Wotja 24 Music Engine

The **Wotja Music Engine** ("WME") has 6 **Generator Types** and associated parameters and 4 **Generator Rule Objects** that allow creation of generative music through a combination of proprietary heuristics and chance (also sometimes referred to as being aleatoric, stochastic or algorithmic). A Wotja Mix Cell can include one or more Wotja Music Engine (WME) "Generators".

Current version | 24 Feature Set | Standalone WME Guide | WME Guide PDF > Doc Archive

New in Wotja 24

- TTM Generator - Arp Mode/options

♩ Generators (see ♩ Generator: Main Editor)

Looking for something?: *Try page search* with Cmd+F/Ctrl+F.

Generator Types

- 🟧 Rhythmic: Generates notes according to the Scale, Harmony, Rhythm, Next Note Rules.
- 🟦 Ambient: Similar to Rhythmic but where note durations are determined by the Ambient parameters.
- ⬜ Sequence: Generates note sequences from a number of different generator sub-types and their data ("Items"): 🟩 Euclidian, 🟩 Text-to-Music (**V24 TTA**), Pattern [🟥 B, 🟪 R, 🟪 F].
- 🟪 Follower: Mirrors notes generated by another Generator.
- 🟨 Repeater: Composes like a Rhythmic Generator but can repeat its notes.
- ⬛ Listener: Detects incoming MIDI notes/events.

Common Parameters

- 🟦 Generator
- 🟦 Rules
- 🟦 Phrasing
- 🟦 Chording
- 🟦 Articulation
- 🟦 Envelopes
- 🟦 Controllers
- 🟦 Micro Controllers
- 🟦 Micro Note Delay
- 🟦 Micro Pitch
- 🟦 Note to MIDI CC
- 🟦 Scripting
- 🟦 Comments

Generator Rule Objects

How do I edit these parameters? See the Generator: Main Editor.

See also the Rule Editor and Mix Rules and Cell Rules.

- Scale Rule: 24 elements governing allowed pitches
- Harmony Rule: 24 elements governing allowed harmonies
- Next Note Rule: 24 elements governing allowed pitch movement
- Rhythm Rule: 12 elements governing note durations

Each of the above Rule Objects can include one or more Rule Items e.g. "All Scale Major".

Rule Items ("Rules") comprise values for each of its 12 or 24 independent Rule Elements ("Elements"). These Elements can be set to values between 0% to 100% which represent **the relative probability (the "weighting")** that the Element will be selected by a Generator when it is composing. An Element with value of 0 will *not* be chosen for composition.

Every time a Generator composes a note its button and the relevant Rule Element will flash.

Composition happens a little in advance but any change to the element values can be reflected quite quickly in the music generated. Some changes, however, such as mix root change, can take a little longer than others to take effect.

Important: When the Pitch Range for a Generator is wide enough, Scale Rules will "wrap around" to accommodate the extra range in notes available.

Generator - Rhythmic

How do I edit these parameters? See the Generator: Main Editor.

Overview

A "Rhythmic" Generator is the default Generator Type. It composes according to the parameters in the "Phrasing" Parameter Group.

Tip: Refer to the Generator Parameter Group for the top level parameters that are common to all Generators.

Tip: To best allow note durations to fit within the bar structure of a Cell, a Rhythmic Generator calculates them according to the Rhythm Rule it uses.

Generator - Ambient

How do I edit these parameters? See the Generator: Main Editor.

Overview

Tip: Refer to the Generator Parameter Group for the top level parameters.

An "Ambient" Generator does not use the Rhythm rule for note durations but instead use durations defined by the specialist parameters in the Ambient parameter group. This is to allow them to generate notes without respect for tempo or bar timings. They are wonderful for creating drifting, floating sounds for either background or foreground use as drones or for musical texture.

Parameter Group - Ambient

- Units
- Duration
- Duration Range
- Gap Minimum
- Gap Range

Units

You define the Unit of Measure for which the other Ambient Generator parameters are interpreted. This may be one of the following values:

- *Seconds (thousandths of a)*
  The parameters including Duration are all interpreted as being in thousandths of a second (i.e. Milliseconds). So, a Duration value of 1000 means one second.

- *Beats (60ths of a)*
  The parameters including Duration are all interpreted as being in 60ths of a beat. In the WME a Beat is defined as being one crotchet; you get 4 beats in a bar of 4:4 music. So, a Duration value of 60 means one beat. A Duration value of 30 means a quaver. A Duration value of 20 means a triplet. A Duration value of 15 means a semi-

quaver. A Duration value of 240 means 4 beats (which is a full bar if the Cell Meter is 4:4).

- *Full seconds*
  The parameters including Duration are all interpreted as being in seconds. So, a Duration value of 10 means ten seconds.

Duration

The Ambient Generator parameters govern how Ambient Generators work.

This defines the minimum duration for which the Ambient Generator will play when it composes a note. The actual value chosen for each note is a value between Duration, and Duration plus the Duration Range. Each and every note composed for this Ambient Generator will have a note whose duration is separately calculated.

Duration Range

This is combined with the Duration parameter, to determine the duration for which the Ambient Generator will play when it composes a note. The actual value chosen for each note is a value between Duration, and Duration plus the Duration Range. Each and every note composed for this Ambient Generator will have a note whose duration is separately calculated.

Gap Minimum

This defines the minimum duration for which the Ambient Generator will play when it composes a rest. The actual value chosen for each rest is a value between *Gap Minimum*, and *Gap Minimum* plus the *Gap Range*. Each and every rest composed for this Ambient Generator will have a rest whose duration is separately calculated.

Tip: This is the Duration used for the Phrase Gaps / Phrase Gaps Range parameters i.e. it allows the duration of gaps to be different to that of the notes.

Gap Range

This is combined with the *Gap Minimum* parameter, to determine the duration for which the Ambient Generator will play when it composes a rest. The actual value chosen for each rest is a value between *Gap Minimum*, and *Gap Minimum* plus the *Gap Range*. Each and every note composed for this Ambient Generator will have a note whose duration is separately calculated.

Tip: This is the Duration Range used for the Phrase Gaps / Phrase Gaps Range parameters i.e. it allows the duration of gaps to be different to that of the notes.

♪ Generator - Sequence

How do I edit these parameters? See the Generator: Main Editor.

Overview

See also: Sequence Array Editor.

The Sequence Generator type is a special type of Generator as it does not itself generate notes, it use the generator sub-types below to do that:

Sequence Generator sub-types

- 🟦 Euclidian
- 🟩 Text-to-Music
- 🟪 Pattern: Both (B)
- 🟪 Pattern: Rhythm (R)
- 🟪 Pattern: Fixed (F)

It is easiest to think of it as a **list** (i.e. Sequence Array ("Array")) which supports a number of **list items** (i.e. Sequence Array Items ("Array Item") - see Sequence Array Editor).

Each Array Item includes all the parameter values needed for the generator sub-type to create note sequences.

In addition, as powerful technique for melody and beat generation, Array Items can be selected at random or played in sequence, as below (see Sequence Chain Editor):

- **Random Selection of Array Items**:
  - When the mix starts, any Sequence Generator that has more than one Array Item will have one of those selected to play, according to the probability weighting each has been given (see "Pattern Syntax: prob").
  - Which Array Item is chosen by the Generator depends on a few things:
    - If there is at least one Array Item, then the Array Item chosen to play is based on the Generator making a weighted random

selection from the available Array Items. When (if!) the Array Item has done what it is intended to do the Generator will make another selection as to which sequenced sub-pattern to use.

    - An TTM note sequence or Pattern note sequence that is less than a whole number of bars at the Generator's current Meter, will be padded automatically with silence to ensure that it remains bar synchronized.

- **Sequencing Array Items with Sequence Chains**:
    - A more advanced technique allows Array Items themselves to be sequenced for play and we call this a Sequence Chain Item. They are easy to use in the Wotja Sequence Chain Editor. If you want to manually edit it, see the syntax below and the syntax examples.

Sequence Chain Syntax

<S100 R 1.20 2.1 1-2.1-4 2.1>

<[S][prob][.M] R {[seqnum[-seqnumrange].[repeattimes[-repeattimesrange]] [seqnum[-seqnumrange].[repeattimes[-repeattimesrange]]}* >

Where:

- ***S***: identifies a sequence sub-pattern
- ***prob*** : relative probability of being chosen when there is more than one sequence sub-pattern.
- ***M***: Mute the sub-pattern (i.e. prevent it being selected!). If none can be selected, then a non-sequence sub-pattern is chosen to play at random as usual each time.
- ***R***: Required for historical reasons.
- ***seqnum***: Sequence Number.
    - The index of the non-sequence sub-pattern to play. Default is 1. The sub-patterns are numbered from 1 up.
    - *seqnumrange* : Sequence Number Range. Default is 0.
- ***repeattimes***: Repeat Times Minimum.
    - The number of times to repeat this sub-pattern, when selected. A value of "0", will cause the sub-pattern (when selected) to keep

playing forever until the end of the Cell! Default is 1.

  - repeattimesrange : Repeat Times Range. Default is 0.

Sequence Chain Syntax Examples:

Key: To aid understanding we use the following color coding: durations and scale intervals.

- Two Array Items of type Pattern - Both (B). Play 1 once, then 2 once...
  <100 B 60 1 60 2 60 3 60 4>

  <100 B 30 9 30 8 30 7 30 6 30 5 30 4 30 3 30 2>

  <S100 R 1.1 2.1>
- Two Array Items of type Pattern - Both (B). Play 1 twice, then 2 twice...
  <100 B 60 1 60 2 60 3 60 4>

  <100 B 30 9 30 8 30 7 30 6 30 5 30 4 30 3 30 2>

  <S100 R 1.2 2.2>
- Two Array Items of type Pattern - Both (B). Play 1 or 2 twice, then 1 or 2 twice...
  <100 B 60 1 60 2 60 3 60 4>

  <100 B 30 9 30 8 30 7 30 6 30 5 30 4 30 3 30 2>

  <S100 R 1-1.2 1-1.2>
- Two Array Items of type Pattern - Both (B). Play 1 once, then 2 twice, the one or 2 once, then 2 once...
  <100 B 60 1 60 2 60 3 60 4>

  <100 B 30 9 30 8 30 7 30 6 30 5 30 4 30 3 30 2>

  <S100 R 1.1 2.2 1-1.1 2.1>
- Two Array Items of type Pattern - Both (B). Play 1 once, then 2 forever...
  <100 B 60 1 60 2 60 3 60 4>

  <100 B 30 9 30 8 30 7 30 6 30 5 30 4 30 3 30 2>

  <S100 R 1.1 2.0>

Sequence: Euclidian

How do I edit these parameters? See the Sequence: Euclidian Editor.

Overview

Tip: See also **this very helpful video** from **UncertainMusicCorps** that explains Euclidian sequencing in detail, and with examples.

The "Euclidian" Sequence Generator sub-type is for generating (at random) a note sequence from 3 core parameters (Steps, Fills, Rotation).

The note pitches are determined by the Pitch and Pitch Strategy settings and note durations are determined with Duration and Rhythm Strategy settings.

The generated note sequence can be repeated a number of times (Repeats) after which time a new note sequence is randomly generated (which is where Range values come into play).

If you want to more tightly specify a note sequence then consider using the "Pattern" Sequence Generator sub-type.

Notes/Tips

- The Pattern Mutation Factor doesn't apply to Euclidians.
- Unlike other Sequence items, Euclidians don't auto-pad to the current bar boundary at the end.
- A rough outline of the Sequence notes is displayed at the top of the Euclidean editor. We hope to improve this in the future.
- You can use a number of different Euclidean generators in a Cell to create a form of chording.
- If you want 4 Euclidean playing against each other, to make an interesting simple drum kit, just have 4 Euclidean sequence generators all feeding the same MIDI channel. Choose different Pitches so each one plays a different Drum sound.
- Try building up "melodic patterns" by having a number of Generators going, each with their own Euclidian pattern!

Parameter Group - Euclidian (EUC)

↑ Steps

Values: 1 to 128

This value determines the number of "steps" there will be in a generated note sequence (assuming the Steps Range, below, is 0). Empty steps are rests and filled steps (Fills, below) play notes.

Example: If Steps is 16 and Steps Range is 0, the number of steps is always 16.

Note: If a non-zero Steps Range is specified the number of steps can change every time the next note sequence is generated.

Tip: If you do not want the Steps value to change when the next note sequence is generated (see Repeats), ensure Steps Range is set to 0.

↑ Steps Range

Values (optional): 0 to 128

Every time a new note sequence is generated (see Repeats) the Steps value is recalculated and will be somewhere between Steps + Steps Range.

Example: If Steps is 16 and Steps Range is 4, then the next time a note sequence is generated the calculated Steps value used could be anywhere between 16 and 16+4 (i.e. between 16 and 20).

↑ Fills

Values: 1 to 128

For the generated note sequence this value determines how many of the steps above will be "filled" and so play a note (assuming the Fills Range, below, is 0).

Example: If Fills is 4 and Fills Range is 0, the number of steps that are "filled" is always 4.

Note: If a a non-zero Fills Range is specified the number of filled steps can change every time the next note sequence is generated.

Tip: If you do not want the Fills value to change when the next note sequence is generated (see Repeats), ensure Fills Range is set to 0.

↑ Fills Range

Values (optional): 0 to 128

Every time a new note sequence is generated (see Repeats) the Fills value is recalculated and will be somewhere between Fills + Fills Range.

Example: If Fills is 4 and Fills Range is 4, then the next time a note sequence is generated the calculated number of Fills used by it could be between 4 and 4+4 (i.e. 8).

↑ Rotation

Values: -128 to 128

Determines in which step the first note of the note sequence will occur (assuming the Rotation Range, below, is 0). This value can be thought of as a "starting offset" if you prefer as the note sequence "wraps around" and does not get foreshortened.

Example: If Rotation is 3 and Rotation Range is 0, the starting note is always in step 3.

Note: If a non-zero Rotation Range is specified the "starting offset" can change every time the next note sequence is generated.

Tip: If you do not want the Rotation value to change when the next note sequence is generated (see Repeats), ensure Rotation Range is set to 0.

↑ Rotation Range

Values: 0 to 256

Every time a new note sequence is generated (see Repeats) the Rotation value is recalculated and will be somewhere between Rotation + Rotation Range.

Example: If Rotation is 3 and Rotation Range is 4, then the next time a note sequence is generated the calculated Rotation value used could be between 3 and 3+4 (i.e. 7).

↑ Repeats

Values: 1 to 100

This value determines how many times a generated note sequence will repeat.

Once the note sequence has been repeated the correct number of times a new note sequence is generated. This cycle continues until the Sequence Item item is changed or the Generator is stopped.

↑ Repeats Range

Values (Optional): 0 to 100

Every time a new note sequence is generated the Repeats value is recalculated and will be somewhere between Repeats + Repeats Range.

Example: If Repeats is 3 and Repeats Range is 4, then the next time the note sequence repeats the calculated Repeats value might be any where between 3 and 3+4 (i.e. between 3 and 7 times).

↑ Pitch

Values: 1 to 128
Important: The Pitch value is only relevant when the Pitch Strategy is set to either "Pitch: Fixed MIDI Pitch" or "Pitch: Interval in Scale Rule".

Note: If a a non-zero Pitch Range is specified the note pitch can change every time a note is played.

- "**Pitch: Fixed MIDI Pitch**":
    - This parameter is primarily for use with beats where a specific MIDI note pitch is used to trigger a specific drum sample.
- "**Pitch: Interval in Scale Rule**":
    - Uses the Pitch value as the *index value* for available scale rule elements (c.f. how Both patterns work). This can get a little complicated as Scale Rules can have from one to 24 elements defined and the actual note played also then depends on what is permitted by the Generator's Pitch and Pitch Range settings.
    - Example: A value of 1 corresponds to the first interval in the Scale Rule, usually the root. Say the Generator's Pitch parameter was set to 48 and Pitch Range set to 24. The note played for value of 1 would have pitch 48. What happens if you have set a Pitch value of 60? Well, that also depends on the number of elements in the Scale Rule which acts like a modulo. Say there were 7 elements in the Scale Rule. 60 modulo 7 is 56 + 4 remainder. So, 60 would represent the 4th scale rule element. As we said, it can get a bit confusing...

Pitch Range

Values: 0 to 128

Every time a note is played the Pitch value is recalculated and will be somewhere between Pitch and Pitch Range.

Example: If Pitch is 60 and Pitch Range is 4, then the next time a note is played the calculated Pitch value used could be between 60 and 60+4 (i.e. between 60 and 64).

Duration

Values:
- 2 note (breve, 480 ticks)
- 1 note (semibreve, 240 ticks)
- 1/2. note (dotted minim, 180 ticks)
- 1/2 note (minim, 120 ticks)
- 1/4 note (crotchet, 60 ticks)
- 1/8. note (dotted quaver, 45 ticks)
- 1/8 note (quaver, 30 ticks)
- 1/12 note (triplet, 20 ticks)
- 1/16 note (semiquaver, 15 ticks)
- 1/24 note (-, 10 ticks)
- 1/48 note (-, 5 ticks)

The value of this setting determines the duration of a "step" when Rhythm Strategy is set to "Built-in".

If Rhythm Strategy is "Use Rhythm Rule" then the duration of any step is that of the particular element of the Generator's Rhythm Rule chosen to be used for that step. That means that *each step* can have a different duration.

↑ Rhythm Strategy

Values:

- Built-in
- Use Rhythm Rule

If Rhythm Strategy is "Built-in" then the duration of a "step" is set by the Duration parameter.

If Rhythm Strategy is "Use Rhythm Rule" then the duration of any step is that of the particular element of the Generator's Rhythm Rule chosen to be used for that step. That means that *each step* can have a different duration.

↑ Pitch Strategy

Values:

- Pitch: Fixed MIDI Pitch
  - Note value number (0 to 127) - great for drums. See Pitch.
- Pitch: Interval in Scale Rule
  - Uses the Pitch value as the index for available scale rule elements. See Pitch.
- Ignore: Let Wotja Compose Each Note
  - The note sequence is composed using the Generator's Scale, Harmony, Next Note rules (e.g. as like for for Ambient, Rhythmic etc. Generators)

Sequence: Text-to-Music (TTM)

How do I edit these parameters? See the Sequence: Text-to-Music Editor.

Overview

'Text-to-Music' Generators have their own special set of parameters and allow text *in any language* to generate a number of notes. These TTM generated notes are partioned into phrases which are combined sequentially into a TTM seed melody ('TTM melody' or 'tune'). Even though not visible, this TTM melody is in a Pattern syntax, specifically that of a B (Both) Pattern.

Use English, Chinese, Japanese, Russian, German, French - whatever language takes your fancy, you will always get a TTM melody!

Tip: In general it takes 2 characters to generate a note.

Tip: that if your text is < 6 characters (e.g. Hello, which is 5 characters), we turn it into HelloHello ... which makes it sufficiently long to make at least 3 notes (that actually generates a few more).

New to Wotja 24 : **'Text-to-Arp' (TTA)**

A TTM Mode selector plus a number of Arp parameters which are used when the TTM Mode is set to Arp. These Arp parameters allow you to use arpeggiation techniques on the notes in the *phrases* that are strung together to result in your TTM melody. Yes, you can now use Wotja for 'Text-to-Arp' (TTA) :).

Parameter Group - Text to Music (TTM)

- 🟩 TTM Mode (W24)
- 🟩 Cut-up Rule
- 🟩 TTM Custom Text
- 🟩 Tune Start at Index
- 🟩 Tune Length Override
- 🟩 Phrase Length
- 🟩 Phrase Length Range
- 🟩 Gaps
- 🟩 Gaps Range
- 🟩 Interval
- 🟩 Interval Range
- 🟩 Repeats
- 🟩 Repeats Range
- 🟩 After Tune Repeats
- 🟩 Variation
- 🟩 Rhythm Strategy
- 🟩 Duration Multiplier
- 🟩 Arp Notes (W24)
- 🟩 Arp Phrase Direction (W24)
- 🟩 Arp Initial Note (W24)
- 🟩 Arp Shift Rule (W24)
- 🟩 Arp Shift Minimum (W24)
- 🟩 Arp Shift Range (W24)
- 🟩 Arp Pad to End of Bar (W24)

↥ 🟩 TTM Mode (W24)

- *Classic* (Default):
  - TTM parameters (except Arp parameters) are used for creating free flowing melodies that get padded to the end of a bar. We call this 'Classic' mode because it is the only mode of TTM prior to Wotja 24.
- *Arp* (W24):

    - A new mode of TTM that allows you to use arpeggiation techniques on the notes in the phrases in your TTM melody, hence 'Arp' mode for 'Text-to-Arp' (TTA).
    - The new TTA parameters are all prefaced with 'Arp' and are as follows: Arp Notes, Arp Phrase Direction, Arp Initial Note, Arp Shift Rule,Arp Shift Minimum, Arp Shift Range and Arp Pad to End of Bar.
    - The values set in these are used in addition to the Classic TTM Parameters.
    - *Important*: If you have an OTB and it is not a 24+ Pro OTB then Wotja will operate in Lite mode if this is selected.

Cut-Up Rule

The selection you make here determines what text is used for TTM. If you select one of the Cut-up options then the **relevant text from your mix Cut-up** will be displayed in the Note Sequence & Cut-up Text Graphic above this parameter. Note that if there is no text available in a selected line of Cut-up (or Custom Text, depending which is selected to be used) then the TTM Generator will have no text to work with and so no notes will be generated.

- *Custom*:
    - Uses text that you enter in the TTM Custom Text field.
        - See the TTM Editor for details on how to do this.
- *Cut-Up: Line#=Track#* (Default):
    - This setting is very powerful when it comes to mixes that feature TTM. It means you can harness the power of the Cut-up Editor to quickly generate text that can be used to populate the TTM for multiple Generators - all at once! It is easiest to understand by example: if you have this setting and are using a TTM Generator in say Track 1 then it will use line 1 of text in your mix Cut-Up. If you had a TTM Generator in Track 3 it would use line 3 of your mix cut-up, and so on.
- *Cut-up: All Lines*:
    - Uses the text in all lines in your Cut-up for the purposes of TTM.
- *Cut-Up: Line# 1-11*:

    - Uses the text from Line# 1 to Line# 11 (as selected) of your Cut-up for the purposes of TTM. You can set up TTM generators all to use the same line if you want!

↑ ▮ TTM Custom Text

This is custom text *in any language* that can be used to generate the notes that are in the phrases of the TTM melody. In Wotja, tap on this field to go to the TTM Custom Text Editor screen.

↑ ▮ Tune Start at Index

From the notes composed, set the first note you want the TTM melody to start playing at. Maximum value is Notes - 1.

↑ ▮ Tune Length Override

From the notes composed, set how many notes will play in the TTM melody. Maximum value is Notes - Tune Start at Index.

↑ ▮ Phrase Length

Defines the minimum number of notes there are in each 'phrase'. Phrases are combined in sequence to make the TTM melody. Tip: you can see in the indicator above how many notes your text has generated.

↑ ▮ Phrase Length Range

Sets the range above the minimum.

↑ ▮ Gaps

Defines the minimum number of rests between each phrase. These rests allow a TTM melody to 'breathe'. Rests are measured in terms of 16th notes.

↑ ▮ Gaps Range

Sets the range above the minimum.

↑ ▮ Interval

Defines the minimum number of rests between each play of the phrase

Defines the minimum number of rests between each play of the phrase (these rests allow a TTM melody to breathe). Rests are measured in terms of 16th notes.

Interval Range

Sets the range above the minimum.

Repeats

The total number of times the TTM melody or a variation of it is played. This also applies to improvised TTM melodies (see Improvise toggle).

Repeat Range

Sets the range above the minimum. Also applies to improvised TTM melodies (see Improvise toggle).

After Tune Repeats

This parameter determines what happens after the FIRST complete play and specified number of repeats of the TTM melody (the 'repeat cycle'). There are 3 options:

- *Improvise with Variations*
  - After the repeat cycle the TTM Generator will continuously generate TTM melody variations.
  - *Tip*: If Variation (below) set to 0, then the original melody will continue to repeat for ever.
  - *IMPORTANT*: If this setting is used in any TTM Sequence Array Item it will cause the Sequence Array Chain to appear to get stuck on this Array Element. The reason is that this TTM Sequence is treated as being infinite in duration.
- *Go Quiet*
  - Once the repeat cycle has completed then the TTM Generator stop playing.
  - *IMPORTANT*: If this setting is used in any TTM Sequence Array Item it will cause the Sequence Array Chain to stop on this Array Element.
- *Select Next Sub-Pattern*

    - Once the repeat cycle has completed then the next Sequence Array Item (if any) is selected to play.

↑ ▮ Variation

Selects how much variation is applied to the previous TTM melody when improvising.

↑ ▮ Rhythm Strategy

Determines the duration of notes to be used for the TTM melody.

- *Built-in*
    - The note durations are generated according to some fixed (and non editable) default settings.
- *Use Rhythm Rule*
    - The note durations are generated according to the Rhythm Rule in use by the Generator.
    - *Tip*: This allows you to decide what durations you want to have used.

↑ ▮ Duration Multiplier

Allows you to increase the duration of EACH TTM note generated.

Values: 1 - 32 (Deafult 1)

Example: A value of 2 will double the duration of all TTM notes generated so e.g. a 1/8th note is changed to have a duration of a 1/4 note etc.

Example Use Case: Using TTM to generate a series of long 'pedal' notes where you do not want to have your mix use a *very* slow mix tempo.

↑ ▮ Arp Notes (W24)

Wotja generates Text-to-Music (TTM) using Cut-up text or Custom text. IN 'Classic' mode this text is used to generate Both (B) Pattern format phrases that are concatenated into a melody. In 'Arp' mode, each individual TTM-generated phrase in a melody is further processed according to the various Arp parameters, allowing it to be arpeggiated according to the various Arp parameters, allowing it to be arpeggiated.

- *TTM* (Default)
  - Notes for each phrase are those generated by the 'Classic' TTM parameters. This results in a melody in Both (B) Pattern format, it being series of paired durations and scale rule element values.
  - Simple example: <100 B 60 **4** 30 **2** 60 **5** 60 **8** 60 **0**>
  - The above, but showing only scale rule element values for clarity e.g.: **4 2 5 8 rest**
- *Scale Rule*
  - As TTM above, but where in the resulting note durations are retained (but not rests) and scale rule element values are *replaced* according to the Arp Phrase Direction, Arp Initial Note, Arp Shift Rule and Arp Shift parameter values plus the elements that are available in the Generator's Scale Rule.
  - *Note*: Scale rules can contain anything from 1 to 24 elements and element 'wrapping' occurs after the last element is reached. E.g. if scale rule had 8 elements then it would wrap as 1 2 3 4 5 6 7 8 1 2 3 4 etc. if ascending, or 8 7 6 5 4 3 2 1 8 7 6 5 etc. if descending.
  - As the TTM example above, but where:
    - Arp Initial Note is Scale Element 1 and ARP Phrase Direction is Ascending, e.g.: **1** 2 3 4
    - Arp Initial Note is TTM and ARP Phrase Direction is Ascending, e.g.: **4** 5 6 7
    - Arp Initial Note is Scale Element 1 and ARP Phrase Direction is Descending, e.g.: **1** 8 7 6
    - Arp Initial Note is TTM and ARP Phrase Direction is Descending, e.g.: **4** 3 2 1

Arp Phrase Direction (W24)

Determines the direction of arpeggiation applied to notes in each phrase of the TTM-generated melody.

Note: For any option below the note sorting is done BEFORE the first note value is overwritten by Arp: Initial Note, if set.

- *Up* (Default)
    - Notes in a TTM-generated (B Pattern) phrase are sorted into ascending order of the Generator's Scale Rule elements.
    - Simple TTM phrase example: <100 B 60 **4** 30 **2** 60 **5** 60 **8** 60 **0**>
    - The above, but showing only scale rule elements for clarity e.g.: **4** 2 5 8
    - The above, after sorting in ascending order e.g.: **2 4 5 8**
- *Down*
    - Notes in a TTM-generated (B Pattern) phrase are sorted into descending order of the Generator's Scale Rule elements.
    - Using the example above, after sorting in descending order e.g.: **2 8 5 4**
- *Alternate*
    - Notes in a TTM-generated (B Pattern) phrases are sorted alternately into ascending or descending order of the Generator's Scale Rule elements.
    - If we had two phrase the same as the example above, after sorting in alternating ascending/descending order e.g.: **2 4 5 8** then **2 8 5 4** etc.
- *Random*
    - As above, the sorting of scale rule elements for each (B Pattern) phrase is done in a random order, i.e. one phrase could be ascending, the next ascending, the next descending, the next ascending, the next descending etc.

Arp Initial Note (W24)

This lets you overwrite the first note in every TTM-generated phrase with a value of 1. This allows a phrase to have a 'pedal' note which is that of the Cell Root (most often the same as the Mix Root).

IMPORTANT: This note replacement does NOT happen if After Tune Repeats is set to 'Improvise with Variations' because when doing this Wotja no longer retains the concept of separate phrases. Instead, phrases are just concatenated into a final melody which is then repeated as per the Repeats settings.

as per the Repeats settings.

- *Default* (Default)

  - The initial note of a phrase remains that which is generated by TTM.
- *Scale Index 1*
  - The initial note of *every* TTM-generated (B Pattern) phrase is *replaced* by the number 1, i.e. the first element in the Generator's Scale Rule.
  - Simple TTM phrase example: <100 B 60 **4** 30 **2** 60 **5** 60 **8** 60 **0**>
  - The above, but showing only scale rule elements for clarity e.g.: **4** 2 5 8 rest
  - The above, after the first scale rule element is replaced with 1, e.g.: **1** 2 5 8 rest

Arp Shift Rule (W24)

Determines how you want Arp Shifts applied to the notes in each TTM-generated (B Pattern) phrase that comprise the melody.

Note 1: If Arp: Initial Note has been set to 'Scale Index 1' then the Arp Shift values are applied to notes in the relevant phrases *after* that has been applied.

Note 2: If After Tune Repeats is set to 'Improvise with Variations' then because of how that works only the All Phrases Shift Rule option will apply Arp Shifts.

- *Second Phrase+* (Default)
  - For the *second and subsequent* phrases in a melody, the notes in that phrase are accumulately shifted up or down by the Arp Shift value (the notes in the first phrase are NOT shifted).
  - Say we had 3 TTM-generated phrases in the melody:
    - Phrase 1: 4 2 5 8
    - Phrase 2: 7 1 4 2
    - Phrase 3: 4 3 6
  - If the Arp Shift Minimum value was 1 then scale elements for the

If the Arp Shift Minimum value was 1 then scale elements for the *2nd and subsequent* phrases are accumulatively shifted by that value:
        - Phrase 1: 4 2 5 8
        - Phrase 2: **8 2 5 3** (accumulative shift of 1)
        - Phrase 3: **6 5 8** (accumulative shift of 2)
- *All Phrases*
    - The notes *in every phrase in the melody* are shifted up or down by the Arp Shift value.
    - Say we had 3 TTM-generated phrases in the melody:
        - Phrase 1: 4 2 5 8
        - Phrase 2: 7 1 4 2
        - Phrase 3: 4 3 6
    - If the Arp Shift Minimum value was 1 then scale elements for every note in the melody is shifted by that value:
        - Phrase 1: **5 3 6 9**
        - Phrase 2: **8 3 5 3**
        - Phrase 3: **5 4 7**

Arp Shift Minimum (W24)

According to the Arp Shift Rule the notes in phrases are shifted by this value plus the Arp Shift Range value whenever calculating the shift for any phrase.

Values: -12 to +12 (0 Default)

Arp Shift Range (W24)

A Random value from this range is added to the Arp Shift Minimum value whenever calculating the shift for any phrase.

Values: 0 - 12 (0 Default)

Arp Pad to End of Bar (W24)

- *No Padding* (Default):
    - Any rest notes at the end of the generated Arp melody are ignored and the Arp melody (accounting for Gap/Interval

settings) is not padded out with silence until the end of the next bar boundary, as is the case in TTM Classic mode. This can make Arps continuous and fluid.

- *Pad to End of Bar*:
  - An Arp melody (accounting for Gap/Interval settings) is padded with silence to the end of the bar. For example, if you had an Arp melody (accounting for Gap/Interval settings) that was 5 notes and you had meter set as 4:4 then there would be silence added until the end of the second bar. This can be useful if you want an Arp but do not need it to be a continuous note pattern, or to come in on a bar boundary.

♪ 🟥 Sequence: Pattern

How do I edit these parameters? See the Sequence: Pattern Editor.

Overview

The Sequence 'Pattern' Generator sub-type can generate notes from various fixed MIDI-like patterns.

There are 3 different kinds of pattern type, and the Generator will reflect the color of whatever is in use at the time: 🟥 **Both (B)**, 🟪 **Rhythm (R)** and 🟪 **Fixed (F)** (see Pattern Types).

All patterns are saved in 'Pattern Syntax', this being a text-format string. It can be edited in the relevant Pattern Editor or, if desired, a text editor.

Patterns are able to follow generative sequencing rules and can adapt automatically to changes in Scale Rules. They are great for bringing some structure to your composition.

Patterns can be mutated while playing, according to parameters defined in the Pattern Parameter Group. When a Pattern is mutating it composes as would a Rhythmic Generator, and they use the Phrasing Parameter Group parameters.

Parameter Group - Pattern

- 🟥 Pattern Types
- 🟥 Mutate Rhythm?

- Use Percent
- Mutation Factor
- Bars Between
- Bars Range
- Meter
- Pattern Syntax
- Pattern Syntax Examples

Pattern Types

There are 3 types of Pattern (see Pattern Syntax):

- **B - Both**: i.e. 'Melodic' pattern using Scale Rule elements. Includes a series of *both* paired note durations and scale rule element values. A scale rule element value of 1 represents the 0ve scale element used by the Generator and a value of 0 represents a rest.
  - Simple example: <100 B 60 **4** 30 **2** 60 **5** 60 **8** 60 **0**>
  - Ignoring note durations for a moment (for clarity), the above would represent notes with the following scale rule elements i.e. **4 2 5 8 rest**.
  - The *pitch* of each note depends on the Scale Rule element, the Pitch parameter for the Generator using the pattern, and the Cell Root (usually the same as the Mix Root).
- **R - Rhythm**: Defines note durations to use, but leaves selection of the note pitches to use up to the Generator acting as a Rhythmic Generator. A negation duration represents a rest.
  - Simple example: <100 R 60 30 60 -90>
  - The above is 3 generated notes of the specified note durations and a rest of duration 90 at the end, i.e. **note, note, note, rest**.
- **F – Fixed**: i.e. 'Melodic' pattern using fixed MIDI *pitches*. Defines the root pitch (60 is Middle C) to use for the pattern and a series of both paired note durations and relative pitches. The pitch values are relative to the root pitch and are independent of scale rule. A pitch value of 0 represents the root pitch and a value of -1 means treat this note as a rest note. These patterns can be useful for drum riffs, e.g. with MIDI drums.
  - Simple example: <100 F60 60 **0** 60 **4** 30 **5** 15 **7** 30 **0**>

- Ignoring durations for a moment (for clarity), the above would represent notes with *MIDI pitches* in an ascending sequence. i.e. **60 64 65 67 rest**.

Use Percent

When the Generator starts a new sub-pattern at the start of a bar, it consults the value you have defined for *Use Percent* . This parameter determines the probably of the Generator using the Pattern for the bar; or alternatively, compose a *completely* new bar (that you will hear only once!) were it to be of Rhythmic Generator Type.

If *Use Percent* is 100, then the Generator will always use the pattern. If *Use Percent* is 50, then the Generator will instead compose a new bar every other bar or so. Note that the Generator will never interrupt a sub-pattern that it is playing; the *Use Percent* parameter is considered only on a sub-pattern boundary, at the start of a new bar.

Mutation Factor

The mutation factor is used when a bar is considered for mutation (which can happen only if *Bars Between* is not zero! The *Mutation Factor* determines the level of mutation to apply. If set to 10.0%, then when playing from a sub-pattern, this means that each note that would be played from the pattern, has a 10% chance of having a different one composed, with subsequence pattern playbacks keeping that mutation. Note that if *Mutate Rhythm?* is set to *Yes* , then if the composed note is longer than the composed-over pattern note, this might overlap and cancel-out some other notes in the sub-pattern.

Bars Between

This parameter defines the number of bars that the Generator waits between, before trying to mutate a bar in a pattern according to the *Mutation Factor* . If *Bars Between* is set to zero, the Generator can never mutate. Set to 1 if you want mutation every bar, 2 if you want mutation every other bar, etc. ...

The actual number of bars used is selected randomly each time, somewhere in the range from *Bars Between* , to *Bars Between* plus *Bars Range* .

Bars Range

This parameter is used to help define the number of bars between attempts by the Generator to mutate the current pattern. The actual number of bars used is selected randomly each time, somewhere in the range from *Bars Between* , to *Bars Between* plus *Bars Range* .

Mutate Rhythm?

If set to *No* , then the timing of the sub-pattern is preserved perfectly; only the frequency of the pattern notes will be changed when the pattern is mutated. Otherwise, the duration of each note is chosen from the rhythm rules and phrase/phrase gap rules for the Generator.

Meter

Defines the Meter to be used by the Generator, such 4:4 or 3:4 or 6:8. A value of ?, which is the default, means to use the Meter defined for the Cell. A different value allows the Generator to work with a completely different meter, which can be used for interesting polyphonic effects.

Pattern Syntax

A Pattern is actually text string in a specific format, surrounded by < and > symbols.

The Pattern syntax is somewhat complicated and will require a bit of effort to get to grips with. Even if you do wish to use it, we still recommend that you first use the Wotja Pattern Editor to familiarize yourself with patterns and how they work.

<[prob][.M] pattype {[dur][.vff[-vffr]] [scaleint]}*>

Where:

- ***prob*** : the relative probability that this sub-pattern is selected; relevant only where there is more than one sub-pattern! The default value is 100%.

- ***M*** : Flag indicating that the sub-pattern is to be "muted", i.e. not allowed to be selected. This can be useful for testing of individual sub patterns; where you might want to "solo" a sub-pattern by muting out all the others.
- ***pattype*** : One of:
    - R: Rhythm
    - B: Both
    - F: Fixed, followed by the root note in MIDIpitch. e.g. F60.
- ***dur*** : Note Duration / WME time units.
    - The WME employs an underlying "time unit" that is 1/60th of a crotchet/quarter note. WME note Duration values map onto standard music notation in the following way (irrespective of meter) [# WME time units - Composed note length]:
        - 240 - whole note (i.e. one bar of 4:4)
        - 120 - minim/half note
        - 60 - crotchet/quarter note
        - 30 - quaver/eighth note
        - 20 - triplet/twelfth note
        - 15 - semi-quaver/sixteenth note
    - So by way of example:
        - one bar of 4:4 is 4 * 60 = 240 WME time units.
        - one bar of 3:4 is 3 * 60 = 180 WME time units.
        - one bar of 2:4 is 2 * 60 = 120 WME time units.
        - one bar of 1:4 is 1 * 60 = 60 WME time units.
        - one bar of 6:8 is 6 * 30 = 180 WME time units.
        - one bar of 9:8 is 9 * 30 = 270 WME time units.
    - You are of course free to experiment using other time unit values, which will mean different things. E.g. 10 time units is a 24th note etc.

      In R patterns a negative duration indicates a rest for that time; in F patterns a pitch of -1 indicates a rest for the note duration.

If a note sub-pattern is not an exact even number of bars (e.g. 2 and and half bars at the current meter!) then the engine will pad to silence to the end of the nearest bar boundary.

- ***vff***: Velocity Force Factor (optional, any integer value)
    - Note: Velocity Force Factor is an **INTEGER % SCALE FACTOR** applied to the velocity, where the velocity is first determined from the velocity envelopes. For example, in a pattern [dur][.vff[-vffr]] 60.50 means a note of length 60 WME time units with 50% VFF scaling, 30.15 means a note of length 30 WME time units with 15% VFF scaling, and 120.100-20 means a note of length 120 WME time units and with 100% VFF scaling with a range of 20%.
        - The scaled pattern note velocity can never be any less than 1.
        - The scaled pattern note velocity can never be any greater than 127.
        - Note that a pattern note velocity scaling factor of 0 always returns minimum MIDI velocity, which is 1. You cannot use a factor of 0 to "completely mute" a note.
        - Example: A Generator's velocity (min) envelope has a value of 100, with a velocity range envelope value of 20 - the velocity for a given note is selected randomly in that range, to be (say) 104. Where defined, the pattern note's Velocity Force Factor is used to scale that velocity, to a final value from 1 to 127. e.g. if the Velocity Force Factor is 50 (%), in this example we'd chose a final velocity value of: 104 * 50 (%) = 52. The Velocity Force Factor Range value, if defined, applies a range to the scaling factor.
- ***vffr***: Velocity Force Factor Range (optional, any integer value and used in conjunction with the above).
- ***scaleint***: Scale interval (not present for Rhythm patterns).
    - B rule: interpreted as being the first valid note in current Generator's Scale Rule; i.e. the first element in the Generator's Current Scale Rule which does not have a zero value. "1" is therefore usually the root note (c.f. the Pitch parameter). "0"

has the special meaning of indicating a "REST" for the note duration.
  - F rule: distance in semitones up from the root note (so "0" means the root note). E.g. if F60 (Middle C), then a pitch value of 5 means MIDI pitch 65. A pitch value of -1 is a rest.

Pattern Syntax Examples:

Key: To aid understanding we use the following color coding: durations, velocity values and scale intervals.

Copy and paste these into Wotja to try them out.

- 🟥 **Both (B)**:
  <100 B 60.15-30 1 60 2 60.127 3 15 7>
- 🟪 **Rhythm (R)**:
  <100 R 60 60 60.127 60>
- 🟪 **Fixed (F)**:
  <100 F60 60.127 1 60 4 30 5 15.70-120 7>

  <100 F58 15 1 45 -1 15 1 45 -1 15 1 45 -1>
  - NB: Plays note with pitch 58 (or MIDI patch 59 on Ch10): note on, note off, note on, note off etc.

  <100 F40 15 1 15 7 15 6 15 13 15 2 15 8 15 4 15 11 15 13 15 2 15 8 15 2 15 2 15 8 15 4 15 14>
  - NB: Plays a series of notes for a whole bar (or patches in the drum kit on Ch10) starting at base pitch 40, each one a 16th note...

Generator - Follower

How do I edit these parameters? See the Generator: Main Editor.

Overview

A "Follower" Generator is used in a call-response manner, allowing it to follow the behavior of other Generators according to parameters in the "Following" Parameter Group.

In the Cell, select the Generator which you want your "Following" Generator to follow - you may follow any Generator of any type. You may even follow a Generator that follows another Generator that follows another Generator... provided that you don't try to define a cyclic dependency which loops back to the current Generator! If you *don't* specify a Generator to follow then it won't play.

Important: If you follow a Generator that is using the Chording parameter (i.e. to create more than one note), then only the first note in the chord is followed.

Parameter Group - Follower

- Follow Generator?
- Percent
- Strategy
- Units
- Delay Generator?
- Delay Range
- Shift Interval
- Shift Interval Range

Follow Generator?

This parameter simply allows you to select another Generator *in the Cell* for your "Following" Generator to follow.

Percent

This parameter sets the percentage of notes that the Followed Generator responds to so as to emit a note. Set to 100 if you want the Following

Generator to emit a note for every note played by the Followed Generator. Set to a smaller value if you want to thin-out the notes played by the Following Generator. This is also useful for building networks of chords, where if you have a number of Following Generators all following either each other or one main Generator, and if those Following Generators have the Percent Parameter to less than 100, then sometimes you will hear dense chords, and sometimes you will hear thinner chords.

Strategy

This parameter defines the pitch to use for a note generated by the Following Generator.

Note: The setting of the Rule Harmonize? flag is important for this parameter. If set to "Yes" then notes will only be generated that are available in the Scale Rule and Next Note Rule AND that harmonize according to the relevant Harmony Rule. If set to "No" then that is not enforced, something that is particularly important when using Semitone Shift, below. See also Cell Harmonize With Me and Cell Harmonize With Others which govern how Cells compose with each other.

The available values are:

- *Chordal Harmony*
  This causes the Following Generator to choose notes which respect the currently defined Scale, Harmony and Next Note Rules.

- *Interval Within Scale Rule*
  This causes the Following Generator to choose notes which are offset from the followed note, such they are at an interval within the Scale Rule, defined as a value randomly selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values.

  For example, if these values are 1 and 2 respectively, then each time a note is chosen, it will be between 1 and (1+2)=3 Scale Rule intervals up from the Followed Generator's note. It is important to understand that this refers to the non-zeroed elements in the current Scale Rule, in other words only those notes that are available within the Scale Rule.

So, in our example, if we were using a Major Scale Rule, and if the followed note were C4 (Middle C), and if Wotja chose a value of 2 as its random value; then the played note would be E4 (Middle C), which is the second note up from Middle C within the Major Scale Rule.

- *Semitone Shift*
  This causes the Following Generator to choose notes which are offset up from the followed note, such they offset from the followed note by a number of semitones which is a value randomly selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values.

  For example, if these values are 1 and 2 respectively, then each time a note is chosen, it will be between 1 and (1+2)=3 semitones up from the Followed Generator's note.

  So, in our example, if we were using a Major Scale Rule, and if the followed note were C4 (Middle C), and if Wotja chose a value of 3 as its random value; then the played note would be D#4 (Middle D#), which is the third semitone note up from Middle C. This value is used even though it is not in the current scale rule, provided of course the "Harmonize?" flag noted above is set to "No". If you want to achieve something similar but with the "Harmonize?" flag set to "Yes", then for the shifted note(s) required, use a Scale Rule, Harmony Rule and Next Note Rule (for the relevant Generator) that allow those note(s) to be chosen.

Units

You define the Unit of Measure by which the Delay and Delay Range parameters are interpreted. This may be one of the following values:

- *Seconds (thousandths of a)*
  The parameters including Duration are all interpreted as being in thousandths of a second (i.e. Milliseconds). So, a Duration value of 1000 means one second.

- *Beats (60ths of a)*

The parameters including Duration are all interpreted as being in 60ths of a beat. In Wotja a Beat is defined as being one crotchet; you get 3 beats in a bar of 4:4 music. So, a Duration value of 60 means one beat. A Duration value of 30 means a quaver. A Duration value of 20 means a triplet. A Duration value of 15 means a semi-quaver. A Duration value of 240 means 4 beats (which is a full bar if the Cell Meter is 4:4).

- *Full seconds*
  The parameters including Duration are all interpreted as being in seconds. So, a Duration value of 10 means ten seconds.

Delay

This defines the minimum delay after which the Following Generator will play a followed note. The actual value chosen for each note is a value between Delay, and Delay plus the Delay Range. Each and every note composed for this Following Generator will have a note whose delay is separately calculated.

Delay Range

This is combined with the Delay parameter, to determine the delay after which the Following Generator will play a followed note. The actual value chosen for each note is a value between Delay, and Delay plus the Delay Range. Each and every note composed for this Following Generator will have a note whose delay is separately calculated.

Shift/Interval

Used when the Strategy is either Interval Within Scale Rule or Semitone Shift.

This causes the Following Generator to choose notes which are offset in some way from the followed note, according to the Strategy; where the offset is defined as a value randomly selected between the Shift/Interval and Shift/Interval plus Shift/Interval Range values.

Shift/Interval Range

This represents the "*Shift/Interval Range*", and is used when the Strategy

This represents the "*Shift/Interval Range*", and is used when the Strategy is either Interval Within Scale Rule or Semitone Shift.

This causes the Following Generator to choose notes which are offset in some way from the followed note, according to the Strategy; where the offset is defined as a value randomly selected between the Shift/Interval and Shift/Interval plus Shift/Interval Range values.

Generator - Repeater

How do I edit these parameters? See the Generator: Main Editor.

Overview

"Repeater" Generators are like "Rhythmic" Generators, with the added feature that they can be defined to repeat notes that they have composed in previous bars, according to rules defined in the Repeat Parameter Group. When not repeating previous bars, Repeater Generators compose as if they were of Rhythmic Generator Type.

Parameter Group - Repeater

- Repeat Generator?
- Percent
- Bars
- Bars Range
- History Generator?
- History Range

Repeat Generator?

You define the name of the Generator from which you would like, from time-to-time, to repeat past bars of music. If you simply want to repeat bars played in the past for the current Generator, simply select the magic value of '?', which is also the default value.

Percent

When the Generator starts composing a new bar, it takes a look at this parameter value. This defines for what percent of the time the Generator should repeat previously-composed music. Set this parameter to 100 if you always want past composed music to be repeated (where available!); set to 0 if you never want past music repeated by this Generator. When the Generator doesn't choose to repeat past data it composes a new bar of music were it to be of Rhythmic Generator Type.

Bars

Defines the number of bars for which the Generator should repeat a past-composed chunk of music. The actual value chosen is somewhere between Bars and Bars + Bars Range.

Bars Range

Defines the upper limit of the number of bars for which the Generator should repeat a past-composed chunk of music. The actual value chosen is somewhere between Bars and Bars + Bars Range.

History

Defines the number of bars in the past, from which the Generator will choose the past-composed music to repeat. The actual value chosen is somewhere between History and History + History Range.

History Range

Defines the upper limit of the number of bars in the past, from which the Generator will choose the past-composed music to repeat. The actual value chosen is somewhere between History and History + History Range.

♩ ▮ Generator - Listener

How do I edit these parameters? See the Generator: Main Editor.

Overview

A "Listener" Generator detects a monophonic (not polyphonic) incoming MIDI note event on its MIDI channel and presents it as a virtual composed note. It will only detect a subsequent note if it first receives a note off for the previous note.

To generate sound via the WAE it needs to be followed by a Follower Generator. Used like this, Listener Generators allow you to create simple hyper-instruments where external input can influence the music that is generated. Such music is also referred to as **Adaptive Generative Music [AGM]**.

Listener Generators do not have any special parameters, which is why there is no special Parameter Group, and nor do they require any use of scripting. However, they can be used with Intermorphic Wotja Script to create more advanced hyper-instruments.

When an incoming MIDI note is detected, e.g. C60, then:

1. If the Generator has a Chords Depth value of 1 and Chords Range value of 0 (both default values) it echoes a single virtual note that can be "heard" only by a Follower Generator - this is used to create an actual note.
2. If the combined Chords Depth or calculated Chords Depth/Chords Depth Range value is >1 then the first note is still silent (and echoed as above and so can be followed, too), but the composed chording notes will also play (e.g. through the WAE) and Generators can follow those notes, too.

The virtual note created by a Listener Generator is pitch shifted, if necessary, to fit within the band of pitch values set by its Pitch and Pitch Range parameters (see Rhythmic Generator).

Playing with a Listener Generator:

- Ensure Wotja has been setup, as below.
- Ensure your Listener Generator is on the MIDI channel you are expecting to detect MIDI notes.
- Either Follow that Listener Generator with a Follower Generator (1 above) and maybe use that Generator's Chording parameters to play chords, OR set its Chording parameters to >1 (as in 2 above).
- Press play in Wotja app to start your Cell and for the Listener Generator to detect the MIDI notes fed into it (and remember that the Listener Generator will only detect a subsequent note if it first receives a note off for the previous note!).

Wotja Setup:

MIDI emitting app or MIDI Device feeding MIDI notes into the Wotja app

- Connect the MIDI Device or load the MIDI app (e.g. for iOS MIDIKeys [you must have CoreMIDI Port set to 'Virtual Port'] or e.g. for macOS Mini Keys). Ensure you have it set up to send MIDI notes on the Virtual MIDI channel you want, e.g. MIDI Channel 1 or Omni etc. (or just check what it is sending using some kind of MIDI Monitoring app).
- Once the Device is connected or the App has loaded you will likely need to restart Wotja for it to be detected.
- Then in Wotja > Settings: General, select the MIDI Input Devices button which takes you to the MIDI Input Devices screen:
  - Toggle on the relevant Channels for your desired MIDI Input Device(s), e.g. 'Network Session 1' on iOS, or e.g. iOS 'MIDIKeys' or e.g. macOS 'Mini Keys' etc.
- To hear sound in Wotja, ensure you have the "WAE for Sounds & FX" setting toggled on in Settings: General. Note that when playing through the WAE the latency you will experience is mostly affected by both the Audio Block Size. When that is 1024 samples the latency is about 1 second; when set to its minimum value of 256 samples then it is about 1/4 of a second. You may also wish to experiment with the MIDI Latency setting.
- **Once you have done the above, try this example**:

1. Create a New Text-only mix (Documents > Add New > Mixes > Text Only).
2. Add this Template to an empty cell - WME Generator Types > Listener + Follower (this is a good starting point).
3. Tap the play button in Wotja to start the mix playing (it will be silent).
4. Tap tap keys on your MIDI Device or MIDI App and you should hear Wotja play that note!

Generator

How do I edit these parameters? See the Generator: Main Editor.

Overview

The "Generator" Parameter Group includes a handful of the most basic parameters used by all Generators types.

Parameter Group - Generator

- Name
- Generator Type
- Mute
- MIDI Channel
- Pitch
- Pitch Range
- Patch
- Send MIDI Bank/Patch?

Name

Every Generator in a Wotja file has a unique name. You can use any name you want, provided it is not empty, and provided it is not a single question mark (which has a reserved meaning for use with Rules, which you will find out about later).

Generator Type

See Generator Types.

Mute

Toggle this setting (Yes/No) to mute or unmute the Generator. Certain Generator Types might take some time to respond, depending on how far in advance their notes are composed.

When the keyboard focus is on the Mute cell, you have various extra menu options available to you in the "Control" Menu. These are as follows:

- Solo Generator
- Unmute All Generators
- Mute All Generators

If you hold down the *ctrl* key when you click on the mute cell, you will toggle all other Generator's mute states, without changing the mute state of the Generator that you *ctrl-click* on. This can be very handy.

MIDI Channel

A Generator emits data on a MIDI Channel. MIDI channels are numbered from 1 to 16. The default MIDI channel for a Generator is actually MIDI channel 0 – which tells the WME to assign a free channel from 1 to 16 automatically, as best it can. MIDI channel 10 is always reserved for percussion sounds, such as drum sounds or other untuned sound.

Pitch

Set the Pitch to be the minimum pitch for which you want your Generator to compose. The WME will ensure that it composes no notes less than this pitch value.

Pitch Range

Set the range of pitches in semitones above the Pitch which can be used for composition. The WME will ensure that it only composes notes with pitches between Pitch and Pitch + Pitch Range.

Note: This has a minimum value of 11 to ensure that notes will be generated *whatever* the Root note of the mix is set to.

Patch

Each Generator is assigned a Patch and that Patch value is used whenever it generates a MIDI note.

Important: The Patch parameter is not used by a WAE synth network, e.g. a Wavetable Unit, where SF2 and patches must be manually selected. It *is* useful, however, when sending MIDI to a 3rd Party MIDI Synth such as a Wotja-hosted Plug-in, a 3rd Party DAW or an external MIDI sound module.

Other Notes

In general, the WME does not emit any MIDI bank select CC information for a Generator before it emits the Patch Change MIDI event. However, you *can* force the WME to emit such information, by typing-in a special format patch value; where you type-in the patch in the format: *patch.msb.lsb*, for example:

```
98.53.4
```

In this example, the WME will emit bank select CCs for both MSB and LSB according to the settings you supply (53 and 4 respectively, in this case). If you don't specify a value for the lsb, then the WME will only emit a Bank Select MSB CC (CC number 0). If you supply the lsb, then the WME will also emit a Bank Select MSB CC (CC number 32).

Send MIDI Bank/Patch?

Not all software synthesizers for your favorite sequencer like having Patch data supplied to them via a Patch Change MIDI event. If this is the case, simply change the *Send MIDI Bank/Patch?* parameter to *No* (unchecked), and the WME won't send any MIDI patch change events.

♩ ▮ Generator - Rule Objects

How do I edit these parameters? See the Generator: Rule Editor.

The Generator Rule Object parameters govern how your Generator works. The Rules themselves are edited in the relevant Rule Editor. See Rule Objects.

Parameter Group - Rules

- ▮ Scale
- ▮ Harmony
- ▮ Rhythm
- ▮ Next Note
- ▮ Harmonize?
- ▮ Generator Root

▮ Scale Rule

See also: Rule Editor and See Rule Objects; Standard Rule Values

Each Generator composes according to an Wotja Music Engine (WME) Scale Rule. The Rule defines both the notes in the musical scale that are available for use and the note probability weightings.

Scale Rules can selected from the Standard Rule Values list (below) or can be a custom Rule you have created and named as you want.

Tip: If you are getting unexpected results, remember that the notes that can be chosen by the WME ALSO depend on the Harmony Rule and Next Note Rule in use, and, as relevant, the settings of the "Harmonize?" and/or Harmonize with Me/Others checkboxes.

Scale Rules can be set at a Generator, Cell or Mix level - see the Rule Editor for details.

- **Scale Rule elements: 24**
  - These elements represent the semitone distance from the Root note defined for this Cell, these being: P1 (root), m2, M2, m3, M3,

    P4 (perfect 4th), b5, P5 (perfect 5th), m6, M6, m7, M7, P8 Oct (octave), m9, M9, m10, M10, P11 (perfect 11th), m125, P15 (perfect 13th), m14, M14, m15, M15.
  - Element values: % probability weighting
- *Note 1*: If opening an "old" rule that contains elements in just one octave range, we automatically extend it by duplicating those elements into a higher octave, and;
- *Note 2*: We wrap around the two octaves, matching Pitch Minimum as well as we can:
  - If Generator has pitch minimum of B, but Root is C; wrap around the rule starting from the C below.
  - If Generator has pitch minimum of D, but Root is C; wrap around the rule starting from the D below.

Included Scale Rules

The "Standard Rule" items below are included in Wotja. To select one of them see the Rule Editor > Toolbar Action button B > "Use Standard Rule Value" menu item.

Note: Rule objects can be referenced in Wotja Script.

Scale Rule Name	**Element Values**
Default	1 0 0.5 0 1 0.5 0 1 0 0.5 0 0.5
All Scale Major	1 0 1 0 1 1 0 1 0 1 0 1
All Scale Minor Natural	1 0 1 1 0 1 0 1 1 0 1 0
All Scale Minor Harmonic	1 0 1 1 0 1 0 1 0 0 0 1
Chord Major triad	1 0 0 0 1 0 0 1 0 0 0 0
Chord Major sixth	1 0 0 0 1 0 0 1 0 1 0 0
Chord Dominant seventh	1 0 0 0 1 0 0 1 0 0 1 0
Chord Major seventh	1 0 0 0 1 0 0 1 0 0 0 1
Chord Augmented triad	1 0 0 0 1 0 0 0 1 0 0 0
Chord Augmented seventh	1 0 0 0 1 0 0 0 1 0 1 0
Chord Minor triad	1 0 0 1 0 0 0 1 0 0 0 0
Chord Minor sixth	1 0 0 1 0 0 0 1 0 1 0 0
Chord Minor seventh	1 0 0 1 0 0 0 1 0 0 1 0

Chord Minor-major seventh	1 0 0 1 0 0 0 1 0 0 0 1
Chord Diminished triad	1 0 0 1 0 0 1 0 0 0 0 0
Chord Diminished seventh	1 0 0 1 0 0 1 0 0 1 0 0
Chord Half-diminished seventh	1 0 0 1 0 0 1 0 0 0 1 0
Chord Augmented major seventh	1 0 0 0 1 0 0 0 1 0 0 1
Chord Seven-six	1 0 0 0 1 0 0 1 0 0 1 0
Chord Mixed-third	1 0 0 1 1 0 0 1 0 0 0 0
Chord Suspended fourth	1 0 0 0 0 1 0 1 0 0 0 0
Chord Dominant ninth	1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0
Chord Dominant eleventh	1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 1 0 0 0 0 0 0 0
Chord Dominant thirteenth	1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 1 0 0 0 1 0 0 0
Chord Seventh minor ninth	1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0
Chord Seventh sharp ninth	1 0 0 0 1 0 0 1 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0
Chord Seventh augmented eleventh	1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 0
Chord Seventh diminished thirteenth	1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 1 0 0 1 0 0 0 0
Chord Add nine	1 0 0 0 1 0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
Chord Add fourth	1 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
Chord Add sixth	1 0 0 0 1 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Chord Six-nine	1 0 0 0 1 0 0 1 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
Chord Suspended second	1 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Chord Jazz sus	1 0 0 0 0 1 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0

	0 0 0 0
Mode Ionian (I)	1 0 1 0 1 1 0 1 0 1 0 1
Mode Dorian (II)	1 0 1 1 0 1 0 1 0 1 1 0
Mode Phrygian (III)	1 1 0 1 0 1 0 1 1 0 1 0
Mode Lydian (IV)	1 0 1 0 1 0 1 1 0 1 0 1
Mode Mixolydian (V)	1 0 1 0 1 1 0 1 0 1 1 0
Mode Aeolian (VI)	1 0 1 1 0 1 0 1 1 0 1 0
Mode Locrian (VII)	1 1 0 1 0 1 1 0 1 0 1 0
Special Root only	1 0 0 0 0 0 0 0 0 0 0 0
Special Scale Chromatic	1 1 1 1 1 1 1 1 1 1 1 1

Harmony Rule

See also: Rule Editor and See Rule Objects; Standard Rule Values.

Each Generator composes according to its defined Wotja Music Engine (WME) Harmony Rule. The Rule defines how likely it is that a note for that Generator will harmonize at a given musical interval in semitones with any note already composed (and in use by) by any *other* Generator.

Tip: If you are getting unexpected results, remember that the notes that can be chosen by the WME ALSO depend on the Scale Rule and Next Note Rule in use, and, as relevant, the settings of the "Harmonize?" and/or Harmonize with Me/Others checkboxes.

Harmony Rules can selected from the Standard Rule Values list (below) or can be a custom Rule you have created and named as you want.

Harmony Rules can be set at a Generator, Cell or Mix level - see the Rule Editor for details.

- **Harmony Rule elements: 24**
  - These elements represent in semitones the possible harmonies available, these being: P1 (root), m2, M2, m3, M3, P4 (perfect 4th), b5, P5 (perfect 5th), m6, M6, m7, M7, P8 Oct (octave), m9, M9, m10, M10, P11 (perfect 11th), m125, P15 (perfect 13th), m14, M14, m15, M15.

    - Element values: % probability weighting
- *Note 1*: For single note drones to work as intended the the harmony rule MUST include the octave element, too (e.g. Standard Rule "P1 and P8").
- *Note 2*: When opening most older mixes that uses an "old" 12 element rule we automatically extend it by duplicating into a higher octave.
- If harmonic distance is greater than 2 octaves, wrap around the rule.
- **Example**:
    - Imagine that you have three Generators, called X, Y and Z.
    - Imagine that at some time in the Cell, the WME has already chosen to play note C for Generator X, and note G for Generator Y. At that time, the WME thinks about composing a note for Generator Z. It looks at the notes available for it to compose, and adjusts the probabilities of choosing each of those notes, by applying the Harmony Rule element values for each of those two composed notes which are active at time (i.e. notes C and G).
    - Harmonies are always calculated based on a rising direction up from the Cell Root. So, if the Cell Root is B and the WME is considering if it can compose note D for Generator Z, and it looks at the note it needs to harmonize with which is note C for Generator X; then Wotja figures-out the Harmony Rule values for Generator Z from the C of Generator X, up and through the Octave (i.e. E, F, F#, G, G# etc.).

Included Harmony Rules

The "Standard Rule" items below are included in Wotja. To select one of them see the Rule Editor > Toolbar Action button B > "Use Standard Rule Value" menu item.

Note: Rule objects can be referenced in Wotja Script.

Harmony Rule Name	Element Values
Default	.35 0 0 .65 .85 1 .65 .65 .65 .1 .1 0 .35
All (one octave)	1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0

All (two octaves)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
P1	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
P1 and P8	1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0

Rhythm Rule

See also: Rule Editor and See Rule Objects; Standard Rule Values.

Each Generator composes note durations according a Rhythm Rule. The Rule defines how likely it is that a note for that Generator has a certain duration. This rule is combined with other factors, including the remaining length of time a Generator has left in the current bar (the WME tries to avoid having notes from non-Ambient Generators drifting across bar boundaries).

Rhythm Rules can selected from the Standard Rule Values list (below) or can be a custom Rule you have created and named as you want.

Rhythm Rules can be set at a Generator, Cell or Mix level - see the Rule Editor for details.

- **Rhythm Rule elements: 12**
    - These elements represent the permitted note durations, these being: 1, 1/2., 1/2, 1/4., 1/4, 1/8., 1/8, Triplet, 1/16
    - Element values: % probability weighting

Included Rhythm Rules

The "Standard Rule" items below are included in Wotja. To select one of them see the Rule Editor > Toolbar Action button Ⓑ > "Use Standard Rule Value" menu item.

Note: Rule objects can be referenced in Wotja Script.

Rhythm Rule Name	**Element Values**
Default	.1 .25 1 .5 .5 .25 .25 0 0
All But Dotted	1 1 1 0 1 0 1 1 1
Slow	1 1 1 0 1 0 0 0 0
Fast Syncopated	0 0 0 0 0 1 1 1 1
Fast Plain	0 0 0 0 0 0 1 0 1

Very Slow	1 0 .5 0 .25 0 0 0 0
Semiquavers Only	0 0 0 0 0 0 0 0 1
Middle	0 1 0 1 1 1 0 1 0
All	1 1 1 1 1 1 1 1 1

Next Note Rule

See also: Rule Editor and see Rule Objects & Standard Rule Values.

Each Generator composes according to its defined Wotja Music Engine (WME) Next Note Rule. The Rule defines the distances in semitones available to be used for the next composed note.

Tip: If you are getting unexpected results, remember that the notes that can be chosen by the WME ALSO depend on the Scale Rule and Harmony Rule in use, and, as relevant, the settings of the "Harmonize?" and/or Harmonize with Me/Others checkboxes.

Next Note Rules can selected from the Standard Rule Values list (below) or can be a custom Rule you have created and named as you want.

Next Note Rules can be set at a Generator, Cell or Mix level - see the Rule Editor for details.

- **Next Note Rule elements: 24**
  - These elements represent in semitones the distance a new note will be from the last composed note, these being: P1 (root), m2, M2, m3, M3, P4 (perfect 4th), b5, P5 (perfect 5th), m6, M6, m7, M7, P8 Oct (octave), m9, M9, m10, M10, P11 (perfect 11th), m125, P15 (perfect 13th), m14, M14, m15, M15
  - Element values: % probability weighting
- Note: If opening a mix that uses an "old" 12 element rule, we automatically extend it by setting the "upper range" items to zero.

Included Next Note Rules

The "Standard Rule" items below are included in Wotja. To select one of them see the Rule Editor > Toolbar Action button Ⓑ > "Use Standard Rule Value" menu item.

Note: Rule objects can be referenced in Wotja Script.

Next Note Rule Name	**Element Values**
Default	0.25 1 1 .7 .3 .2 .1 .1 .1 .1 .05 .02 .05 0 0 0 0 0 0 0 0 0 0 0
All (one octave)	1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0
All (two octaves)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Harmonize?

The default value for this parameter is "Yes". What that means is that notes composed by this Generator will be considered for harmonization with other Generators (including itself, if it uses Chording).

If you *do not* want A) other Generators to harmonize with the notes composed by this Generator, or B) for it not to harmonize with its own notes when chording (i.e. within Chords), then set it to "No".

See also: Follower / Follower Strategy and Chording / Chording Strategy.

Generator Root

Normally, you want your Generator to use the Cell Root. This is represented by the value ? However, sometimes you really want to force your Generator to use a different Root note; in which case, set the Generator Root to be whatever value suits.

This allows you to work-around the following sort of problem:

Imagine that you have a sampler, where you load-up a variety of loops against MIDI note C3 up to D3. To have your Cell drive this from a Rhythmic Generator such that the sounds you hear are not affected by changes to the Cell Root, you should set the Generator Root to e.g. C3 and your Generator will then be unaffected by changes to the Cell Root. Note that in this specific example, it would probably be a good idea to set the Harmonize? Flag to No.

♩ ▮ Generator - Phrasing

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Phrasing parameters are used in certain situations by most of the generators with the exception of the TTM Generator, which has its own special Phrasing parameters.

Parameter Group - Phrasing

- ▮ Note Rest %
- ▮ Phrase Length
- ▮ Phrase Length Range
- ▮ Phrase Gaps
- ▮ Phrase Gaps Range

↥ ▮ Note Rest %

This value defaults to zero. If not zero, then the defined percentage of notes that would otherwise be played by your Generator will instead be treated as a rests of the same duration. This is very useful for making any Generator sound sparser. Give it a go: this parameter is very powerful, and applies to **all** Generator Types.

↥ ▮ Phrase Length

Set this to define the shortest possible sequence of notes that your Generator will compose in sequence. The Generator composes a sequence of notes, followed by a sequence of rests. The length of each sequence of notes is governed by this and the Phrase Length Range parameter.

↥ ▮ Phrase Length Range

This value defines the upper limit to the number of notes that your

Generator will compose in sequence. For example, if the Phrase Length is 3, and the Phrase Length Range is 25, then the minimum phrase will be 3 notes, and the maximum phrase length will be (3+25) = 28 notes.

Phrase Gaps

Set this to define the shortest possible sequence of rests that your Generator will compose. Your Generator composes a sequence of notes, followed by a sequence of rests. The length of each sequence of rests is governed by this and the Phrase Gaps Range parameter.

Phrase Gaps Range

This value defines the upper limit to the number of rests that your Generator will compose in sequence. For example, if the Phrase Gaps is 3, and the Phrase Gaps Range is 25, then the minimum phrase will be 3 rests, and the maximum phrase length will be (3+25) = 28 rests.

Generator - Chording

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Chording parameters let you configure *any* Generator Type to generate chords automatically.

In outline, use the *Depth* and *Depth Range* values to define the "Chording Depth"; which is the number of notes that will play at any one time for a given Generator. The first note in any chord is composed according to the normal mechanism for the Generator Type; additional notes that cause a chord to be built-up may be generated automatically according to the Chording parameters.

Parameter Group - Chording

- Depth
- Depth Range
- Percent
- Strategy
- Units
- Delay
- Delay Range
- Shift/Interval
- Shift/Interval Range
- Pitch Offset
- Velocity Factor

Depth

Specify the minimum *Depth* of chord that you want your Generator to play with. A value of 1 will mean that the Generator will not chord (unless the *Depth Range* parameter is greater than zero).

The *Depth* defines the number of notes that are played by the Generator at any one time.

Depth Range

Specify the relative maximum *Depth* of chord that you want your Generator to play with. A value of 0 means that whenever the Generator is played, it will play a number of notes equal to the *Depth*. A value of one or more means that whenever the Generator is played, it will play a number of notes equal to a randomly selected value between the *Depth* and the *Depth* plus the *Depth Range*.

Percent

This parameter tells the Generator the percentage chance that it should actually emit any given note in the chord (after the first note, of course!). Set to 100 if you want the Chording Generator to always emit a note for every note played by the Generator. Set to a smaller value if you want to thin-out the notes played within the chord. This allows you to create chords of varying depth; sometimes dense, sometimes thin.

Strategy

This parameter tells the Generator what it should do when it decides the pitch to use for a note generated within a chord.

Note: The setting of the Rule Harmonize? flag is important for this parameter. If set to "Yes" then notes will only be generated that are available in the Scale Rule and Next Note Rule AND that harmonize according to the relevant Harmony Rule. If set to "No" then that is not enforced, something that is particularly important when using Semitone Shift, below. See also Cell Harmonize With Me and Cell Harmonize With Others which govern how Cells compose with each other.

The available values are:

- *Chordal Harmony*
  This causes the Generator's chord notes to be selected according to the currently defined Scale, Harmony and Next Note Rules.

- *Interval Within Scale Rule*
  This causes the Generator's chord note to be selected offset from the followed note, such they it is at an interval within the Scale Rule beyond the previous note in the chord, defined as a value randomly

selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values.

For example, if these values are 1 and 2 respectively, then each time a note is chosen within the chord, it will be between 1 and (1+2)=3 Scale Rule intervals up from the previous note in the chord. It is important to understand that this refers to the non-zeroed elements in the current Scale Rule, in other words only those notes that are available within the Scale Rule.

So, in our example, if we were using a Major Scale Rule, and if the first note in the chord were C4 (Middle C), and if the Generator chose a value of 2 as its random value; then the played note would be E4 (Middle C), which is the second note up from Middle C within the Major Scale Rule.

- *Semitone Shift*
  This causes the the Generator's chord note to be selected offset up from the previous note in the chord, such it is offset from the previous chord note by a number of semitones which is a value randomly selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values. A note chosen in this way ignores the current Scale Rule.

  For example, if these values are 1 and 2 respectively, then each time a note is chosen, it will be between 1 and (1+2)=3 semitones up from the previous note in the chord.

  So, in our example, if we were using a Major Scale Rule, and if the previous note in the chord were C4 (Middle C), and if the Generator chose a value of 3 as its random value; then the played note would be D#4 (Middle D#), which is the third semitone note up from Middle C. This value is used even though it is not in the current scale rule, provided of course the "Harmonize?" flag noted above is set to "No". If you want to achieve something similar but with the "Harmonize?" flag set to "Yes", then for the shifted note(s) required, use a Scale Rule, Harmony Rule and Next Note Rule (for the relevant Generator) that allow those note(s) to be chosen.

Units

You define the Unit of Measure by which the Delay and Delay Range parameters are interpreted. This may be one of the following values:

- *Seconds (thousandths of a)*
  The parameters including Duration are all interpreted as being in thousandths of a second (i.e. Milliseconds). So, a Duration value of 1000 means one second.

- *Beats (60ths of a)*
  The parameters including Duration are all interpreted as being in 60ths of a beat. In the WME a Beat is defined as being one crotchet; you get 3 beats in a bar of 4:4 music. So, a Duration value of 60 means one beat. A Duration value of 30 means a quaver. A Duration value of 20 means a triplet. A Duration value of 15 means a semi-quaver. A Duration value of 240 means 4 beats (which is a full bar if the Cell Meter is 4:4).

- *Quantized Beats (60ths of a)*
  This works the same way as *Beats (60ths of a)* except that where the *Delay* has a special value of 10, 15 or 20; the delay is interpreted in a special way that is very useful for some breakbeat-based music. Specifically, in this case, the calculated value for the delay is rounded to the nearest sub-multiple of the *Delay* value. So, for example, if the engine calculates a value of 43, and if *Delay* is 20, the used value for the delay is actually 40 (which is the nearest multiple of 20).

Delay

This defines the minimum delay after which the Chording Generator will play a followed note. The actual value chosen for each note is a value between Delay, and Delay plus the Delay Range. Each and every note composed for this Chording Generator will have a note whose delay is separately calculated.

Delay Range

This is combined with the Delay parameter, to determine the delay after which the Chording Generator will play a followed note. The actual value chosen for each note is a value between Delay, and Delay plus the Delay Range. Each and every note composed for this Chording Generator will have a note whose delay is separately calculated.

Shift/Interval

Used when the Strategy is either Interval Within Scale Rule or Semitone Shift.

This causes the Chording Generator to choose notes which are offset in some way from the followed note, according to the Strategy; where the offset is defined as a value randomly selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values.

Shift/Interval Range

This represents the "*Shift/Interval Range*", and is used when the Strategy is either Interval Within Scale Rule or Semitone Shift.

This causes the Chording Generator to choose notes which are offset in some way from the followed note, according to the Strategy; where the offset is defined as a value randomly selected between the Shift / Interval and Shift / Interval plus Shift / Interval Range values.

Pitch Offset

This parameter defines the amount that the pitch of each note in the chord should be offset, in semitones, from the previous note in the chord; the actual value selected might be overridden according to the various rules that apply to the Generator, but in general, this parameter allows you to "shape" a chord to have a given range of pitch values. In combination with the *Delay*-related parameters, this allows you to create some very interesting arpeggiation effects.

For example, a value of +12 would tend to space each note in the chord by a range of 12 semitones (which is one octave), with each subsequent value in the chord being higher in pitch that the previous.

For example, a value of -12 would tend to space each note in the chord by a range of 12 semitones (which is one octave), with each subsequent value in the chord being lower in pitch that the previous.

Velocity Factor

This parameter allows you to specify the range of relative velocities for the notes in a chord. Each subsequent note in the chord is the defined percentage louder (for a positive value) or quieter (for a negative value) than the previous note in the chord. A value of zero means that all notes in the chord are played with the same velocity.

The Generator velocity envelope values are ignored when this parameter is applied.

For example, a value of *-30* would tell the Generator to generate its chords such that each auto-chorded note is 30% quieter than each preceding note in the chord; giving a noticeable tailing-off effect.

Generator - Articulation

How do I edit these parameters? See the Generator: Main Editor.

Overview

Important: A Generator's Articulation parameters apply to any/all notes it composes, be that via e.g. generative parameters, patterns or text-to-music.

The Generator Articulation parameters define the percentage of the duration of composed note, i.e. they determine how long a composed note actually plays for. A long time ago the WME used to compose notes to be played "Legato" (no gap between one note and the next) - this parameter allows you to play them with a shorter duration, e.g. staccato.

Parameter Group - Articulation

- Minimum
- Range
- Change
- Change Range

Minimum

1 is very staccato and 100 is legato (the new default).

Range

Max articulation is the value of Articulation (min) + Articulation range, and is used in combination with the variation values (below).

Change

The minimum variation in staccato between notes, c.f. other parameters that adopt the min + range approach.

Change Range

The range in variation of staccato between the notes (in addition to the min).

Generator - Envelopes

How do I edit these parameters? See the Generator: Envelope Editor.

Overview

See also the Envelope Editor.

Generator Envelopes are supported for a number of parameters. Envelopes work in the same way for all of these, so they are all grouped here.

Each envelope is a collection of up to 100 data points. A Cell starts with the value at the left side of the envelope, and as it progresses, eventually ends up with the value from the far right of the envelope.

You can draw direct on to the envelope with your mouse.

Alternatively, you may use one of the various powerful envelope editing tools that we have made available to you.

To use the envelope editing tools:
- Right-click (win) or ctrl-click (mac) on the envelope tool
- Select the option you want. e.g. random, curve up etc.
- Select the range using the mouse...
- Then: either press space or enter, or select pop-up envelope tool to apply to the selected range.
- Select freehand mode to return to the normal click-to-paint mode.

Parameter Group - Envelopes

- Volume (User Envelope 1)
- Pan (User Envelope 2)
- Micro Vol Env (Envelope 1)
- Velocity
- Velocity Range
- Velocity Change
- Velocity Change Range

Volume (User Envelope 1)

This envelope has a Default MIDI CC value of 7, which is the Volume controller CC.

This allows you to define an envelope that is used to emit a MIDI CC of your choice.

- *MIDI CC*
  - Use this to define the MIDI CC that you want to be emitted by this envelope. The default value is 7, which is the Volume controller.
- *Enabled?*
  - Use this to turn your envelope on or off.
- *Envelope*

Pan (User Envelope 2)

This envelope has a Default MIDI CC value of 10, which is the Pan controller CC.

This allows you to define an envelope that is used to emit a MIDI CC of your choice.

- *MIDI CC*
  - Use this to define the MIDI CC that you want to be emitted by this envelope.
- *Enabled?*
  - Use this to turn your envelope on or off.
- *Envelope*

Micro Vol Env (Envelope 1)

This is not actually an envelope, but it provides fine variation in the values generated by the User Envelope 1 above. Any value generated by this micro controller is added to the User Envelope 1 value, to give fine variation in any such envelope.

- *Range*
  - The maximum amount of micro change in the User Envelope 1 that can be applied. Zero means off (which is the default).

- *Change*
    - The amount of micro change in the User Envelope that is applied by Wotja between “update” periods. The value drifts between zero (off) and the Range, changing by plus or minus the Change value each time.
- *Update*
    - The time in milliseconds between updates to the Micro User Envelope value. The actual value chosen is selected randomly each time, to be a value somewhere between Update and Update Range.
- *Update Range*
    - The upper limit of time between updates to the Micro User Envelope value. The actual value chosen is between Update and Update Range.

Velocity Envelope

This allows you to define how the Velocity level is changed automatically for your Generator throughout playback of the Cell. The velocity defines relatively how loud each note is.

The actual Velocity value used at any point in the Cell is calculated as being a value somewhere in the range from Velocity, to Velocity plus the value of the Velocity Range envelope.

Velocity Range Envelope

The value in this envelope is added to the value in the Velocity Envelope.

Velocity Change Envelope

The velocity for any composed note can change by a value between Velocity Change Envelope value (VCE) and the VCE plus the Velocity Change Range Envelope value.

Velocity Change Range Envelope

The value in this envelope is added to the value in the Velocity Change Envelope.

Generator - Controllers

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Generator Controllers parameters define some of the key MIDI controller values that are emitted by the Generator.

Parameter Group - Controllers

- Damper/Hold
- Harmonic Content (71)
- Reverb (91)
- Chorus (93)
- Damper Release
- Portamento (65)
- MIDI Channel Sharing

Damper/Hold (64)

Set this value to other than the default of "-1", if you want to emit a Damper/Hold MIDI controller (MIDI CC 64) at the specified value on this Generator's MIDI line. This is a funny MIDI controller, with only two states; in that a value of 64 or greater activates Damper/Hold, and any value of 63 or less means to turn it off! Leave this value at the default of "-1" if you don't want the Generator to emit any information for this MIDI controller.

Harmonic Content (71)

Set this value to other than the default of "-1", if you want to emit a Harmonic Content MIDI controller (MIDI CC 71) at the specified value on this Generator's MIDI line. Leave this value at the default of "-1" if you don't want the Generator to emit any information for this MIDI controller.

Reverb (91)

Set this value to other than the default of "-1", if you want to emit a Reverb MIDI controller (MIDI CC 91) at the specified value on this

Generator's MIDI line. Leave this value at the default of "-1" if you don't want the Generator to emit any information for this MIDI controller.

Chorus (93)

Set this value to other than the default of "-1", if you want to emit a Chorus MIDI controller (MIDI CC 93) at the specified value on this Generator's MIDI line. Leave this value at the default of "-1" if you don't want the Generator to emit any information for this MIDI controller.

Damper Release

If you are using Damper/Hold (64), then you will find that your notes can start building-up and never decay! In which case, set the Damper Release parameter to "Yes", which tells the Generator to momentarily release the damper just before the end of every bar. This prevents build-up of notes and generally sounds wonderful.

Portamento (65)

Set this value to other than the default of "-1", if you want to emit a Portamento MIDI controller (MIDI CC 65) at the specified value on this Generator's MIDI line. Leave this value at the default of "-1" if you don't want the Generator to emit any information for this MIDI controller.

MIDI Channel Sharing

The default value of "Yes" means that this Generator can share its MIDI channel with other Generators. This is only considered if you have defined the MIDI Channel parameter for a Generator to be 0.

Generator - Micro Controllers

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Generator Microcontroller parameters (there are two - User C1 and User C2) allow you to define very powerful Microcontrollers to be associated with your Generator.

Microcontrollers are very powerful and you can think of them as built-in, highly configurable MIDI event generators. They can either synchronize to the tempo of your Cell, or you can let them run free-floating. Experiment with them – they can do a huge amount to make your music interesting and dynamic.

Tip: if you want to synchronize your Microcontroller to the time-base, so that your MIDI controller is synchronized to bar boundaries in your music, you'll need to use the Beat Cycle Length parameter.

Parameter Group - Micro Controllers

- MIDI CC
- Mode
- Minimum
- Range
- Change
- Change Range
- Update
- Update Range
- Update Units
- Beat Cycle Length
- Phase Shift %

MIDI CC

This tells your Generator which MIDI controller (also referred to as the MIDI CC) to emit for this microcontroller, e.g. 11. When the Microcontroller is active, the Generator will emit values for this MIDI controller that change at various times, with behavior that you define using the various parameters in this Parameter.

Mode

The Mode defines the shape of the waveform that the Generator will use to shape this waveform.

The Mode may be one of the following values:

- *-1 – Off*
  - The microcontroller is off. This is the default value.
- *0 - Random Drift*
  - The microcontroller will drift between the Minimum and Minimum plus Range, changing at times specified by the Update and Update Range parameters, by an amount between the Change and Change plus Change Range parameters.
- *1 - LFO (Min-Max-Min)*
  - A triangular waveform, that starts at the minimum value, works up to the maximum value, and works back to the minimum value.
- *2 - LFO (Max-Min-Max)*
  - A triangular waveform, that starts at the maximum value, works down to the minimum value, and works back to the maximum value.
- *3 - Sawtooth (Min-Max)*
  - A sawtooth waveform, that starts at the minimum value, works up to the maximum value, and then starts again from the minimum value.
- *4 - Sawtooth (Max-Min)*
  - A sawtooth waveform, that starts at the maximum value, works down to the minimum value, and then starts again from the maximum value.

Minimum

Defines the minimum value that may be emitted by the Microcontroller.

Range

The microcontroller will emit a value between the Minimum and Minimum plus Range values.

So for example, if you define Minimum to be 20, and Range to be 100, the value that is emitted will be in the range 20 to 120 inclusive.

Change

Defines the amount by which the microcontroller will change, every time it is allowed to change. Typically set to a value of 1. If this value is set to 0, the Microcontroller will change only if the Change Range is greater than or equal to 1.

Change Range

Defines the upper limit to the amount by which the microcontroller will change, every time it is allowed to change. Typically set to a value of 1. If this value is set to 0, the Microcontroller will change only if the Change Range is greater than or equal to 1.

For example, if you define Change to be 1, and Change Range to be 3, the value that is emitted will vary by a value between 1 and (3+1)=4 each time.

Update

Defines the minimum time in milliseconds between changes in the emitted Microcontroller value. The system might not be able to emit changes as quickly as you want, if you set a very small value! If you don't want changes to happen very often, then use a large value.

Ignored if Beat Cycle Length is non-zero.

Update Range

Defines the upper limit in the time in milliseconds between changes in the emitted Microcontroller value. Use this parameter to apply some uncertainty in when the changes will occur.

For example, if you define Update to be 1000, and Update Range to be 500, the value that is emitted will change every 1000 to 1500 milliseconds (or in other words, every 1 to 1.5 seconds).

Ignored if Beat Cycle Length is non-zero.

Update Units

You define the Unit of Measure by which the Update and Update Range parameters are interpreted. This may be one of the following values:

- *Seconds (thousandths of a)*
  - The Update and Update Range are interpreted as being in thousandths of a second (i.e. Milliseconds). So, a Update value of 1000 means one second.
- *Full seconds*
  - The Update and Update Range are interpreted as being in seconds. So, a Update value of 10 means ten seconds.

Beat Cycle Length

This parameter is critical for generating effects which synchronize with the bar timing of your Generator. If you want to achieve an effect like a filter-sweep that synchronizes to your bar boundary, then this is the parameter to use.

Here are some of the values you could use.

Note in the WME a Beat is defined as being one crotchet; you get 4 beats in a bar of 4:4 music. So, a Duration value of 60 means one beat. A Duration value of 30 means a quaver. A Duration value of 20 means a triplet. A Duration value of 15 means a semi-quaver. A Duration value of 240 means 4 beats (which is a full bar if the Cell Meter is 4:4).

Phase Shift %

Use this parameter if you want to start the microcontroller from a start-point other than at the very start of its cycle.

Generator - Micro Delay

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Generator Micro Note Delay parameters provide fine variation in the times of Note events generated by a Generator. This can be used to give a Generator more “human” feel.

Parameter Group - Micro Note Delay

- Delay Range
- Delay Offset
- Delay Change

Delay Range

The maximum amount of delay generated by micro note delay changes, that may be applied to note events. Zero means off (which is the default).

Delay Change

The amount of change in the micro delay that is applied by Wotja between note on/off events. The value drifts between zero (off) and the Delay Range, changing by plus or minus the Delay Change value each time.

Delay Offset

Fixed amount of offset note delay to apply, used only when the Micro Note Delay controller is in use. The default value is zero.

Generator - Micro Pitch

How do I edit these parameters? See the Generator: Main Editor.

Overview

The Generator Micro Pitch parameters provide fine variation through use of the MIDI Pitch Wheel controller.

Tip: This is not normally used on MIDI line 10, which is the drum/percussion line!

Parameter Group - Micro Pitch

- Bend Sensitivity
- Pitch Bend Offset
- Pitch Range
- Pitch Change
- Pitch Update
- Pitch Update Range

Bend Sensitivity

A value from 0 to 24, meaning how many semitones are controlled by the full available range of Micro Pitch parameters. The default value is 2, which represents two semitones.

Pitch Bend Offset

Fixed amount of pitch-bend to apply on this MIDI line, used to tune/de-tune an instrument.

The default value is zero, which means to apply no offset pitch bend.

From -8192 to +8191; which covers a range of pitch bend defined by the Bend Sensitivity parameter.

Pitch Range

The maximum amount of micro pitch change that can be applied. Zero means off (which is the default). The maximum value allowed is 8191. The value chosen is added to the pitch bend offset.

Pitch Change

The amount of change in Micro Pitch that is applied by Wotja between “update” periods. The value drifts between zero (off) and the Pitch Range, changing by plus or minus the Pitch Change value each time.

Pitch Update

The time in milliseconds between updates to the pitch controller. The actual value chosen is selected randomly each time, to be a value somewhere between Pitch Update and Update Range.

Pitch Update Range

The upper limit of time between updates to the pitch controller. The actual value chosen is between Pitch Update and Update Range.

Generator - Note to MIDI CC

How do I edit these parameters? See the Generator: Main Editor.

Overview

Normally, Generators compose and emit MIDI note events. The Generator Note to MIDI CC Mapping parameters allow you to tell a Generator to emit MIDI controller data instead of MIDI note events.

Why would you want to do this? Well, it lets you use a Generator as a very powerful generative MIDI event generator with a huge range of potential applications.

Parameter Group - Note to MIDI CC

- CC for Note On?
- Note On CC
- CC for Velocity?
- Velocity CC
- CC for Note Off?
- Note Off CC

CC for Note On?

If you want this Generator to emit a MIDI CC instead of note on/off events, set this parameter to Yes.

Note On CC

If you have set CC for Note On? to Yes, then instead of emitting a note on event, the Generator will emit the specified MIDI CC, with a value equal to the composed pitch.

CC For Velocity?

If you want this Generator to emit a MIDI CC proportionate to the Velocity of the composed note (in addition to any controller defined for Note On CC), then set this parameter to Yes.

Velocity CC

If you have set CC for Velocity? to Yes, then the Generator will (in addition to the Note On CC value) emit the specified MIDI CC, with a value equal to the composed velocity.

CC for Note Off?

If you want this Generator to emit a MIDI CC when a note off occurs, set this parameter to Yes. This applies only if CC for Note On? Is set to Yes.

Note Off CC

If you have set CC for Note Off? to Yes, then instead of emitting a note off event, the Generator will emit the specified MIDI CC, with a value equal to the composed pitch of the stopped note.

Generator - Scripting

The Generator Scripting parameter allows your Generator to use Intermorphic Wotja Script. For full details please refer to the Wotja Script Engine Guide.

Generator - Comments

How do I edit these parameters? See the Generator: Main Editor.

Overview

This Generator Comments parameters allow you to store comments in your Generator, in the form of copyright information and any notes you might want to make for future reference.

Parameter Group - Comment

- Copyright
- Notes

Copyright

Enter the Copyright information you might want to record for the Generator. In the case of a Generator from a template pack, this might contain a copyright notice associated with that template.

Notes

Enter any detailed notes you might want to make about this Generator for future reference.

♪ Cell - Rules

How do I edit these parameters? See the Cell: Properties.

Overview

The Cell Rules parameters allow you to define the default Rules used by the Generators in the selected Cell. Each Cell can have different Cell Rules.

Scale Rules

Set this to define the default Scale Rule to use when the Cell plays. Individual Generators are allowed to override this setting if they so wish.

Harmony Rules

Set this to define the default Harmony Rule to use when the Cell plays. Individual Generators are allowed to override this setting if they so wish.

Next Note Rules

Set this to define the default Next Note Rule to use when the Cell plays. Individual Generators are allowed to override this setting if they so wish.

♪ Cell - Meter

How do I edit these parameters? See the Cell: Properties.

Overview

The Cell Meter parameters define the Meter to be used by the Cell, such 4:4 or 3:4 or 6:8. A Generator will generally use this Meter, but the Meter value to be used for each Generator may actually override this setting. This approach allows Generators to be configured to work with a completely different Meter, which can be used for interesting polyphonic effects.

♩ Cell - Scripts

The Cell Scripting parameter allows a Cell to use Intermorphic Wotja Script. For full details please refer to the Wotja Script Engine Guide.

♪ Cell Info

How do I edit these parameters? Cell: Properties.

Overview

The Cell Info Object allows you to define some book-keeping parameters for your Cell. None of these parameters affect the way that your Cell sounds. However, **they are useful if you you wish to later export the Cell as a new Template because when you load that new Template it will show the values set here**.

Template Title (editable)

The title of the Template that was first added to the Cell. If you change the title the changed title is not shown in the Cell, only here.

Template Author (editable)

The author of your Template.

Template Notes (editable)

Any notes you want to include for your Template.

File Path (non-editable)

This shows file path to the Pak that the Template is in.

Content Duration (non-editable)

This is non-editable and shows the duration of a WAV file or MIDI file (if used, and which is why it is shown) or 8:53:20 for generative content.

♪ Mix Settings

How do I edit these parameters? See the Mix: Properties.

Mix Tempo

The Mix Tempo allows you to define the tempo for your mix.

Mix Root

The Mix Root parameter allows you to define the Root Pitch to use for the mix. For example, if you are using a Major Scale Rule, then set this value to be C for your Cell to play in the key of C Major.

Ramp Up

Sets how long it takes for the file volume to ramp up once the file has started to play.

Playlist Duration

Sets how long the mix file will play for in the Playlist.

Playlist Duration Range

Sets a range on how long the mix file will play for in the Playlist.

Playlist Ramp Down

Sets how long it takes for the mix file volume to ramp down before play moves to the next mix file in the Playlist.

Intermorphic

Intermorphic is a brother team with a 30+ year passion for developing powerful generative music apps, engines & tools.

We ❤ our customers and ❤ making apps to help aid creativity & relaxation.

Wotja

App

Downloads

Help & FAQs

Tutorials

Add-on Paks

Wotja Docs

Wotja User Guide

Music Engine (WME)

Audio Engine (WAE)

Script Engine (WSE)

Wotja Pak Maker

News & Blog

News

Blog > Posts

Press > Releases

Press > Resources

News Archive

Other

Contact Us

T-Shirts etc.

About Us

SSEYO Koan

App Archive