A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 17:36

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 17:44

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§1 PREFACE

This paper is a result of my experiences with arranging lute music by the great master of the baroque lute, Silvius Leopold Weiss, on the alto guitar, and my efforts to clarify my thoughts on scordatura and connected topics such as notation and tuning.

To keep the theory compact, some definitions (of terms), abbreviations and representations will be presented. If not explicitly otherwise stated, any such definition, abbreviation or representation is my own.

The analysis of Weiss music, the results of which are presented in this paper, is based on the tablatures and scores provided by Jean-Daniel Forget. Many thanks to him for the tremendous work he dedicated to Weiss, for the benefit of all of us.

§2 NOTATION

In this paper, notes are named by a variant of the Helmholtz notation.
This variant differs from the original Helmholtz notation by replacing subscripts and superscripts by numbers.

Examples:
c'' is replaced by c2
C, is replaced by C1.

Using this variant avoids the occurrence of a certain problem in the editor software.
The same variant is used by Per-Olof Johnson in his description of the alto guitar.

In connection with lutes and guitars there exist two types of musical notation, namely tablature and stave. In this paper we focus on stave.
In the baroque period lute music was usually notated by tablature. The description of the rules for the transformation of lute music from tablature to stave is not in the scope of this paper, so we consider the result of this transformation to be the base of an alto arrangement.

In stave notation, a note is represented by a note symbol, possibly modified by a sharp or flat sign. The corresponding note name is determined by the clef. The clef which is normally used in scores for the alto (as well as for the classical guitar and the baroque lute) is the suboctave treble clef, which is written as a treble clef with an eight below it. In comparison to the treble clef note symbols are placed one octave higher. So the note symbol between the third and fourth line represents an a and not an a1.
In scores for the classical guitar, it is common practice to omit the eight below the treble clef. So what appears to be a treble clef is in reality a suboctave treble clef.
However, Jean-Daniel Forget never omits the eight in his Weiss scores.

The term note name used above does not include a precise synchronization with tone frequencies. In connection with classical guitars and alto guitars it is normal, to synchronize according to the modern concert pitch (with 440 hz for a1). In the Baroque Era, there was no universally recognized pitch standard, but musicologists tend to consider about 415 hz for a1 to be realistic for Weiss music.

As the alto guitar is used as a transposing instrument, scores for the alto guitar are normally notated three semitones below sound.

In this paper, the following abbreviations will be used:

AA-notation:
Notation used in the scores of alto arrangements.
The key in the scores of an alto arrangement is called nominal key, transposing key, arranging key or AA-key.
The formulation 'tuning in AA-notation' which will be used in the following, means, that the notes specified have to be interpreted relatively to AA-notation, i.e. belong to AA-notation.

A-notation:
Notation three semitones obove AA-notation, representing the sound of an alto guitar.
The key of a piece of music in A-notation is called A-key.
The formulation 'tuning in A-notation' means, that the notes specified belong to A-notation.

O-notation:
Notation used in the scores for the lute (original instrument).
The key in the scores of a piece of music for the lute is called O-key.
The formulation 'tuning in O-notation' means, that the notes specified belong to O-notation.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 17:52

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§3 TUNING OF AN ALTO GUITAR

Representation:
A TUNING OF AN 11 STRING ALTO GUITAR is represented by a sequence of note names n1 n2 n3 ... n11, where n1 = tuning of string 1, n2 = tuning of string 2 and so on.

Definition:
The STANDARD TUNING OF AN 11 STRING ALTO GUITAR in A-notation is
g1 d1 a f c G F Eb D C B1b

This is precisely the 'tuning' of an 11 string alto guitar given by Per-Olof Johnson in the book 'Altgitarren' (on page II of the translation of the first 12 pages into English by Sten Edebäck).

Conclusion:
The STANDARD TUNING OF AN 11 STRING ALTO GUITAR in AA-notation is
e1 b f# d A E D C B1 A1 G1

Representation:
A TUNING OF A 13 STRING ALTO GUITAR is represented by a sequence of note names n1 n2 n3 ... n13, where n1 = tuning of string 1, n2 = tuning of string 2 and so on.

Definition:
The STANDARD TUNING OF A 13 STRING ALTO GUITAR in A-notation is
g1 d1 a f c G F Eb D C B1b A1 G1

This is precisely the 'tuning' of a 13 string alto guitar given by Per-Olof Johnson in the book 'Altgitarren' (on page II of the translation of the first 12 pages into English by Sten Edebäck).

Conclusion:
The STANDARD TUNING OF A 13 STRING ALTO GUITAR in AA-notation is
e1 b f# d A E D C B1 A1 G1 F1# E1

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 17:58

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§4 TUNING OF A BAROQUE LUTE

The strings of a baroque lute are grouped by courses.
Courses 1 to 2 are single-strung.
Each of the courses 3 to 6 consist of two strings which are tuned in unison.
Each of the other courses consists of two strings which are tuned in octave.

Representation:
A tuning of an 11 course baroque lute is represented by an expression t1 t2 (t3) (t4) ... (t11), where

t1 = tuning of the single string of course1
t2 = tuning of the single string of course2
t3 = tuning of the two strings of course 3, in ascending order of strings
t4 = tuning of the two strings of course 4, in ascending order of strings
...
t11 = tuning of the two strings of course 11, in ascending order of strings

Definition:
The standard tuning of an 11 course baroque lute in O-notation is
f1 d1 (aa) (ff) (dd) (AA) (gG) (fF) (ebEb) (dD) (cC)

If a course contains two strings, both are simultaneously fretted by the same finger, and the corresponding pair of notes is represented in the scores by a single note. If the two strings are tuned in octave, the lower of the two notes is represented in the scores. For instance, the course (gG) is represented in the scores by a G.

Representation:
A tuning of a 13 course baroque lute is represented by an expression t1 t2 (t3) (t4) ... (t13), where
t1 = tuning of the single string of course1
t2 = tuning of the single string of course2
t3 = tuning of the two strings of course 3, in ascending order of strings
t4 = tuning of the two strings of course 4, in ascending order of strings
...
t13 = tuning of the two strings of course 13, in ascending order of strings

Definition:
The standard tuning of a 13 course baroque lute in O-notation is
f1 d1 (aa) (ff) (dd) (AA) (gG) (fF) (ebEb) (dD) (cC) (BbB1b) (AA1)

There seems to be a consensus with regard to the standard tuning of courses 1 to 6, but not with regard to the standard tuning of the other courses.
The definitions chosen here facilitate showing a certain parallelism of baroque lute and alto guitar. In addition, the 13 course variant of this tuning obviously plays an outstanding role among the tunings used by Weiss for the 13 course lute. Details of these aspects will be presented later.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:05

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§5 SCORDATURA

According to the Concise Oxford Dictionary of Music (1996) a scordatura is an abnormal tuning of a string instrument in order to obtain special chordal effects and changes of tonal quality.

So, focussing on technical aspects, according to our terminology, we have the following definition:
A scordatura is a tuning of a string instrument, which differs from the standard tuning of this instrument.

Usually an instrument has strings, which keep their standard tuning, whatever scordatura is applied, whereas the other strings may be involved in retuning. The latter are called the variably tuned strings.
Courses of a baroque lute with variably tuned strings are called variably tuned courses.

Obviously Weiss keeps the tuning of courses 1 to 6 constant. So the variably tuned courses are the courses 7 to 11 and 7 to 13 for an 11 course baroque lute and a 13 course baroque lute respectively.

The further development of the theory will deal with different tunings for an instrument. Doing so has the advantage, that standard tuning does not have to be treated as an exception.

In order to avoid superfluous repetitions, the representation of the tunings will be restricted to the variably tuned strings. Besides specifying the note names for the variably tuned strings, any such tuning will be characterized in terms of retuning based on standard tuning.

The following definition will be used for the description of the tunings of the variably tuned strings both of baroque lutes and altos.

Definition:
The key-specific descending note sequence of length n for a key and a start note (where the start note is a note of the musical scale of the key) is a sequence of notes, which is determined as follows:
. The first note is the start note
. The second note is the next lower note to the start note, in the scale of the key
. The third note is the next lower note to the second note, in the scale of the key
...
. The nth note is the next lower note to the (n-1)th note, in the scale of the key
For minor keys the natural scale is the relevant scale.

Example:
The key-specific descending note sequence of length 8 for major key A and start note E is
E D C# B1 A1 G1# F1# E1
As will be shown later, the tuning of the variably tuned strings for the performance of a piece of music by Weiss is mostly determined by the key of the piece, insofar as the variably tuned courses reflect a contiguous part of the musical scale of the key (plus octaves).
This is the motivation, to define for every combination of instrument type (11 course baroque lute, 13 course baroque lute) and key a special tuning, which is called the natural tuning of this key for the given instrument type.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:17

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§6 NATURAL TUNINGS OF AN 11 COURSE BAROQUE LUTE

§6.1 ALGORITHM

The natural tuning of the variably tuned strings for a key on an 11 course baroque lute is determined as follows:

Step 1:
Determine the start note in O-notation as follows:
= G#, if the key signature consists of 3#, 4#, 5#, 6#
= Gb, if the key signature consists of 5b or 6b
= G, else

Step 2:
Determine the key-specific descending note sequence n1 n2 n3 n4 n5 for the key and the start note

Step 3:
Determine the natural tuning of the variably tuned strings as
(o1 n1) (o2 n2) (o3 n3) (o4 n4) (o5 n5)
where o1 = n1 + one octave, o2 = n2 + one octave and so on.

Example:
Given: Key = E (key signature = 4#)
=> Start note = G#
Key-specific descending note-sequence of length 5 = G# F# E D# C#
Tuning = (g#G#) (f#F#) (eE) (d#D#) (c#C#)

As the musical scales for the major and minor keys with the same key signature contain the same notes, the natural tunings for a major key and the minor key with the same key signature are identical.

§6.2 COMPLETE LIST OF NATURAL TUNINGS OF AN 11 COURSE BAROQUE LUTE

I) TUNING OF VARIABLY TUNED STRINGS (in O-Notation):

Tuning for key signature =6#: (g#G#) (f#F#) (e#E#) (d#D#) (c#C#)
Tuning for key signature =5#: (g#G#) (f#F#) (eE) (d#D#) (c#C#)
Tuning for key signature =4#: (g#G#) (f#F#) (eE) (d#D#) (c#C#)
Tuning for key signature =3#: (g#G#) (f#F#) (eE) (dD) (c#C#)
Tuning for key signature =2#: (gG) (f#F#) (eE) (dD) (c#C#)
Tuning for key signature =1#: (gG) (f#F#) (eE) (dD) (cC)
Tuning for key signature = : (gG) (fF) (eE) (dD) (cC)

Tuning for key signature =1b: (gG) (fF) (eE) (dD) (cC)
Tuning for key signature =2b: (gG) (fF) (ebEb) (dD) (cC)
Tuning for key signature =3b: (gG) (fF) (ebEb) (dD) (cC)
Tuning for key signature =4b: (gG) (fF) (ebEb) (dbDb) (cC)
Tuning for key signature =5b: (gbGb) (fF) (ebEb) (dbDb) (cC)
Tuning for key signature =6b: (gbGb) (fF) (ebEb) (dbDb) (cbCb)
So the tunings for key signatures 2b and 3b are identical with standard tuning.

II) RETUNING BASED ON STANDARD TUNING:

Retuning for key signature =6#: Sharpen courses 7, 8, 9(twice), 10, 11
Retuning for key signature =5#: Sharpen courses 7, 8, 9, 10, 11
Retuning for key signature =4#: Sharpen courses 7, 8, 9, 10, 11
Retuning for key signature =3#: Sharpen courses 7, 8, 9, 11
Retuning for key signature =2#: Sharpen courses 8, 9, 11
Retuning for key signature =1#: Sharpen courses 8, 9
Retuning for key signature = : Sharpen course 9
Retuning for key signature =1b: Sharpen course 9
Retuning for key signature =2b:
Retuning for key signature =3b:
Retuning for key signature =4b: Flatten course 10
Retuning for key signature =5b: Flatten courses 7, 10
Retuning for key signature =6b: Flatten courses 7, 10, 11

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:20

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§6.3 UNIFORMITY OF THE O-NOTATION FOR VARIABLY TUNED COURSES

The set of pairs (key signature, corresponding natural tuning) for the 11 string baroque lute has a property, which is important for sight-reading:

Given an arbitrary variably tuned course, the empty strings of this course are represented by the same note symbol in the scores, whatever natural tuning is used. This representation is called the standard representation of this course (in O-notation).

Example:
Course 10 is represented by a note symbol, which is divided in the middle by the 4th ledger line below the five line stave.
Using key signature 4#, the 10th course is tuned to (d#D#), and, the key signature containing a # for d, the 10th course is represented within the scores by this note symbol, without modification.
Using key signature 2#, the 10th course is tuned to (dD), and, the key signature containing no # for d, the 10th course is represented within the scores by the same note symbol, without modification.
Using key signature 4b, the 10th course is tuned to (dbDb), and, the key signature containing a b for d, the 10th course is represented within the scores by the same note symbol, without modification.

Hint:
There are examples of Weiss pieces, the tuning of which is the natural tuning for some key signature, but the key signature of the piece differs from this key signature. In this case the representation of a variably tuned course is not necessarily identical with the standard representation of this course (in O-notation).

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:27

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§7 NATURAL TUNINGS OF A 13 COURSE BAROQUE LUTE

§7.1 ALGORITHM

The natural tuning of the variably tuned strings of a 13 course baroque lute for a key is determinded as follows:

Step 1:
Determine the start note in O-Notation as follows:
= G#, if the key signature consists of 3#, 4#, 5#, 6#
= Gb, if the key signature consists of 5b or 6b
= G, else

Step 2:
Determine the key-specific descending note sequence n1 n2 n3 n4 n5 n6 n7 for the key and the start note

Step 3:
Determine the natural tuning of the variably tuned strings as
(o1 n1) (o2 n2) (o3 n3) (o4 n4) (o5 n5) (o6 n6) (o7 n7)
Where o1 = n1 + one octave, o2 = n2 + one octave and so on.

§7.2 COMPLETE LIST OF NATURAL TUNINGS OF A 13 COURSE BAROQUE LUTE

I) TUNING OF VARIABLY TUNED STRINGS (in O-Notation):

Tuning for key signature =6#:	(g#G#)	(f#F#)	(e#E#)	(d#D#)	(c#C#)	(BB1)	(A#A1#)
Tuning for key signature =5#:	(g#G#)	(f#F#)	(eE)	(d#D#)	(c#C#)	(BB1)	(A#A1#)
Tuning for key signature =4#:	(g#G#)	(f#F#)	(eE)	(d#D#)	(c#C#)	(BB1)	(AA1)
Tuning for key signature =3#:	(g#G#)	(f#F#)	(eE)	(dD)	(c#C#)	(BB1)	(AA1)
Tuning for key signature =2#:	(gG)	(f#F#)	(eE)	(dD)	(c#C#)	(BB1)	(AA1)
Tuning for key signature =1#:	(gG)	(f#F#)	(eE)	(dD)	(cC)	(BB1)	(AA1)
Tuning for key signature = :	(gG)	(fF)	(eE)	(dD)	(cC)	(BB1)	(AA1)
Tuning for key signature =1b:	(gG)	(fF)	(eE)	(dD)	(cC)	(BbB1b)	(AA1)
Tuning for key signature =2b:	(gG)	(fF)	(ebEb)	(dD)	(cC)	(BbB1b)	(AA1)
Tuning for key signature =3b:	(gG)	(fF)	(ebEb)	(dD)	(cC)	(BbB1b)	(AbA1b)
Tuning for key signature =4b:	(gG)	(fF)	(ebEb)	(dbDb)	(cC)	(BbB1b)	(AbA1b)
Tuning for key signature =5b:	(gbGb)	(fF)	(ebEb)	(dbDb)	(cC)	(BbB1b)	(AbA1b)
Tuning for key signature =6b:	(gbGb)	(fF)	(ebEb)	(dbDb)	(cbCb)	(BbB1b)	(AbA1b)

So the tuning for key signature 2b is identical with standard tuning.

II) RETUNING BASED ON STANDARD TUNING:

Retuning for key signature =6#:	Sharpen courses	7,	8,	9(twice),	10,	11,	12, 13
Retuning for key signature =5#:	Sharpen courses	7,	8,	9,	10,	11,	12, 13
Retuning for key signature =4#:	Sharpen courses	7,	8,	9,	10,	11,	12
Retuning for key signature =3#:	Sharpen courses	7,	8,	9,		11,	12
Retuning for key signature =2#:	Sharpen courses		8,	9,		11,	12
Retuning for key signature =1#:	Sharpen courses		8,	9,			12
Retuning for key signature = :	Sharpen courses			9,			12
Retuning for key signature =1b:	Sharpen course			9,			
Retuning for key signature =2b:							
Retuning for key signature =3b:	Flatten course						13
Retuning for key signature =4b:	Flatten courses				10,		13
Retuning for key signature =5b:	Flatten courses	7,			10,		13
Retuning for key signature =6b:	Flatten courses	7,			10,	11,	13

§7.3 UNIFORMITY OF THE O-NOTATION FOR VARIABLY TUNED COURSES

This property is also valid for the 13 course baroque lute (for details see §6.3).

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:50

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§8 TUNINGS IN THE DRESDEN AND LONDON WEISS MANUSCRIPTS

The following analysis is based on the details about tunings provided by Jean-Daniel Forget.

The scope of the analysis are all pieces in the Dresden and London Weiss Manuscripts, with the exception of the duos of the Dresden Manuscript and the concerts of the London Manuscript.

§8.1 CLASSIFICATION OF THE SCORES

The scores are assigned to three classes:

Suite:
A set of connected pieces which is originally called a suite, a suonata or a partie.

Sequence of pieces:
A set of connected pieces which is no suite.

Single piece:
A piece of music which is not connected to another piece.

The Dresden MS consists of 34 suites.
The London MS consists of 27 suites, 3 sequences of pieces and 34 single pieces.

§8.2 KEY-CONFORM AND INDIVIDUAL TUNING

The following definitions will be used in the analysis of Weiss scores.

Definition:
A piece of music has key-conform tuning on an instrument, if the tuning for the piece is identical with the natural tuning for the key of the piece on this instrument.

Definition:
A suite / sequence of pieces has key-conform tuning, if all pieces of the suite / sequence have key-conform tuning.

Definition:
A piece of music / suite / sequence of pieces has individual tuning, if it hasn't key-conform tuning.

Conclusion for 13 course baroque lutes:
If a suite / sequence of pieces has key-conform tuning, and all pieces in the suite / sequence of pieces have the same tuning, then all these pieces have the same key signature.
Proof:
Let us assume that this conclusion is not true. Then there exists a suite with the same tuning for all pieces, but at least two pieces having different key signatures. From the list of natural tunings on a 13 course baroque lute follows, that two different key signatures also have different tunings. This is a contradiction to the assumption.
Comment:
The same conclusion is not valid in context with 11 course baroque lutes, as key signatures blank and 1b have the same tunings (likewise 2b and 3b).

§8.3 LEVEL OF ASSIGNMENT OF A TUNING

For every suite / sequence of pieces / single piece in the two manuscripts, the level of assignment of a tuning is the same suite / sequence of pieces / single piece.

In other words: A tuning is never changed within a suite or sequence of pieces.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:54

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§8.4 WEISS MUSIC FOR AN 11 COURSE BAROQUE LUTE

Key signature 3#:

Suites in the Dresden MS with key-conform tuning:
No 17 (A)

Key signature 2#:

Single pieces in the London MS with key-conform tuning:
No 6 (D)

Key signature 1b :

Suites in the London MS with key-conform tuning:
No XIV (F) : Jean-Daniel Forget assigns a 13 course lute, but in fact an 11 course lute is sufficient

Single pieces in the London MS with key-conform tuning:
No 3 (F), 4 (F), 25 (d), 39 (d), 40 (d)

Key signature 2b :

Single pieces in the London MS with key-conform tuning (standard tuning):
No 8 (Bb), 9 (Bb), 10 (Bb), 28 (Bb)

Key signature 3b :

Single pieces in the London MS with key-conform tuning (standard tuning):
No 27 (c)

Mixed key signatures:

Sequence of pieces in the London MS with individual tuning:
No 57 (G and g): Used tuning: Natural tuning for key G.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 18:58

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§8.5 WEISS MUSIC FOR A 13 COURSE BAROQUE LUTE

§8.5.1 WEISS MUSIC FOR A 13 COURSE BAROQUE LUTE, WITHOUT COURSE 13 BEING USED

Key signature 2#:

Suites in the London MS with key-conform tuning:
No II (D)

Single pieces in the London MS with key-conform tuning:
No 67 (D)

Key signature 1#:

Suites in the London MS with key-conform tuning:
No IV (G)

Key signature :

Single pieces in the London MS with key-conform tuning:
No 61 (C), 62 (C)

Key signature 1b:

Suites in the Dresden MS with key-conform tuning:
No 3 (F, Sarabande in d)

Single pieces in the London MS with key-conform tuning:
No 59 (F), 16 (d)

Key signature 2b:

Suites in the London MS with key-conform tuning (standard tuning):
No III (g, Menuet ii in Bb)

Key signature 3b:

Jean-Daniel Forget only provides tunings for courses 1 to 12.
It is assumed, that the unused course 13 is tuned to (AA1) in O-notation, which is identical to the typical tuning for key signature 3b in context with course 13 being used.

Suites in the Dresden MS:
No 31 (c).
Used tuning: Natural tuning for Bb/g (standard tuning) => individual tuning

Suites in the London MS:
No VI (Eb), V (c).
Used tuning: Natural tuning for Bb/g (standard tuning) => individual tuning

Mixed key signatures:

Suites in the Dresden MS with individual tuning:
No 9 (C and c): Used tuning: Natural tuning for key C

§8.5.2 WEISS MUSIC FOR A 13 COURSE BAROQUE LUTE, WITH COURSE 13 BEING USED

Key signature 3#:

Suites in the Dresden MS with key-conform tuning:
No 18 (A), 19 (A), 20 (A, Sarabande in f#), 21 (A, Sarabande in f#), 22 (A), 23 (f#, Sarabande in A)

Suites in the London MS with key-conform tuning:
No VIII (A, Sarabande in f#), XI (A)

Key signature 2#:

Suites in the London MS with key-conform tuning:
No XIII (D) , XX (D)

Sequences of pieces in the London MS with key-conform tuning:
No 66 (D)

Single pieces in the London MS with key-conform tuning:
No 65 (D)

Key signature 1#:

Suites in the London MS with key-conform tuning:
No XVI (G, Sarabande in e)

Single pieces in the London MS with key-conform tuning:
No 11 (G), 13 (G), 18 (G)

Key signature :

Suites in the Dresden MS with key-conform tuning:
No 10 (C, Sarabande in a), 11 (C), 12 (C, Sarabande in a), 13 (a, Rigaudon in C), 14 (a, Sarabande in C), 15 (a), 16 (a, Sarabande in C)

Suites in the London MS with key-conform tuning:
No XII (C) , XXIII (a)

Single pieces in the London MS with key-conform tuning:
No 23 (C), 35 (C), 36 (C), 63 (C), 64 (C), 26 (a)

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:01

Key signature 1b :

Suites in the Dresden MS with key-conform tuning:
No 1 (F), 2 (F, Sarabande in d), 4 (F, Sarabande in d), 5 (d), 6 (d), 7 (d, Sarabande in F), 8 (d, Sarabande in F)

Suites in the London MS with key-conform tuning:
No I (F, Sarabande in d) , XXII (F, Sarabande in d), XXV (F, Menuet 2do in d), XXVI (F, Sarabande in d), VII (d), IX (d), Suite en duo (d, Menuet in F)

Single pieces in the London MS with key-conform tuning:
No 2 (F), 48 (F), 22 (d)

Key signature 2b :

Suites in the Dresden MS with key-conform tuning (standard tuning):
No 24 (Bb, Sarabande in g), 25 (Bb), 26 (Bb), 27 (Bb, Sarabande in g), 29 (g, Sarabande in Bb), 30 (g, Polonoise in Bb)

Suites in the London MS with key-conform tuning (standard tuning):
No X (Bb) , XVII (Bb), XIX (g)

Sequences of pieces in the London MS with key-conform tuning (standard tuning):
No 24, Duette (g): Jean-Daniel Forget assigns a tuning for 12 courses, but in fact 13 are needed.

Single pieces in the London MS with key-conform tuning (standard tuning):
No 12 (Bb), 29 (Bb)

Key signature 3b :

Suites in the Dresden MS with individual tuning:
No 34 (Eb), 32 (c, Sarabande and Angloise in Eb), 33 (c, Siciliana in Eb)
Used tuning: Natural tuning for Bb/g (standard tuning)

Suites in the London MS with individual tuning:
No XXIV (Eb) , XXI (c, Sarabande and La belle Tiroloise in Eb)
Used tuning: Natural tuning for Bb/g (standard tuning)

Single piece in the London MS with individual tuning:
No 56 (Eb)
Used tuning: Natural tuning for Bb (standard tuning)

Key signature 4b :

Suites in the Dresden MS with individual tuning:
No 28 (f)
Used tuning: Natural tuning for g (standard tuning)

Suites in the London MS with individual tuning:
No XV (f)
Used tuning: Natural tuning for g (standard tuning)

Key signature 5b :

Single pieces in the London MS with individual tuning:
No 60 (bb)
Used tuning: (gG) (fF) (ebEb) (dbDb) (cC) (BbB1b) (AA1)
This is not a natural tuning of any key.

Key signature 6b :

Single pieces in the London MS with individual tuning:
No 34 (eb)
Used tuning: (gG) (fF) (ebEb) (dbDb) (cbCb) (BbB1b) (AbA1b).
This, too, is not a natural tuning of any key.

Mixed key signatures:

Suites in the London MS with individual tuning:
No XVIII (C and c): Used tuning: Natural tuning for key C

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:04

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§8.6 SUMMARY

Lutes:

There are relatively few pieces for an 11 course lute. There are pieces for a 13 course lute which use course 12, but not course 13. Details:

Music for an 11 course lute:
Dresden MS: 1 suite
London MS: 1 suite, 1 sequence of pieces, 11 single pieces

Music for a 13 course lute, without course 13 being used:
Dresden MS: 3 suites
London MS: 5 suites, 5 single pieces

Music for a 13 course lute, with course 13 being used:
Dresden MS: 30 suites
London MS: 21 suites, 2 sequences of pieces, 18 single pieces

Key signatures:

Mostly the key signatures of the pieces in a suite or sequence of pieces are identical.
There are only 2 suites and 1 sequence of pieces with mixed key signatures. Details:

Music with one key signature in the Dresden MS:
3#: 7 suites
Blank: 7 suites
1b: 8 suites
2b: 6 suites
3b: 4 suites
4b: 1 suite

Music with one key signature in the London MS:
3#: 2 suites
2#: 3 suites, 1 sequence of pieces, 3 single pieces
1#: 2 suites, 3 single pieces
Blank: 2 suites, 8 single pieces
1b: 8 suites, 10 single pieces
2b: 4 suites, 1 sequence of pieces, 6 single pieces
3b: 4 suites, 2 single pieces
4b: 1 suite
5b: 1 single piece
6b: 1 single piece

Music with two key signatures in the Dresden MS:
Blank and 3b: 1 suite

Music with two key signatures in the London MS:
Blank and 3b: 1 suite

1# and 2b: 1 sequence of pieces

Key of a suite

In any suite, there is a predominant key. It is common practice, to call this key the key of the suite. Actually often one of the pieces of a suite is composed in the corresponding minor / major key, and this piece is typically a Sarabande.

Key-conform tuning:

Key-conform tuning is predominant. Details:

Music with key-conform tuning:
Dresden MS: 28 out of 34 suites
London MS: 21 out of 27 suites, 2 out of 3 sequences of pieces, 31 out of 34 single pieces

Standard tuning:

The key signatures, which have standard tuning as natural tuning, are 2b for 11 and 13 string lute and 3b for 11 string lute. In addition, Weiss uses standard tuning as a tuning for all music in the two manuscripts that has a key signature of 3b or 4b. This is a strong argument to define standard tuning for a baroque lute the way it has been done in this paper. Details:

Music with standard tuning:
Dresden MS: 11 out of 34 suites
London MS: 9 out of 27 suites, 1 out of 3 sequences of pieces, 8 out of 34 single pieces

Applied tunings:

In the two manuscripts there are only two tunings which are not a natural tuning of any key, and each of these tunings is only applied in one single piece.

These are the tunings applied in the two manuscripts to an 11 course baroque lute (in O-notation):

Tuning for key signature =3#: (g#G#) (f#F#) (eE) (dD) (c#C#)
Tuning for key signature =2#: (gG) (f#F#) (eE) (dD) (c#C#)
Tuning for key signature =1#: (gG) (f#F#) (eE) (dD) (cC)
Tuning for key signature =1b: (gG) (fF) (eE) (dD) (cC)
Tuning for key signature =2b or 3b: (gG) (fF) (ebEb) (dD) (cC)

These are the tunings applied in the two manuscripts to a 13 course baroque lute (in O-notation):

Tuning for key signature =3#: (g#G#) (f#F#) (eE) (dD) (c#C#) (BB1) (AA1)
Tuning for key signature =2#: (gG) (f#F#) (eE) (dD) (c#C#) (BB1) (AA1)
Tuning for key signature =1#: (gG) (f#F#) (eE) (dD) (cC) (BB1) (AA1)
Tuning for key signature = : (gG) (fF) (eE) (dD) (cC) (BB1) (AA1)
Tuning for key signature =1b: (gG) (fF) (eE) (dD) (cC) (BbB1b) (AA1)
Tuning for key signature =2b: (gG) (fF) (ebEb) (dD) (cC) (BbB1b) (AA1)

Tuning for London no 60: (gG) (fF) (ebEb) (dbDb) (cC) (BbB1b) (AA1)
Tuning for London no 34: (gG) (fF) (ebEb) (dbDb) (cbCb) (BbB1b) (AbA1b)

Maximum interval of retuning of a string:

Inspecting all tunings in the two manuscripts reveals an interesting property: there is only one course the maximum interval of retuning of which is two semitones (namely course 11), whereas the maximum interval of retuning for the other courses is one semitone.

Example:
Course 9 is tuned either to (eE) or (ebEb).
The interval between e and eb (and likewise between E and Eb) is one semitone.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:13

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§9 VARIABLY TUNED STRINGS OF AN ALTO GUITAR

The comparison of the standard tuning of the 11 course baroque lute in O-notation
f1 d1 (aa) (ff) (dd) (aA) (gG) (fF) (ebEb) (dD) (cC)
to the standard tuning of the 11 string alto in A-notation
g1 d1 a f c G F Eb D C B1b
shows a correspondence between courses 7 to 11 of the baroque lute and strings 6 to 10 of the alto.
As the courses 7 to 11 of the baroque lute are the variably tuned courses, it suggests itself to consider the strings 6 to 11 as the variably tuned alto strings.

Likewise, the comparison of the standard tuning of the 13 course baroque lute in O-notation
f1 d1(aa) (ff) (dd) (aA) (gG) (fF) (ebEb) (dD) (cC) (BbB1b) (AA1)
to the standard tuning of the 13 string alto in A-notation
g1 d1 a f c G F Eb D C B1b A1 G1
shows a correspondence between courses 7 to 13 of the baroque lute and strings 6 to 12 of the alto.
As the courses 7 to 13 of the baroque lute are the are the variably tuned courses, it suggests itself to consider the strings 6 to 13 as the variably tuned alto strings.

Digression :

There is also a correspondence between courses 2, 3 and 4 of the lute and strings 2, 3 and 4 of the alto guitar.

An important consequence of this is, that, when arranging a piece for lute on an alto guitar, in a way that A-key = O-key (which means transposing the scores 3 semitones down), fretting positions concerning these courses can be preserved, provided that the musical context (i.e. the notes simultaneously played on the other strings) allows it.

This can be made transparent by the following consideration:
Let for example p be an arbitrary fretting position on course 3 (p = 0 representing the open course, p = 1 representing the first fret, p=2 representing the second fret, and so on).
Then the corresponding note is
a + p semitones (in O-notation).
Transposing this note 3 semitones down yields
(a + p semitones) - 3 semitones =
(a - 3 semitones) + p semitones =
f# + p semitones.
As f# is the note of the open empty 3rd alto string (in AA-notation), the fretting position of the note f# + p semitones is again p, i.e. the fretting position is preserved.

Any other transposing strategy is worse with respect to preserving fretting positions for courses which are not variably tuned.
Transposing one semitone down, the fretting positions for the first course are preserved.
Transposing five semitones down, the fretting positions for the fifth course are preserved.

§10 NATURAL TUNINGS OF A 13 STRING ALTO GUITAR

As there are two relevant notations for the alto guitar, natural tunings can be expressed in two ways, with respect to AA-notation and with respect to A-notation.

§10.1 ALGORITHMS

The natural tuning of the variably tuned strings for an AA-key on a 13 string alto guitar is determined as follows:

Step 1:
Determine the start note in AA-notation as follows:
= E#, if the key signature consists of 6#
= Eb, if the key signature consists of 2b, 3b, 4b, 5b or 6b
= E, else

Step 2:
The tuning of the variably tuned strings is identical with the key-specific descending
note sequence for the key, start note and length 8.

The natural tuning of the variably tuned strings for key an A-key on a 13 string alto guitar is determined as follows:

Step 1:
Determine the correspondent AA-key as A-key minus 3 semitones.

Step 2:
Determine the natural tuning for the AA-key

Step 3:
Transform the tuning from AA-notation to A-notation (by adding 3 semitones to every note).

Comment:

This design of the algorithms focuses on ascertaining the uniformity of the AA-notation for variably tuned strings over all natural tunings. This makes sense, as this is the notation which is relevant for sight-reading (confer §6.3).
A consequence is, that this uniformity does not hold for the A-notation.
For example string 8 is tuned to C#, C or Cb in AA-notation, but E, Eb, D# or D in A-notation. The problems are caused by the cases, where the counterpart of a #-A-key is a b-AA-Key, concretely, by
A-key F# with counterpart AA-key Eb
A-key B with counterpart AA-key Ab
A-key E with counterpart AA-key Db
A-key A with counterpart AA-key Gb.

As A-key A has a second counterpart, which is F#, there is no need to use Gb as a transposing key for A-key A.

AA-keys Eb, Ab and Db are inconvenient transposing keys, so they will hardly ever be used.

Even if one would be willing to use them and apply transposing strategy A-key = O-key for Weiss music, there would not exist a practical example:
From where we stand, there exists no Weiss piece with O-key = F#, B, E, d#, g# or c# in any known manuscript.

§10.2 COMPLETE LIST OF NATURAL TUNINGS OF A 13 STRING ALTO GUITAR

Definition of abbreviations:
AA-tuning: Tuning in AA-notation
A-tuning: Tuning in A-notation
AA-keysig: Signature of AA-key
A-keysig: Signature of A-key

I) TUNING OF VARIABLY TUNED STRINGS:

AA-keysig: 6# => AA-tuning = E# D# C# B1 A1# G1# F1# E1#
=> A-keysig: 3#, A-tuning = G# F# E D C# B1 A1 G1#
AA-keysig: 5# => AA-tuning = E D# C# B1 A1# G1# F1# E1
=> A-keysig: 2#, A-tuning = G F# E D C# B1 A1 G1
AA-keysig: 4# => AA-tuning = E D# C# B1 A1 G1# F1# E1
=> A-keysig: 1#, A-tuning = G F# E D C B1 A1 G1
AA-keysig: 3# => AA-tuning = E D C# B1 A1 G1# F1# E1
=> A-keysig: , A-tuning = G F E D C B1 A1 G1
AA-keysig: 2# => AA-tuning = E D C# B1 A1 G1 F1# E1
=> A-keysig: 1b, A-tuning = G F E D C B1b A1 G1
AA-keysig: 1# => AA-tuning = E D C B1 A1 G1 F1# E1
=> A-keysig: 2b, A-tuning = G F Eb D C B1b A1 G1
AA-keysig: => AA-tuning = E D C B1 A1 G1 F1 E1
=> A-keysig: 3b, A-tuning = G F Eb D C B1b A1b G1
AA-keysig: 1b => AA-tuning = E D C B1b A1 G1 F1 E1
=> A-keysig: 4b, A-tuning = G F Eb Db C B1b A1b G1
AA-keysig: 2b => AA-tuning = Eb D C B1b A1 G1 F1 E1b
=> A-keysig: 5b, A-tuning = Gb F Eb Db C B1b A1b G1b
AA-keysig: 3b => AA-tuning = Eb D C B1b A1b G1 F1 E1b
=> A-keysig: 6b, A-tuning = Gb F Eb Db Cb B1b A1b G1b
or A-keysig: 6#, A-tuning = F# E# D# C# B1 A1# G1# F1#
AA-keysig: 4b => AA-tuning = Eb Db C B1b A1b G1 F1 E1b
=> A-keysig: 5#, A-tuning = F# E D# C# B1 A1# G1# F1#
AA-keysig: 5b => AA-tuning = Eb Db C B1b A1b G1b F1 E1b

=> A-keysig: 4#, A-tuning = F# E D# C# B1 A1 G1# F1#
AA-keysig: 6b => AA-tuning = Eb Db Cb B1b A1b G1b F1 E1b
=> A-keysig: 3#, A-tuning = F# E D C# B1 A1 G1# F1#

So standard tuning is connected with AA-keysig = 1#.

II) RETUNING BASED ON STANDARD TUNING:

Tuning for AA-keysig =6#: Sharpen strings 6, 7, 8, 10, 11, 13
Tuning for AA-keysig =5#: Sharpen strings 7, 8, 10, 11
Tuning for AA-keysig =4#: Sharpen strings 7, 8, 11
Tuning for AA-keysig =3#: Sharpen strings 8, 11
Tuning for AA-keysig =2#: Sharpen string 8,
Tuning for AA-keysig =1#:
Tuning for AA-keysig = : Flatten string 12
Tuning for AA-keysig =1b: Flatten strings 9, 12
Tuning for AA-keysig =2b: Flatten strings 6, 9, 12, 13
Tuning for AA-keysig =3b: Flatten strings 6, 9, 10, 12, 13
Tuning for AA-keysig =4b: Flatten strings 6, 7, 9, 10, 12, 13
Tuning for AA-keysig =5b: Flatten strings 6, 7, 9, 10, 11, 12, 13
Tuning for AA-keysig =6b: Flatten strings 6, 7, 8, 9, 10, 11, 12, 13

§11 NATURAL TUNINGS OF AN 11 STRING ALTO GUITAR

The natural tuning of an 11 string alto guitar for an arbitrary key is determined by omitting everything with respect to strings 12 and 13 from the corresponding tuning of a 13 string alto for the same key.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:21

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§12 DERIVATION OF THE TUNING OF AN ALTO ARRANGEMENT

§12.1 BASIC TRANSPOSING MECHANISMS

In this chapter some insights will be derived from the following two transposing schemes for keys:

C -> Db -> D -> Eb -> E -> F -> F# or Gb -> G -> Ab -> A -> Bb -> B -> ..

c -> c# -> d -> d# or eb -> e -> f -> f# -> g -> g# -> a -> bb -> b -> ..

The first scheme concerns major, the second minor keys.
Any arrow -> in the schemes represents a transposition of a semitone.

For example the detail D -> Eb has to be interpreted as:
'Transposing a piece in D major one semitone upwards leads to Eb major'
or
'Transposing a piece in Eb major one semitone downwards leads to D major'.

Transposing an arbitrary number n of semitones upwards / downwards means following n successive arrows forwards / backwards starting from the source key.

For example, transposing 3 semitones downwards from source key f minor, we have to follow 3 arrows backwards:
d -> d# or eb -> e -> f
So the resulting target key is d minor.

These schemes have to be interpreted in a circular way, i.e. for instance transposing a semitone upwards from B leads to C.

Definition:

The forward distance from an arbitrary source key k1 to an arbitrary target key k2, abbreviated by fdist(k1,k2), is the minimum number of arrows leading from k1 to k2 in the corresponding transposing scheme, if arrows are followed

forwards. So fdist(k1, k2) is the minimum number of semitones leading from k1 to k2 when transposing upwards.

Example:

C is reached from A by following 3 arrows forwards. Of course it is also reached by following 15 arrows forwards. But according to the definition fdist(A,C) = 3.

Definition:

The backward distance from an arbitrary source key k1 to an arbitrary target key k2, abbreviated by bdist(k1,k2), is the minimum number of arrows leading from k1 to k2 in the corresponding transposing scheme, if arrows are followed backwards. So bdist(k1,k2) is the minimum number of semitones leading from k1 to k2 when transposing downwards.

Example:

bdist(A,C) = 9

Proposition1:

If a piece is transposed from an arbitrary source key k1 n semitones upwards to a target key k2, then fdist(k1,k2) = n mod 12.

Here mod is the modulo function (n mod 12 is the rest remaining, when n is divided by 12; hence 12 mod 12 = 0, 13 mod 12 = 1, 2 mod 12 = 2 and so on).

Background: Complete octaves don't contribute to fdist.

Example:

Transposing from C major 14 semitones upwards results in target key D major. According to the definition of fdist we have fdist(C major, D major) = 2. 2 is equal to 14 mod 12.

Proposition2:

If a piece is transposed from an arbitrary source key k1 n semitones downwards to a target key k2, then bdist(k1,k2) = n mod 12.

Example:

Transposing from C major 2 semitones downwards results in target key Bb major. According to the definition of bdist we have bdist(C major, Bb major) = 2. 2 is equal to 2 mod 12.

Proposition3:

For any pair of keys k1, k2, where k1 is not equal to k2,
fdist(k1,k2) + bdist(k1,k2) = 12

Background:

One complete circle consists of 12 arrows, i.e. 12 semitone steps constitute one octave.

Example:

fdist(A,C) = 3.
bdist(A,C) = 9.
fdist(k1,k2) + bdist(k1,k2) = 12

Proposition4:

Transposition does not change key distances.

In other words:
If there are two arbitrary keys k11 and k21 with distance d and we transpose from both keys the same number of semitones upwards or downwards, then the resulting keys again have a distance of d. The distance can be measured alternatively in terms of fdist or bdist.

Example 1:

k11 = Eb, k12= Bb, according to transposing scheme fdist(Eb,Bb) = 7.
Transposing 3 semitones down from Eb yields C.
Transposing 3 semitones down from Bb yields G.
fdist(C,G) = 7, too.

Proof:

Let
- s be the number of semitones
- k12 the key resulting from the transposition of k11
- k22 the key resulting from the transposition of k21.

There are four cases:
Case 1: Transposing upwards, distance measured in fdist
Case 2: Transposing upwards, distance measured in bdist
Case 3: Transposing downwards, distance measured in bdist
Case 4: Transposing downwards, distance measured in fdist

Proof of case 1:

As fdist(k11,k21) = d, we reach k21 from k11 by following forwards d arrows in the scheme:

k11 + d arrows => k21

As k22 is the key resulting from the transposition of k21, we reach k22, if we follow further s arrows. So in total we reach k22 by following forwards d + s arrows, starting from k11:

k11 + d arrows + s arrows => k22.

It is clear that we also reach k22 from k11 by first following forwards s arrows and then d arrows.

k11 +s arrows + d arrows => k22.

According to the presupposition we reach k12, if we follow s arrows forwards starting from k11:

k11 +s arrows => k12.

So d arrows lead from k12 to k22:

k12 +d arrows => k22.

I.e. fdist(k12,k22) = d. This had to be proved.

Proof of case 2:

If bdist(k11, k21) = d, then fdist(k11, k21) = 12 - bdist(k11, k21) , see proposition 3.
Let us denote 12 - bdist(k11, k21) by d'.

Now we have transformed case 2 to case 1.

From the proof of case 1 follows, that fdist(k12,k22) = d'.
Now bdist(k12,k22) = 12 – d' = 12 – (12 - bdist(k11, k21)) = bdist(k11,k21). This had to be proved.

Proof of case 3:

This proof can derived from the proof of case 1 by replacing every occurrence of fbist by bdist and every occurrence of the word forwards by backwards.

Proof of case 4:

Can be derived from the proof of case 3, analogously to case 2.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:26

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§12.2 A GUIDELINE TO DERIVING ALTO TUNINGS

Transposing a piece of lute music, any source note is transformed to a target note which lies a fixed number s of semitones above or below the source note. This, of course, especially applies to the source notes, which are played on variably tuned courses.

Mostly, variably tuned courses are played as open courses. In order not to increase the risk of creating unfrettable constellations on the alto guitar, an alto tuning is favourable, if it fulfils this

Requirement:

The counterpart of any note of a piece which is played by striking an open variably tuned lute course can be played on the alto by striking an open variably tuned string.

In almost all Weiss pieces O-tuning is a natural tuning of some O-tuning-key. In this case the requirement can be fulfilled by tuning the alto according to the natural tuning of the AA-tuning-key, which lies s semitones above/below O-tuning-key, provided that all these counterparts lie within the range of the variably tuned alto strings.

Especially if O-tuning is key-conform (i.e. O-tuning-key = O-key), adding/subtracting s semitones to/from both O-tuning-key and O-key results in the same key, i.e. AA- tuning-key = AA-key. In other words, key-conformity is preserved.

But this is not necessarily the only way to fulfil the requirement. There are lute pieces with natural tuning, for which an alto tuning can be devised, which fulfils the requirement formulated above, but is not a natural tuning. The arrangement of the well known passagaille by Weiss (from suite no XIII, London MS) for an 11 string alto, contained in Per-Olof Johnson's Altgitarren book, is an example of such an arrangement:

O-key =D.
O-tuning is key-conform:
(gG) (f#F#) (eE) (dD) (c#C#) (BB1) (AA1)
The notes of the piece which are played on the variably tuned courses, are: G F# D C# B1 A1.
I.e. the pieces doesn't contain any E.

Transposing three semitones down to AA-key = B, key-conform AA-tuning on a 13 string alto would be:
E D# C# B1 A1# G1# F1# E1
The notes of the piece which are played on the variably tuned courses, are (in AA-notation):
E D# B1 A1# G1# F1# (these are the counterparts of G F# D C# B1 A1, O-notation).
I.e. two of the variably tuned alto strings are not used.

Instead the piece is arranged on a 11 string alto tuned like this:
E D# B1 A1# G1# F1#.
As all counterparts of the notes played on the open variably tuned lute courses can be played as open variably tuned alto strings, the requirement is fulfilled. But this tuning isn't a natural tuning.

It is true that this way the piece can be arranged on an 11 string alto in B without disrupting bass lines.
On the other hand doing so has quite a few disadvantages:
- It is unlikely that this exotic tuning can be used for a lot of other pieces. So the total number of tunings of one's repertoire is inflated.
- This tuning is inappropriate for playing the whole suite, because there are pieces in the suite which do have an E (in O-notation)
- Sight reading is disturbed, as standard representation of strings 8 to 11 is not valid.

So on balance there are strong arguments to derive alto tunings according to this general guideline:

If a lute piece has natural tuning of some O-tuning-key , and the piece is transposed s semitones upwards/downwards, then the tuning of the alto arrangement should be the natural tuning of the key which lies exactly s semitones above/below O-tuning-key. A consequence of this approach is, that a key-conform lute tuning is transformed to a key-conform alto tuning.

§12.3 ALGORITHMS

All algorithms presented in the following are based on these data:
..O-key
..O-tuning
..O-tuning-key (only existent, if O-tuning is a natural tuning)
..AA-key
..Direction of transposition: upwards/downwards
..Number of semitones of the transposition (abbreviated by transp-dist)

§12.3.1 DERIVATION OF THE TUNING OF AN ALTO ARRANGEMENT FROM A KEY-CONFORM LUTE TUNING

According to the general guideline, a key-conform lute tuning should be transformed to a key-conform alto tuning. So AA-tuning-key = AA-key.

§12.3.2 DERIVATION OF THE TUNING OF AN ALTO ARRANGEMENT FROM A NATURAL, BUT NOT KEY-CONFORM LUTE TUNING

One may choose among the following two algorithms.

§12.3.2.1 ALGORITHM 1

Determine AA-tuning-key by
.. transposing transp-dist semitones downwards from O-tuning-key, if direction of transposition is downwards.
.. transposing transp-dist semitones upwards from O-tuning-key, if direction of transposition is upwards

§12.3.2.2 ALGORITHM 2

This algorithm derives straightforwardly from §12.1, proposition 4.

Step 1:
Calculate alternatively d =fdist(O-key,O-tuning-key) or d = bdist(O-key,O-tuning-key).

Step 2:
Determine AA-tuning-key by transposing from AA-key d semitones upwards or downwards, respectively.

§12.3.2.3 EXAMPLE 1

Suite no 34 in the Dresden MS:
O-key = Eb,
O-tuning-key = Bb.
Let us assume that AA-key = C, direction of transposition = downwards, transp-dist = 3.

Algorithm 1:
As direction of transposition is downwards, we have to transpose 3 semitones downwards form Bb. So AA-tuning-key = G.

Algorithm 2:
Step 1: bdist(O-key,O-tuning-key) = 5 semitones
Step 2: AA-tuning-key is determined by transposing 5 semitones downwards from C, i.e. AA-tuning-key = G.

§12.3.2.4 EXAMPLE 2

Suite no 28 in the Dresden MS:
O-key =f,
O-tuning-key = g.
Let us assume that AA-key = d, direction of transposition = downwards, transp-dist = 3.

Algorithm 1:
As direction of transposition is downwards, we have to transpose 3 semitones downwards from g. So AA-tuning-key = e.

Algorithm 2:
Step 1: fdist(O-key,O-tuning-key) = 2 semitones
Step 2: AA-tuning-key is determined by transposing 2 semitones upwards from d, i.e. AA-tuning-key = e.

§12.3.3 DERIVATION OF THE TUNING OF AN ALTO ARRANGEMENT FROM A LUTE TUNING, WHICH IS NOT A NATURAL TUNING

The idea is to consider such a tuning as a modification of key-conform tuning.

Step 1:
Compare O-tuning with key-conform tuning. Identify all variably tuned courses of key-conform tuning, which differ from O-tuning. The result consists of
triples (c,(n11 n12),d),
where c is a number of a course, (n11 n12) the key-conform tuning of this course in O-notation and d the amount of semitones between the key-conform tuning of c and the real tuning of the same course.

Step 2:
For every tripel (c,(n11 n12),d) from the result of step 1 do:
Step 2.1: Determine n2 = the note which lies transp-dist semitones above/below n12.
Step 2.2: If n2 is the tuning of a variably tuned string from the key-conform tuning of AA-key, then retune this string by d semitones

Example:
London MS, no 60. O-key signature = 5b. O-key = bb
O-tuning = (gG) (fF) (ebEb) (dbDb) (cC) (BbB1b) (AA1)
Let us assume that the piece has to be transposed 4 semitones down, i.e. direction of transposition = downwards, transp-dist = 4, so AA-key = f#, and that transposition is made for a 13 string alto.

Step 1:
The key-conform lute tuning would be :
(gbGb) (fF) (ebEb) (dDb) (cC) (BbB1b) (AbA1b).
So we can consider O-tuning as key-conform tuning with additional modification of courses 7 (one semitone upwards) and 13 (also one semitone upwards).

So there are two relevant triples:
(7,(gbGb),1) and (13,(AbA1b),1)

Step 2:
For AA-key = f#, the key-conform alto tuning is
E D C# B1 A1 G1# F1# E1.

Dealing with triple (7,(gbGb),1):
Step 2.1: n2 = n12 minus 4 semitones = Gb minus 4 semitones = D
Step 2.2: D is contained in E D C# B1 A1 G1# F1# E1, so string 7 has to be retuned to D#.

Dealing with triple (13,(AbA1b),1):
Step 2.1: n2 = n12 minus 4 semitones = A1b minus 4 semitones = E1.
Step 2.2: E1 is contained in E D C# B1 A1 G1# F1# E1, so string 13 has to be retuned to E1#.

So AA-tuning = E D# C# B1 A1 G1# F1# E1#.

§12.4 TRANSPOSING DOWNWARDS WITHOUT EXCEEDING BASS RANGES

Transposing downwards, one runs the risk that some of the resulting notes lie below the bass range of the used alto guitar. A method to solve this problem, is to octavate the problematic notes upwards. But this may have the consequence, that bass lines are disrupted. So it is favourable to limit the number of semitones of the transposition so that the bass range of the alto is not exceeded.

In this paragraph this topic will be discussed for lute pieces with natural tuning. It is presupposed that the corresponding alto tunings are derived according to the guideline from §12.2.

Whether an alto bass range is sufficient, depends on
... the range of used courses of the lute piece (11 courses, 12 courses or 13 courses)
... the number of semitones of the transposition
... the key signature of the tuning for the lute piece
... the kind of alto used (11 string or 13 string)

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:30

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§12.4.1 MUSIC FOR A 13 COURSE LUTE, WITH COURSE 13 BEING USED

Transposing 3 semitones down

Example:

Key signature of O-tuning = 2#.
As course 13 is being used, the deepest note of the piece is A1, in O-notation.
Transposing 3 semitones down, the counterpart of A1 is F1# and the resulting key signature of AA-tuning is 5#.
With respect to this tuning, F1# is the note of the open 12th alto string (if existent).
So an 11 string alto is not sufficient for this transposition, provided that one does not accept octavating basses as a means to solve problems of bass range.

The following tables show for all natural O-tunings
.. the key signature of O-tuning (abbreviated by)
..the deepest note of the piece in O-notation (abbreviated by)
.. the key signature of AA-tuning (abbreviated by < AA-tuning-keysig>)
..the deepest note of the piece in AA-notation (abbreviated by)
..the number of the corresponding alto string (abbreviated by)

O-tuning-keysig.....6#.....5#....4#.....3#.....2#....1#.....bl
Deep. note lute.....A1#..A1#..A1.....A1.....A1.....A1.....A1
AA-tuning-keysig...3b.....4b....5b.....6b/6#.....5#.....4#.....3#
Deep. note alto.....G1....G1...G1b..G1b/F1#....F1#...F1#....F1#
Alto string.....11....11.....11.....11/12.....12.....12.....12

O-tuning-keysig.....1b.....2b.....3b....4b.....5b....6b
Deep. note lute.....A1.....A1... A1b..A1b..A1b..A1b
AA-tuning-keysig....2#.....1#.....bl.....1b....2b....3b
Deep. note alto.....F1#...F1#...F1...F1.....F1....F1
Alto string.....12.....12.....12....12....12....12

Result: A 13 string alto is sufficient in any case. In fact a 12 string alto would do. An 11 string alto is insufficient in most cases.

Transposing 2 semitones down

O-tuning-keysig....6#.....5#.....4#.....3#.....2#....1#.....bl
Deep. note lute.....A1#..A1#....A1.....A1.....A1....A1....A1
AA-tuning-keysig...4#.....3#.....2#.....1#.....bl.....1b....2b
Deep. note alto.....G1#...G1#...G1....G1... G1...G1...G1
Alto string.....11.....11.....11.....11.....11....11....11

O-tuning-keysig....1b....2b.....3b.....4b.....5b.....6b
Deep. note lute.....A1....A1.....A1b....A1b.....A1b...A1b
AA-tuning-keysig...3b....4b.....5b.....6b/6#.....5#....4#
Deep. note alto.....G1....G1....G1b...G1b/F1#...F1#....F1#
Alto string.....11.....11.....11.....11/12.....12.....12

Result: In most cases, an 11 string alto is sufficient.

Transposing 1 semitone down

O-tuning-keysig.....6#....5#....4#.....3#.....2#.....1#.....bl
Deep. note lute.....A1#..A1#..A1.....A1.....A1.....A1.....A1
AA-tuning-keysig...1b.....2b....3b.....4b.....5b.....6b/6#.....5#
Deep. note alto.....A1....A1....A1b...A1b....A1b...A1b/G1#...G1#
Alto string.....10.....10....10.....10.....10.....10/11.....11

O-tuning-keysig....1b.....2b.....3b.....4b.....5b.....6b
Deep. note lute.....A1.....A1.... A1b...A1b...A1b...A1b
AA-tuning-keysig...4#.....3#.....2#.....1#.....bl.....1b
Deep. note alto.....G1#...G1#....G1....G1....G1.....G1
Alto string.....11.....11.....11.....11.....11.....11

Result: In any case, an 11 string alto is sufficient.

§12.4.2 MUSIC FOR A 13 COURSE LUTE, WITHOUT COURSE 13 BEING USED

Transposing 3 semitones down

O-tuning-keysig.....6#.....5#.....4#.....3#.....2#....1#.....bl
Deep. note lute.....B1....B1.....B1.....B1.....B1....B1....B1
AA-tuning-keysig...3b.....4b.....5b.....6b/6#.....5#.....4#.....3#
Deep. note alto.....A1b...A1b...A1b..A1b/G1#...G1#..G1#...G1#
Alto string.....10.....10.....10.....10/11.....11.....11.....11

O-tuning-keysig....1b....2b.....3b.....4b.....5b....6b
Deep. note lute.....1b...B1b...B1b..B1b..B1b..B1b
AA-tuning-keysig...2#....1#.....bl.....1b....2b.....3b
Deep. note alto.....G1...G1....G1....G1....G1....G1
Alto string.....11.....11.....11.....11.....11....11

Result: In any case, an 11 string alto is sufficient.

§12.4.3 MUSIC FOR AN 11 COURSE LUTE

Transposing 4 semitones down

O-tuning-keysig....6#.....5#.....4#....3#.....2#....1#.....bl
Deep. note lute.....C#....C#....C#...C#....C#.....C.....C
AA-tuning-keysig...2#.....1#.....bl....1b.....2b.....3b.....4b
Deep. note alto.....A1.....A1.....A1....A1....A1...A1b...A1b
Alto string.....10.....10.....10....10....10.....10.....10

O-tuning-keysig....1b.....2b.....3b.....4b.....5b.....6b
Deep. note lute.....C.....C.....C.....C.....C.....Cb
AA-tuning-keysig...5b.....6b/6#.....5#.....4#.....3#.....2#
Deep. note alto.....A1b...A1b/G1#...G1#...G1#....G1#....G1
Alto string.....10.....10/11.....11.....11.....11.....11

Result: In any case, an 11 string alto is sufficient.

§13 CONVENIENT TUNINGS FOR ALTO GUITARS

§13.1 CONVENIENT KEY-SIGNATURES FOR ALTO GUITARS

There are AA-key signatures which are convenient for alto guitars. The following is based on the assumption that there is a consensus on these being 5#, 4#, 3#, 2#, 1#, blank and 1b.

§13.2 ALTO TUNINGS FOR KEY-CONFORM LUTE MUSIC

Preserving key-conformity of tuning when transposing, the alto tunings for key-conform lute pieces are the natural tunings of the AA-key signatures
5#, 4#, 3#, 2#, 1#, blank and 1b.
These tunings will be referred to as convenient tunings for alto guitars (or short: convenient alto tunings).

§13.3 ALTO TUNINGS FOR LUTE MUSIC WITH NATURAL, BUT NOT KEY-CONFORM TUNING

The analysis of the two manuscripts has shown, that there is music, the tuning of which is a natural tuning of some key signature (O-tuning-keysig), but this key signature differs from the key signature in the scores (O-keysig).
Following the rule, that a natural lute tuning is transformed to a natural alto tuning, transposing such music to a convenient key signature (AA-keysig) requires a tuning, which is a natural tuning of some other key signature (AA-tuning-

keysig). But it is not guaranteed, that this tuning is a convenient tuning.

In order not to inflate the set of alto tunings it would be fortunate, if the convenient alto tunings were sufficient as alto tunings in these cases, too.
So for each of the relevant combinations (O-keysig, O-tuning-keysig) it has to be verified, that there is at least one convenient AA-keysig such that the resulting tuning is a convenient tuning, in other words: that AA-tuning-keysig is a convenient key signature, too.

This applies especially to the suites with mixed key signatures. In such a suite there are pieces with key-conform tuning and others without.

These combinations occur:
Combination 1: O-keysig = 3b, O-tuning-keysig = 2b
Combination 2: O-keysig = 4b, O-tuning-keysig = 2b
Combination 3: O-keysig = 3b, O-tuning-keysig = blank
Combination 4: O-keysig = 2b, O-tuning-keysig = 1#

In alto arrangements, mostly the AA-key is not higher than the O-key and not lower than O-key minus 4 semitones.
So we will check the key signatures resulting from transposing 0, 1, 2, 3 and 4 semitones down.

Results:

Combination 1: Transposing
.. 0 semitones down: AA-keysig= 3b, AA-tuning-keysig = 2b, validation = (-,-)
.. 1 semitone down: AA-keysig= 2#, AA-tuning-keysig = 3#, validation = (+,+)
.. 2 semitones down: AA-keysig= 5b, AA-tuning-keysig = 4b, validation = (-,-)
.. 3 semitones down: AA-keysig= blank, AA-tuning-keysig = 1#, validation = (+,+)
.. 4 semitones down: AA-keysig= 5#, AA-tuning-keysig = 6#, validation = (+,-)

Explanation:
Validation = (-,-) means, that neither AA-keysig nor AA-tuning-keysig are convenient key signatures.
Validation = (+,+) means, that AA-keysig is a convenient key signature and the tuning is a convenient tuning.

So there are two 'good' arrangements for combination 1.

Combination 2: Transposing
.. 0 semitones down: AA-keysig= 4b, AA-tuning-keysig = 2b, validation = (-,-)
.. 1 semitone down: AA-keysig= 1#, AA-tuning-keysig = 3#, validation = (+,+)
.. 2 semitones down: AA-keysig= 6b, AA-tuning-keysig = 4b, validation = (-,-)
.. 3 semitones down: AA-keysig= 1b, AA-tuning-keysig = 1#, validation = (+,+)
.. 4 semitones down: AA-keysig= 4#, AA-tuning-keysig = 6#, validation = (+,-)
Again there are 2 'good' arrangements.

Combination 3: Transposing
.. 0 semitones down: AA-keysig= 3b, AA-tuning-keysig = blank, validation = (-,+)
.. 1 semitone down: AA-keysig= 2#, AA-tuning-keysig = 5#, validation = (+,+)
.. 2 semitones down: AA-keysig= 5b, AA-tuning-keysig = 2b, validation = (-,-)
.. 3 semitones down: AA-keysig= blank, AA-tuning-keysig = 3#, validation = (+,+)
.. 4 semitones down: AA-keysig= 5#, AA-tuning-keysig = 4b, validation = (+,-)
There are 2 'good' arrangements, too.

Combination 4: Transposing
.. 0 semitones down: AA-keysig= 2b, AA-tuning-keysig = 1#, validation = (-,+)
.. 1 semitone down: AA-keysig= 3#, AA-tuning-keysig = 6#, validation = (+,-)
.. 2 semitones down: AA-keysig= 4b, AA-tuning-keysig = 1b, validation = (-,+)
.. 3 semitones down: AA-keysig= 1#, AA-tuning-keysig = 4#, validation = (+,+)
.. 4 semitones down: AA-keysig= 6b, AA-tuning-keysig = 3b, validation = (-,-)
There is only one 'good' arrangement.

So the result of the verification is positive, i.e. that for each of the four cases there exists at least one convenient AA-key signature such that the resulting tuning is contained in the convenient tunings.
Especially, it becomes apparent, that in any constellation transposing 3 semitones down leads to a 'good' arrangement.

§13.4 DIVERSITY OF TUNINGS

The analysis of the two manuscripts has shown, that there are only two pieces the tuning of which is not a natural tuning of some key.
So we can assume, that alto arrangements of Weiss music essentially use the convenient tunings.

From an anecdote we know that Weiss spent much time with tuning his instruments (see http://www.classical.net/music/comp.lst/articles/weiss/bio.php).

From the analysis above we also know that he used the natural tunings of six key signatures in the two manuscripts. He might have reduced the time spent for tuning by reducing the number of scordaturas. The fact, that he didn't do so, indicates that he esteemed the diversity of tunings.

The number of key signatures for convenient natural alto tunings is seven. So there is little difference between the diversity of the convenient natural alto tunings and the diversity of the natural lute tunings used by Weiss (as for number of different key signatures).

Further above natural tunings of alto guitars have been expressed in terms of both AA-tuning and A-tuning.
It makes sense, to consider a natural alto tuning to be the counterpart of a natural lute tuning, if O-tuning-keysig = key-signature of A-tuning (abbreviated by A-tuning-keysig).

So we have these correspondences between the convenient alto tunings and the natural tunings used by Weiss:

AA-tuning-keysig = 5# corresponds to O-tuning-keysig (= A-tuning-keysig) = 2#
AA-tuning-keysig = 4# corresponds to O-tuning-keysig (= A-tuning-keysig) = 1#
AA-tuning-keysig = 3# corresponds to O-tuning-keysig (= A-tuning-keysig) = blank
AA-tuning-keysig = 2# corresponds to O-tuning-keysig (= A-tuning-keysig) =1b
AA-tuning-keysig = 1# corresponds to O-tuning-keysig (= A-tuning-keysig) = 2b

For the following two convenient tunings there exists no counterpart among the natural tunings used by Weiss:
AA-tuning-keysig = blank
AA-tuning-keysig = 1b

The corresponding O-tuning-keysig is 3b and 4b, respectively, but Weiss didn't use these tunings in the two manuscripts.

For the natural tuning with O-tuning-keysig = 3# used by Weiss there exists no counterpart among the convenient alto tunings.
The corresponding AA-tuning-keysig is 6#, but this is not a convenient alto tuning.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:34

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§14 HOW TO AVOID FREQUENT RETUNING OF ALTO GUITARS

Frequent retuning leads to fatiguing a string, and this has negative impact on sound.
In this chapter three approaches will be discussed to avoid frequent retuning.

§14.1 HOW TO AVOID FREQUENT RETUNING OF 13 STRING ALTOS

For 13 string altos, the convenient tunings are:

AA-key signature 5# => AA-tuning: E D# C# B1 A1# G1# F1# E1
AA-key signature 4# => AA-tuning: E D# C# B1 A1 G1# F1# E1
AA-key signature 3# => AA-tuning: E D C# B1 A1 G1# F1# E1
AA-key signature 2# => AA-tuning: E D C# B1 A1 G1 F1# E1
AA-key signature 1# => AA-tuning: E D C B1 A1 G1 F1# E1
AA-key signature blank => AA-tuning: E D C B1 A1 G1 F1 E1
AA-key signature 1b => AA-tuning: E D C B1B A1 G1 F1 E1

Strings 6 and 13 are not touched by retuning, so 6 of the 8 variably tuned strings are in fact involved in scordatura.
The difference between the tunings of two adjacent AA-key-signatures in this order is one semitone, i.e. one string has to be retuned by one semitone.

§14.1.1 APPROACH 1: PLAYING ALONG A SORTED REPERTOIRE

Approach 1 requires that all suites, sequences of pieces and single pieces of one’s repertoire be grouped by the natural tuning of the respective alto arrangement and these groups sorted in the order 5#, 4#, 3#, 2#, 1#, blank and 1b. Playing takes place 'along' this sorted repertoire. There are essentially two variants of playing 'along':

1st variant:

One playing cycle consists of 5#, 4#, 3#, 2#, 1#, blank and 1b.
(I.e. at first one plays all pieces with tuning = natural tuning of AA-key signature 5#, then all pieces with tuning = natural tuning of AA-key signature 4# and so on. When one has played all pieces with tuning = natural tuning of AA-key-signature 1b, one starts again with 5#).

2nd variant:

One playing cycle consists of 5#, 4#, 3#, 2#, 1#, blank, 1b, blank, 1#, 2#, 3#, 4#.

Evaluation:

The degree of avoiding frequent retuning can be measured by the average number of strings involved in retuning when proceeding from a natural tuning to the next natural tuning (in the following abbreviated by avnstr).

Proceeding from group to group in a random way results in an avnstr of about 2.7. So using playing cycles, if of any value, must result in an avnstr which is significantly less than 2.7.

1st variant:

Proceeding from 5# to 4# requires retuning of one string, proceeding from 4# to 3# requires retuning of another string, and so on. Finally, proceeding from 1b to 5# requires retuning of 6 strings. So we have avnstr = 12 / 7 = about 1.7.

2nd variant:

Here the optimum is achieved (avnstr = 1).
But one must be aware, that there is also a con in comparison to the 1st variant. Using the 1st variant, each key signature reappears after exactly 6 other key signatures. Using the 2nd variant, the number of intermediate key signatures varies. For example 3# reappears after 7 or 3 intermediate key signatures, 4# after 1 or 9 intermediate key signatures.

§14.1.2 APPROACH 2: REDUCING THE SET OF TUNINGS USED

One might decide to reduce the set of natural tunings used in one's alto arrangements for example to

AA-key signature 3# => AA-tuning : E D C# B1 A1 G1# F1# E1
AA-key signature 2# => AA-tuning : E D C# B1 A1 G1 F1# E1
AA-key signature 1# => AA-tuning : E D C B1 A1 G1 F1# E1
AA-key signature blank => AA-tuning : E D C B1 A1 G1 F1 E1

The effect would be, that
..the average number of pieces per tuning increases
..the number of strings involved in retuning decreases from 6 to 3
..the number of retuning activities per playing cycle decreases from 12 to 6.

It is appropriate to discard tunings 'at the edges' of the list of tunings. If, for example, the natural tunings of key signature 2# and 1# would be eliminated (i.e. tunings in the middle of the list), we would have no effect with respect to decreasing the number of strings involved in scordatura or the number of retuning activities per playing cycle:

AA-key signature 5# => AA-tuning : E D# C# B1 A1# G1# F1# E1
AA-key signature 4# => AA-tuning : E D# C# B1 A1 G1# F1# E1
AA-key signature 3# => AA-tuning : E D C# B1 A1 G1# F1# E1
AA-key signature blank => AA-tuning : E D C B1 A1 G1 F1 E1
AA-key signature 1b => AA-tuning : E D C B1B A1 G1 F1 E1

Provided that tunings are only discarded 'at the edges' and n is less than or equal to 7, any reduction of the basical set of tunings to n tunings reduces
..the number of strings involved in retuning to n-1
..the number of retuning activities per playing cycle to (n-1) * 2.

In other words, any reduction by one tuning reduces the number of strings involved in retuning by 1 and the number of retuning activities per playing cycle by 2.

The cons of this approach are:
..Reduction of the richness of sonorities available
..Reduction of the chance to find optimal or at least good arrangements (in terms of playability, number of compromises, affinity to the original)

Using just one natural tuning completely eliminates retuning and playing cycles. But it is clear, that in this case the disadvantages weigh heavily.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2010/06/21 19:37

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§14.1.3 APPROACH 3: INCREASING THE NUMBER OF ALTO GUITARS USED

If one has two altos available, one may, for example, decide to use one of them for

AA-key signature 5# => AA-tuning : E D# C# B1 A1# G1# F1# E1
AA-key signature 4# => AA-tuning : E D# C# B1 A1 G1# F1# E1
AA-key signature 3# => AA-tuning : E D C# B1 A1 G1# F1# E1

and the other one for

AA-key signature 2# => AA-tuning : E D C# B1 A1 G1 F1# E1
AA-key signature 1# => AA-tuning : E D C B1 A1 G1 F1# E1
AA-key signature blank => AA-tuning : E D C B1 A1 G1 F1 E1
AA-key signature 1b => AA-tuning : E D C B1B A1 G1 F1 E1

and play every guitar along its sorted repertoire.

The effect would be, that
..the number of strings involved in retuning decreases from 6 to 5
..the number of retuning activities per playing cycle (i.e. one playing cycle of the first alto plus one playing cycle of the second alto) decreases from 12 to 10.

One can switch back and forth between the two sub-repertoires (by exchanging the guitar) at any time without affecting the frequency of retuning.

It stands to reason that only 'adjacent' tunings should be grouped together. If, for example, the natural tuning of key signature 1b would be added to the first group of tunings (i.e. a tuning which is not adjacent to the natural tuning of 3#), we would have an adverse effect (number of strings involved increasing to 8, number of retuning activities per playing cycle increasing to 16):

First group of tunings:
AA-key signature 5# => AA-tuning : E D# C# B1 A1# G1# F1# E1
AA-key signature 4# => AA-tuning : E D# C# B1 A1 G1# F1# E1
AA-key signature 3# => AA-tuning : E D C# B1 A1 G1# F1# E1
AA-key signature 1b => AA-tuning : E D C B1B A1 G1 F1 E1

Second group of tunings:
AA-key signature 2# => AA-tuning : E D C# B1 A1 G1 F1# E1
AA-key signature 1# => AA-tuning : E D C B1 A1 G1 F1# E1
AA-key signature blank => AA-tuning : E D C B1 A1 G1 F1 E1

It can be proved that, provided that only adjacent tunings are grouped together and n is less than or equal to 7, any partitioning of the original set of tunings in n subsets (for n guitars) reduces
..the number of strings touched by retuning to 7 - n
..the number of retuning activities by playing cycle to (7-n) *2 .

In other words, any additional guitar reduces the number of strings involved in retuning by 1 and the number of retuning

activities per playing cycle by 2.

The cons of this approach are:
..This is the most expensive of all approaches
..Increasing the number of alto guitars increases the number of guitars (and hence total number of strings) which must be kept in tune.

Using 7 altos completely eliminates retuning and playing cycles. But again, in this case the disadvantages weigh heavily. One must take into consideration how many bass strings could be bought for the equivalent of 6 additional altos.

§14.2 HOW TO AVOID FREQUENT RETUNING OF 11 STRING ALTOS

For 11 string altos, the convenient tunings are:

AA-key signature 5# => AA-tuning: E D# C# B1 A1# G1#
AA-key signature 4# => AA-tuning: E D# C# B1 A1 G1#
AA-key signature 3# => AA-tuning: E D C# B1 A1 G1#
AA-key signature 2# => AA-tuning: E D C# B1 A1 G1
AA-key signature 1# or blank => AA-tuning: E D C B1 A1 G1
AA-key signature 1b => AA-tuning: E D C B1B A1 G1

There is no difference between the tunings of AA-key signatures 1# and blank.
String 6 is not touched by retuning, so 5 of the 6 variably tuned strings are in fact involved in scordatura.
The difference between two adjacent tunings in this order is one semitone.

§14.2.1 APPROACH 1: PLAYING ALONG A SORTED REPERTOIRE

Approach 1 requires that all suites, sequences of pieces and single pieces of one's repertoire be grouped by the natural tuning of the respective alto arrangement, the groups 1# and blank joined, and the result sorted in the order 5#, 4#, 3#, 2#, 1# or blank, 1b.

Playing cycles:

1st variant:
One playing cycle consists of 5#, 4#, 3#, 2#, 1# or blank, and 1b.

2nd variant:
One playing cycle consists of 5#, 4#, 3#, 2#, 1# or blank, 1b, 1 # or blank, 2#, 3#, 4#.

Evaluation:
Proceeding from group to group in a random way: avnstr = about 2.3.
1st variant: avnstr = 10 / 6 = about 1.7.
2nd variant: avnstr = 1

§14.2.2 APPROACH 2: REDUCING THE SET OF TUNINGS USED

Again, provided that tunings are only discarded 'at the edges', any reduction by one tuning reduces the number of strings involved in retuning by 1 and the number of retuning activities per playing cycle by 2. Using just one natural tuning completely eliminates retuning and playing cycles.

§14.2.3 APPROACH 3: INCREASING THE NUMBER OF ALTO GUITARS USED

Again, provided that only 'adjacent' tunings are grouped together, any additional guitar reduces the number of strings involved in retuning by 1 and the number of retuning activities per playing cycle by 2. Using 6 altos completely eliminates retuning and playing cycles.

END OF THEORY OF SCORDATURA

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2011/06/30 13:33

The theory has been reworked and supplemented by some new insights.

Essentially involved were §1, §2, §8, §9, §10.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Sten - 2011/07/01 06:06

Silvanig,
This is interesting!
Sten

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by tenvec - 2011/07/01 13:06

Silvanig,
A major effort, congratulations! I have run off the complete paper so that it is easier to study.
Like Sten, I do not like retuning basses, but will do so if I find the piece is very attractive. In any case, frequent retuning tends to fatigue a metal string resulting in a dull tone.
I suspect that like many players of older music, I prefer to stay with the original key, but recognise that modern pitch is probably about half a tone sharp. For this reason, I have a number of instruments tuned in F# to simulate old G pitch. Although originally done to play renaissance and later renaissance music, this pitch is useful for some baroque pieces. For example, a piece in D, would typically require retuning of three alto basses for the transposing key of B, where all basses are used. A piece in D can be played on an F# tuned instrument using a transposing key of C, as F# is just a tone higher than a standard guitar E-tuning. I do realise this is still half a tone sharp, but life is full of compromises, and half a tone is not a big compromise ... .
Still, Sivang, you have made a major study of the issues of performing Weiss on an alto; and have produced an algorithm to expedite transcription. I do not think anyone else has done anything remotely comparable.
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2011/07/10 12:36

Sten and James,
Thanks for your feedback!

James,
Your idea to use an F# tuned instrument especially offers an elegant way to achieve 'Baroque sound' in all the cases where a transposition of three semitones down results in a convenient key, but not of four semitones down.

Examples:

Original key =G, 3 semitones down -> E, F# tuned instrument -> Eb.

Likewise:
F -> D -> Db
Bb -> G -> Gb
C -> A -> Ab

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2011/08/27 13:06

A new chapter has been added:

§14 HOW TO AVOID FREQUENT RETUNING OF ALTO GUITARS

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Sten - 2011/08/27 13:35

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silvanig,

Thank you again for this excellent, brilliant, and yet practical and useful treatise!

The new §14 is very interesting to me. It shows the dilemma we all have and the compromises we may choose. Currently I use a combination of approaches number 2 and 3, always considering and pondering over this matter.

Sten

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Bruma - 2011/08/29 21:23

Hi Silvanig,

Congratulations for your work and thank you for sharing this valuable information for everyone.

All the best
Bruma

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2011/09/17 09:32

Recently I happened to notice some discrepancy between Jean-Daniel Forget's and Leyenda's versions of no 34, London MS. This is the piece written in the exotic key bb minor.

I addressed Jean-Daniel for help.

The explanation for the discrepancy was, that, caused by an error in the Django software, the scores of the Django version erroneously showed C for all occurrences of Cb (course 11).

This small difference had quite a few consequences for the theory of scordatura:

.. The tuning for no 34 was erroneous.

.. The number of natural tunings applied in the two manuscripts to 13 course baroque lutes decreased by 1 (to 6) and the number of additional tunings used increased by 1 (to 2).

.. The diversity of convenient natural alto tunings didn't equal any more the diversity of the natural tunings used by Weiss in the two manuscripts (as for number of tunings).

.. An example of the derivation of the tuning of an alto arrangement became obsolete.

.. The statement, that the maximum interval of retuning of a bass was one semitone, was not valid any more. Now there was one exception to the rule.

Meanwhile I have worked in the necessary amendments.
According to Jean-Daniel the error in the Django software has been corrected, too.

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Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by Sten - 2011/09/17 10:37

Silvanig,

Thank you for the correction and clarification!
This is a complicated matter.

Sten

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Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by tenvec - 2011/09/17 12:34

Silvanig,
Congratulations on this attention to detail, and resolving the issue!
James.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by silvanig - 2011/10/22 17:46

The former
§14 HOW TO AVOID FREQUENT RETUNING OF ALTO GUITARS
has been enhanced and divided into
§14 CONVENIENT TUNINGS FOR ALTO GUITARS
and
§15 HOW TO AVOID FREQUENT RETUNING OF ALTO GUITARS.

§9, Digression 1
has been extended.

Some new abbreviations have been introduced in §10.2 and §12.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by tenvec - 2011/10/24 13:15

Silvanig,
Phew! Quite an effort to work out all these combinations ... !
It occurs to mind that alto players could borrow from theorbo players the idea of having just TWO alto guitars, but with different tunings, viz., one suited to sharp keys, the other to flat keys.Tuning in G is flat key friendly, tuning in E or A is sharp key friendly. Although I do not play much baroque lute music, I tend to use a 10s in E when the key is in C, Am, or contains sharps. Using a 10s with standard basses at D, C, B', A', mostly requires only the 8th to be sharpened, but does have the problem that the low G and F have to be fretted.
I think it would be worthwhile examining the advantages and disadvantages of tuning in E or A. Theorbo players used a tuning in A. One obvious advantage is that the 7th string is G, the 8th string is F, so, these are potentially available as open strings. The transposing keys for tuning in A are the same as for the standard requinto in A. Alternatively, one could tune in E, but from the 5th string down use Carulli decacorde tuning, viz., G, F, E, D, C, B' for an 11s instrument.
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by silvanig - 2011/12/14 18:04

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§12 and §13 have been refined and joined.
The result is the new
§12 DERIVATION OF THE TUNING OF AN ALTO ARRANGEMENT.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Sten - 2011/12/14 20:22

Silvanig,

On previous pages of this thread I read your updated document which was obviously last edited today December 14.
I did not follow all of the text in detail but I read it thoroughly enough to find the new §12 quite interesting.
I got the thought that this could be interesting also to Göran Söllscher, our alto guitar guru. He is currently professor at Malmö Musikhögskola and has the email address goran.sollscher@mhm.lu.se
Perhaps you would like to put the text into a document and send it to him? He may remember my name after the publication of the book Altgitarren online here at altoguitar.com, so you could try to mention me as a reference if you think that would be an advantage. Or you could just mention that your document has been published on altoguitar.com.

Best regards,
Sten

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Glen - 2011/12/16 00:24

All of this looks like way too much thinking for me. I certainly won't be playing volumes of Weiss' pieces to make this an issue at all. Select some pieces you want to learn, discern what new key will work best, and play them. Sometimes down a minor 3rd works fine for the alto, but not always. Sometimes the new key is awkward on the guitar and it will be better to adjust up or down a tad. For example, original key of E major down to C# major is not good. Adjust to C major for a better fit. Honestly, I don't see the need for such a cerebral dissertation for this subject.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2011/12/21 20:24

Sten,
Thank you for your kind response.

Maybe this theory of scordatura is even interesting for Göran Söllscher.
But, frankly, as the paper is publicly accessible, I don't want anybody to feel induced to commenting on it by personally addressing him.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Monypm - 2012/02/13 00:57

Dear Silvanig,

Your in depth paper on this interesting subject is much appreciated. May I ask if it is available in its entirety as a Word or Text document anywhere? I would like to have a good read of it but find following the separate threads a little cumbersome. Please excuse me if I am missing the obvious as to where to locate it but I am relatively new to the forum.

Once again many thanks, a great effort.

Peter Mony, Sydney, Australia. email monypm@laudarra.com.au

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/02/13 19:07

Hi Peter,

Sorry, there does not (yet) exist a complete version of the theory outside the alto forum.

It is true that the theory has mainly evolved from a series of WORD documents. But it has undergone some filing directly in the forum, and probably still will. Luckily the forum software supports repeated editing of messages already posted, which allows reworking and extending the 'paper'.

Anyhow, maybe this will help you:
The surface of the alto forum offers two modes of presenting the messages:
 and .
Perhaps you have been only using up to now.

If you're in , just click on menu item , to switch over to .
And, vice versa, if you're in , just click on menu item , to switch over to .

 integrates several adjacent messages of a thread into one 'page'.
So it takes just 4 successive 'pages', to read the whole theory.
Proceeding to the next page is triggered by clicking on at the bottom of a page.

PS: I'm glad you like the theory.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/02/24 01:40

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§9, Digression 2
has been replaced by the new
§12.4 TRANSPOSING DOWNWARDS WITHOUT EXCEEDING BASS RANGES

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/08/22 16:51

James,

I've been thinking about your idea to examine the advantages and disadvantages of several guitar types in order to complement an alto guitar as a flat key friendly instrument type by a sharp key friendly instrument type, in the context of playing baroque music.

The longer I've been pondering on this topic, the more it gained in attractivity.

But let's try to proceed systematically:
In order to have a common base for further examination, we might start with specifying precisely
.. what flat/sharp key friendliness means
.. which are the guitar types to examine.

FLAT/SHARP KEY FRIENDLINESS OF A GUITAR TYPE

Here is a proposal for a definition:

A guitar type is (baroque) flat / sharp key friendly, if the arrangement of a baroque lute piece originally composed in a flat / sharp key, in such a way that the sound (in terms of primary tone frequencies) of the piece is preserved, usually

produces scores in a convenient key signature. In this context, key signature blank is considered belonging to the flat keys.

Remark 1:
This definition is restricted to baroque lute music because the discussion of the topic depends on the instrument type the original music is composed for.

Remark 2:
It is presupposed that preserving tone frequencies applies to the second string of a lute course, if the strings of this course are tuned in octave.

Remark 3:
It is assumed that the following key signatures are convenient key signatures for guitar arrangements: 5#, 4#, 3#, 2#, 1#, blank, 1b.

Remark 4:
It is presupposed that the synchronization of notes (on sound level) with tone frequencies is the same for all instrument types involved (i.e. also for the underlying baroque lute). This guarantees, that the arrangement key signature for a given baroque piece on a given instrument type is not ambiguous.

This will be made more transparent by the following examples.

Example 1:
Let us assume that we have a piece in G, played on a Baroque lute tuned with 440 Hz for a1. A sound preserving arrangement of this piece for an alto also tuned with 440 Hz for a1 is produced by transposing three semitones down, which results in an arranging key of E, i.e. key signature 4#. 4# is a convenient arranging key signature.

Example 2:
The sound for the same piece is also preserved by the same arrangement if both instruments are tuned with 415.305 Hz (or any other frequency) for a1.

Example 3:
However, if the pitch of the lute is one semitone below the pitch of the alto (for example with 415.305 Hz for a1 on the lute and 440 Hz for a1 on the alto), a sound preserving arrangement is achieved by transposing 4 semitones down, which results in an arranging key of Eb, i.e. key signature 3b. This is not a convenient arranging key signature for guitars.

NUMBER OF STRINGS

In order to achieve comparability, the guitar types examined should allow to produce sound preserving arrangements of the same pieces.

Producing a sound preserving arrangement implies, that the bass range of the respective guitar type is not exceeded. One might demand, that the number of strings be sufficient to produce a sound preserving arrangement of any lute piece written for a 13 course lute (with course 13 being used). This makes sense, as this is the most common type of music in Weiss's oeuvre.

DESCRIBING GUITAR TYPES

In order have the same level of description, one might describe a guitar type by

.. Determining whether it's a transposing or non-transposing guitar type

.. Specifying its number of strings

.. Identifying the variably tuned strings

.. Specifying its natural tunings. The tuning for the convenient key signature 1# on score level will be taken as a representative of these tunings.

GUITAR TYPES

The alto guitar will also be described according to the pattern defined above (see Guitar type 1).

Guitar type 1

A transposing guitar type with 12 strings.
Variably tuned strings: 6 to 12.

Natural tunings for strings 6 to 12: see , §10.2.

Tuning for key signature 1# on score level:
e1..b...f#..d..A..E..D..C..B1..A1..G1...F1#
Resulting tuning on sound level:
g1..d1..a...f..c..G..F..Eb..D..C...B1b..A1

Guitar type 2

A transposing guitar type with 13 strings.
Variably tuned strings: 7 to 13.

Natural tunings for strings 7 to 13 on score level: Similar to natural tunings for strings 7 to 13 for a 13 string alto on score level (see , §10.2.) .

Tuning for key signature 1# on score level:
e1..b...f#..d..A..E..D..C...B1..A1..G1..F1#..E1
Resulting tuning on sound level:
a1..e1..b...g..d..A..G..F....E...D....C...B1....A1

Guitar type 3

A non-transposing guitar type with 10 strings.
Variably tuned strings: 6 to 10.

Natural tunings for strings 6 to 10 on score and sound level: Similar to natural tunings for strings 6 to 12 for guitar type 1 on score level.

Tuning for key signature 1# on score level:
e1..b..f#..d..A..E..D..C..B1..A1
Resulting tuning on sound level:
e1..b..f#..d..A..E..D..C..B1..A1

This guitar type is easy to implement by using a 10-string guitar with baroque tuning.

Guitar type 4

A non-transposing guitar type with 12 strings.
Variably tuned strings: 6 to 12.

Natural tunings for strings 8 to 12 on score and sound level: Similar to natural tunings for strings 6 to 10 for guitar type 1. Natural tunings for string 6 on score level: G#, G or Gb depending on key signature. Natural tunings for string 7 on score level: F# or F, depending on key signature.

Tuning for key signature 1# on score level:
e1..b..f#..d..A..G..F#..E..D..C..B1..A1
Resulting tuning on sound level:
e1..b..f#..d..A..G..F#..E..D..C..B1..A1

Guitar type 5

A non-transposing guitar type with 12 strings.
Variably tuned strings: 6 to 12.

Natural tunings for strings 6 to 12 on score and sound level: Similar to natural tunings for strings 8, 9, 10, 11, 12, 6, 7 of guitar type 4.

Tuning for key signature 1# on score level:
e1..b..f#..d..A..E..D..C..B1..A1..G...F#
Resulting tuning on sound level:
e1..b..f#..d..A..E..D..C..B1..A1..G...F#

(DRAFT OF) A ROAD MAP FOR FURTHER EXAMINATION

E1. Verifying flat/sharp key friendliness of the guitar types

E2. Comparing the guitar types with respect to criteria, which can be examined independently of concrete pieces:

E2.1 Number of variably tuned strings

In order not to increase the risk of creating unfrettable constellations on a guitar type, it is fortunate, if the number of variably tuned strings is equal to the number of variably tuned courses of the underlying baroque lute, i.e. = 7.

E2.2 Correspondences of adjacent lute courses with fixed tuning and adjacent guitar strings with fixed tuning

It is fortunate if frettings or parts of frettings of lute courses with fixed tuning can be preserved. The probability of achieving this increases with the number of adjacent strings of the respective guitar type with the same fixed tuning (on sound level) as adjacent lute courses.

E2.3 Identical transformation note -> fretting position for the pair of guitar types

The aim of the examination is to complement an alto guitar as a flat key friendly instrument type by a sharp key friendly instrument type. With respect to sight-reading it is fortunate, if the same fretting positions on the two instrument types correspond to the same notes on score level. So one can switch back and forth between the two instrument types without having to observe a change of the rules for locating the notes on the respective instrument type.

E3. Comparing the guitar types with respect to criteria, which can only be examined with concrete pieces as a basis

E3.1 Playability of the music
The only difference between the tunings of the 13 string alto and the tunings of guitar type 2 on score level is, that the 6th string of the 13 string alto is variably tuned, whereas the 6th string of guitar type 2 has fixed tuning. A closer inspection reveals, that for the key signatures we focus on in this treatise, namely the convenient key signatures, there is no difference in tuning.

So we can test the playability of arrangements for guitar type 2 on a 13 string alto, using a transposition of 5 semitones down.

Similarly the playability of arrangements for guitar type 3 can be simulated on an 11- or 13-string alto, using original scores (i.e. scores for the lute, without transposition).

The test of the playability of the music on guitar types 4 and 5 requires the availability of an appropriate instrument, using original scores.

E3.2 Actual sound

This requires the availability of appropriate instruments.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by tenvec - 2012/08/23 13:40

_____

Silvanig,
A very thoughtful analysis. Just a few comments on the problem of playing baroque lute music on a guitar with typical guitar tuning, i.e., fourths and one third in the first six strings.
1) There are two problems in trying to play baroque lute music on a multi-string guitar in E: a) the open 6th and 7th courses on a baroque lute, viz., G and F, which can be sharpened, offer a supporting bass that cannot always be

reproduced or reproduced easily by fretting the 6th string;
2) the different tuning of a baroque lute(f', d', a, f, d, A, etc.), means in many cases that a lutenist plays notes in the treble across the strings, that a guitarist plays along the string; played in the way a guitarist plays, although all the notes are reproduced, the campanella effect inherent in performance on a baroque lute is lost. Further, certain chords, slurs and ornaments are not playable on a guitar, i.e., a chord may have a note missing, etc.. I have noted in transcribing baroque pieces that a composer can deliberately choose alternative fingerings to exploit the campanella effect.
Both points are important. While a piece by Weiss played on guitar may still sound impressive, it would be enhanced by the natural campanella effect of performance on a baroque lute, and, of course, on a lute, all chords and slurs can be played accurately. In my experience, problems with slurs, ornaments and chords can be more or less important in a given piece, one can be lucky. Accuracy of performance on a guitar-like instrument is possible if one adopts the "Dresden" guitar developed by Michael Thames. It has thirteen strings, and is tuned like a baroque lute, but without any octave strings in the bass as could occur on some baroque lutes. Being tuned like a baroque lute, one can play from tablature, and/or, learn a new fret board. While this may sound like a lot to learn, if one's major interest is baroque lute music, the effort must be worthwhile.
If one is prepared to live with the inaccuracies caused by guitar tuning, performance of baroque pieces in open or sharp keys can have point 1), and a number of arrangements of other music, greatly helped by a 12s guitar in E with tuning along the lines you have indicated, e', b, g, d, A, G, F, E, D, C, B', A'. The additional G and F can be placed below the A'. This tuning was proposed by the Russian guitarist, Nikolai Pavlistcheff, sometime in the 1840's, I believe, when he went to live in Poland.
James.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/09/22 11:44

James,

I have added the instrument type proposed by Pavlistcheff as guitar type 5 to the list of guitar types to be examined.

==========

Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/09/22 12:50

ANALYSIS CONTINUED:

E1. VERIFYING FLAT / SHARP KEY FRIENDLINESS OF GUITAR TYPES 1 TO 5

Inspection of guitar type 1

Lute key signature.....:6#...5#...4#....3#....2#...1#.....bl....1b...2b....3b...4b...5b...6b
Guitar key signature (scores).....:3b...4b...5b....6#....5#...4#....3#....2#...1#....bl....1b...2b...3b
Convenient key signature (scores)..:..-.....-.....-.....-....OK..OK..OK..OK..OK..OK..OK....-.....-

Hints:

.. Guitar key signature 6b, which would be an alternative counterpart to lute key signature 3#, has been omitted, assuming that 6# is a better key signature than 6b.

.. OK/- indicates a convenient/inconvenient arranging key signature

Verifying the thesis, that guitar type 1 is flat key friendly:

Lute key signatures blank, 1b, 2b, 3b and 4b lead to convenient key signatures on score level, but not 5b and 6b. The definition of flat key friendliness requires that a sound preserving arrangement usually produces scores in a convenient key signature. As 5b and 6b are rarely used (from where we stand, there are just 2 pieces in the whole Weiss oeuvre composed with these key signatures), the definition of flat key friendliness is fulfilled.

Inspection of guitar type 2

Lute key signature.....:6#...5#...4#....3#....2#...1#....bl....1b...2b...3b...4b...5b...6b
Guitar key signature (scores).....:5b...6#...5#....4#....3#...2#....1#....bl...1b...2b...3b...4b...5b
Convenient key signature (scores)..:..-.....-...OK..OK..OK..OK..OK..OK..OK....-.....-.....-....-

Verifying the thesis, that guitar type 2 is sharp key friendly:

Lute key signatures 1#, 2#, 3# and 4# lead to convenient key signatures on score level, but not 5# and 6#. But as 5# and 6# are rarely used (from where we stand, there is no piece in the whole Weiss oeuvre composed with these key signatures), the definition of sharp key friendliness is fulfilled.

Inspection of guitar type 3

As this instrument type is a non-transposing one, there is no difference between scores and sound.

Formally applying the same scheme as above, we have:
Lute key signature.....:6#...5#...4#...3#....2#....1#....bl....1b...2b...3b...4b...5b...6b
Guitar key signature (scores).....:6#...5#...4#...3#....2#....1#....bl....1b...2b...3b...4b...5b...6b
Convenient key signature (scores)..:..-...OK..OK..OK..OK..OK..OK..OK....-.....-.....-..... -.....-

Verifying the thesis, that guitar type 3 is sharp key friendly:

Key signatures 1#, 2#, 3#, 4# and 5# are convenient key signatures, but not 6#. But as 6# is rarely used (from where we stand, there is no piece in the whole Weiss oeuvre composed in this key signature), the definition of sharp key friendliness is fulfilled.

Inspection of guitar types 4 and 5

Like guitar type 3.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by tenvec - 2012/09/27 13:20

Silvanig,
I have been on holiday, so, I am slow responding to your extensive classification of the suitability of guitar types to the keys commonly found in baroque lute music. A lot of work, well done!
My own preference for playing sharp keys, and help with upward range when arranging music from other instruments, is an alto in A. Ideally, this would be a 13s instrument, 57 scale, so that the lowest string is at A'. For those not used to working out transposing keys, here are some examples.

Original	Transposing
C	G
D	A
E	B
G	D
A	E

For some flat keys:

Cm	Gm
Dm	Am
Eb	Bb
F	C
Gm	Dm
Ab	Eb
Bb	F

To get original pitch, notes on the score are written down a 4th. Thus, played frets are moved towards the nut, and the top string at a', of course, helps this playing in low positions. Tuning in A is thus a fairly useful key.
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by tenvec - 2012/09/27 13:26

Hello all,
I had the keys well separated in relevant columns in the original ... .
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss
Posted by silvanig - 2012/11/23 15:55

ANALYSIS CONTINUED:

E2. Comparison of the guitar types with respect to criteria, which can be examined independently of concrete pieces

E2.1: Number of variably tuned strings

The guitar types 2, 4 and 5 have seven variably tuned strings and hence the same granularity of the variably tuned strings as the alto guitar (guitar type 1).

Guitar type 3 has only five variably tuned strings.
James, this reflects the following point of your comment concerning a :
.

So the guitar types 2, 4 and 5 fare better than guitar type 3 with respect to this criterion.

E2.2 Correspondences of adjacent lute courses with fixed tuning and adjacent guitar strings with fixed tuning

For a 13 course baroque lute the tuning of the courses with fixed tuning is:
f1 d1 (aa) (ff) (dd) (AA)

For an alto guitar (guitar type 1) the tuning of the strings with fixed tuning is
g1 d1 a f c.
So there is a correspondence of the tunings of the lute courses 2, 3 and 4 and the tunings of the alto strings 2, 3 and 4.

For guitar type 2 the tuning of the strings with fixed tuning is
a1 e1 b g d A.
So there is only a correspondence of the tunings of the lute courses 5 and 6 and the tunings of the strings 5 and 6 of guitar type 2.

For the guitar types 3, 4 and 5 the tuning of the strings with fixed tuning is
e1 b f# d A.
So there is only a correspondence of the tunings of the lute courses 5 and 6 and the tunings of the strings 4 and 5 of the guitar types 3, 4 and 5.
James, this reflects the following point of your comment concerning a :

Comparing the alto guitar (guitar type 1) with the other guitar types (2, 3, 4 and 5) shows, that only the alto guitar has a to the baroque lute, insofar as there are adjacent trebles with the same (fixed) tuning as the baroque lute. In total, the alto guitar has 3 adjacent strings with the same (fixed) tuning as the baroque lute.
The other guitar types have an affinity with respect to the 5th and 6th lute course. This is rather a weak affinity.

E2.3 Identity of mapping note -> fretting position for the pair of guitar types

The alto guitar has the following tuning for key signature 1# on score level:
e1..b...f#..d...A...E...D...C...B1..A1..G1..F1#.
The corresponding tuning of guitar type 2 is
e1..b...f#..d...A...E...D...C...B1..A1..G1..F1#..E1.
The tuning of the alto guitar is the same as the tuning of the corresponding strings (i.e. strings 1 to 12) of guitar type 2.
So the same fretting positions on the two instrument types correspond to the same notes on score level.
The same statement is also valid for all other convenient key signatures on score level.

Guitar type 3 has the following tuning for key signature 1# on score level:
e1..b...f#..d...A...E..D...C...B1..A1.
So again the mappings note -> fretting position for the pair of guitar types are identical with respect to the corresponding strings. This also applies to the other convenient key signatures on score level.

Things are different with the other guitar types:

The tuning of guitar type 4 for key signature 1# on score level is
e1..b...f#..d...A...G...F#..E...D...C...B1..A1.
So the note/fret relation of the strings 6 to 12 differs from the alto guitar.

The tuning of guitar type 5 for key signature 1# on score level is
e1..b...f#..d...A...E...D...C...B1..A1...G...F#
So the note/fret relation of the strings 11 to 12 differs from the alto guitar. But as the difference only applies to 2 strings, guitar type 5 is closer to the alto guitar than guitar type 4.
http://altoguitar.com/images/fbfiles/files/flat_friendly_5___pdf___ergebnis.pdf

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by tenvec - 2012/12/03 13:44

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silvanig,
I am slow responding, other than having too many things to do, it took some time to study your detailed analysis.
It seems to me that if one wants to play baroque lute music without any compromises with slurs, ornaments, some chords, and the campanella effect inherent in much baroque lute composition, one really must use an instrument tuned as a baroque lute. If one does not do so, one is playing baroque music, but not the music as the lute composer intended. In some pieces compromises over slurs, ornaments and chords may be minimal, but the campanella effect will always be lost. Although I have only a minor interest in baroque lute music, I have sat through many baroque lute recitals at the UK LS, and there is as noticeable difference in musical ambience between performance on lute and that on guitar, even where the bass is not compromised when a 10s or alto is used.
I use an E-tuned instrument with spruce top for baroque lute pieces in open or sharp keys, and accept that this is not really "authentic", but still sounds attractive. As an example, in the recent edition of Lute News, the quarterly publication of the UK Lute Society, there is a Suite in Dm for lute by Robert de Visée, in which opening notes are on a' and g', which could be easily fretted on the first course, but RdV chooses the g' on the second course. Examples could be multiplied.
That said, Weiss still sounds impressive on guitar.
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by tenvec - 2012/12/06 14:14

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Silvanig,
With your interest in guitar tunings, you may be interested in the following observation; it was brought to my attention by Marion Ceruti.
Tuning the 3rd string of an alto to 'a', gives on the bottom ten strings a 'tenor' in D. The transposing key for this tuning is a tone higher. As an example, if a piece is in Gm, writing it in Am, and playing it on the inner ten strings will sound in Gm. the first string could then be integrated for certain high notes.
James.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2012/12/29 13:09

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James,

The diversity of alternatives is amazing.

If I understood correctly, the idea of Marion Ceruti's is to reinterpret the strings of an alto in a way, that the second string

is a quasi first string, the third string is a quasi second string, and so on.

The second string of an alto is tuned to d1 on sound level and would be interpreted as e1 on score level, i.e. we have a transposing effect of 2 semitones down.

The third string of an alto is tuned to a on sound level and would be interpreted as b on score level, so again we have a transposing effect of 2 semitones down.

The fourth string of an alto is tuned to f on sound level. Adding two semitones gives g, which is the tuning of the third string of a classical guitar (but not an alto guitar) on score level. In order to be able to interpret this string as the third alto string (with standard tuning f# on score level), it would be consequent, to tune this string to e on sound level.

The next two strings again match the transposing pattern of two semitones down perfectly (d -> c, A -> G).

Problems start with string 7. Following the pattern of string reinterpretation, this string would have to be interpreted as E on score level, but the tuning on sound level is F. I.e. this would be a transposing effect of one semitone up instead of two semitones down. Similar problems arise for the other basses.

How can we get out of this dilemma, preserving the transposing effect of 2 semitones down? I see two ways.

The first way is to retune the strings 7,8,9... on sound level in such a way, that the (reinterpreted) tuning on score level is the tuning of an alto (and the transposing effect is 2 semitones down):

(Reinterpreted) tuning for key signature 1# on score level:
a1..e1..b...f#...d...A...E...D...C....B1...
Resulting tuning on sound level:
g1..d1..a...e...c...G...D...C...B1b.A1...

The deepest tone of a piece in G composed for a 13 course lute is A1. As a consequence of the retuning A1 is the tuning of the 10th guitar string on sound level. So a 10 string instrument would be adequate:

(Reinterpreted) tuning for key signature 1# on score level:
a1..e1..b...f#...d...A...E...D...C....B1
Resulting tuning on sound level:
g1..d1..a...e...c...G...D...C...B1b.A1

This variant will be referred to as guitar type 6.

For a piece in A with key-conform tuning the 7th course of a baroque lute (which is a variably tuned course) is tuned to g#G#. So it would be consequent to treat the 6th string of guitar type 6 as the first variably tuned string. This leads to an unusual situation for sight-reading, the quasi 5th string being treated as a variably tuned string.

The second way is to preserve the alto tunings of the strings 7,8,9… on sound level (apart from key dependent adjustments) and the effect of transposing 2 semitones down, and accept a change of tuning on score level. Proceeding like this, the tuning of the 12th string on sound level is A1. So we would need a 12 string instrument. The result is a tuning on score level analogous to guitar type 4:

(Reinterpreted) tuning for key signature 1# on score level:
a1..e1..b...f#..d...A...G...F#..E...D...C....B1
(The tuning for guitar type 4 on score level is
.....e1..b...f#...d...A...G...F#..E...D...C....B1)
Resulting tuning on sound level:
g1..d1..a...e....c...G...F...E...D...C...B1b.A1

This variant will be referred to as guitar type 7.

With an argumentation similar to guitar type 6 the 6th to the 12th string of guitar type 7 would be treated as the variably tuned strings, again leading to an unusual situation for sight-reading.

E1. Verifying flat/sharp key friendliness of the guitar types 6 and 7.

Lute key signature.....:6#...5#...4#...3#...2#...1#...bl...1b...2b...3b...4b...5b...6b
Guitar key signature (scores).....:4b...5b...6#...5#...4#...3#...2#...1#...bl...1b...2b...3b...4b
Convenient key signature (scores)..: -.....-.....-....OK.OK.OK.OK.OK.OK.OK....-.....-.....-

Verifying the thesis, that guitar types 6 and 7 are sharp key friendly:
Lute key signatures 1#, 2# and 3# lead to convenient key signatures on score level, but not 4#, 5# and 6#. But as 4#, 5# and 6# are rarely used (from where we stand, there is no piece in the whole Weiss oeuvre composed with these key signatures), the definition of sharp key friendliness is fulfilled.

E2. Comparison of the guitar types with respect to criteria, which can be examined independently of concrete pieces

E2.1: Number of variably tuned strings

Guitar type 6 has only five variably tuned strings.
Guitar type 7 has seven variably tuned strings and hence the same granularity of the variably tuned strings as the alto guitar (guitar type 1).

E2.2 Correspondences of adjacent lute courses with fixed tuning and adjacent guitar strings with fixed tuning

For a 13 course baroque lute the tuning of the courses with fixed tuning is:
f1 d1 (aa) (ff) (dd) (AA)

For guitar types 6 and 7 the tuning of the strings with fixed tuning on sound level is
g1..d1..a...e...c
So there is a correspondence of the tunings of the lute courses 2 and 3 and the tunings of strings 2 and 3 of guitar type 6.

E2.3 Identity of mapping note -> fretting position for the pair of guitar types

The alto guitar has the following tuning for key signature 1# on score level:
…..e1..b....f#..d...A...E...D...C...B1..A1..G1..F1#.
The corresponding (reinterpreted) tuning of guitar type 6 is
a1..e1..b...f#...d...A...E...D...C...B1

Comparing the 1st alto string with the quasi 1st string of guitar type 6, the 2nd alto string with the quasi 2nd string of guitar type 6, and so on, the same fretting positions correspond to the same note on score level. But I wonder, whether this reinterpretation of strings during sight-reading is an easy task.

The (reinterpreted) tuning of guitar type 7 on score level is
a1..e1..b...f#...d...A...G...F#..E...D...C....B1.
The mapping note -> fretting position of this guitar type differs from the alto guitar. For example the note D on score level is played as the open 7th string of the alto guitar, whereas the open 7th (reinterpreted) string of guitar type 7 corresponds to F#. http://altoguitar.com/images/fbfiles/files/guitar_types_6_and_7___pdf__ergebnis.pdf

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Bruma - 2013/01/05 15:50

Hi Silvanig,

I want to thank you for all your very valuable contribution to this forum. Your knowledge is deep and very important for all of us.

Best
Bruma

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2013/01/05 16:33

A few remarks concerning

E3.1 PLAYABILITY OF THE MUSIC

Giving each of the criterions E2.1 to E2.4 the same weight, guitar type 2 is the best alternative. What in addition makes this instrument type attractive for me, is that it provides new transposing keys for the pieces composed in sharp keys.

In the Dresden and London Weiss manuscripts there are pieces with the sharp key signatures 3#, 2# and 1#. Sound preserving arrangements lead to arranging key signatures 4#, 3# and 2#. As guitar type 2 and the 13 string alto have the same note/fret relation, the playability of these arrangements for guitar type 2 can be tested on a 13 string alto. I have started to do so.

My interest has especially been aroused by the

TRANSPOSITION FROM 3# to 4#

When I started arranging Weiss pieces written in A on the alto I used to choose transposing key G. But some comparison showed, that, in contrast to other constellations, the effect of reducing the number of critical F/F#s and G/G#s by transposing downwards obviously didn't apply to transposing from A to G (see thread).

Furthermore I experienced, that for quite a few pieces the result of the transcription sounded muddy.

An example of this problem is suite XI (in Jean-Daniel's numbering) of the London Weiss MS. In order to achieve a brighter sound, I changed my arranging method by playing this suite with arranging key = original key.

But I was never quite happy with the playability of these arrangements (arranging keys G and A) because of the number of compromises needed. Especially problematic in this respect proved bars 37 to 45 of the allemande in this suite. I never found a satisfying compromise for this passage in either of these arranging keys.

Replacing some of the bass strings of my alto by the sonorous, full basses of the Hannabach series 815, the problem of muddy sound was solved. But the problem of playability remained. So I continued looking for alternatives.

Knowing that transposing 3 semitones down has the positive effect, that often fretting positions for strings 2 to 4 can be preserved, and hoping that this might improve playability considerably, I experimented with transposing key = F# (using the same scordatura as for arranging key = B). But the result was not convincing.

Going one more semitone down (to F) didn't bring a substantial improvement, either.

But then I made the breakthrough by transposing 5 semitones down to E. The problem of critical F/F#s and G/G#s vanished into thin air. And sight-reading was easy compared with arranging key F#, which mostly required painstaking preparation of fingerings. So, with respect to playability, E is my favourite transposing key for this suite. And E is precisely the arranging key for a sound preserving arrangement on guitar type 2 (with the same playability).

Wondering whether this result was generalizable, I approached suite 20 of the Dresden manuscript. There is a fantastic Presto in this suite, and I hoped that E would provide the ideal transcription with respect to playability.
But the result is not clear. Comparing the E version of the Presto with the G version, there are pros and cons; some passages play better in E, others better in G. So I don't yet know, which version to prefer.

MY CONCLUSION

If I had such a (baroque) sharp key friendly instrument (guitar type 2), I'd surely not use it in a strict sense, i.e. for all pieces originally composed in sharp keys, but consider it as a means to enrich the set of options available for finding the best transposing key for a baroque lute suite, sequence of pieces or single piece in terms of playability and sound.

MUSCLE STIFFNESS DUE TO PLAYING THE ALTO

This is the state of insight I have reached about two months ago. Since then increasing aches in my left shoulder and forearm have forced me to pause. I guess the reason for these persistent aches is, that I have been playing my alto too long without a supporting device between left thigh and guitar body, resulting in muscle stiffness of shoulder and arm. I wonder how violinists avoid similar problems on the long run. Perhaps this is a special alto problem? Are there any experiences/recommendations in the group? Any ideas to shorten my forced alto abstinence would be appreciated.

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Bruma - 2013/01/05 17:08

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Hi Silvanig,

You've already experienced the http://www.ergoplay.de/?

This duo of altoguitar (www.andreas-Koch-gitarre.de) plays with ergoplay, you can see on youtube:

http://www.youtube.com/watch?NR=1&v=0jCgUH1NGcg&feature=endscreen

Personally, I have experienced many supports for guitar, and I prefer the old footrests.

You can see more in here:

http://humaneguitarist.org/support.htm

Best
Bruma

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Jazzgeir - 2013/01/17 12:21

I have been using the old footrest until recently, when I bought a Dynarette cushion.

Throughout the years I didn't notice any back pains until recently: My raised leg causes my hip to twist slightly, and this in turn causes the spine to swerve a bit (like an s). And after becoming older this has caused a bit of pain to a greater and greater degree.

The alto is a bit heavy in the fingerboard end, and the combination of the spine out of place and greater forces exerted on your left arm may be a bad one indeed.

The back pain was gone immediately when switching to the cushion, but it takes some getting used to it. Lately I have been experimenting with higher chairs too, widening the hip angle, and this is a further improvement to my back as far as I can tell.

Any effort spent on finding a good ergonomy is well spent in my opinion. I know people who had to stop playing altogether due to ergonomic issues...

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by silvanig - 2013/01/25 21:50

Hi Bruma and Jazzgeir,

Thank you very much for your advice and the links.
Based on this I was able to gather a lot of additional information about the available supports. Especially in www.classicalguitardelcamp.com
I found long threads discussing pros and cons of some supports. Besides, there are some practical demonstrations in You Tube.

Up to now the only supporting device I have ever used was a footstool with a height of 22 cm.

Before posting my previous message I had already thought about trying to make a supporting cushion with stable geometry, not knowing that the idea was not new. I had bought a panel of insulating material (3 cm thick, probably made of polyurethane foam) and started to saw profiles out of it. The concept was to glue several of these profiles together and coat the whole construction by some smooth stuff. Sorry to say, I found out that the material has a property which probably makes it inappropriate for a support: It is squeaking.

Well, I learned from your messages, that a similar concept has already been realized. So buying a Dynarette cushion is probably the easier way to get ahead. In addition, a comment in the list of supports provided by you, Bruma, and the experience made by you, Jazzgeir, recommend to proceed like this.

Jazzgeir, there is one more detail I'd like to learn from your experience: How stable is the position of the Dynarette cushion? In other words: Is there no tendency that while playing the guitar the support slides away from its initial position, or the guitar slides away from its initial position on the support, requiring repeated readjustment of the position of the support and/or guitar, or, worse, requiring permanent muscular tension to prevent this kind of movement?

I understand that slippage of the Dynarette cushion has been an issue in the past, probably having been coped with in the meantime by enhancing the construction by a neoprene strip on the underside. But the guitar might still slide on the support into the direction of the feet. My concept incorporated a kind of step in the surface of the cushion, in order to prevent the guitar from moving this way.

I am busy doing stretching exercises to relax my stiff muscles. I don't expect success to come quickly, but I strongly hope not to belong to those .

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Glen - 2013/01/25 23:34

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I use the Dynarette cushion. When I first got it I had problems with it sliding down my leg. This was because my thigh sloped downhill. Most chairs are about 18 inches tall, and with my short legs this means that my thigh will slope downhill. One day someone posted a link to this musician's chair which is adjustable, the lowest height being 15 inches. I bought it and it's perfect for me in combination with the Dynarette cushion.

http://www.amazon.com/ADJUSTRITE-Musicians-Chair-Vivo-USA/dp/B0016OIIX0

http://www.harpcenter.com/product/adjustrite-musicians-chair/benches-and-chairs-for-musicians

Glen

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Bruma - 2013/03/12 12:27

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Hi Silvanig,

Glenn is absolutely right. If you go and sit in a lower chair, you dont need to elevate the position of the footrest, so the whole left side of your body will be more balanced and relaxed.

I also sent another link with adjustable chairs:

http://bison.se/products/musicians-orchestra-chairs/

Best
Bruma

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Re:A Theory of Scordatura for Music by S.L. Weiss

Posted by Jazzgeir - 2013/03/14 12:31

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silvanig wrote:
Hi Bruma and Jazzgeir,

>snip<
Well, I learned from your messages, that a similar concept has already been realized. So buying a Dynarette cushion is probably the easier way to get ahead. In addition, a comment in the list of supports provided by you, Bruma, and the experience made by you, Jazzgeir, recommend to proceed like this.

Jazzgeir, there is one more detail I'd like to learn from your experience: How stable is the position of the Dynarette

cushion? In other words: Is there no tendency that while playing the guitar the support slides away from its initial position, or the guitar slides away from its initial position on the support, requiring repeated readjustment of the position of the support and/or guitar, or, worse, requiring permanent muscular tension to prevent this kind of movement?

The trouble with ergonomy is that different things work well for different people, so I can only tell you how it works for me. And, mind you, I never spend more than 3 hours per day rehearsing (that's the ill fortune of amateurs), so my experience with the Dynarette is limited, both in terms of time period and session length.

First of all, there is no doubt about the positive effects for my hip and back. The more relaxed angle between leg and back is way more comfortable than with a stool.

The cusion itself has a neoprene strip underneath and this sits well on any pants at least in my wardrobe. The neoprene sticks to next to any material, I would think, but then I have used it only with my jeans and thin cotton pants. The cushion is tapered, it gets higher and higher the further from your tummy you get. That's why I thought of lowering the leg/back angle further to get an even more relaxed playing position.

The cushion must be placed carefully on your thigh (inside/outside), and this is really all the adjustment you can do with it. I had to experiment to find the most stable position. But once you find it, the cushion is stable, and you can move your guitar around on it. When rehearsing I tend to keep the guitar at a slight angle, so that the guitar is resting on the the inside/backside edge. The contact patch between guitar and cushion is little, but that's no problem, it still sits well.

I have been experimenting a bit to avoid twisting my hip too. When you keep your guitar towards your tummy, the tendency is to twist your spine to the left so that your guitar is not in line with your hip. The problem with keeping the guitar in line with your hip is that you have to hold your left hand further from your body, potentially introducing upper (mainly) and lower arm tension.

I have also noticed how your guitar sounds differently when you keep the guitar back away from your tummy. Maybe the guitar should be held very lightly against your rummy to improve sound and projection, I don't know.

Anyway, before digressing to much: The Dynarette cushion integrates well with a five-point guitar "harness" platform: Left hand, right forearm, tummy, the inside of your right thigh, and elevated left thigh. You can move the guitar around on the cushion, but due to the tapered form of the cushion, your guitar will tend to move towards your body if nothing else. At least, I have not thus far, experienced any muscle tension stemming from having to hold the guitar in position. The cushion itself will sit safely on your thigh, and any movement, if any, will be between guitar and cushion. In my experience the cushion is stable enough to take it even further with seat height etc.

The dynarette is not very expensive, so it is worth a try, IMO. But again, we're all different, and what works for me may not work for you.

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