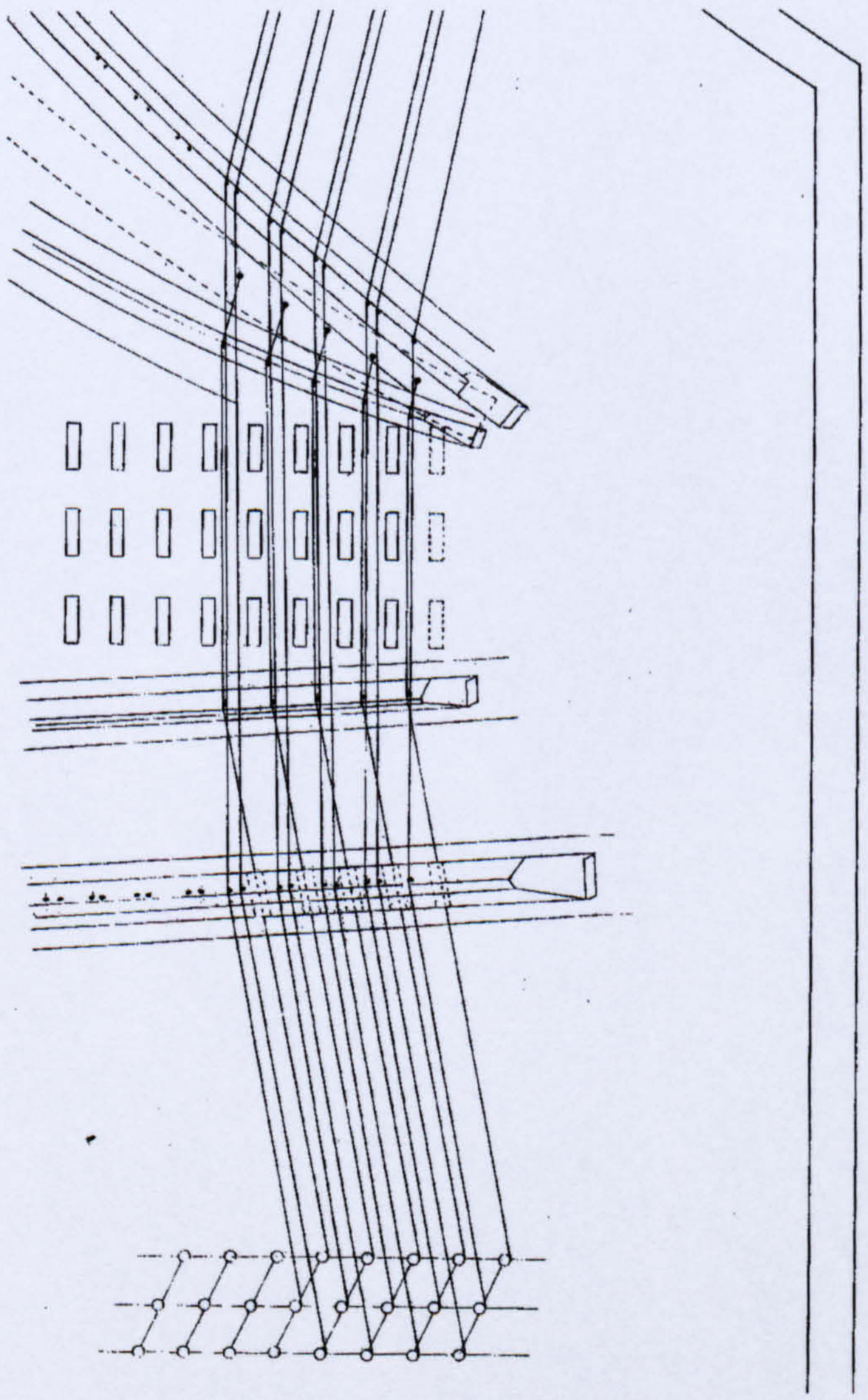


Figure THEEWES.2 – Section view of the Theewes harpsichord.



Drawing by Malcolm Rose, reprinted with permission.

Figure THEEWES.3 – Close view of the treble part of the soundboard in the instrument's original form.



Drawing by Malcolm Rose, reproduced with permission.

OVERALL INSTRUMENT DIMENSIONS: 2128 x 898 x 206/217.

BASEBOARD: Oak, 10.7 - 11.5 thick.

SPINE: Oak, 2128 long, 204½ - 206 high, 12.0 - 14.3 thick. Overlapping mitre joint with the tail.

CHEEK: Oak, 564½ long, 204½ high, 13.4 thick. Overlapping mitre joint with the bestside.

BENTSIDE: Oak, 206 high, 13.3 thick. Overlapping mitre joints with the tail and cheek.

TAIL: Oak, 176 long, 206 high, 13.7 thick. Overlapping mitre joint with the spine and bentside.

FACEBOARDS: Poplar, both 90½ long, 199 high, 6 thick.

KEYWELL SIDES: Poplar, both 106½ long to the front of the nameboard, 199 high, 6 thick.

NAMEBOARD: Poplar, 126 high, 6 thick. Keywell space 674 at bottom.

WRESTPLANK: Beech, 50.8 wide, 45.7 high.

FRAMES: Lower belly rail oak, 113 high, 13.2 thick. Upper belly rail lime, 36.6 high, 17.0 wide. The belly rail is cut down to clear the 4' hitchpin rail from $d^{\#2}$. Two other frames, deal, 117 high, 14.5 thick. Both are perpendicular to the spine.

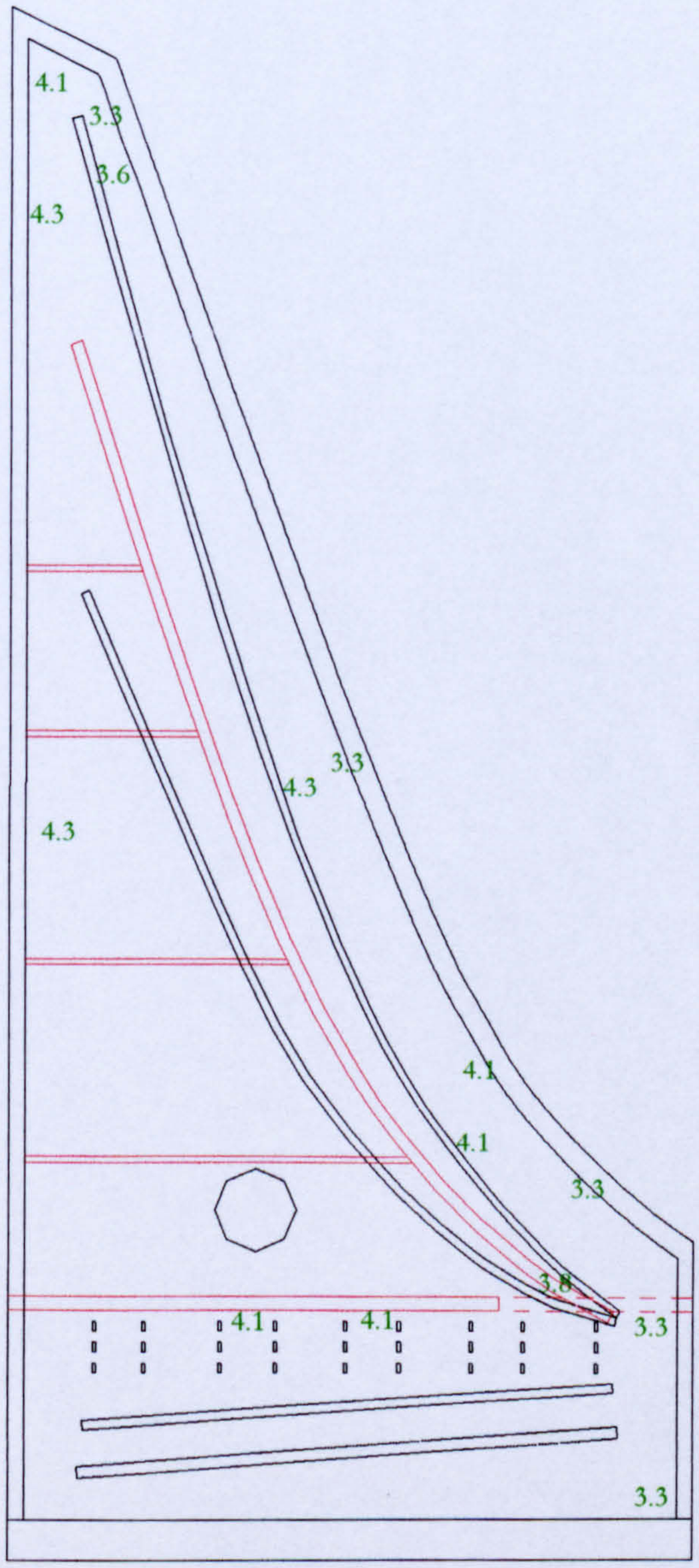
LINERS: Spine liner oak, 33.0 high, 20.3 wide. Tail liner lime(?), 45.7 high, 27.9 wide. Bentside liner lime, 44.5 high, 27.9 wide (tail), 17.8 wide (middle), 20.3 wide (treble).

JACKRAIL: Lime, maximum dimensions 90.6 x 21.0. The top of the jackrail is 9.0 below the top of the case.

LID AND LID FLAP: Oak, c. 13 thick. The majority of the lid flap is not original.

SOUNDBOARD: Coniferous wood, Thickness varies from 4.6 near the rose to 3.3 along the edge of the bentside and cheek. The top of the liners are approximately 140 above the top of the baseboard. Rosehole, 104 diameter.

Figure THEEWES.4 – Soundboard thicknesses (in green).



SOUNDBOARD REGISTER: Leather, glued to the top of the soundboard, 1.5 thick. The slots in the soundboard are cut oversize. The leather presently on the instrument is not original, earlier leather is in the possession of the museum. There are 50 slots for each register in the soundboard and lower guides, although only 49 have been used.

LOWER REGISTER: Three separate sliders, the middle one at a lower level than the others. The sliders are 5.0 thick, covered in leather 1.0 thick. There are three stop knobs which protrude through the faceboards. The two on the left operate the rear (8') and middle (4') registers, the right knob operating the front (8') register. The stop knobs must be pushed in to turn the register on.

SOUNDBOARD BARRING: No longer present. When the instrument was examined by John Barnes in c. 1966 he found two soundbars, the second and third (of four) from the front. The second was 15 high, tapering from 7.6 - 5.3 thick. The third was 16 high, tapering from 7.1 to 4.3 thick. The 4' hitchpin rail is of oak, 16.5 wide by 12.7 high in the bass, 16.5 x 15.2 at around c, 15.2 x 14.0 at around f1, and 14.0 x 14.0 in the treble.

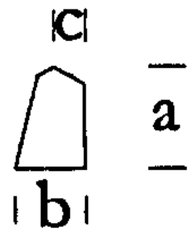
SOUNDBOARD MOULDINGS: Poplar, 11.5 high, 5.6 wide. The hitchpins go into the soundboard, not the tail and bentside liners.

OTHER MOULDINGS: Poplar

HITCHPINS AND TUNING PINS: The hitchpins (8' and 4') are iron, c. 1.0 diameter. The original tuning pins are iron.

BRIDGES: Only the 8' nut and the treble section of the 8' bridge survive. Both are of pear.

Bridge Dimensions:

8' nut 

8' bridge 

8' nut	C		c^1		c^3
A	22.3		19.7		19.2
B	15.3		14.2		14.2
C	6.7		5.8		5.8

8' bridge		d	c^1		c^3
a		19.4	16.9		15.5
b		12.5	10.0		9.3
c		5.0	4.5		5.2

String Lengths and (Plucking Points)

	Back 8' String length	Back 8' Plucking pt.	Front 8' String length	Front 8' Plucking pt.	4' String length	4' Plucking pt.
c^3	171½	132	161½	105½	84½	23
f^2	265	139	250	112½	126	29½
c^2	349	143½	333½	117	172	34
f^1	497	150	478	124	260	40½
c^1	637	155	607	128½	336	45
f	890	161½	844½	135	482½	51½
c	1124	166½	1087	140	642	56
F	1434½	174	1398	157½	865½	63
C	1661	178	1622	152	1016	67½

The quoted string lengths and plucking points have been determined from a computer reconstruction of the instrument. They differ slightly from the figures given in Rose (2002/1), but this difference is due to slightly different bridge placements. Positioning the bridge slightly differently in between the guide lines on the soundboard can easily account for differences in measurements of up to ten millimetres in the tenor and bass regions of the compass.

The back 8' register plucks towards the left, and the forward 8' and 4' registers pluck towards the right.

Keyboard and Action

COMPASS: C - c^3.

BALANCE RAIL: Poplar, 67 wide and 12.8 high, with an oak capping 37.8 - 35.3 wide (bass to treble), 7.7 high. The balance pins for C and c^3 are 7.8 and 8.0 respectively from the front of the oak capping, the other natural balance pins 12.3 - 14.2 from the front of the capping. The accidental balance pins are 12 - 13 behind the natural balance point lines.

Plate THEEWES.3 – The balance rail, showing the recesses cut for the keys.

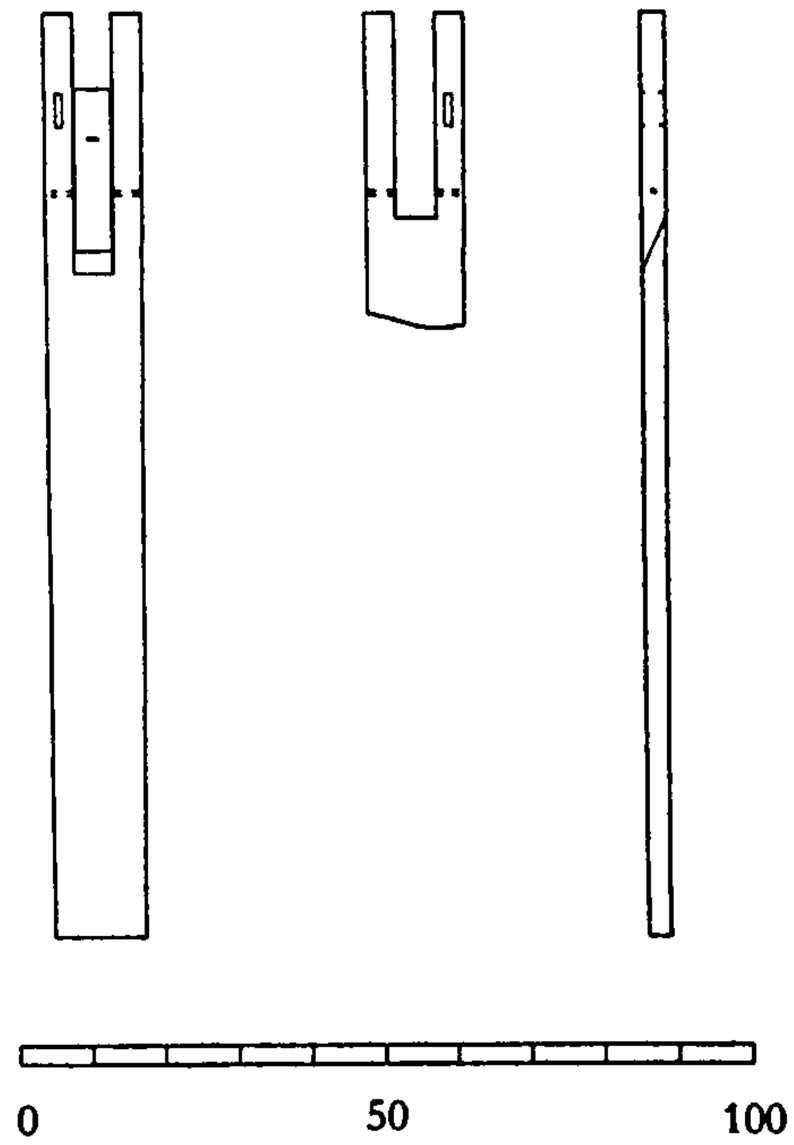


There are rusted pin holes in the baseboard which align with turnbuckle positions on the balance rail, and hold-down blocks on the lower belly rail. All other parts of the keyboard and keyframe are missing, although the joints in the poplar section of the balance rail indicate the width of the keyframe sides.

KEYWELL BATTEN: Missing, but its original position can be seen from a shadowmark against the spine and cheek to be c. 26 x c. 9.7.

JACKS: Pear bodies with tongues of hornbeam(?). The total length is typically 126.1. They taper in width from 13.45 - 12.45, and in thickness from 3.4 - 3.0. The axle pins are positioned 14.1 (64%) from the top of the tongue.

Figure THEEWES.5 - Drawing of the surviving jack.



There are no original action cloths.

Decoration

The Theewes must have been a stunning instrument when new. The exterior is covered in embossed leather, much of it originally probably gilt, and heavy ironwork strap hinges, hasps, and turnbuckles. The interior of the lid is painted with two landscaped pictures in panels, surrounded by elaborate strapwork decoration inspired by the work of Pellegrino, Fiorentino, Cornelius Floris and Hans Vredeman de Vries (see Rose (2002/1) for further details). The majority of the lid flap is missing, but the section adjacent to the main lid is present, and includes a panel with the maker's name which faces the player with the main lid closed and the lid flap open.

Plate THEEWES.4 – photograph showing the main panel in the lid.



The gilt pressed papers have been damaged in many places, but where they survive it can be seen that they were of very fine quality, with very intricate designs. The papers around the soundwell and centre of the jackrail echo painted designs on the main lid. Two geometrical designs are found, one used only on the top surface of the nameboard, keywell sides and faceboards, and the other forming a thinner band towards the outside of the top of the jackrail and nameboard, keywell sides and faceboard. A fourth design, now almost entirely obliterated, is found in the centre of the nameboard, keywell sides and faceboards, and is probably an earlier variant of the "monkey" design.

The soundboard is decorated with sparsely painted flowers, much damaged by water. The rose, probably originally gilded, is now missing.

The mouldings on the instrument are unusual in being of a pale coloured wood, probably poplar. In addition to a tall, narrow soundboard moulding, there are upper soundwell mouldings, plus intricate mouldings on the top and sides of the jackrail (entirely symmetrical in design and execution), and on the faceboard, keywell sides and nameboard.

The front of the instrument, comprising faceboards at each side of the keyboard is entirely reminiscent of virginals, as is the decorative method using wide papers in the centre, surrounded by mouldings, then narrower papers, and then further mouldings.

Plate THEEWES.5 – Photograph showing the virginal-like faceboard.



Condition

The instrument has been in a very poor condition from at least the first half of the nineteenth century. It has suffered considerable water damage which has eventually been responsible for the loss of the 4' nut and bridge and the bass section of the 8' bridge, as well as the loss of most of the keyboard and action. The organ on which the instrument sits is now missing all but one of its wooden pipes (now also damaged) and a number of regal boots.

Much of the decoration has suffered damage, almost certainly as a result of the water. The soundboard paintings are now mostly obliterated, and the leather exterior has been damaged or is missing. The pressed papers are now generally damaged or missing as well.

There have been various reports about what of the instrument survived at different times, including an accidental touchplate, two soundbars, and several further organ pipes. Although there is no reason to doubt their former existence, there is no reasonable chance they will be re-discovered.

The instrument has had visual repairs carried out in order for the instrument to be put onto public display. Replacement 4' bridge and nut, and a replacement bass section of the 8' bridge were in position before 1948, when the instrument was examined by Frank Hubbard. Most recently, the soundboard was removed in c. 1966, when it was seen by John Barnes, who made detailed measurements of the interior. His notes are the only record of this repairwork.

The harpsichord is now housed in the new British Galleries at the Victoria and Albert Museum, London.

Commentary

The Theewes harpsichord is among the most extraordinary surviving keyboard instruments from any tradition. It has three registers - 2x8' 1x4' -, and a four octave C - c^3 chromatic compass, both of which are more advanced than contemporary instruments built in other countries. As a result of this the instrument has been well chronicled by modern authors, the most in-depth study reported in Rose (2002/1). This publication made use of work by Malcolm Rose, John Barnes, John Koster, Miles Hellon and this author. The measurements given above have been taken from this joint work, and the opinions expressed by Rose were discussed with the author before publication, although, ultimately, are those of Malcolm Rose himself.

The research published in Rose (2002/1) shows the registration and compass to be original, and proposes that the threaded brass pieces screws into the 8' bridge were originally intended as brays. It speculates on the reason the soundboard and lower registers were marked out with 50 holes, when only 49 were actually used, and discusses whether the organ and harpsichord were conceived together.

It is known that the organ contained only 48 notes, almost certainly C,D - c^3. The missing note, $C^{\#}$, was omitted because it was commonly tuned to AA, a note which requires organ pipes too large to comfortably fit in the organ case. This does

not, however, provide any real clue about whether the organ and harpsichord were conceived together. It is also known that the instrument was in the possession of Sir Edward Hoby and Elizabeth Carey before her death in 1605, and that their arms are painted over those of Anthony Roper, who died in 1597. It is, therefore, possible that the organ could have been made any time up to 1597, some 18 years after the date that appears on the harpsichord. Rose (2002/2) has suggested that the instrument was purchased by Anthony Roper with money gained by inheritance following the death of his father in 1577, which, if correct, would make it most likely that the organ was built at an early date. The possibility (never seriously argued by any author) that the organ actually precedes the harpsichord can be reasonably ignored since there is no evidence to suggest it originally had it own keyboard, and is an most unlikely shape for an organ which served no other purpose.

There are several aspects of the construction which point to the organ being conceived at a later date than the harpsichord. The most obvious is the broken section at the front of the baseboard. The use of full length baseboard planks appears to be a common practice amongst early English makers, also being found in the 1622 Hasard harpsichord. There is no reason this should cause constructional problems in normal use, as the baseboard planks would be supported by battens. However, there was a large slot cut through the Theewes baseboard to provide space for the stickers from the harpsichord keys to the organ. This slot fatally weakened the wood to the front of the slot, which broke through and is now missing. There is no obvious need for such a large slot in the baseboard, as the stickers must be held in a secure position in order to be operated from the correct key. The method and workmanship used in cutting out the slot clearly shows it was done after the casework of the harpsichord (at the least) was completed. Even if such a large space was deemed necessary it would have been achieved more satisfactorily with a cross piece in front of the slot.

As the slot was cut *in situ* after the casework was completed it would provide positive evidence that the organ and harpsichord were not conceived together. It does not rule out, however, the possibility that the organ was built by Theewes and completed at the same time as the harpsichord, or at a later time. This cannot be proven, one way or the other, but no mouldings are identical. Even this does not necessarily answer who made the organ. It is, however, likely that Theewes was

responsible for the organ pipes and action, even if he didn't make the organ case himself. It would be reasonable to suppose that the harpsichord was commenced first, and the organ commissioned afterwards. It is not possible to know exactly when the organ was built, although speculation that it was soon after the harpsichord is not unreasonable.

Rose (2002/1) has speculated that the original 50 note compass was intended to provide a split key for AA/C$^{\#}$. This is unlikely for several reasons. First, the use of split keys is unknown in England before the last decades of the seventeenth century (and very uncommon elsewhere at the time the Theewes was made). Second, the existence of a dedicated C$^{\#}$ would probably have resulted in a 49 note organ compass. Third, the use of 50 notes for the register with a 49-note compass is found in all English virginals up to the Restoration. This practice was probably second nature to Theewes. That a 50-note register was originally intended can be confirmed by the fact that the register is centrally placed with the full 50 notes. The final use of 49 notes may be due to difficulties with positioning the 4' bridge, or with Theewes deciding that extra C strings and jacks would be unnecessary with a 2x8' 1x4' registration.

It is clear that the front of the instrument and its decoration was designed to mimic an English virginal. This confirms that the decorative style found in later virginals was well established by 1579, confirmed also by its appearance on the Mar virginal. It has been speculated that the use of the wide case was a compromise due to the existence of the organ, but, as has been shown above, it is entirely unlikely that the organ was conceived at the same time as the harpsichord. Instead, it is probable that the design originated through the maker's familiarity with virginals, and designing the harpsichord from that viewpoint. The use of movable lower registers and a small wrestplank which is essentially square in section might appear to confirm this, although those features are also found in other early harpsichords (for example the 1537 Muller in Rome).[1]

[1] Information from John Koster (PC, 2003).

HASARD

Plate HASARD.1 – Three-quarter view of the Hasard harpsichord.



Ownership and Provenance

Possession of Lord Sackville, Knole Park, Sevenoaks, Kent.

References:

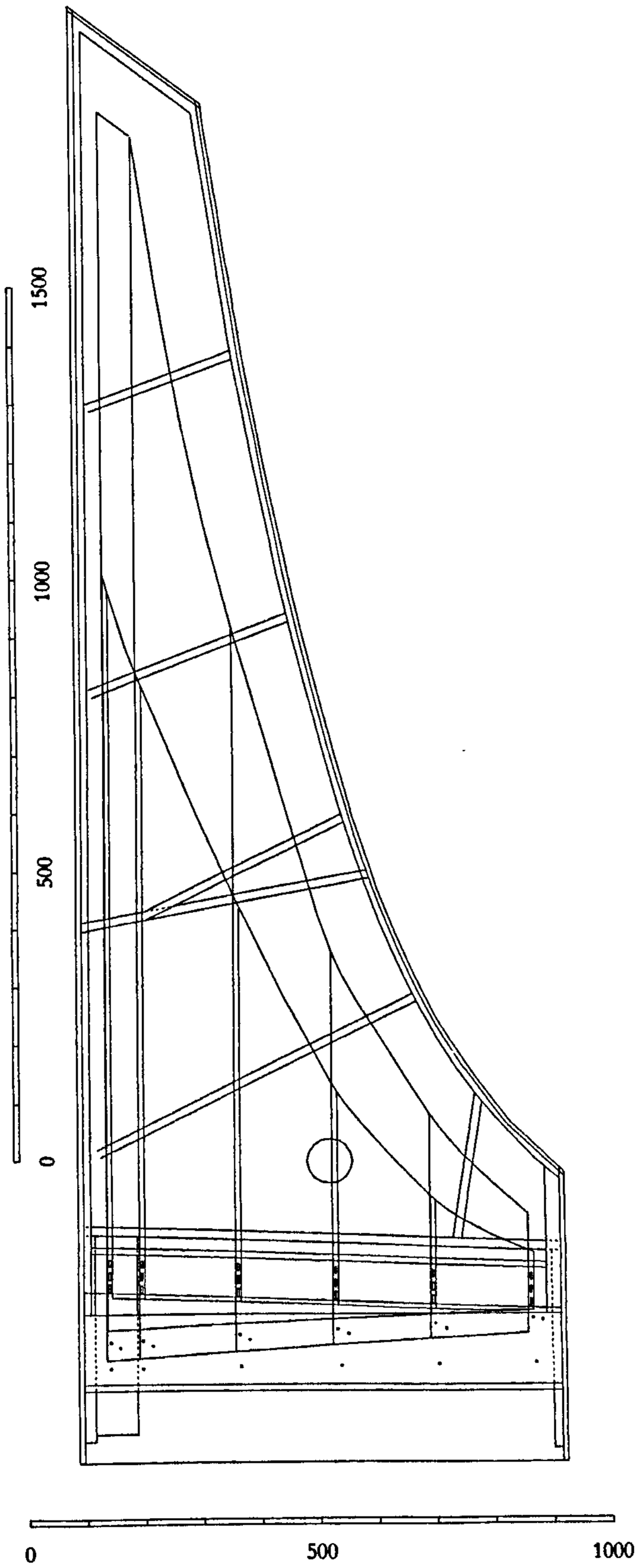
B2 HAWARD, John, No. 1. B3 No. HASARD,J. 1622, James (1930), Hubbard (1950), Russell (1959), Hubbard (1965), McGeary (1973), MacTaggart (1978), Koster (1980). Technical drawing commenced by John Koster.

Inscriptions:

Signed "JOHANNES HASARD FECIT LONDINI MDCXXII" on the nameboard. A Latin motto, "LAVDATE DOMINVM IN CORDIS LAVDATE INSTRVMENTIS BENE SONANTIBVS E CANO MVSICA" appears around the soundwell.

Construction

Figure HASARD.1 - Plan view of the Hasard harpsichord.



OVERALL INSTRUMENT DIMENSIONS: 2498 x 837 x 238.

BASEBOARD: Deal, 10.5 – 13.0 thick.

SPINE: Oak, 2498 - 2494 long, 2238 - 239 high, 8.8 – 8.0 – 8.5 thick. Dovetailed to the tail.

CHEEK: Oak, 492½ long, 239 - 238 high, 7.8 – 8.2 thick. Dovetailed to the bentside.

BENTSIDE: Oak, 237½ - 239 - 237½ high, 6.8 – 7.7 – 6.4 thick. Dovetailed to the cheek and tail.

TAIL: Oak, 278 long, 236 - 238 high, 8.2 thick.

NAMEBOARD: Oak, 107 – 108 high, 10.1 – 11.1 – 10.4 thick. Keywell space 820½ at bottom (measured at the nameboard). The top of the nameboard is 16.3 (bass – 13.7 (treble) below the top of the case sides.

WRESTPLANK: Oak, 120 wide, 23.5 high. There is a second piece glued under the wrestplank at the front, 35 wide, 24.5 thick.

FRAMES: Lower belly rail poplar, 166 high, 11.3 – 12.4 – 11.3 thick. Upper belly rail deal, 48 high, 15 – 17 - 16 wide. One other baseboard frame, poplar, 66.5 high, 14.5 thick. This frame is essentially perpendicular to the bentside. There were five upper frames which went from notches cut in the bentside liner (see Plate Hasard.2) to the baseboard near the spine (the first, second and fourth frames from the tail), the top of the lower frame (third upper frame from the tail), and lower belly rail (fifth frame from the tail).

Plate HASARD.2 – Close view of notch in the bentside liner for a frame.

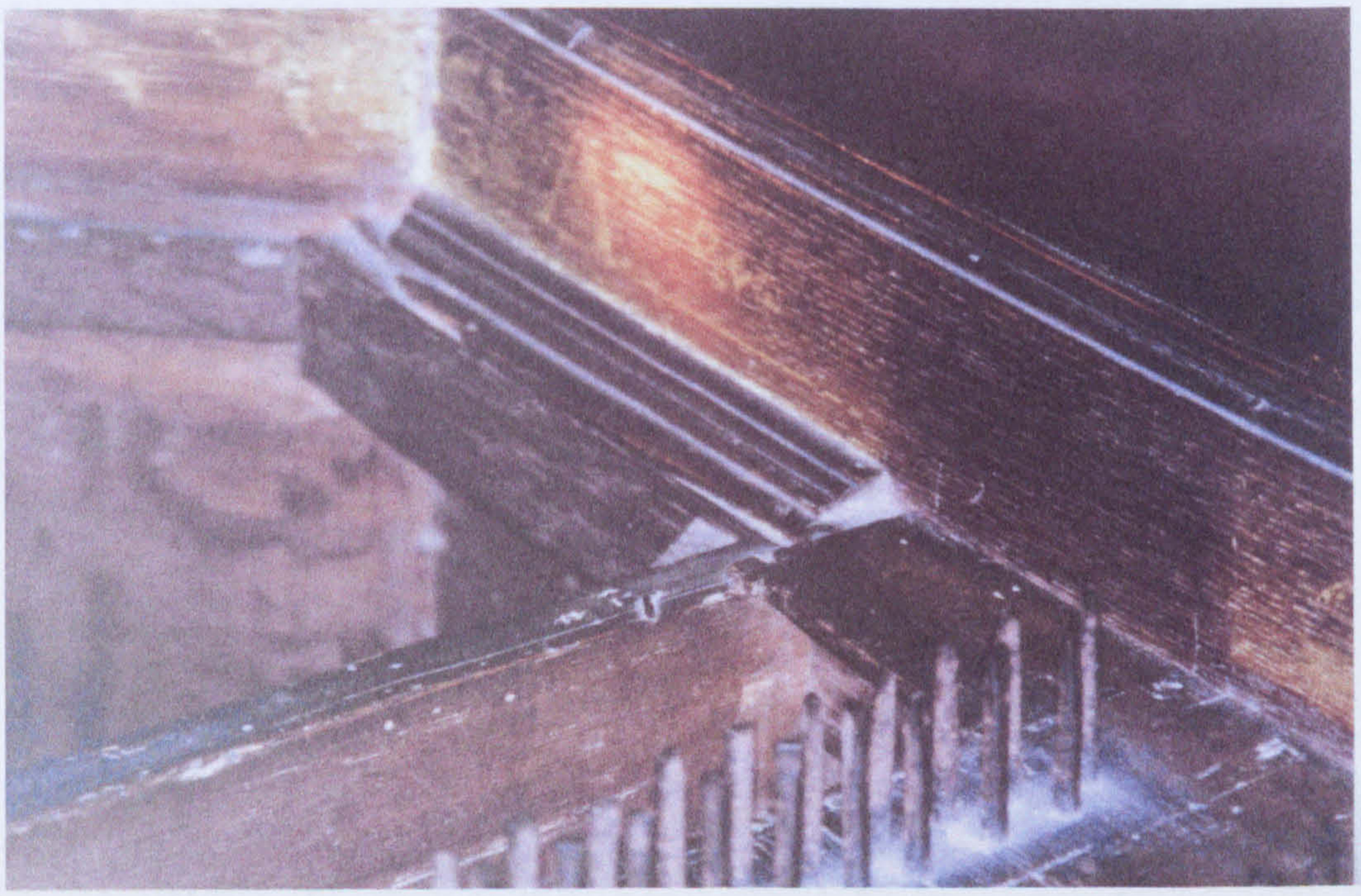


LINERS: Oak. Spine liner 35 high, 12.3 wide. Tail liner 15.7 wide. Bentside liner (of two pieces, jointed with a halflap approximately halfway along the bentside) 11.5 (bass) – 10.0 (treble) wide, cheek liner 24.5 wide.

JACKRAIL, LID AND LID FLAP: missing.

SOUNDBOARD: Only a small section in the treble remains (see Plate Hasard.3) Almost certainly of slab-sawn cypress. The wrestplank veneer is of quarter-sawn spruce, and joins the soundboard at the upper belly rail.

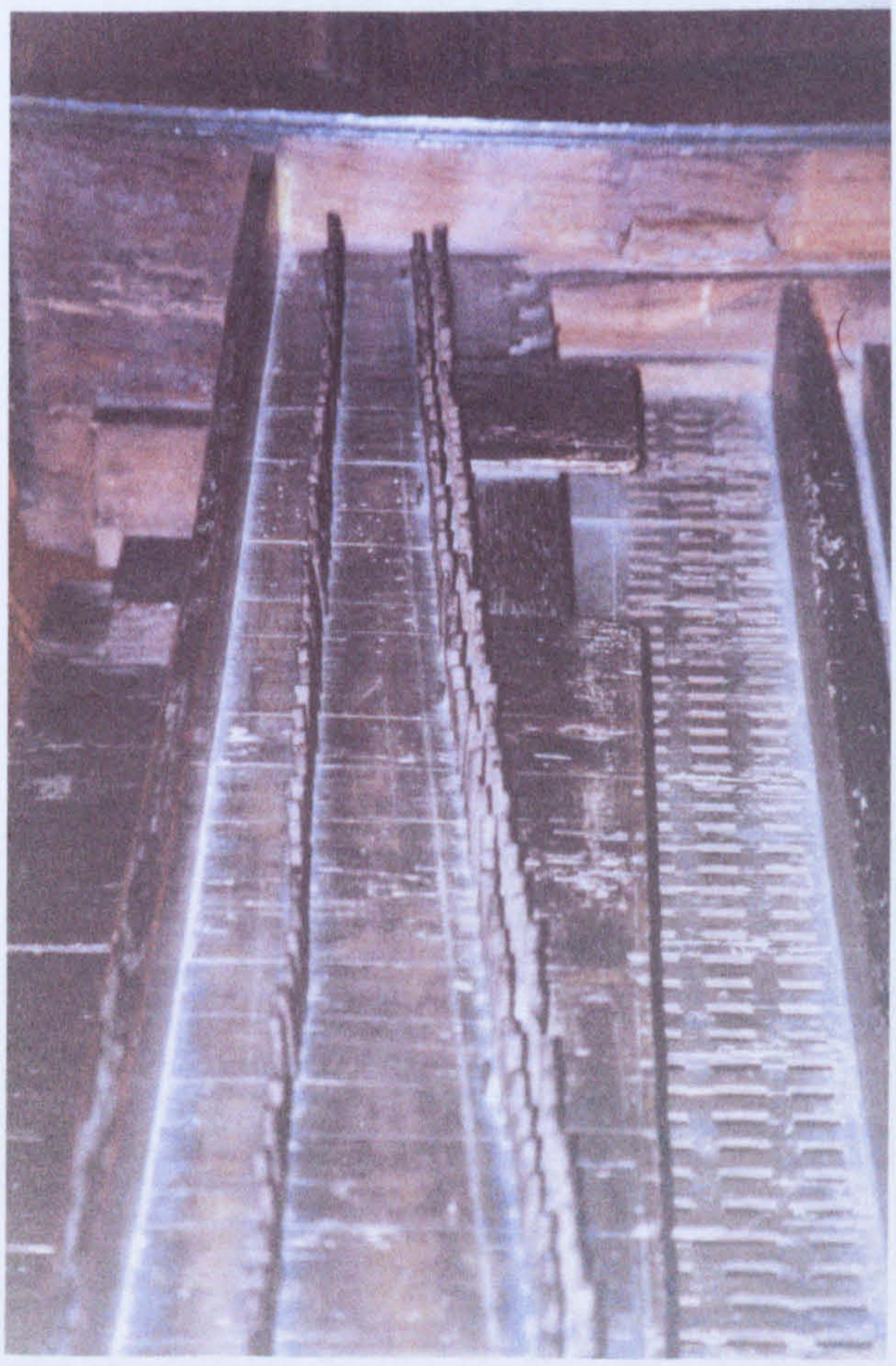
Plate HASARD.3 – The small remaining piece of the soundboard.



SOUNDBOARD REGISTER: Now missing (see Plate Hasard.4). Originally slots were cut into the soundboard, as can be determined along the edge, with the wrestplank veneer extending on either side to the upper belly rail. There must have been movable guides above these slots.

LOWER REGISTER: Three registers, cut directly into a piece of spruce, c. 4 thick. The spruce extends from the back of the wrestplank to the lower belly rail. The three-octave span of the lower register is 502 mm.

Plate HASARD.4 – The slots cut into the lower register, also showing the missing upper registers.



SOUNDBOARD MOULDINGS: Only the cheek moulding remains. Oak, 14 wide and 7.8 high. The hitchpins went directly into the tail and bentside mouldings.

OTHER MOULDINGS: Oak. The soundwell moulding has been cut directly into the case sides. The mouldings on the outside of the case are applied, typically 24.5 wide and 7.1 thick.

TUNING PINS: Tuning pins are iron, c. 4.0 diameter.

String Lengths and Plucking Points

	V – 5s String length	V – 5s Plucking pt.	Long V + 7s String length	Long V + 7s Plucking pt.	Short V + 7s String length	Short V + 7s Plucking pt.
c^3	203	73	101½	34½	97½	34
c^2	386	89	203	48	185	38
c^1	677	105½	406	61½	367½	38
c	1244½	122½	738½	75½	681	37½
C	2096	139	1129	89½	1055½	37½
GG	2143	144½	1301	94	1214	37½

The quoted string lengths and plucking points have been determined from a computer reconstruction of the instrument, and should be considered only approximate below c^3. The arguments used for determining the compass and bridge positions are discussed below in the Commentary section. ALL of the plucking points have been measured from the middle register. For the front register 21 mm must be deducted from the quoted figure, and for the back register 21 mm must be added to the quoted figure. It is not possible to make anything other than a guess as to which register was for each choir of strings.

Keyboard and Action: missing

Decoration

The harpsichord is made from quarter-sawn plain oak. The exterior is decorated by applied oak mouldings. There were originally iron strap hinges from the spine to the lid. The interior was of plain oak, decorated by the maker's name painted on the nameboard, and a Latin motto painted around the soundwell. Both were painted in orpiment over black (see MacTaggart (1978)). There are thin black bands on the keywell sides along the front and top edges. Originally there were further pieces on the keywell sides (see the Commentary section below).

The harpsichord sits on a very fine arcaded oak stand with ten fluted legs and lower stretchers.

There is no indication that any varnish or colouring agent was used on the exterior of the case. The present finish is wax, but this may be only what has been applied to the instrument since it has been on display. The wax may conceal another finish type underneath.

Condition

The instrument is now just a shell, having only the casework, baseboard, stand, and isolated internal pieces surviving. It has clearly been in this condition for many years, probably centuries. It is housed at Knole, in part of the building which is operated by the National Trust and open to the public. There is a very high polish from many years of wax having been applied to the instrument.

Commentary

The Hasard harpsichord is, like the Theewes, an extraordinary instrument with an unusual disposition (one long and two short choirs of strings) and compass (53 notes). There has been much speculation on its original form, the most in-depth previous analysis carried out by Koster (1980).

Koster made a series of deductions to speculate that the compass was C- e^3, and defined the registration as K (for the long choir) and K8 (for the short choirs). He presented an argument to show that the top string of the K choir was c. 205 mm long. The most convincing evidence used to calculate approximate string lengths was the assumption that the sidedraft from both the nut and bridge would be the same. This author agrees with that assumption, and has used it as the starting point for the presented analysis.

Although the nuts are now missing, their positions can be calculated accurately. There are various scribed lines on the wrestplank veneer and on the baseboard. By plotting and superimposing the position of these lines it can be seen that those on the baseboard accurately reflect the lines of bridge pins, consistently positioned at reasonable distances from the lines on the wrestplank veneer. This confirms the views of McGeary (1973) and Koster (1980) who show that there was originally three nuts. The nuts for the higher-pitched choirs of strings come together in the treble, and it is uncertain if the nut closer to the player had holes for the bass strings of the further nut

to pass through, or if it was recessed for the strings (as must have occurred closer to where they meet).

Koster, in discussing compasses argues for a C – e^3 compass on the basis of the available space between the endblocks and the compass of early English virginals. The 1641 GT has a C – e^3 compass, and it has been established that Hasard was Townsend's father-in-law (MacTaggart (1978)). The argument by Koster in favour of the C – e^3 compass makes the assumption (and follows the argument) that there were additional endblocks which were approximately the same width as a natural key. The only other compass which can be shown to be reasonable, GG,AA – c^3 was dismissed as the available space for supplementary endblocks would be too small.[1]

Although not explicitly stated, the assumption appears to be that the surviving endblocks were visible. This is unlikely to be the case. The endblocks are different widths from each other, and the visible dimensions are noticeably different, and would be more so once the missing parts (the keyboard, name batten and supplementary endblocks) were in place. Although the lack of worm damage on the endblocks makes it clear that the supplementary endblocks were not glued directly to the surviving endblocks, the worm damage on the spine and cheek keywell sides (see Plate HASARD.5 and Plate HASARD.6) show that there were glued pieces in a position above the bottom of the nameboard, probably designed so that the bottom of these pieces (sections of moulding (?)) was level with the top of the name batten. Worm damage it clearly shows that there was a rectangular oak block in the treble, similar in size to the surviving block in the bass, and a batten glued at the front of the baseboard which fitted in the cut-outs in the surviving endblocks (see Figure HASARD.2 and Plate HASARD.6). The baseboard edge is 16.3 (bass) and 13.0 (treble) behind the front of the spine and cheek, and there is clear evidence that there was originally a batten of some description attached to the front of the baseboard. From this it can be assumed that the keyboard sat on top of the rectangular oak blocks and that the supplementary endblocks went to the edge of the keywell sides, sliding under the added pieces in a manner similar to the English virginals. There is more-than-adequate room for a

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[1] Koster pointed out that this compass could exist with wider endblocks if the keys splayed out towards the rear but rejected the idea. This author agrees with Koster .

keywell front batten to be glued to the top of the top baseboard batten, leaving the front baseboard batten to act as a base for a hinged keywell flap.

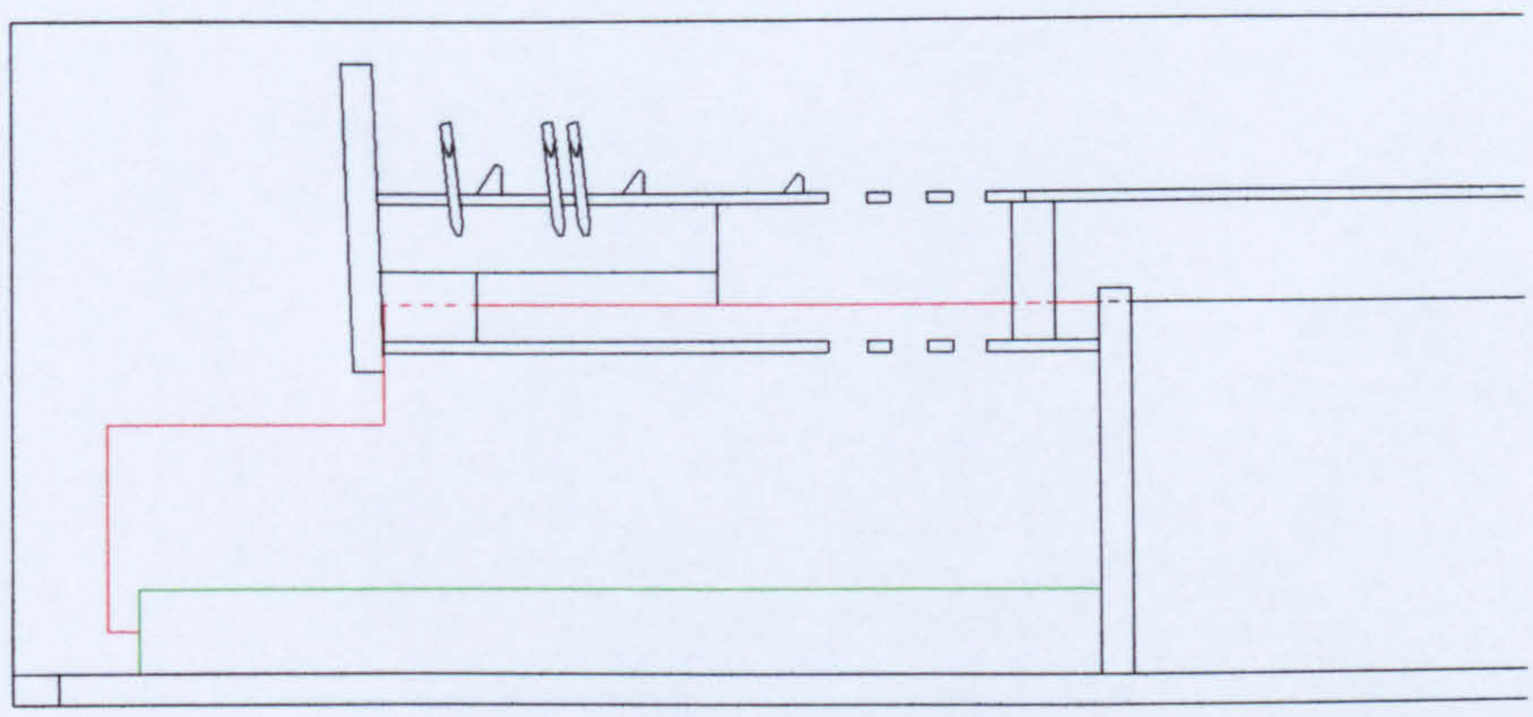
Plate HASARD.5 – The bass keywell side, showing worm damage.



Plate HASARD.6 – The treble keywell side, showing worm damage. Note how the worm damage covers the same area on the bass and treble keywell sides.



Figure HASARD.2 – Side view of the keywell, showing the endblock (in red), and the baseboard block (in green).



Assuming a keyboard three-octave span of 502 mm, the same as the lower register, the total width of the keyboard would be approximately 765 mm. The total width of the keywell is 820½ mm, leaving an available space for endblock of 55.5 mm in total. Allowing 2 mm at either end for the space between the edge of the key and the endblocks leaves a total space of 51.5 mm. Dividing that figure by two (allowing an equal endblock width at each end) gives 25.75 mm, to all intents and purposes one inch. This would give a supplementary endblock thickness of 6 mm (for the bass endblock) and 10 mm (for the treble endblock. Although this figure (particularly for the bass endblock) may be considered inadequate, it is probable that the endblocks were also glued to the keyframe at the front edge, and further supported by a keywell front batten glued along the front of the entire keyframe. As the keyboard (supplementary) endblocks are glued to the keyframe along three sides, and as they are not stress-bearing (being held in place by the pieces glued to the inside of the spine and cheek, there would be ample strength. The resulting visible width of the endblocks would be similar to the width of each natural key.

Therefore it can be shown that a keyboard with 32 naturals would fit ideally into the available space and would, visually, look better than a proposed C – e^3 (31 natural) keyboard. Agreeing with the assumption made by Koster that the compass would include all of the notes from C – c^3, the only two possible compasses are AA,BB – d^3, or GG,AA – c^3. A compass descending to AA is unknown in England (with the exception of the much altered "Jessus Cassus" harpsichord which shows signs of

keyboard alterations), and rare (if known at all) elsewhere in Europe. The GG,AA – c^3 compass is known in Flanders from at least 1616 (with the addition of the $GG^{\#}$, found in the 1616 IR harpsichord). On historical grounds it is most likely that the compass was, therefore GG,AA – c^3.

With that compass established as likely, it is possible to make assumptions about the pitch and disposition. Based on the evidence presented in Chapter Two that the scaling-design note is a simple fraction of the English inch, and the analysis of Koster showing that the top string is likely to have the same sidedraft, it is possible to suggest that the string length of the top string of the "K" choir is likely to be 203 mm; that is 8 inches. As this note is a c^3, a pitch of V – 5s can be directly calculated. This is also found as the pitch of the (missing) mother of the 1638 TW virginal, and can be thus shown to be a known English pitch level. Assuming the top string of the K8 choir is half that of the K choir it will be 4". Koster has suggested that the top string of the K8 choir would be longer than half the K choir on the basis that the K choir scalings are foreshortened throughout the compass. This has obvious implications for pitch. If the K8 choir is 4½" long, rather than 4" long as proposed by halving the top string of the K register, the overall pitch of the instrument would be V – 7s / V + 5s, which is the level of English "organ" pitch (see Chapter One). This also, obviously, can be shown to be a possible pitch level based on the evidence of other English keyboard instruments. As all of the soundboard (with the exception of a small piece by the cheek) is missing, there is no evidence on the instrument itself to help decide if the pitch level should be V – 7s / V + 5s (organ pitch), or V – 5s / V + 7s (as found in the 1638 TW). The likely answer can be found in the study of English pitch nomenclature as shown in Chapter One. An instrument with the lowest note below the *gamut* G is defined as being a "double" virginall. For all intents and purposes the "lowest note" should be considered the C, as found in the organs of the sixteenth century – the bass extension of the Hasard compass to GG will be discussed below. An instrument with the lowest note within the octave starting on G would be referred to as a "single" virginall, and an instrument which had its lowest note more than one octave below the *gamut* G would be a "double double" virginall.[2] Assuming a V – 5s / V + 7s pitch level, the Hasard would be described as a "double and single" virginall. Were organ pitch (V

[2] This is not merely academic. James Talbot, writing c. 1695 refers to pipe registers as "double double", and even "double double double" (as opposed to "triple" and "quadruple" as we might expect).

– 7s / V + 5s) used, the instrument would be described as a "double-double and double" virginall. If organ pitch was specifically intended the instrument would almost certainly be made so that the lowest choir of strings would be at V + 5s, with additional strings an octave above that.

The bass extension to GG was probably for transposition purposes. As shown above (Performance Considerations, Chapter Five), the likely use of the instruments at this pitch is to accompany large-viol consorts. By 1622 the different instruments in an English consort were typically ascribed nominal bass notes as D, G, and d (bass, tenor and treble respectively). Although most consorts probably typically tuned to a V- 3s pitch level (Mace (1676)), it has been shown that consorts of other sizes existed (Harwood (1981)). Harwood proposes another pitch level a fourth above V – 3s, that is V + 2s. This pitch level is otherwise unknown, and an examination of the sizes of surviving viols[3] suggests the "high" viol pitch level is closer to a minor third, in other words, V. There are, however, existing pieces which require a viol consort pitched a fourth lower than the standard tunings (ie. AA, D and A). Assuming the instrument in D was at the pitch levels found as the bass instruments of the normal consort, the lowest note of the double bass viol was tuned to V – 8s or V – 5s. Using a consort of this size to play music written for a normal viol consort (ie. the player of the double bass viol imagining his instrument's lowest note to be D) would require a keyboard instrument tuned to V – 5s, were the consort to be actually pitched a fourth below high viol (V) pitch, or V – 8s were the consort actually pitched a fourth below a consort at V – 3s. By extending the compass of the Hasard to GG, it was possible to accompany a viol consort at this pitch using simple transposition.

The decoration of the Hasard is unique in the period covered by the thesis. It is the only instrument in which mouldings have been cut directly into the case wood, the only instrument to have applied mouldings on the exterior of the instrument, and the only instrument which does not have any evidence of gilt pressed papers or soundboard decoration. It is, however, clear from the surviving stand (see Plate HASARD.1) that the instrument was not simply built to a cheap budget. The use of a cypress soundboard is probably related to the decoration, and it is possible this instrument was made as a replacement for, on in imitation of, a *quarto alla bassa*

instrument, such as the 1574 Baffo (W18, in the Victoria and Albert Museum, London), or 1579 Baffo (W20, Cité de la Musique, Paris). If not a direct imitation, the instrument could have been inspired by such instruments. The exterior case decoration could be considered to be influenced by Italian outer cases, and the use of paint on wood to be an English interpretation of Italian practice. The thin black bands, painted at the front and top of the cheek and spine give a pseudo- Italian inner-outer effect. The Latin motto around the soundwell is, on the other hand, identical in practice to what is found on some sixteenth-century Flemish instruments (for example the Duke of Cleves virginal in the Vicoria and Albert Museum, London).[4] It is possible that the pieces glued to the inside of the cheek and spine were of general Italian design, but the worm damage is more consistent with rectangular pieces. Although not found in other surviving English instruments, cypress is mentioned as a possible soundboard wood by James Talbot.[5]

There is no evidence of any internal soundbar positions, so all that can be said with certainty is that the hitchpin rail for the V + 7s (K8) choirs was not let into the spine liner, cheek liner, or upper belly rail. With cypress as a soundboard wood it would not be at all necessary (unless, perhaps, a very heavy string was used). Many Italian harpsichords have the 4' hitchpins attached only to the soundboard (anchored with a drop of glue) and no hitchpin rail at all. Given the large soundboard area of the Hasard, plus the two V + 7s choirs, it is likely some form of rail was used. The scribed "rose", clearly visible on the baseboard has been assumed to reflect the original position, although it is not positioned in a very central position, being closer to the V + 7s bridge than the edge of the soundboard. Similarly, there is no evidence to support the suggestion that other roses were also marked on the baseboard but their positions subsequently planed off (proposed by Koster (1980)). Examining the top of the baseboard under raking light shows no evidence of the planning that would be expected were this to be the case. Instead, although the scribed rose may reflect the diameter of any rose, it cannot be considered to necessarily be indicative of its original position. As described by MacTaggart (1978), the painted decoration is in varying

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[3] My thanks to Thomas McCracken (PC) for making available his list of English viol dimensions.
[4] I would like to thank John Koster (PC, 2003) for bringing this to my attention.
[5] See Koster (1980) and Martin (1995).

states of survival, the first and third letters of the maker's surname being almost entirely obliterated. This has caused much speculation over the identity of the maker.

There are some remains of strings on various tuning pins, the diameters quoted in McGeary (1973). Although entirely plausible (even if light – particularly in the bass) they remain open to some speculation. The string diameters were not measured by this author during examination due to the fragile nature of the wire, and this author is unaware of other diameter measurements which have been carried out. As the method that McGeary used to determine the diameter of the strings is unknown, plus the potential inaccuracies of the measuring tools themselves and alteration to the wire diameter itself as a result of oxidisation the quoted diameters should best be considered as only potentially indicative of historical stringing.

CATALOGUE APPENDIX – VIRGINAL LONG FORM

VIRGINAL LONG FORM **Darryl Martin**

1. Reference
Maker :
Place of manufacture :
Date of manufacture :
Location :
Inv No :
Signature :
Inscriptions :.

2. Construction measurements
a. Baseboard :
F Length: **B Length:**
LH Width : **RH Width :**
Thickness - L : **M :** **R :**
Material :
No of planks :
Dimensions - B : **M :** **F :**
Nailed end? : **Nailed spine? :**
Do ends overlap? : **Does spine overlap? :**
b. Casework **Total Front Length T :** **M :** **B :**

	Length			Height			Thickness			Wood
Spine :	**T**	**M**	**B**	**L**	**M**	**R**	**L**	**M**	**R**	
LH case end :	**T**	**M**	**B**	**B**	**M**	**F**	**B**	**M**	**F**	
RH case end :	**T**	**M**	**B**	**B**	**M**	**F**	**B**	**M**	**F**	
LH faceboard :			**B**	**L**	**M**	**R**			**B**	
RH faceboard :			**B**	**L**	**M**	**R**			**B**	
Nameboard :	**T**		**B**	**L**	**M**	**R**	**LT**	**LB**	**RT**	**RB**

Thickness of faceboard cap moulding :
Distance between top of moulding and top of case : L : **R :**
Keywell sides material : **Thickness : L :** **R :**
Total length of keywell side wood (ni moulding) : L : **R :**
Front of keywell side wood to nameboard slot L : **R :**
LH front to Keywell liner : **RH front to keywell liner :**
Framing wood :
LH thickness : **height :**
RH thickness : **height :**
Joins between spine and case ends : **angle LH :** **RH :**
case ends and faceboards :
faceboards and keywell sides :
keywell sides and frames :
frames and spine :
Keywell liner height LH : **RH :**
thickness LH : **RH :**
Keywell liner wood :
Other liner wood : **Dimensions :**
Protrusions under soundboard? :
Distance between top of baseboard and keywell liner LH : **RH :**
c. Wrestplank
Treble wrestplank width : **thickness :** **wood :**
Bass wrestplank width : **thickness :** **wood :**
Wrestplank capping wood :
treble width : **thickness :**
Front length: **Back length :**
bass width : **thickness :**
LH length : **RH length :**
Note : Capping width does not include mouldings, widths with mouldings are :
treble : **bass :**

Ft distance to RH case end at spine (ni moulding) :
Back distance to RH case end at spine (ni moulding) :
Scribed lincs on wrestplank capping :

Tuning pin Diameter : Height : Material :
Tuning pin division :

Tuning pin placements :

d. Soundboard
Soundboard wood :
Maximum annual rings per 25mm :
Minimum annual rings per 25mm :
Top of soundboard to top of casc :
Soundboard thickness at keywell liner :

Scribed lines on soundboard :

e. Soundboard Barring
Barring wood :
Barring dimensions :
Soundboard barring :

f. Bridges
LH bridge pin diameter : Hcight : Material :
RH bridge pin diameter : Height : Material :

	Bass.	C.	c.	c^1.	c^2.	c^3.	Tr.
LH bridge A.							
B.							
C.							
sd ang.							

Bridge material :
Scribed lines on bridge :

Bridge position holes etc. :

	Bass.	C.	c.	c^1.	c^2.	c^3.	Tr.
RH bridge A.							
B.							
C.							
sd ang.							

Bridge material :
Scribed lines on bridge :

Bridge position holes etc. :

Angle of RH bridge to faceboard :
Bridge pins placement :

	ex C	btm	C	F	c	f	c^1	f^1	c^2	f^2	c^3	top
LH: to LH end.												
to spine.												
RH: to RH end.												
to spine.												

Right hand bridge pins to spine :

f^3	f^2	f^1	f	F	F_1
e^3	e^2	e^1	e	E	
e^{b3}	e^{b2}	e^{b1}	e^b	E^b	
d^3	d^2	d^1	d	D	
$c^{\#3}$	$c^{\#2}$	$c^{\#1}$	$c^\#$	$C^\#$	
c^3	c^2	c^1	c	C	Ex C
b^2	b^1	b	B	B_1	
b^{b2}	b^{b1}	b^b	B^b	B^b_1	
a^2	a^1	a	A	A_1	
$g^{\#2}$	$g^{\#1}$	$g^\#$	$G^\#$	$G^\#_1$	
g^2	g^1	g	G	G_1	
$f^{\#2}$	$f^{\#1}$	$f^\#$	$F^\#$		

If positioning marks on bridge then measurements in relation to the spine :

g. Registers

Register slot placement :

	ex C	btm	C	F	c	f	c^1	f^1	c^2	f^2	c^3	top
to LH end.												
to spine.												

Note : when measuring the register the point measured from is the back left hand corner.
Register slot dimensions :
Soundboard leather dimensions :
Length : Width : Thickness :
Any indication as to how slots cut? :
Is soundboard cut out for each or a pair of slots? :
Marks on soundboard leather :

Lower guide wood : Width : Thickness :
How attached to frames : Leathered :
Strengthening bars :

h. Scalings and plucking points
: is the long string

	Str Len	pitch c^2	% pitch c^2	Pl.Pnt	% Pl.Pnt
top note( )	*	*	*	*	*
c^3	*	*	*	*	*
f^2	*	*	*	*	*
c^2	*	*	*	*	*
f^1	*	*	*	*	*
c^1	*	*	*	*	*
f	*	*	*	*	*
c	*	*	*	*	*
F	*	*	*	*	*
C	*	*	*	*	*
btm note( )	*	*	*	*	*
extra C	*	*	*	*	*

Gauge numbers and/or original strings :

String band width :
If scalings aren't integral, is middle of close strings :

Are close strings parallel? :
Are wide strings parallel? :

String lengths :

f^3	f^2	f^1	f	F	F_1
e^3	e^2	e^1	e	E	
e^{b3}	e^{b2}	e^{b1}	e^b	E^b	
d^3	d^2	d^1	d	D	
$c^{\#3}$	$c^{\#2}$	$c^{\#1}$	$c^\#$	$C^\#$	
c^3	c^2	c^1	c	C	Ex C
b^2	b^1	b	B	B_1	
b^{b2}	b^{b1}	b^b	B^b	$B^b{}_1$	
a^2	a^1	a	A	A_1	
$g^{\#2}$	$g^{\#1}$	$g^\#$	$G^\#$	$G^\#{}_1$	
g^2	g^1	g	G	G_1	
$f^{\#2}$	$f^{\#1}$	$f^\#$	$F^\#$		

i. Roscs

1. mm from H end, mm from spine.
Diameter : Bevel : Scribed circle :
2. mm from H end, mm from spine.
Diameter : Bevel : Scribed circle :
3. mm from H end, mm from spine.
Diameter : Bevel : Scribed circle :
4. mm from H end, mm from spine.
Diameter : Bevel : Scribed circle :

Material :

How are they attached to the soundboard? :

j. Hitchpin rails and mouldings
LH case end hitchpin rail width :
height :
material :
pins from LH case end :
pin distances from spine :

Spine hitchpin rail width :
height :
material :
pins from spine :
pin distances from LH case end :

Pin diameter : height : material :
Pin division :

soundboard mouldings width and material :

Case top moulding material : Width : Thick :
Cap moulding material : Width :
faceboard mouldings material : Width :

k. Jackrail

Jackrail material :
Bottom of jackrail to top of soundboard. Bass : Treble :
Jackrail end view dimensions :

Length front : Back :
Nameplate Length : Width :

Bass support piece width : Length left :
Length right :
LH case end inside to left hand side of bass support :

Treble support piece width : Length left :
Length right :
angle to spine :
RH case end to spine/right hand joint :
Note : measurement is from wood inside, not from the papers.

l. Toolbox

Toolbox capping piece material : Height :
distance from faceboard inside L : R :
Toolbox lid hinges at front or back? :
Lid hinge material : Diameter :
Toolbox lid material : Thickness :
Length front : back :
width left : right :

m. Lid and keywell flap.

Lid wood :
Interior height of coffer L: R :
Thickness of lid at front L : M : R :
Lid batten thickness L : R :
Lid batten length L : R :
Inside plank widths B : M : F :
Mouldings on top? :
Type of hinges to spine :
How was lid originally held open? :

Keywell flap wood :
Height L : M : R :
Thickness L : M : R :
Type of hinges to baseboard :
Front edge of baseboard to faceboard moulding front L : R :
Thickness of moulding bandings on faceboards :
Hinge and lock material :
Hinge and lock thickness :

Moulding details :

3. Keyboard
a. Compass :
b. Keyframe
Keyframe sides material : Thickness :
LH side width : RH side width :
Backrail material : Thickness : Width :
rack from front of backrail L : R :
Type of joints between backrail and keyframe sides :
Frontrail material : Thickness : Width :
Type of joints between frontrail and keyframe sides :
Balance rail material : Height : Width :
Chamfers :
Type of joints between balance rail and keyframe sides :
Front of balance rail from front of keyframe :
Rack material : Thickness : Width :
Scribed lines on rack :

Balance pin diameter : Height : Material :
LH endblock length : Width : Material :
Height at front : Height at back :
Top of baseboard to btm of moulding panel F : B :
RH endblock length : Width : Material :
Height at front : Height at back :
Top of baseboard to btm of moulding panel F : B :
Top of baseboard to top of keyplate at ft. L : M : R :
Keyfront batten height : Thickness : Material : Length :
Is it let flush into the endblocks or overlap?
Front in relation to faceboard front :
Overall width between keywell sides at btm :
Overall width between endblocks :

c. Keylevers
Keylever material :
Keylever thickness front : back :
Rackpin material : diameter :
Overall width of keyboard :
3 octave span : C - b^1 : F - e^1 : c - b^2 :

Bass Treble

Total keylength :
Ft of touchplate to balance point :
Keylever ratio :
Accidentals balance: mm behind naturals :
Do pins rock at bottom or middle of keylever hole? :
Scribed lines on keyplank :

Are sides of keys planed or sawn? :
How are front of naturals cut out? :
d. Natural touchplates
Natural touchplate material :
Natural touchplate thickness front : back :
Overhang of plate on lever :
Total touchplate length (if consistent) :
Natural headlength Bass : Middle : Treble :
Scribed lines at :
Details of chamfers and notches :

How were touchplates glued to keylevers? :
Touchplate back widths :

F_1	G_1	A_1	B_1	C	D	E	
F	G	A	B	c	d	e	
f	g	a	b	c^1	d^1	e^1	
f^1	g^1	a^1	b^1	c^2	d^2	e^2	
f^2	g^2	a^2	b^2	c^3	d^3	e^3	f^3

Lettering transcriptions :

e. Accidental touchplates
Accidental touchplate material :
Accidental touchplate length bass : middle : treble :
Dimensions of accidental touchplates :

f. Arcades
Arcade thickness :
Arcade width : height :
Arcade design :

g. Cloths
Details of original cloths :

h. Jacks
The following jacks are original :

Dimensions :

Numbering transcriptions :

Jack body material :
Jack tongue material :
Is plectrum hole crescent shaped? :
Axle pin diameter :

4. Decoration details
a. Case exterior decoration :

b. Soundboard decoration :

c. Keywell and faceboard decoration :

d. Soundwell decoration :

e. Lid and keywell flap decoration :

f. Stand details :

Marks on case/baseboard (inc face marks) :

Details of wear (ie jackrail for music, feet on stand) :

5. Alteration Details :

6. Restoration Details :

7. Commentary :

8. Instrument ownership history :

9. Bibliography :

Acknowledgements and other details :