

How to employ transposition and transposing instruments when using microtonal systems via Nonstandard Key Signatures in Finale

To transpose music using Utilities > Transpose:

- Select music to transpose.
- Select Utilities > Transpose.
- Select Direction (Up or Down).
- Select Method: Chromatically.
- Select Interval: Other...
A small "Interval" dialog box opens.
- **In the "Interval" box**, enter the number of the (diatonic) interval by which to transpose (2nd = 2; 3rd = 3; 4th = 4; etc.).
- **In the "Alteration" box**, enter the result of the calculation ($a - b$), where
 a = total number of steps (in the current tone system) in the interval by which to transpose (for example, in 24-EDO: semitone = 2, whole tone = 4, octave = 24)
 b = number of semitones in the related major or perfect interval in 12-EDO (i.e.: 2nd = 2; 3rd = 4; 4th = 5; 5th = 7; 6th = 9; 7th = 11; octave = 12; etc.)
- Click OK twice.

Read the caveat below!

To define a staff as a transposing instrument:

- Open the Staff Attributes dialog of the staff you want to be transposing.
- Beside Transposition, click Select...
- Select button Chromatic, then from the drop-down menu, select Other...
A small "Interval" dialog box opens.
- If the instrument transposes *downwards* (e.g. Clarinet in Bb, Double bass):
Calculate and enter the values for the "Interval" and "Alteration" boxes as explained above.
- If the instrument transposes *upwards* (e.g. Clarinet in Eb, Piccolo):
Calculate the values for the "Interval" and "Alteration" boxes as explained above, but enter negative numbers instead (or positive if the number was initially negative; i.e. –2 instead of 2, and vice versa).
- Click OK x 3.

Note: If the values entered in the "Interval" and "Alteration" boxes happen to be identical with the values of a common interval in 12-EDO, Finale will afterwards display that 12-EDO interval as the selected interval, even though that interval's name is likely to be incorrect in the current tone system. You should simply ignore this.

Important caveat:

The range of accidentals supported by Finale is only from –7 till +7 steps away from natural. For transposition to work correctly, BOTH the transposed and untransposed notes must fall within the range of +/- 7 steps away from natural. If this is not the case, Finale will transpose incorrectly without warning you about it!

Note: This issue concerns only chromatic transposition as described above. Diatonic transposition is free of this problem.

In EDOs not larger than 31-EDO, this is likely not to be a problem in normal use, especially if you favor the simplest enharmonic notations and use only the most common transposition intervals (e.g. perfect, minor, major).

When transposing in EDOs larger than 31-EDO, the accidental range issue may be encountered more often. If a (transposed) note needs an accidental more than 7 steps away from natural, Finale will transpose and display it incorrectly, erring by exactly 8 steps towards natural (or a multiple of 8). No

error message is given when this happens, and such notes may exhibit other anomalous behavior later, unless manually edited and corrected.

This issue may become critical with transposing instruments. On a transposing instrument's staff, only those pitches will work correctly whose accidentals are within the ± 7 steps' range in both concert pitch and transposed notations. You may be able to avoid this problem by always notating enharmonically so that both the untransposed and transposed notes fall within the ± 7 steps' range. You might want to make a list of all such usable enharmonic notations, separately for each transposing instrument.

Octave transpositions and octave-transposing instruments are problem-free in all (octave-based) systems. Instruments transposing more than an octave have the same problems as those that transpose an octave less.

In EDOs larger than 48-EDO, the possibilities for transposition become increasingly limited. In many large EDOs such as 72-EDO, transposing staves (other than octave-transposing) cannot really be used at all, because many pitches would be impossible to notate correctly on such staves.

Note: In certain editing situations it may appear possible to create pitches with accidentals beyond the ± 7 steps' range, but this is useless, since Finale will automatically alter such pitches (again, by 8 steps) to stay within the said range, either immediately, or during some later editing action. Also, in the Nonstandard Key Signature / Attributes / Symbol List dialog, it is possible to enter accidental values beyond ± 7 , but they do not serve any purpose.

Further, in your Nonstandard Key Signature, it is advisable to define all the accidentals from -7 till $+7$ steps (the whole range supported by Finale), even if you are not planning to use all of them in your score. By doing this, you will maximize the available range of accidentals for transposition, and you will also avoid unintentionally getting notes without any accidental – as that is what happens if an accidental that is left undefined were needed after transposition.

Don't forget that you can show different enharmonic spellings in score and in linked parts, also in microtonal contexts. You could have, for example, in 24-EDO, a sounding B quarter-sharp for Clarinet in B \flat showing as such in an untransposed score, but showing as D quarter-flat in the Clarinet part (instead of C $\frac{3}{4}$ -sharp, the literal transposition). To show different enharmonic spellings in score and in linked parts, do the enharmonic change while viewing the linked part.

Finally, if you have transposing instruments in your score, and the accidental range issue presents problems, but you have no need for an untransposed score ("Score in C") and you don't need playback, it may be better not to define any actual transposition for any of the staves. This way you could use the full accidental range of ± 7 steps on all staves.

Examples

Below are the required values for the "Interval" and "Alteration" boxes for common transposition intervals in a few EDOs (including, for comparison, 12-EDO), followed by a summary of potential problems concerning the accidental range issue.

	12-EDO		24-EDO		31-EDO		48-EDO	
	Interval	Alteration	Interval	Alteration	Interval	Alteration	Interval	Alteration
minor 2nd	2	-1	2	0	2	1		
major 2nd	2	0	2	2	2	3	2	6
minor 3rd	3	-1	3	2	3	4	3	8
major 3rd	3	0	3	4	3	6		
perfect 4th	4	0	4	5	4	8	4	15
augmented 4th	4	1	4	7	4	10		
diminished 5th	5	-1	5	5	5	9		
perfect 5th	5	0	5	7	5	11	5	21
minor 6th	6	-1	6	7	6	12		
major 6th	6	0	6	9	6	14	6	27
minor 7th	7	-1	7	9	7	15	7	29
major 7th	7	0	7	11	7	17		
perfect octave	8	0	8	12	8	19	8	36
major 9th	9	0	9	14	9	22	9	42
double octave	15	0	15	24	15	38	15	72

In **24-EDO** and **31-EDO**, the accidental range issue is insignificant; problems might only occur when transposing notes with double sharps/flats in an even sharper/flatter direction.

In **48-EDO**, all non-octave transpositions are subject to some limitations.

On the staves of transposing instruments, the following pitches cannot be used (their enharmonic equivalents can be used instead):

- Instruments in F: avoid B# (and any higher accidentals on B)
- Instruments in Bb: avoid E#, B# (and any higher accidentals on E, B)
- Instruments in Eb: avoid A#, E#, B# (and any higher accidentals on A, E, B)
- Instruments in G: avoid Fb (and any lower accidentals on F)
- Instruments in D: avoid Cb, Fb (and any lower accidentals on C, F)
- Instruments in A: avoid Gb, Cb, Fb (and any lower accidentals on G, C, F)

And so on.

All regular transposition operations have analogous limitations.

Also note that in 48-EDO, double flats and double sharps are not available, as they are 8 steps away from natural.

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