

Using textmidifor~~med~~it

The textmidicgm form editor

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Table of Contents

1	Overview	2
1.1	What is textmidiformedit?.....	2
2	Downloading textmidiformedit	3
3	Invoking textmidiformedit	4
4	Musical Form Window	5
4.1	Name	5
4.2	Len	5
4.3	Min/Max Note Len	6
4.4	Pulse/Sec	6
4.5	Melodic Probabilities	6
4.6	Scale Transpose and From Keyboard.....	6
4.7	Pitch Form	7
4.8	Rhythm Form	7
4.9	Dynamic Form	7
4.10	Texture Form	7
5	Instrumental Voices Window	8
5.1	Number of Voices	8
5.2	Voice	8
5.3	Low Pitch	8
5.4	High Pitch	8
5.5	Channel	8
5.6	Program	9
5.7	Walking	9
5.8	Pan	9
5.9	Follow/Leader	9
5.10	Interval Type/Interval	9
6	Form Plot Window	10
6.1	Open	10
6.2	Save	10
6.3	Redraw	10
6.4	Save Postscript	10
6.5	About	11
6.6	Quit	11

7	Keyboard Window	12
7.1	Clear	12
7.2	All	12
7.3	Complement	12
7.4	Octave Repeat	12
8	GNU Free Documentation License	13
8.1	PREAMBLE	13
8.2	APPLICABILITY AND DEFINITIONS	13
8.3	VERBATIM COPYING	15
8.4	COPYING IN QUANTITY	15
8.5	MODIFICATIONS	16
8.6	COMBINING DOCUMENTS	17
8.7	COLLECTIONS OF DOCUMENTS	18
8.8	AGGREGATION WITH INDEPENDENT WORKS	18
8.9	TRANSLATION	18
8.10	TERMINATION	19
8.11	FUTURE REVISIONS OF THIS LICENSE	19
8.12	RELICENSING	20
8.13	How to use this License for your documents	20
9	Bibliography	21
10	Concept Index	22

1 Overview

The `textmidiformedit` program can be used interactively to edit new or pre-existing musical form files used by `textmidicgm`, which generates works of music in `textmidi` language, which can then be converted by `textmidi` into standard MIDI 1.1 file formats. Using `textmidiformedit`, it is possible to edit musical forms as defined by `textmidicgm` rather than hand-edit the XML form file.

The model of musical form defined by `textmidicgm` is described in the `info` file for `textmidicgm`. This manual only describes the user interface for `textmidiformedit.py`.

1.1 What is `textmidiformedit`?

The program `textmidiformedit` can be used interactively to create new musical form files, or edit previously-existing musical form files, as used by `textmidicgm`.

2 Downloading textmidiformedit

If you have downloaded textmidiformedit.py and its support *.py files, then you can run it as described below. You can also download textmidiformedit from pypi.org.

```
python3 -m pip install --no-deps textmidiformedit
```

3 Invoking textmidiformedit

`textmidiformedit.py` has no options. To run it, go to the directory where it is found (after unpacking the archive for TextMIDITools) and invoke it:

```
./textmidiformedit.py
```

If you downloaded `textmidiformedit` from `pypi.org`, or installed it in an equivalent way, you can use it as a python package:

```
python3
>>> from textmidiformedit import *
>>> textmidiformedit()
```

When you quit the application, just exit from python with control-D or

```
>>> exit()
```

4 Musical Form Window

The screenshot shows a window titled "Musical Form" with a close button (X) in the top right corner. The window contains several input fields and sliders for configuring musical parameters.

Parameter	Value
Name	Wave Sonata
Len	600.0
Min Note Len	0.0
Max Note Len	2.0
Pulse/Sec	8.0
Down	0.25
Same	0.5
Up	0.75

Below the table, there are several sections for configuring different musical attributes:

- Scale:** A dropdown menu set to "Diatonic".
- Transpose:** A dropdown menu set to "-2" and a button labeled "From Keyboard".
- PITCH:**
 - Mean: Period 180.0, Range -pi.....0.....pi, Phase slider.
 - Range: Period 210, Range -pi.....0.....pi, Phase slider.
- RHYTHM:**
 - Mean: Period 150, Range -pi.....0.....pi, Phase slider.
 - Range: Period 190, Range -pi.....0.....pi, Phase slider.
- DYNAMIC:**
 - Mean: Period 360, Range -pi.....0.....pi, Phase slider.
 - Range: Period 240, Range -pi.....0.....pi, Phase slider.
- TEXTURE:**
 - Mean: Period 180.0, Range -pi.....0.....pi, Phase slider.

The Musical Form window allows the setting of global form qualities except for the instrumental attributes of individual voices, which is done on the Voices window. The Musical Form Window has several items.

4.1 Name

The name string can be typed in; it is meant to be the title of the musical work to be created by textmidicgm.

4.2 Len

The len text field is the duration of the musical work in seconds. Entering 600 will tell textmidicgm to generate 10 minutes of music.

4.3 Min/Max Note Len

The minimum and maximum note lengths specifies the duration range for all note events. When the rhythm curve is very low and the range curve narrow, the min note length is used; when the rhythm curve is high with a narrow range, the maximum note length is used.

4.4 Pulse/Sec

Pulse per second is used optionally to force textmidicgm to generate rhythms that line up on a pulse. Such music is likely to be easier to notate in scoring program such that human players could play it. Note, however, that textmidicgm has no model of meter, that is, the grouping of beats and accents. The original concept for this model of form (developed in 1976 for manual composition) was connected to very fluid, conversational, ametrical rhythms. On the other hand, setting a pulse can make works produced by textmidicgm sound more dance-like, for example, with a pulse of about 5 or so per second.

4.5 Melodic Probabilities

Melodic Probabilities are cumulative probabilities that apply only when a voice is in walking mode: they determine how often a voice moves up, or moves down, repeats a note, or is resting. A random variable used to select melodic movement varies in (0..<1.0). When the random variable is:

- Below the "Down" probability, the voice will move down a step in the scale; when ;
- At or above Down and below the Same probability, it will repeat the previous key;
- At or above the Up probability, it will step up the scale.
- At or above the Up probability, it will be silent.

Because these are cumulative probabilities, the following inequalities must hold: $0.0 \leq \text{Down} \leq \text{Same} \leq \text{Up} \leq 1.0$. If you don't want the voice to drift off down or up, then the probabilities for up and down should be equal, but by differences: $(\text{Up} - \text{Same}) == (\text{Same} - \text{Down})$. These probabilities apply only if a voice is in walking mode.

4.6 Scale Transpose and From Keyboard

Scales can be entered the following ways:

- Loaded from a form file
- Set from the scale menu selections
- Loaded from the keyboard window, by using the "From Keyboard" push button.

Once a scale has been loaded, it may be transposed by using the transpose spin button. Note that if the scale loaded from a file was already transposed, then that version of the scale will be the transposition of zero (0) in the Musical Form window for that scale.

Pushing the From Keyboard button will copy the scale that is set in the keyboard window to be the scale in the musical form.

4.7 Pitch Form

The Form curves are the core concept of the textmidicgm model for musical form. The curves are always sinusoidal (wave-like), but they are biased to sit above zero and range from 0 to 1. Pitch, Rhythm, and Dynamic curves have two sinusoids: mean and range. The controls for each sinusoid include a period (in seconds) and a phase slider in radians. There are two π radians (about 6.28) in a full circle. The slider ranges from $-\pi$ to $+\pi$. For example, to get 90 degrees, set the slider about 3/4 of the way across between 0 and $+\pi$. The mean sinusoid is roughly the average or center value of the parameter (in which parameter refers to pitch, rhythm, and dynamic) and the sinusoid for range gives the range from low value to high value. Only a range sinusoid is used for texture. The seven sinusoids are all independent in phase and period. After adjusting form curve values, you should select the Redraw item on the Form Plot window's menu to see how you have changed the form. The result of these curves is to cause the music generated by textmidicgm to change in character over time. Ordinarily the periods used are around 120 to 360 seconds (2 to 6 minutes). However, to make a parameter's mean or range stay static, merely make the period very long, such as 1000000 seconds. Unless a voice is in walking mode, the Pitch mean curve generally causes the pitches played to be higher when the curve is higher and lower when the curve is low; the Pitch range curve causes a wider range of notes in the scale when the curve is higher and fewer (even just repeating a pitch). In walking mode, a voice ignores the pitch curves and follows the melodic probabilities on how to walk up and down.

4.8 Rhythm Form

A high rhythm mean curve generally tells textmidicgm to make longer duration (slower) note events. When the rhythm mean curve is at a low point in the wave, it tends to make shorter durations (faster notes). A high rhythm range curve tends to make a wider range of durations and sound more syncopated, even with a pulse-per-second set; a low rhythm range curve tends to make more monotonous and repetitive durations.

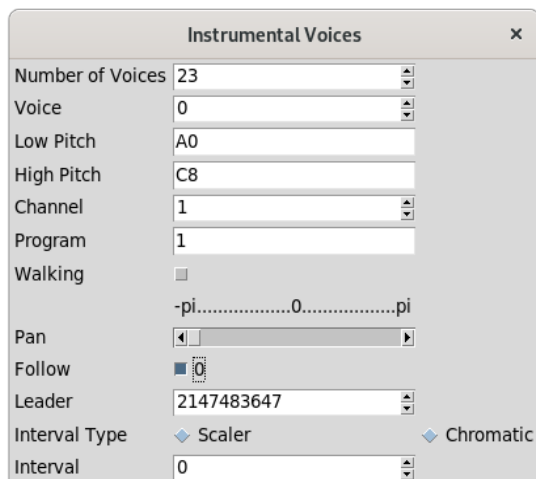
4.9 Dynamic Form

A high dynamic mean curve generally tells textmidicgm to make louder note events. When the dynamic mean curve is at a low point in the wave, it tends to make quieter notes. A high dynamic range curve tends to make a wider range of loudnesses and sound more natural; a low dynamic range curve tends to make more evenly loud notes.

4.10 Texture Form

A high texture range curve makes more voices play (a larger complement); a low texture range curve makes fewer voices play. As the texture curve rises, the voices are added in voice number order. To suggest a soloist, the solo voice should probably be in voice 0 position in the voice window.

5 Instrumental Voices Window



The Instrumental Voices Window has several items.

5.1 Number of Voices

The number of voices is the total number of voices that can play when the form's texture curve is high. This model of musical form is basically counterpunctal and made of solo voices. There is no real limit for number of voices, but the form editor only offers 23 voices.

5.2 Voice

Voice is the index (in 0..Number of Voices - 1) of the voice to be currently edited in the voice window.

5.3 Low Pitch

The low pitch is the low pitch for the voice. If the Form Pitch curve goes below this low pitch, then the low pitch will be played. This can be monotonous; `textmidicgm` has an option on the command that trims the scale to the range for all the instruments together to help with this, but this is not a perfect fix.

5.4 High Pitch

The high pitch is the high pitch for the voice. If the Form Pitch curve goes above this high pitch, then the high pitch will be played. This can be monotonous; `textmidicgm` has an option on the command that trims the scale to the range for all the instruments together to help with this, but this is not a perfect fix.

5.5 Channel

The channel is the MIDI Channel (1..16) for the voice.

5.6 Program

The Program is the MIDI program in (1..128) for the voice.

5.7 Walking

The walking flag sets walking for a voice. In walking mode, a voice ignores the Form Pitch curve and follows the Melodic Probabilities.

5.8 Pan

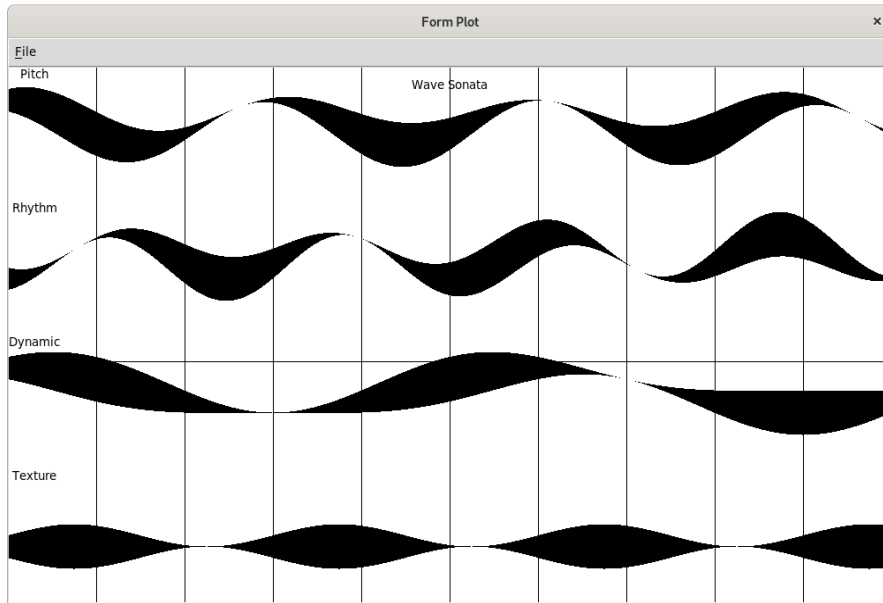
Pan is the MIDI stereo pan for the voice.

5.9 Follow/Leader

The Follower/Leader feature permits you to tell a voice to ignore the Form curves altogether, and instead to follow another voice. Set the follow button to make a voice follow another. Set the Leader to the number of the voice to follow. Select the interval type of following: scaler or chromatic. Scaler intervals will count steps up in the scale (down for a negative interval) being used to select the interval of following; chromatic intervals will count by 1's up (down for a negative interval) in a chromatic scale to find the follower's pitch.

5.10 Interval Type/Interval

6 Form Plot Window



The Form Plot window has a menu. The Form Plot Window shows the sinusoidal curves that act to change the mean and range of pitch, rhythm (duration), dynamic (loudness) and the complement (the number of instruments playing). A vertical line is drawn at each minute of time from the beginning. The Form Plot Window menu has several items.

6.1 Open

The Open menu allows you to load a `boost::serialization` (cf. boost.org) XML archive form file. All of the values of the form file will be distributed throughout the user interface and the plot redrawn.

6.2 Save

The Save menu allows you to save an XML form file. All of the values of the form in the user interface of `textmidiformedit.py` will be written out to the file.

6.3 Redraw

The form plot is redrawn; this is called for if the form curves are changed in the Musical Form window.

6.4 Save Postscript

The Save Postscript menu item will save a Postscript image of the Form Plot window.

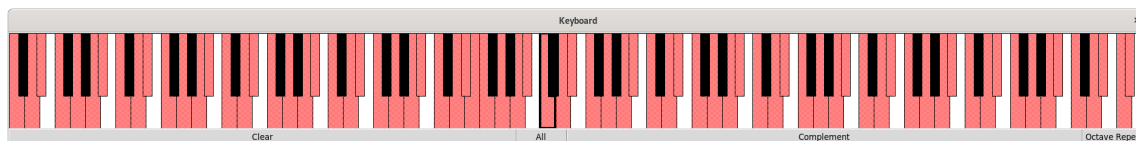
6.5 About

The About item puts up a window with information about the program.

6.6 Quit

The Quit menu item will exit the program. The window close decoration will also do this. Any work done but unsaved is lost; you are not prompted to save work.

7 Keyboard Window



The Keyboard Window has a keyboard in which individual keys can be clicked, and also several buttons. The keyboard presents 128 keys, all of the keys supported by MIDI (C-1 to G9). Middle-C is outlined in a thicker line than other keys. Any key can be clicked to toggle whether it is to be included in a scale. When a key is included in a scale it is drawn with a stipple in red. Keys that are not in the scale are white if they are white keys and black if they are black keys. The keyboard will reflect selection of scale made in the Musical Form window. Any arbitrary combination of the 128 keys can be clicked to create a scale. To create a scale that repeats each octave, just click the unique keys for one octave, then hit the "Octave Repeat" push button.

7.1 Clear

Clear the scale.

7.2 All

Set all of the keys, that is, the full chromatic MIDI scale.

7.3 Complement

Set the scale to select notes not in the scale and remove notes that were in the scale. For example, select a Diatonic scale in the Musical Form window; this will appear in the keyboard as C Major. Then push the Complement push button on the Keyboard window to select the missing notes instead, and the result will be the black keys only, which is a form of pentatonic scale.

7.4 Octave Repeat

Any notes set in the keyboard are repeated per octave throughout the full scale.

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9 Bibliography

10 Concept Index

A

About	11
All	12

B

Bibliography	21
--------------------	----

C

Channel	8
Clear	12
Complement	12

D

Downloading textmidiformedit	3
Dynamic Form	7

F

Follow/Leader	9
Form Plot Window	10

H

High Pitch	8
------------------	---

I

Instrumental Voices Window	8
Interval Type/Interval	9
Invoking textmidiformedit	4

K

Keyboard Window	12
-----------------------	----

L

Len	5
Low Pitch	8

M

Melodic Probabilities	6
Min/Max Note Len	6
Musical Form Window	5

N

Name	5
Number of Voices	8

O

Octave Repeat	12
Open	10
overview	2

P

Pan	9
Pitch Form	7
Program	9
Pulse/Sec	6

Q

Quit	11
------------	----

R

Redraw	10
Rhythm Form	7

S

Save	10
Save Postscript	10
Scale Transpose and From Keyboard	6

T

textmidiformedit	2
Texture Form	7

V

Voice	8
-------------	---

W

Walking	9
---------------	---