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PORTABLE

CLAVICHORD

No. 36

OWNER'S MANUAL

PORTABLE CLAVICHORD

by Peter Bavington, 2016 (No. 36)

This clavichord is an original design, intended to provide a portable instrument playing at standard pitch. The general plan was suggested by a clavichord in the Vienna Kunsthistorisches-museum collection in which, as in this instrument, reduced size is made possible by the use of single stringing for part of the compass.

ACCESSORIES

Tuning key: this should be kept in the socket provided for it at the left-hand end of the instrument.

The following items may be kept in the toolbox to the left of the keyboard; note that the lid of the toolbox slides forward to open:

Cloth strip (see page 6);
Wooden wedge for inserting cloth strip between strings;
Felt wedge for minor tuning adjustments;
Spare pivot-pin for easing keys;
Stringing tool (see pages 8–9);
Miniature wire cutter (alias nail-clipper).

ENVIRONMENTAL CONDITIONS

This is a robust and stable instrument and, generally speaking, conditions that are comfortable for you will do no harm to the instrument. Nonetheless, it would be wise not to expose it unnecessarily to sudden fluctuations of temperature and humidity. Avoid excessively dry atmospheres (e.g. centrally heated rooms without humidification) and do not leave the clavichord in direct sunlight. Keep the lid closed when the instrument is not in use.

STRINGING

The stringing is in two sections:

(1) the 17 notes from *C* to *e* (a minor sixth below middle C) have a single over-wound string each.

(2) from note *f* upwards, there are two plain brass strings to each course.

Details of the strings are given on the back page of this booklet.

FRETTING

Up to and including note *e* (a minor sixth below middle C) a single separate string is provided for each note. From note *f* upwards the instrument is diatonically fretted: this means that in each octave the following pairs of notes are obtained from a single course:

C and C#/D♭; E and D#/E♭; F and F#/G♭;
G and G#/A♭; B and A#/B♭.

All the Ds and As are unfretted.

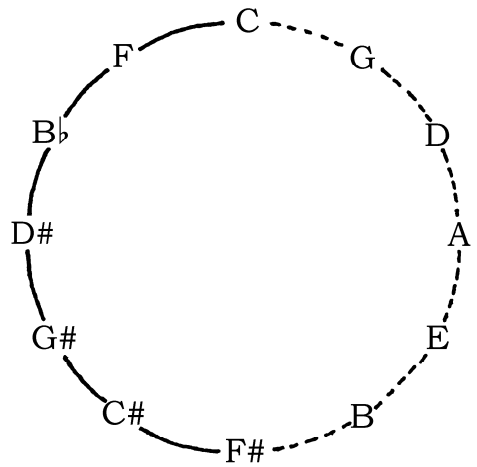
Fretting imposes certain limitations on what it is possible to play. You cannot sound the paired notes simultaneously, so occasionally you may have to omit a note, or curtail it by lifting the finger before it has sounded for its full value. Moreover, when playing the paired notes one after another, you will produce an ugly sound if there is any overlap, especially when descending. Minor-second *appoggiature* in particular may need special care. With practice, though, it is possible to produce a *legato*, and to play rapid ornaments, even when all the notes involved are produced from a single pair of strings.

PITCH

The instrument is designed to play at modern standard pitch (a^1=440 Hz).

TEMPERAMENT

The fretting is based on the temperament generally called 'Thomas Young No. 2', which makes it possible to play music of any period. There are six narrowed and six perfect fifths, as shown in the following diagram:



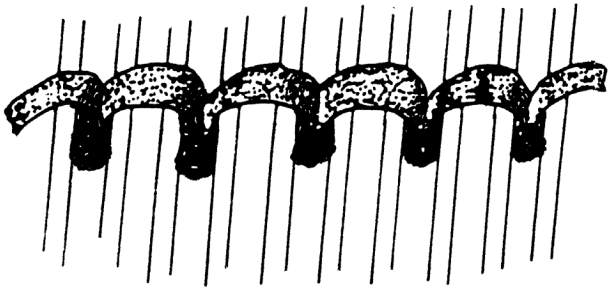
Pure: ——— Narrowed fifth/wide fourth: - - - - -

For a practical method of setting this temperament on the instrument, see page 6 below.

TUNING

Please always use the tuning key supplied with the instrument. To help you find your place, the tuning pins for all the C's are indicated by a red washer.

A full tuning, including re-setting the temperament, should be required only three or four times a year. I suggest you begin by silencing one of each pair of strings in the double-strung section, using the strip of cloth supplied. Starting with the gap immediately behind the topmost double course (note d^3) and working towards the front of the instrument, use the wooden wedge to push the felt between the strings, passing over four strings at a time, thus:



If the cloth is correctly positioned, only one string of each course in the double-strung section will sound; the whole instrument will, in effect, be single-strung. The sounding strings will be controlled by the two outer rows of tuning pins: use these for your tuning. First set the temperament (as described below), then tune the remaining notes upwards and downwards by octaves. Below note *e* you must tune every note but, because of the diatonic fretting, from note *f* upwards you need only tune the natural notes: the sharps and flats should then automatically be in tune (though it is wise to check).

When you are satisfied with your tuning of the whole instrument in its single-strung state, remove the cloth strip and tune the second string of each note, using this time the inner rows of tuning pins.

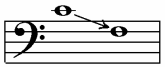
For touching-up the tuning of individual courses, on occasions when a full tuning is not necessary, you can use the felt wedge supplied.

SETTING THE TEMPERAMENT

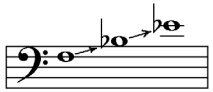
There are a number of possible methods: the best is the one which works best for you. The following scheme, relying mostly on pure intervals, does not require special training or skill, can be done quickly, and is capable of producing good results.

Begin by silencing one string of each pair in the double-strung section, as described above (page 5). Use a standard tuning fork to set the pitch of note *c*¹ (middle C). Then proceed as follows:

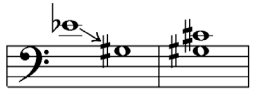
1. Tune *f* a perfect fifth below *c*¹.



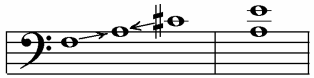
2. Tune *b*♭ a pure fourth above *f* and *e*♭¹ a pure fourth above *b*♭.



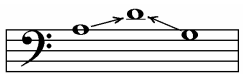
3. Tune *g*#/*a*♭ a pure fifth below *e*♭¹. Check that *g*#–*c*#¹ is a pure fourth.



5. Now tune note *a* so that the third *f*–*a* and the third *a*–*c*#¹ sound equal Both thirds will be somewhat wide. Check that *a* makes an acceptable fifth with *e*¹: it will be somewhat narrow.



6. Finally, tune *d*¹ so that it makes an acceptable fourth with *a* and an acceptable fifth with *g*: the fourth will be slightly wide and the fifth slightly narrow.



At this point, all the notes in the octave *f*–*f*¹ are tuned. Tune the remainder of the instrument by pure octaves, first moving upwards to the treble and then downwards to the bass.

These tuning instructions are summarised in shorthand form on the card supplied, which can be kept with the instrument.

TO REMOVE THE OVER-RAIL

This rail covers the damping cloth (also known as 'listing') and also serves as music rest. You will need to remove it to get access to the hitch-pins, for instance when replacing a broken string. It is secured at the left by two pins passing horizontally into sockets in the side of the instrument, at the back by blocks under the spine moulding, and at the right by an L-shaped pin passing vertically into the hitch-pin rail.

First withdraw the L-shaped pin, which is held in place by friction only: you may need to loosen it by rotating a quarter-turn in either direction. Then move the whole rail approximately one inch (25 mm) to the right, disengaging the left-hand pins from their socket; raise the front edge of the rail a little until it is free at the back, and lift it off.

Replacing is the reverse of the above.

TO REMOVE INDIVIDUAL KEYS

Keys may have to be removed to deal with problems arising with the tangents, pivot-pins or guide slips, or to retrieve objects accidentally lodged inside the instrument. A key which is straight (or nearly straight) can usually be removed by lifting it off its pivot-pin and simply drawing it forward, keeping the tangent end as low as possible so as not to foul the strings. To remove cranked keys, it is usually best to start by removing the nearest straight key, and then adjacent keys until you reach the one you want.

The lowest 18 keys (notes *C* to *f*) are heavily cranked, and keys in the middle of this section cannot be removed individually. It is best to start by removing one of the keylevers at the end of this group – either the lever for *C* or for *f* – and work inwards until you reach the note you want.

REPLACING BROKEN STRINGS

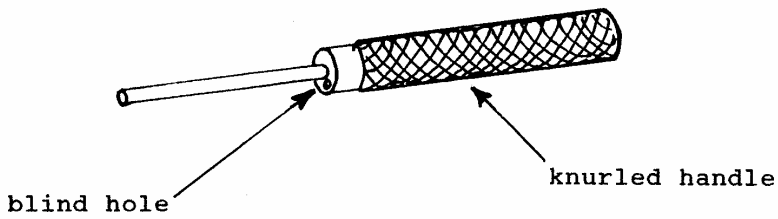
Do *not* begin by removing the broken string. First remove the over-rail, as described on page 7 above. Then identify the broken string, and check which note it belongs to. Now find the correct replacement string by referring to the string-list on the back page of this leaflet.

Extract the tuning pin from its hole (I can supply a special tool for this purpose). Take the new string from its packet. Bend about 1½ inches (30 mm) of the plain, untwisted end of the new wire back on itself. Lift the loop of the old, broken string off the hitch-pin, and hook the bent end of the new string through the loop. Now use the old string to pull the new one through the listing cloth. Once the new string is safely through the listing, place the new loop on the hitch-pin and discard the broken string.

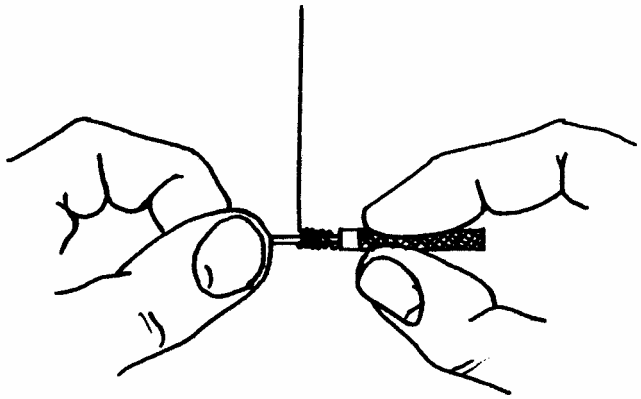
The next step is to wind the string on to the tuning pin: I recommend that you use the special tool supplied for this purpose (see opposite). First, line up the new string so that it passes over the vacant tuning pin hole: you will need about 4 inches (100 mm) of wire beyond the hole (somewhat less for thicker wires), so cut off any excess using the clippers supplied. Put the end of the wire into the blind hole in the handle of the stringing tool, and turn the tool so that it is at right angles to the wire, with the handle in your right hand (see opposite). Now roll the tool forwards so that the wire forms a tight coil round the narrow part of the tool: continue until you reach the vacant tuning pin hole.

Slip the coil off the tool and cut off the uncoiled end. Now, taking the coil in your left hand and the tuning pin in your right, gently push the coil over the bottom end of the pin whilst revolving it anticlockwise. The coil will grip tightly, but revolving the pin anticlockwise loosens it temporarily just enough for you to be able to slide it up and down the pin. Adjust the coil in this way until it matches the position of the coils on the neighbouring pins. Now push the pin into the hole with the tuning key, and use your fingers to coax the wire into its correct position on the bridge. Check that the hitch-pin end is secure, that the tuning pin is roughly the same height as its neighbours, and that the wire leaves the bridge at roughly the same downward angle as neighbouring strings. It is now safe to tune the new string to pitch. Finally, replace the over-rail.

Spare strings of various gauges are supplied with the instrument. Further replacement strings can be ordered from me, including the specially-made over-wound strings which are fitted for note *e* and below.



Stringing tool



Stringing tool in use

note	material	gauge (mm)	note	material	gauge (mm)
C–e	Overwound strings		*b♭¹/ b¹*	IWS brass	0.305
f/f#	IWS brass	0.405	*c²/ c#²*	"	0.305
g/g#	"	0.405	*d²*	"	0.279
a	"	0.405	*e♭²/e²*	"	0.279
b♭/b	"	0.356	*f²/f#²*	"	0.254
c¹/c#¹	"	0.330	*g²/g#²*	"	0.254
d¹	"	0.330	*a²*	"	0.254
e♭¹/e¹	"	0.305	*b♭²/b²*	"	0.254
f¹/f#¹	"	0.305	*c³/c#³*	"	0.254
g¹/g#¹	"	0.305	*d³*	"	0.254
a¹	"	0.305	*e♭³/ e³*	"	0.254

In this list :
'IWS' means harpsichord brass wire supplied by Instrument Workshop, USA.

Spare strings of various gauges are supplied with the instrument. Further replacement strings can be ordered from me, including the specially-made overwound strings which are fitted for the lowest 17 courses (notes *C–e*).