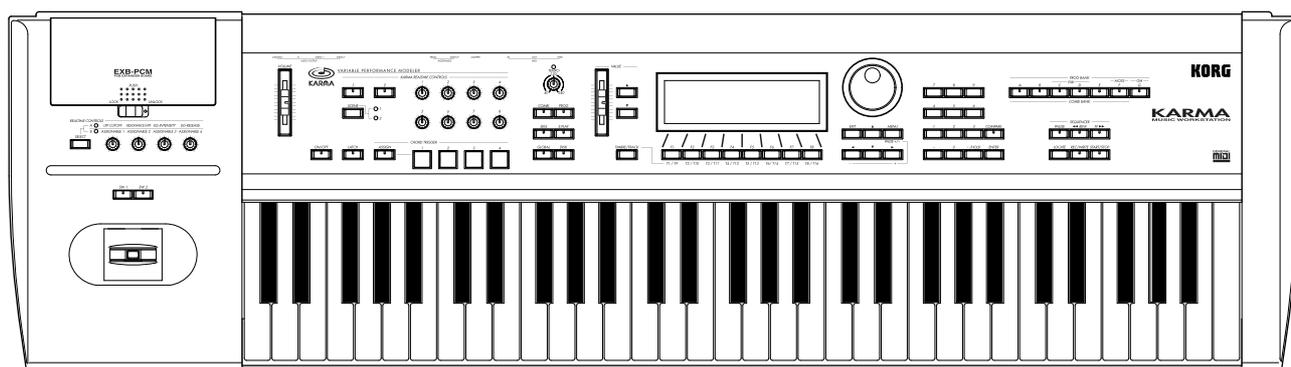


KARMA

MUSIC WORKSTATION

KARMA GE Guide



KORG

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About this manual

The “KARMA GE Guide” explains the GE parameters of the KARMA function built into this **KARMA Music Workstation**, organized according to the groups that make up the Generated Effects.

The **KARMA Music Workstation** provides more than **one thousand preset GE’s (Generated Effects)**. For each GE, up to sixteen of the more than four hundred GE parameters have been selected for optimal control from the **KARMA Music Workstation**.

The GE parameters and ranges that can be controlled will differ for each GE.

Some GE parameters are related to other parameters, and are affected by them. In this case, the parameters that are producing the effect may not always be displayed, since they may already be preset for that GE.

Furthermore, the KARMA-related parameters in pages 6.1–6.4 of each mode may also function differently or not at all, depending on the settings of these GE parameters. Some of the internal parameters of each GE are displayed in the Voice Name List. (☞VNL)

In order to explain the GE parameters, this document includes example settings using these parameters that cannot be viewed or set, and examples of pattern settings using pattern grids that cannot be displayed in the LCD screen of the KARMA Music Workstation.

Printing conventions in this document

Abbreviations for the owner’s manuals: PG, VNL

The included owner’s manuals are abbreviated as follows.

PG: Parameter Guide

VNL: Voice Name List

Parameters “ ”

Parameters are enclosed in “double quotation marks.”

Bold type

Parameter values are printed in bold type.

Bold type is also used for text that is being emphasized.

☞p. ■ ■, ☞PG p. ■ ■

These respectively indicate a GE Guide page or Parameter Guide page to which you can refer.

Symbols , 

These symbols respectively indicate cautions or advice.

Illustrations in this manual

Pattern grid screens etc. in this manual are provided to supplement the explanation.

They are not displayed in the LCD screen of the KARMA Music Workstation.

MIDI-related listings

CC# is an abbreviation for Control Change Number.

How to read the “GE Guide”

The GE’s (Generated Effects) are organized into 14 groups. Each group has GE parameters. (☞p.3 diagram)

The 6.3: Ed-KARMA GE (or KARMA GE) page shows the group name, parameter name, and parameter value of the GE parameters.

You can use the 6.3: Ed-KARMA GE (or KARMA GE) page to check the group name and parameter name of the GE parameter you wish to look up, and then find it in the GE Guide.

Here’s an example from Program mode.

Access the PROG 6.3: Ed-KARMA GE page, and display the GE parameters in the LCD screen. (☞PG p.32 PROG 6.3: Ed-KARMA)

PROG 6.3:Ed-KARMA GE		Value	Asgn	Pol
☐ GE Parameter		+0000	--	+
01.Rhythm: Swing %		+0007	1	+
02.Rhythm: Template [B]		+0050	1	-
03.Velocity: Pools-Random Factor[B]		-0006	4	+
04.Repeat: Decay				
GE P..4 GE P..8 GE P..12 GE P..16				

The GE parameters displayed in the LCD screen show the group name and parameter name.

☐ GE Parameter	Value
01.Rhythm: Swing %	+0000

Group name Parameter name Parameter value

For example in the case of 01. Rhythm: Swing %, the group is Rhythm Group and the parameter is “Swing %.”

The explanation for “Swing %” is given on p.13 “Rhythm Group”Swing %.”

The parameter value is displayed by “Value” at the right of the parameter name.

The default value and editing range of the parameter is preset for each GE. Depending on the selected GE, the same GE parameter may have a different default value and a different editing range.

For some GE parameters, the following information is displayed in addition to the parameter name.

• Parameter name [Phase]

This indicates the phase for which the parameter is valid. (For details refer to p.53)

Display example

Rhythm: Template [B]
[Phase]

• CCs: parameter name #No. #No.

Parameters of the CCs group also indicate the MIDI message that is controlled by the CCs. (For details refer to p.53)

Display example

CCs: Fixed/On [B] 010 074
[Phase] #No. #No.

- **Env: parameter name [ENV] #No. #No. #No.**

Parameters of the Env (Envelope) Group also indicate the envelope for which that GE parameter is valid, and indicate the parameter or MIDI message that is controlled by the Envelope. (For details refer to p.53)

Display example

Env: Env On/Off [3] 010
 [Env] #No.

- **Drum: parameter name [Pat]**

Parameters of the Drum group also indicate the drum pattern for which that GE parameter is valid. (Some parameters in the Drum Group that are not related to the individual Drum Patterns will not display this information.) (For details refer to p.53)

Display example

Drum: Row 1 Note [1]
 [Pat]

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About KARMA

Overview

KARMA stands for **Kay Algorithmic Realtime Music Architecture**, named after its inventor, Stephen Kay.

The **KARMA** function generates MIDI data, using many different complex algorithms seamlessly integrated to provide a powerful "music generation engine". Based on the notes and chords you play, **KARMA** generates phrases and patterns in real-time, generating not just notes but MIDI control data as well. The **KARMA** architecture allows the various algorithms to be reconfigured and varied in real-time, as you play them.

For example, you can create spectacular cascades of complex interweaving notes, techno arpeggios and effects, dense rhythmic and melodic textures, natural sounding glissandos for acoustic instrument programs, guitar strumming and finger-picking simulations, random effects, auto-accompaniment effects, gliding and swooping portamento and pitch bend effects, and new sound design possibilities. **KARMA** lets you produce phrases and patterns far beyond the level provided by conventional arpeggiators or pattern playback functions.

Theory Of Operation

A performance of a musical phrase can be thought of as having many different "attributes" which determine the overall effect of the resulting music. For example, a musical phrase has a "rhythm" attribute, which is the rhythm with which the notes are being played. The number of notes ("chords") being played at the same time in various places of the musical phrase could be called a "cluster" attribute. The velocity (accent) with which the notes are played is a "velocity" attribute. The spatial location in a stereo field where the notes are played is a "pan" attribute, etc.

Typically, music that has been recorded or sequenced has all of these attributes predetermined and fixed in relation to each other. A specific note is to be played with a specific rhythmic value for a specific period of time, at a specific volume level, at a specific location in a stereo field, with the sound of a specific musical instrument, and these relationships remain fixed no matter how many times you play back the performance. For example, in most if not all auto-accompaniment instruments, to achieve a variation in the accompaniment pattern the instrument essentially switches to a different pre-recorded sequence of musical events (again with specific relationships that are fixed in the data).

In **KARMA**, every aspect of a musical phrase has been separated into independently controllable attributes. Each of these attributes is controlled by a separate group of parameters, which can be individually varied or changed in groups by the user in real-time as the music is being generated; or changed all at once with the selection of a program or combination.

KARMA can also be used to generate infinitely variable

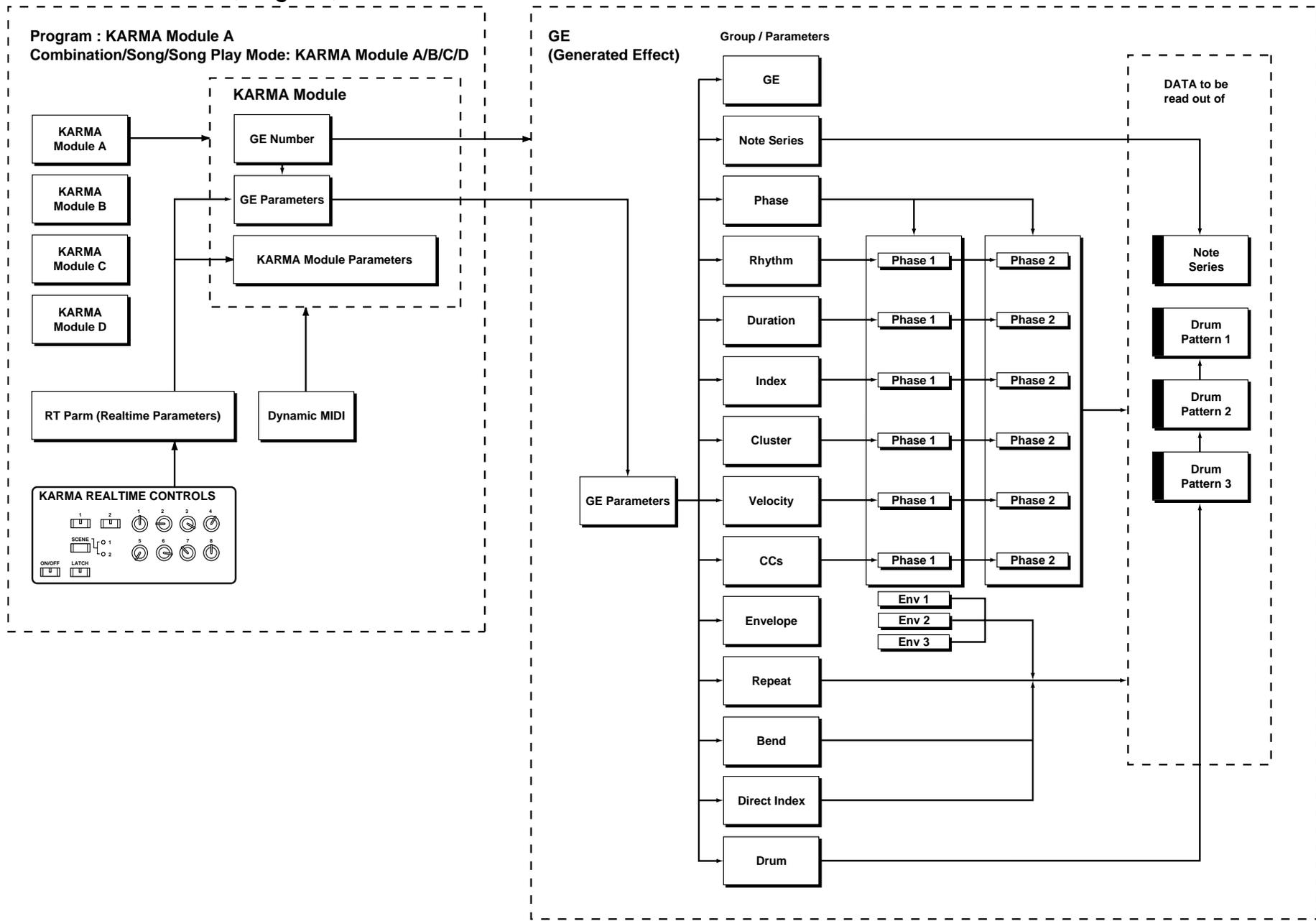
randomized grooves and accompaniment backings. Up until now there have been two basic types of backing track generation. The traditional method used in all auto-accompaniment keyboards is a system which analyzes notes played on a keyboard (chord recognition) and then plays back patterns stored in memory through transposition tables. The second method is the one used by some algorithmic software products that create new patterns each time the algorithm is called. In general, the first method is static and repetitive, while the second method cannot be modified in real-time.

KARMA combines the algorithmic diversity of the second method with the real-time control and immediate access of the first method to create a new form of interactive groove generation, where the user is in more direct control, since what is produced is directly related to which notes are pressed. Furthermore, extensive aspects of the rhythm, velocity, chord size and other parameters can be randomly varied in real-time to allow the user to control the complexity and density of the resulting performance.

The new **KARMA** function is the heart of the **KARMA** Music Workstation.

Whether you are playing programs or combinations, performing with the **KARMA** Realtime Controls knobs, switches, and [CHORD TRIGGER] keys, giving a live performance, or recording new music using the onboard sequencer, you can take full advantage of the **KARMA** function at any time.

KARMA Architecture (Diagram)



GE (Generated Effect) Group

Overview

The phrases and patterns produced by a KARMA module are generated by a **GE (Generated Effect)**.

Based on note data from the keyboard or external MIDI device, the GE uses various internal parameters to control how the note data will be developed, and how rhythm, chord structure, and velocity etc. will be controlled to generate a phrase or pattern. MIDI control changes and pitch bend data can also be generated in synchronization with the phrase or pattern, making it possible to create phrases and patterns in which the tone color and note pitches change independently.

This instrument contains **over 1000 preset GEs** that can be used with a wide range of instruments, playing styles, and musical genres.

GE Global Parameters

GE Type [0...3]

- | | |
|---------------------------|--------------------------|
| 0: Generated-Riff | 2: Generated-Drum |
| 1: Generated-Gated | 3: Real-Time |

Chooses one of several different overall algorithm configurations for the current Generated Effect. This setting determines some basic modes of operation, and also which parameters are available within the various GE Groups.

0: Generated-Riff

Produces riffs, arpeggios, and chord clusters based on the notes given as input source material. The notes are expanded, transposed, replicated, and otherwise altered to form a Note Series by the parameters in the Note Series Group. Effects are generated based on the Rhythm Pattern as it relates to the clock source or tempo envelope.

1: Generated-Gated

Retriggers the actual notes given as input source material according to the parameters. While the Note Series is still created, the generated notes do not extend beyond the actual notes played. Effects are generated based on the Rhythm Pattern as it relates to the clock source or tempo envelope. The notes themselves can be generated, or a sustained set of notes which is then "sliced and diced" by a selected controller value. This can be used to simulate several types of popular techno effects, such as gating a synth pad with a hi-hat track and an external audio gate/compressor.

2: Generated-Drum

Uses special patterns of predetermined pitches rather than the Note Series to generate notes. These can be used not only to create Drum Patterns, but to create controlled musical patterns. Effects are generated based on the Rhythm Pattern as it relates to the clock source or tempo envelope. Riffs based on the notes in the Note Series can be applied as pitch bend, to create wave-sequence and other unique effects, and also to control other things such as the length of Phases.

3: Real-Time

Different from the previous types in that the actual notes given as input source material are used as a starting point, from which effects are generated over time according to time calculations. Examples include glissandos and arpeggios which start with the note(s) given as input (Melodic Repeat), and Auto-Bending an input note a certain amount or to another note.

Gate Type [0...4]

0: [Vel]-retrigger notes with velocity

1: CC [T]-sustain notes; retrigger only if Phase Transpose is different

2: CC [1]-sustain notes; retrigger when entering Phase 1

3: CC [2]-sustain notes; retrigger when entering Phase 2

4: CC [A]-sustain notes; retrigger when entering any Phase

 Available only when "GE Type" (p.4)= 1: Generated-Gated.

0: [Vel]-retrigger notes with velocity

The actual notes given as input source material are generated repetitiously as note-ons and note-offs according to the parameters. This produces a "gated" effect where each cluster of notes possesses the attack portion of the program being used, as if someone was repeatedly striking a keyboard very quickly.

CC - 4 different CC Gate Types

When one of the 4 "CC Gate Types" is chosen, "Gate CC Number" becomes available. The actual notes given as input source material are then generated as note-ons only once at the beginning of the effect; the rest of the note-ons are turned into the specified CC controller value with the same value as the velocity of the note-on; the note-offs are turned into CC values of 0. Essentially, this means that a pad will be sustained, having the attack portion triggered only once. For example, if the selected CC was #11 (Expression) or #07 (Volume), the pad will be repeatedly turned on and off, simulating the popular techno effect of gating a synth pad with a hi-hat track and an external audio gate/compressor. In KARMA however, the Velocity Pattern can be used to control the value of each CC that is generated for a note-on (the volume of each "slice"), and the Duration Pattern (p.17) can be used to control the duration of each "slice."

Other CCs can produce other interested stepped and wave-sequence like effects. For example, using a CC to control Filter Cutoff Frequency can produce interesting "Sample & Hold" effects.

1: CC [T]-sustain notes; retrigger only if Phase Transpose is different

When this first CC option is chosen, the "pad" will only be triggered manually (i.e. when you strike the keyboard), or only if there is a Phase Change and the Phase Transpose (p.10) is different, requiring that the generated notes be transposed. Therefore, if the Phase Transposes are the same, the "pad" will never retrigger unless you trigger it manually.

2: CC [1]-sustain notes; retrigger when entering Phase1

Same as CC [T] above, with the exception that the “pad” will be retriggered when striking the keyboard, and every time that the Phase Pattern enters a step containing Phase 1. You can use this to have the notes retriggered occasionally while moving through the Phase Pattern.

3: CC [2]-sustain notes; retrigger when entering Phase2

Same as CC [T] above, with the exception that the “pad” will be retriggered when striking the keyboard, and every time that the Phase Pattern enters a step containing Phase 2. You can use this to have the notes retriggered occasionally while moving through the Phase Pattern.

4: CC [A]-sustain notes; retrigger when entering any Phase

Same as CC [T] above, with the exception that the “pad” will be retriggered when striking the keyboard, and every time that the Phase Pattern causes a Phase Change. You can use this to have the notes retriggered occasionally while moving through the Phase Pattern.

Gate CC Number**[0...127]**

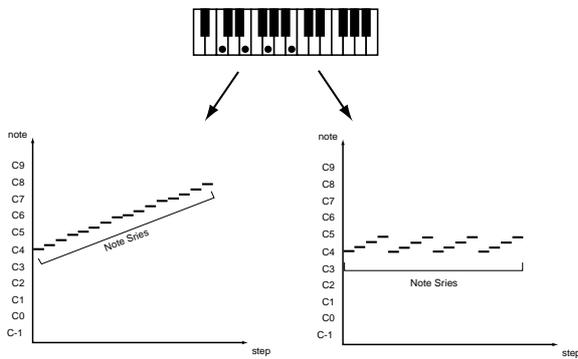
 Available only when “Gate Type” is one of the 4 CC options. Chooses which CC will be transmitted instead of the note-ons and note-offs of the generated notes. For example, for “chopping” effects, set to 12 (CC#11).

0: Off**1...96: MIDI CC #00...95****97...127: N/A (Not available)**

Note Series Group

Overview

The **Note Series Group** controls the creation of a "Note Series" in memory, which is the foundation of nearly all Generated Effects. The Note Series is a collection of pitches and corresponding velocities, created from initial notes coming from input source material (i.e. a keyboard). The various parameters control how these initial notes are replicated, shifted, sorted, filtered, and otherwise arranged into the Note Series. The Note Series is then used as the basic collection of pitches and velocities from which notes are generated, as controlled by most of the other parameters of the Generated Effect.



Parameters

When "GE Type" (p.4) = **2: Generated-Drum**, the effect of changing most of these parameters is only apparent if the Note Series is being applied as pitch bend in the Phase Group/Bend Group, or riff length is being used in the Drum Group.

Note Type [0...9]

- | | | |
|---------------------|----------------------|--------------------|
| 0: Regular | 4: WholeTone | 8: Tritones |
| 1: Scalic | 5: Diminished | 9: Fifths |
| 2: Scalic2 | 6: Augmented | |
| 3: Chromatic | 7: Fourths | |

Selects one of several modes for supplying the initial notes from which the Note Series is created.

0: Regular

The Note Series created in memory will be produced based on the actual notes given as input source material (i.e. a keyboard).

1: Scalic

The Note Series created in memory will be produced based on chord analysis of the input source material; then a group of notes corresponding to the analyzed chord will be used instead of the actual notes. The initial octave is based on the lowest note received as input source material. This can be used so that one finger chords produce scalic riffs, or to supply notes that are not present in the source material.

2: Scalic 2

Same as **1: Scalic**(above), except an attempt is made to keep a seven note scale for each chord type. In other words, there will be more passing tones, and it will sound more "modal" in nature. For a good example of the difference, play a 4 note diminished chord with each one. This can be of use for creating a bass line that is more predictable when changing chords, or jazzy soloing kinds of effects.

3: Chromatic

The 12 steps of a chromatic scale will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

4: WholeTone

The 6 steps of a whole tone scale will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

5: Diminished

The 4 steps of a diminished chord will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

6: Augmented

The 3 steps of an augmented chord will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

7: Fourths

3 steps of stacked fourths will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

8: Tritones

2 steps of a tritone (augmented fourth) will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

9: Fifths

2 steps (root and fifth) will be used as input source material. The first note of the Note Series is based on the lowest note received as input source material.

note If "Root Position" is **on (checked)** in (PG p.30), then the pitches of the Note Series will be shifted so that different inversions of the same chord produce the same set of pitches.

Input Sort

- 0: Up** **1: Down** **2: Actual** **3: Random**

How the notes (and corresponding velocities) from the input source material are arranged prior to creating the Note Series.

0: Up

notes are arranged from lowest to highest.

1: Down

notes are arranged from highest to lowest.

2: Actual

notes are left in the order received.

3: Random

notes are randomly arranged.

Inversion [-24...+24]

Allows different “inversions” of the notes prior to creation of the Note Series. For example, if the notes {C, E, G, B} were received in that order as a chord and Inversion was 1, then the notes would be shifted to {E, G, B, C 8va} before creation of the Note Series (thus playing the 1st inversion). This is especially useful for setting multiple modules to play different inversions of the same effect, such as natural harp glissandos or riffs in harmony. Normally used with Input Sort set to **0: Up** or **1: Down**. The effect of this parameter when Input Sort is **2: Actual** or **3: Random** is less predictable, although potentially useful for some effects.

Replications [0...4000]

0...4000: range 0.0...40.0

How many times the input notes will be replicated according to the Interval. For example, 3 “Replications” with an “Interval” of 12 will give you a **3 octave arpeggio**. Can be a fraction to achieve only a portion of the last replication. The value is represented as being x100 - so 350 is 3.5, 475 is 4.75, etc. Note that if “GEType” (p.4) = **1: Generated-Gated** this has no audible effect on the pitches of the Generated Effect; however this still affects the overall range of the available notes for Direct Indexing of the Note Series (described elsewhere).

Max [1...255]

Sets an overall “final place” in the Note Series, beyond which indexes will never be chosen during playback, even if other settings might allow it. This is a playback only parameter which does not affect the creation of the Note Series.

Symmetry [0, 1]

0: Off **1: On**

When turned **1: On**, additional notes are extrapolated at the end of the Note Series beyond the number specified by the “Replications” setting, which are accessed when clusters are generated in that area of the Note Series, or when the Index Group “Double/Invert” parameters (p.20, 21) are used. This primarily allows different cluster sizes to be used without affecting the length and shape of the resulting riff. This interacts with Cluster Patterns and the Index Pattern Cluster Advance Mode, discussed elsewhere. Note that when this is **0: Off**, clusters will “wrap around” at the end of a phase, or cause Phase Changes or cycling. Doubled notes caused by the use of the “Double” parameter in the Index Group will also be wrapped around at the top of the Note Series when this is of f.

0: Off

The notes determined by the Repetitions setting (described above) are used as the range within which to generate notes.

1: On

Extra notes may be extrapolated at the end of the range depending on the cluster size at that point. The result will be a widening of the apparent range of the riff.

Interval [-24...+24]

The number of semitones to offset each replication of the input notes by. For example, if set to +12 or -12, the Arpeggio will repeat in octaves (most normal). If set to 2, and “Replications” to 3, then playing a CMaj {C, E, G} will produce a CMaj, then DMaj {D, F#, A}, then EMaj {E, G#, B} as each replication is shifted by a whole-tone. Settings other than multiples of 12 are extremely useful in conjunction with “Chord Shift,” described below, so that atonal notes are shifted to musically correct pitches.

Chord Shift [0...2]

0: Off **1: Scalic** **2: Scalic2**

0: Off

The Note Series is created with no further modification from this setting.

1: Scalic

Chord analysis is performed on the input source material, and as the Note Series is created, notes which may be “atonal” based on the analyzed chord (due to being shifted by non-octave values of “Interval”) are shifted to tonal notes. Especially useful when “Interval” (discussed above) is set to something other than multiples of 12. The note tables used to shift the notes are the same as the ones used in “Note Type” (p.6) : **1: Scalic**, described above.

2: Scalic2

Same as **1: Scalic**(above), except that the note tables used to shift the notes are the same as the ones used in “Note Type”: **2: Scalic2**, described above. **Scalic2** is more modal in nature and has more passing tones than **1: Scalic**

Wrap Bottom [0...127]

Wrap Top [0...127]

0...127: range C-1...G9

Sets an overall range for the pitches in the Note Series. Notes created beyond this range are wrapped around (dropped or raised an octave, depending on which end). Mainly intended to limit the Note Series to useable ranges, these settings can also be used creatively to force a riff to cycle around inside a certain range.

Voicing [0...8]

0: Closed **3: Open2A** **6: Open3B**
1: Open1A **4: Open2B** **7: Open4A**
2: Open1B **5: Open3A** **8: Open4B**

0: Closed

The Note Series is created with no further modification from this setting.

1...8: Open 1A...4B

The Note Series has certain notes shifted up by an octave as it is created, then may be re-ordered according to the setting of the “Input Sort” (p.6) . Can be used to create different types of wider voiced chords for simulating guitar or string section voicings.

Filter Dupes

[0...2]

0: Off 1: Adjacent 2: All

0: Off

The Note Series is created with no further modification from this setting.

1: Adjacent

As the Note Series is being created, notes which are the same as the immediately preceding note are discarded.

2: All

After the Note Series has been created, any notes which are duplicates of any others are removed.

 Not available if "GE T ype" (p.4) = 1: **Generated-Gated**.

Filter Fixed

[0, 1]

0: Off 1: On

When Filter Steps is used (described below), allows the resulting tonality of the Note Series to be "Filter Fixed" in relation to the key of C. For example, assume that "Note Type" (p.6) is set to **Chromatic** and "Chord Shift" is **Off**, so that the Note Series is essentially a chromatic scale. If you play a single C (and "Inversion" (p.7) is set to 0), you will get a chromatic scale starting with C. If you then set up Filter Steps so that you are filtering steps {1, 3, 6, 8, 10} you would have a **C Major diatonic scale**. With "Filter Fixed" set to **Off**, if you then play a D on the keyboard, the whole scale will shift to become a **D Major diatonic scale**. With "Filter Fixed" set to **On**, the scale stays fixed to the key of C, but you are starting on the D; essentially, you have a **D minor scale**. You will be playing different modal scales starting with different pitches. Note that this is always related to the key of C; so if you want to put the resulting filtered, fixed Note Series into another key, you can use the Transpose (6.2-1a) KARMA Module parameter to do so. For example, if you set the transpose to +4, you would still play notes in the **key of C**, but the resulting generated notes would be in the **key of E**. In the above example, playing a C would result in a **E diatonic scale**, playing a D results in an **F# minor scale** (F# Dorian mode) and so on.

 Not available if "GE T ype" (p.4) = 1: **Generated-Gated**.

Filter Template

[0...77]

Selects from 78 different combinations of preset "Filter Steps" settings.

Step	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
Key: C	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
Key: E	E	F	F#	G	G#	A	A#	B	C	C#	D	D#

[Filter Steps]

A 12 step grid corresponds to the scale tones with regard to a current "key," which is determined by Chord Analysis of the input source material. For example, if the key is determined to be C, then the steps 1 through 12 correspond to C, C#, D to B; if the key is determined to be "E," then steps 1 through 12 correspond to E, F, F# to D#. After the Note Series is created, notes belonging to the chosen steps are removed, thus "filtering" them out. For example,

if {C, E, G, B} was the input material, CMaj7 would be the analyzed chord; if step #4 "3rd" was selected on the grid, all occurrences of E would be removed from the Note Series. Useful for creating complex grooves where several modules are all supplied with the same source material, where for example you might not want the bass line to play the 3rd even if it is supplied from the keyboard, might want to remove all chance of 7ths from a comping guitar part, etc.

 Selecting all steps to be filtered will result in a single note in the Note Series, determined by the settings of other parameters such as "Input Sort", "Inversion", etc.

 To "fix" the resulting filtered collection of notes with regards to a specific key, use "Filter Fixed" (described above).

 Not available if "GE T ype" (p.4) = 1: **Generated-Gated**.

 The following 3 parameters will have an effect on when Phases change if the Phase "Length Mode" (p.9) is set to 0: **AC-Actual: "Replications"** (p.7), "Filter Steps" (Filter Template), and "Filter Dupes". See Phase Group.

Phase Group

Overview

A Generated Effect has two different “Phases.” Each of them is a separate collection of certain parameters including Rhythm, Velocity, Cluster, Pan and Index Patterns, among others. As the effect is generated, a Phase Pattern controls switching between the two Phases, so that completely different collections of parameters can be used for a period of time. The Phase Group contains parameters which control the length, direction, and various other attributes of each Phase, the number of times and in what order the Phases will play, and whether or not a portion will be looped.

About Phase Patterns

Phase Pattern = 8

Step	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase/2	1	1	1	1	1	1	1	2								

The Phase Pattern allows a pattern of switching between the 2 Phases of a Generated Effect to be constructed. The resulting Phase Pattern may have a minimum of 1 step and a maximum of 16 steps. The example above shows an 8 step Phase Pattern: 7 times through Phase 1 followed by once through Phase 2. After completing the 8 steps, execution may loop back to Step 1. Note that the actual number of steps performed and whether it loops back at the end will be determined by other settings described in this chapter.

General Parameters

This group of parameters affects some overall characteristics of Phase performance.

Total Steps [0...32]

0: (infinity) **1...32: number of steps**

Sets the total number of steps of the Phase Pattern that will be played before stopping. The infinity sign **0: (infinity)** sets it to loop forever; otherwise the setting represents a number of steps of the selected Phase Pattern. For example, if the Phase Pattern is a simple 2-step pattern of {1, 2}, and the Total Steps menu is {4}, then 4 Phases would be played in the following order before stopping: {1, 2, 1, 2}.

Start % [0...100 (%)]

Controls the location in the Note Series at which the effect will start when it is triggered. Closer to **0%** starts nearer the beginning while closer to **100%** starts nearer the end; beginning/end relates to highest/lowest depending on the Phase “Direction” (p.10) setting. This can be applied just once when first triggering the effect, or as various steps of the Phase Pattern are entered, in conjunction with the Start Mode described below.

 Not available when “GE Type” (p.4) = **1: Generated-Gated**. If **2: Generated-Drum**, the Note Series can be applied as pitch bend, discussed elsewhere.

Start Mode [0...3]

- 0: T-only when Triggered**
- 1: 1-when entering Phase1**
- 2: 2-when entering Phase2**
- 3: A-when entering any Phase**

Controls how the “Start %” described above is applied to the effect as it is being generated.

0: T-only when Triggered

The “Start %” is applied only when the effect is triggered, i.e. from the keyboard or through Dynamic MIDI. When other steps of the Phase Pattern are entered during subsequent playback, the Note Series will reset to either the top or bottom depending on the Phase “Direction” setting and Phase “Beginning/End Offset” settings.

1: 1-when entering Phase1

Each time that playback of a Phase Pattern step containing Phase 1 begins, the “Start %” will be applied. This can be used to start a phase somewhere in the middle of the Note Series from which the indexes can be chosen in either direction according to the Index Pattern.

2: 2-when entering Phase2

Each time that playback of a Phase Pattern step containing Phase 2 begins, the “Start %” will be applied. This can be used to start a phase somewhere in the middle of the Note Series from which the indexes can be chosen in either direction according to the Index Pattern.

3: A-when entering any Phase

Each time that playback of any Phase Pattern step begins, either Phase 1 or Phase 2, the “Start %” will be applied. This can be used to start a phase somewhere in the middle of the Note Series from which the indexes can be chosen in either direction according to the Index Pattern.

 Not available when “GE Type” (p.4) = **1: Generated-Gated**. If **2: Generated-Drum**, the Note Series can be applied as pitch bend, discussed elsewhere.

Length Mode [0...2]

0: AC-Actual **1: TS-Time Signature** **2: EV-Events**

Determines when a Phase Change from the current step to the next step of the Phase Pattern will occur. Note that this has a certain interaction with the Cycle Mode parameter, described below.

0: AC-Actual

Causes the Phase Change to be completely dependent on the length of the Note Series and the Phase “Beginning/End Offsets.” The portion of the Note Series to be used as specified by the Phase “Beginning/End Offsets” (described below) is referred to as the “playback portion” of the Note Series. The notes are generated by moving through the Note series according to the Index Group settings; when either end of the playback portion has been reached, a Phase Change occurs (depending on the setting of the “Cycle Mode” parameter (p.10), described below). Therefore, if more or less notes are played, the Phases will change sooner or later and bear no relation to any time signatures or specific number of events. This is useful for GEs that model the behavior of most simple arpeggiators.

 Not available if "GE Type" (p.4) = **1: Generated-Gated**.

1: TS-Time Signature

Makes the Time Signature parameters ("Tsig Numerator/Denominator" p.11) available in the Phase Specific Parameter area of each Phase (described below). These allow setting each Phase to various time signatures, which cause the Phase to playback a certain number of beats regardless of any other circumstances which might trigger a Phase Change. When moving through the Note Series, if either end of the playback portion is reached (specified by the "Phase Beginning/End Offsets" p.11) before the amount of beats specified has occurred, then the movement either freezes and repeats at that point, or cycles back and continues (depending on the setting of the "Cycle Mode" parameter, described below). Useful for groove generation and constraining effects to certain time signatures.

2: EV-Events

Makes the "Events" parameter available in the Phase Specific Parameter area of each Phase (described below). This is used to set the Phase to perform a certain number of events before changing Phases (an event being a note or cluster). When moving through the Note Series, if either end of the playback portion is reached (specified by the "Phase Beginning/End Offsets" p.11) before the number of events specified has occurred, then the movement either freezes and repeats at that point, or cycles back and continues (depending on the setting of the "Cycle Mode" parameter, described below). Useful for constraining effects to a certain number of specific events, such as 4 strums per Phase.

Cycle Mode

[0...3]

0: OFF

1: B-Beginning Of Phase

2: E-End Of Phase

3: BE-Beginning & End Of Phase

Determines what will happen when either end of the playback portion of the Phase (specified by the "Phase Beginning/End Offsets") is reached during note generation. This has a different effect depending on the setting of the Phase "Length Mode" (above). If **1: TS-Time Signature** or **2: EV-Events** Mode, "cycling" can be allowed to occur; if **0: AC-Actual**, an immediate Phase Change will occur.

 Not available if "GE Type" (p.4) = **1: Generated-Gated**. If **2: Generated-Drum**, the Note Series can be applied as pitch bend, discussed elsewhere.

0: OFF

If the Phase "Length Mode" is **1: TS-Time Signature** or **2: EV-Events**, when either end of the playback portion of the Phase is reached, the movement freezes and repeats at that point until the specified number of events or beats of a time signature are generated; then a Phase Change occurs. Settings of the Index Pattern which would cause movement beyond that point have no effect. If the Phase "Length Mode" is **0: AC-Actual**, then when the end of the playback portion is reached no Phase Change occurs. Note that this means the Phase will never change, and has mainly been allowed only for completeness with the more normal uses below.

1: B-Beginning Of Phase

If the Phase Length Mode is **1: TS-Time Signature** or **2: EV-Events**, allows "cycling" to occur at the beginning of the playback portion of the Phase. For example, if the movement specified by the Index Pattern causes the index to go backwards beyond the beginning of the playback portion, "cycling" will occur (the index will automatically be jumped back into the playback portion by a calculated amount). If the Phase "Length Mode" is **0: AC-Actual**, then if the movement specified by the Index Pattern causes the index to go backwards beyond the beginning of the playback portion, a Phase Change will immediately occur.

2: E-End Of Phase

If the Phase "Length Mode" is **1: TS-Time Signature** or **2: EV-Events**, allows "cycling" to occur at the end of the playback portion of the Phase. For example, if the movement specified by the Index Pattern causes the index to go forwards beyond end of the playback portion, "cycling" will occur (the index will automatically be jumped back into the playback portion by a calculated amount). If the Phase "Length Mode" is **0: AC-Actual**, then if the movement specified by the Index Pattern causes the index to go forwards beyond the end of the playback portion, a Phase Change will immediately occur. This is probably the most "normal" and easily understood setting.

3: BE-Beginning & End Of Phase

Allows the behaviour described above at both ends of the playback portion of the Phase.

Phase Specific Parameters

For each of the 2 Phases, a group of Phase Specific Parameters allow control of some performance characteristics within each Phase. If settings of the Phase Pattern indicate a particular Phase is not being used, the Phase Specific Parameters for that Phase will not be available.

Direction

[0, 1]

0: Forward

1: Backward

Selects the direction for general movement through the Note Series in a particular phase. Works in conjunction with the parameters in the Index Group, which control how the index(es) move through the Note Series. For example, when the Direction is **0: Forward**, the Index Pattern values are added to the index to move it through the Note Series from left to right; when Direction is **1: Backward**, the Index Pattern values are subtracted to move the index through the Note Series from right to left.

 Not available when "GE Type" (p.4) = **1: Generated-Gated**. If **2: Generated-Drum**, the Note Series can be applied as pitch bend, discussed elsewhere.

Transpose

[-36...+36 (semitones)]

Allows each Phase to be transposed individually. Has no effect on Direct Indexing effects, which have a separate Transpose parameter (see Direct Index Group).

 Not available when "GE Type" (p.4) = **2: Generated-Drum**.

Octave Transpose [-36...+36]

Allows the Phase's Transpose value to be quantized to the nearest octave, so that when being changed in real-time, only transposition by octaves is possible. In this case, the value of the parameter changes by semitones, but the actual transpose value will only change at certain points within the range:

- 36 to -31 = -36 (-3 octaves)
- 30 to -19 = -24 (-2 octaves)
- 18 to -7 = -12 (-1 octave)
- 6 to +5 = 0 (no transpose)
- +6 to +17 = +12 (+1 octave)
- +18 to +29 = +24 (+2 octaves)
- +30 to +36 = +36 (+3 octaves)

Oct/5th Transpose [-36...+36]

Allows the Phase's Transpose value to be quantized to the nearest octave or fifth, so that when being changed in real-time, only transposition by octaves or fifths is possible. In this case, the value of the parameter changes by semitones, but the actual transpose value will only change at certain points within the range:

- 36 to -33 = -36 (-3 octaves)
- 32 to -27 = -29 (-3 octaves +5th)
- 26 to -21 = -24 (-2 octaves)
- 20 to -15 = -17 (-2 octaves +5th)
- 14 to -9 = -12 (-1 octave)
- 8 to -3 = -5 (-1 octave +5th)
- 2 to +3 = 0 (no transpose)
- +4 to +9 = +7 (+5th)
- +10 to +15 = +12 (+1 octave)
- +16 to +21 = +19 (+1 octave +5th)
- +22 to +27 = +24 (+2 octaves)
- +28 to +33 = +31 (+2 octaves +5th)
- +34 to +36 = +36 (+3 octaves)

Events [1...96]

TSig Numerator [0...31]

0...31: 1...32

TSig Denominator [0...4]

0: 16 1: 12 2: 8 3: 6 4: 4

The availability of these parameters vary according to the setting of the Phase "Length Mode" (p.9), described in General Parameters above. When the Phase "Length Mode" is 1: **TS-Time Signature**, "TSig Numerator" and "TSig Denominator" are available which allow you to specify various time signatures for each Phase. A certain number of beats is then performed in the Phase, regardless of any other circumstances which might trigger a Phase Change. When the Phase "Length Mode" is 2: **EV-Events**, a events is available which allows you to specify a certain number of events (an event being a note or cluster of notes). The specified number of events is then performed in each Phase, regardless of any other circumstances which might trigger a Phase Change. When the Phase "Length Mode" is 0: **AC-Actual**, then these parameters are not available. The Phases will then change according to the movement through the Note Series.

 0: **AC-Actual** not available when GE Type (p.4) = 1: **Generated-Gated**.

Beginning Offset % [0...100 (%)]

End Offset % [0...100 (%)]

Sets an overall beginning and end range in the Note Series for note generation within the Phase. Even though settings in the Note Series Group may have created a very long Note Series, these can be used to select just a portion of the Note Series from which to generate notes over the length of a particular Phase.

For example, if the "Beginning Offset" is 25% and the "End Offset" is 75%, note generation within the Phase would be restricted to coming from the portion of the Note Series 1/4 to 3/4 of the way from the beginning.

 Not available when "GE Type" (p.4) = 1: **Generated-Gated**. If 2: **Generated-Drum**, the Note Series can be applied as pitch bend, discussed elsewhere.

End Loop Parameters

Determines whether a portion of the effect will loop, after a certain number of steps of the Phase Pattern have been completed. Note that once the loop has started, it continues using the Phase Pattern, and current Phase "Length Mode".

End Loop On/Off [0, 1]

0: Off 1: On

Enables/disables this feature, and the following two parameters.

End Loop Start Step [1...17]

Chooses a step of the Phase Pattern after which looping begins. For example, if the Phase Pattern was set to a 2 step pattern of {1, 2} and the Start Step menu to 4, the loop would be entered after the 2nd time through the Phase Pattern, at the end of the 4th step in total. Not available if the "End Loop On/Off" is set to 0: **Off**.

End Loop Length [1...96]

1...96: events

Determines how many events (notes or clusters) will be moved forward/backward while looping, according to various other parameters such as the Index Pattern. Not available if the "End Loop On/Off" is set to 0: **Off**.

Pattern Parameters

Pattern Items [1...16 (steps)]

Sets the number of steps in the Phase Pattern.

Pattern Step 1...16 [0, 1]

0: Phase1 1: Phase2

Sets which phase (Phase 1 or Phase 2) will be used for generating data when a specific step of the Phase Pattern is entered during playback. For each step that is enabled, the step may be set to either Phase 1 or Phase 2.

Note that if the number of steps in the Phase Pattern (Pattern Items) is less than the step being edited, this will produce no audible results.

Template Parameters [0...15]

The following 5 parameters select 1 of 16 templates (each having 4 steps) that can be applied to all or parts of the Phase Pattern. They specify 16 different combinations of Phase 1 and Phase 2 within a 4 step section:

0: 1-1-1-1	6: 1-2-1-1	12: 1-2-2-2
1: 2-2-2-2	7: 2-1-1-1	13: 2-2-2-1
2: 1-2-1-2	8: 1-1-2-2	14: 2-2-1-2
3: 2-1-2-1	9: 1-2-2-1	15: 2-1-2-2
4: 1-1-1-2	10: 2-2-1-1	
5: 1-1-2-1	11: 2-1-1-2	

Template (All Steps)

The chosen template is applied to all steps of the Phase Pattern, regardless of how many there are. For example, if you selected **6: 1-2-1-1** (Template 6), then the following would happen to the Phase Pattern:

If the Phase Pattern had 1 step: **1**
If the Phase Pattern had 2 steps: **1-2**
If the Phase Pattern had 4 steps: **1-2-1-1**
If the Phase Pattern had 7 steps: **1-2-1-1 1-2-1**
If the Phase Pattern had 16 steps: **1-2-1-1 1-2-1-1 1-2-1-1 1-2-1-1**

Template Steps 1...4

Applies the selected template only to the first 4 steps of the Phase Pattern.
If there are more steps, they will remain unchanged.

Template Steps 5...8

Applies the selected template only to steps 5-8 of the Phase Pattern. If there are more steps, they will remain unchanged. Steps 1-4 will remain unchanged.

Template Steps 9...12

Same as above, except for steps 9-12.

Template Steps 13...16

Same as above, except for steps 13-16.
Note that if the number of steps in the Phase Pattern (Pattern Items) is less than the steps for which Templates are being changed, these will produce no audible results.

Rhythm Group

Overview

The **Rhythm Group** controls the rhythmic characteristics of the Generated Effect. It can also have an influence on when "Auto Bend" pitch bending effects (set up on the Bend Group) are generated.

About Rhythm Patterns

Rhythm Patterns control how often and when exactly notes will be generated. A value derived from a Rhythm Pattern is the size of the step between each generated note. Choices can be made from "Random Pools" (p.14) of values as described in detail later on. Furthermore, values can be tied to each other; the ties can be absolute or random.

Rhythm Patterns may be multiplied by the "Rhythm Multiplier," which gives them many more variations, in addition to providing easy ways to experiment with fractal and poly-rhythmic effects. A Rhythm Pattern of {8th, 16th, 16th} with a "Rhythm Multiplier" (p.15) of 200% will play {Quarter, 8th, 8th}.

A Rhythm Pattern will loop as long as note generation continues. It normally will not reset to the beginning of the Pattern unless a new Trigger is received, or the Phase Pattern has been configured to restart it at the beginning of certain Phases. That means that a 4 step Rhythm Pattern can be looping while an 8 step Velocity Pattern and a 12 step Cluster Pattern are also independently looping, for example.

Global Parameters

Humanize [0...255 (ms)]

Sets a range in milliseconds within which each note/cluster may be randomly shifted in time. For example, if set to 10 ms, then each cluster or note as it is generated has a possibility of a random offset in time of between 0 to 10 ms. This affects all of the notes in the cluster at the same time. This can be used to impart a more "human," less machine-like precision to generated notes. This can also be used to totally destroy the timing!

Swing Note Value [0...3]

- | | |
|---------------------|--------------------|
| 0: 32th note | 2: 8th note |
| 1: 16th note | 3: 4th note |

The base note value to be used in calculating swing. For example, if you want to add a swing feel to a steady string of 16th notes, you would select a **1: 16th note**. Straight 8th notes would exhibit no change with this setting, since they do not swing in such a feel unless they are syncopated. On the other hand, if you swing 16th notes with a **2: 8th note** Swing Note selected, the 16th notes are swung in an 8th note feel. While this is not necessarily natural "swing," interesting shiftings of timings can be produced. Note that the setting of this parameter can be modified by the "Swing Use Multiplier" parameter, explained below.

Swing % [0...100 (%)]

Percentage of swing/hip-hop feeling to be applied. 0% = no swing, 50% = triplets, while 100% pushes the swung notes all the way to the next value of half the note length set by the "Swing Note Value". For example, if swinging straight **1: 16th notes**, 100% would push the swung notes to **32nds**. Note that triplet rhythm values are not affected by swing.

Swing Use Multiplier [0...3]

- | | |
|-----------------------------|---------------------|
| 0: Off | 2: P1-Phase1 |
| 1: Ind-Independently | 3: P2-Phase2 |

The "Rhythm Multiplier" (explained later on in this chapter) causes the values in the Rhythm Pattern to be increased or decreased by a percentage. The "Swing Use Multiplier" specifies several options for selectively applying (or not applying) the Rhythm Multiplier(s) to the "Swing Note Value" also, thereby affecting the resulting swing feel.

0: Off-do not use Multipliers for Swing

The "Rhythm Multipliers" in each Phase do not have any affect on the "Swing Note Value". For example, if generating 16th notes with a "Rhythm Multiplier" of 100% and "Swing Note Value" set to **1: 16th note**, the resulting **16th notes** will be swung with a 16th note feel. If the "Rhythm Multiplier" is changed to 50%, the resulting **32nd notes** will still be swung with a **16th note feel**. If the "Rhythm Multiplier" is changed to 200%, the resulting **8th notes** will also be swung with a **16th note feel**, resulting in no perceptible swing (unless the rhythm is syncopated).

1: Ind-independently use each Phase's Multiplier

Each Phase's "Rhythm Multiplier" (p.15) will independently affect swing calculations while generating rhythms within that Phase. In other words, the "Swing Note Value" will also have the "Rhythm Multiplier" applied to it. For example, if generating 16th notes with a "Rhythm Multiplier" of 100% and "Swing Note Value" set to **1: 16th note**, the resulting **16th notes** will be swung with a **16th note feel**. If the "Rhythm Multiplier" is changed to 50%, the resulting **32nd notes** will be swung with a **32nd note feel**. If the "Rhythm Multiplier" is changed to 200%, the resulting **8th notes** will be swung with an **8th note feel**. With this setting, it is possible to swing with different values in the two Phases, such as swinging with an 8th note feel in one phase and swinging with a 16th note feel in the other.

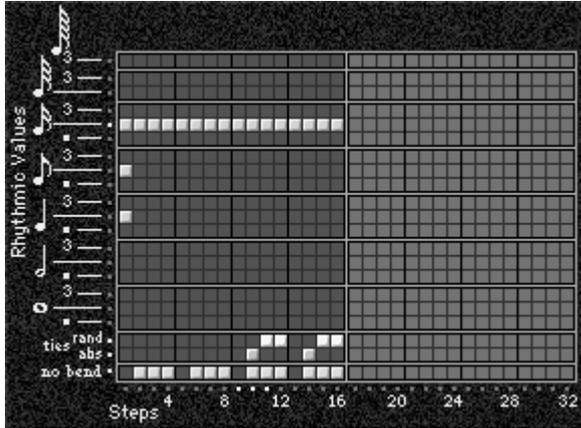
2: P1-always use Phase1's Multiplier

Same as **1: Ind** above, except that Phase 1's "Rhythm Multiplier" will always be used, regardless of which Phase is currently generating rhythms. This allows the Rhythm Multiplier to be varied in Phase 1 while affecting the overall swing settings for the whole effect. For example, if generating 16th notes in both phases with both Phase's "Rhythm Multipliers" set to 100% and "Swing Note Value" set to **1: 16th note**, the resulting **16th notes** will be swung with a **16th note feel**. If Phase 1's "Rhythm Multiplier" is changed to 200%, the resulting 8th notes in Phase 1 and 16th notes in Phase 2 will all be swung with an 8th note feel. If the "Rhythm Multiplier" in Phase 1 is 100% and changed to 50% in Phase 2, the resulting **16th notes** in Phase 1 and 32nd notes in Phase 2 will all be swung with a 16th note feel.

3: P2-always use Phase2's Multiplier

Same as 2: P1 described above, except utilizing Phase 2's "Rhythm Multiplier."

Pattern Grid & Associated Parameters



Rhythm Pattern

A Rhythm Pattern controls the rhythm that the notes are generated with according to a grid of rhythmic values. It has any number of steps up to 32, with each step being represented by one column on the grid. The first column always contains at least one value; unused columns appear disabled. The top part of the grid corresponds to 18 different rhythmic values; the bottom 3 rows are special purpose rows:

[ties: rand]- Random Tie: randomly ties the rhythmic value in the same column to the previous column's rhythmic value. For example, a 16th note in the first column followed by a 16th note and a random tie in the 2nd column yields either an 8th note or two 16th notes. When at least one random tie has been selected, a weighting curve is available which allows choices to be slanted towards more ties or less ties, as described later.

[ties: abs]- Absolute Tie: always ties the rhythmic value in same column to the previous column's rhythmic value. For example, a 16th note in the first column followed by a 16th note and an absolute tie in the 2nd column yields an 8th note.

The 2 tie rows are mutually exclusive; only one at a time can be used in any given column.

[no bend]- No Bend: affects when Automatic Pitch Bending effects can occur, as set up in the Bend Group. These effects will normally be triggered with every single generated note or cluster; by using the "no bend" row, bends can be prevented from occurring on various steps of the Rhythm Pattern.

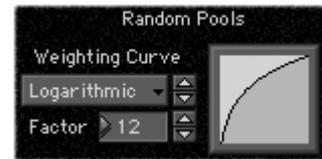
 Pattern grids cannot be viewed and edited in the KARMA Music Workstation.

Random Weighting Parameters - Pools

The Random Weighting Parameters - Pools are made available when at least one step (column) in the Rhythm Pattern has multiple rhythmic values selected (constituting a "random pool" of values).

Whenever a random pool is encountered in playing through the pattern, a random choice is made from the rhythmic values in that step. Certain areas of the random pool can be favored by the use of a weighting table, with various shaped curves. Using the curves, you can influence certain choices to be made more or less often than others, allowing very musical real-time control of the randomness.

Whether or not a certain random sequence will repeat for a number of times is controlled by settings in the Phase Pattern.



Pools-Random Factor [-99...+99]

Controls the degree of slope to the Weighting Curve. 0 = a Linear Curve with any Weighting Curve. **Negative values** not only invert but rotate the curve. When the value is either +99 or -99, the choices are "locked" to the highest or lowest values in the columns, and there are no random choices at all. (The only exception to this is an S-shaped curve with a value of -99. In this case, a random choice will be made between the highest and lowest values only.) For more information, see the Appendices: "Random Weighting Curves." (p.50)

Pools-WeightingCurve (Pools-Weighting Curve) [0...3]

0: Exponential

2: Exp-S

1: Logarithmic

3: Log-S

4 different shapes are available, which act to favor certain areas of the pool over others when each random choice is made. For more information, see the "Appendices Random Weighting Curves." (p.50)

0: Exponential

With a **positive Factor (+)**, choices will be exponentially weighted towards the shorter rhythms. With a **negative Factor (-)**, choices will be exponentially weighted towards the longer rhythms.

1: Logarithmic

With a **positive Factor (+)**, choices will be logarithmically weighted towards the shorter rhythms. With a **negative Factor (-)**, choices will be logarithmically weighted towards the longer rhythms.

2: Exp-S (Exponential S)

With a **positive Factor (+)**, choices will be exponentially weighted towards the middle rhythms, and away from the shorter and longer rhythms. With a **negative Factor (-)**, choices will be exponentially weighted towards the shorter and longer rhythms, and away from the middle rhythms.

3: Log-S (Logarithmic S)

With a **positive Factor (+)**, choices will be logarithmically weighted towards the middle rhythms, and away from the shorter and longer rhythms. With a **negative Factor (-)**, choices will be logarithmically weighted towards the shorter and longer rhythms, and away from the middle rhythms.

▲ A Factor of **0** with any shaped curve yields a linear table (straight diagonal line), and each of the values in the pool will have an equal chance of getting chosen.

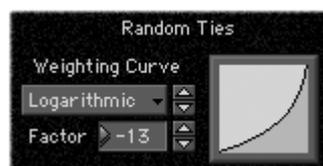
note While exponential and logarithmic curves may seem to have a similar shape, they have slight differences which can affect the outcome of the random choices. For more information, see the Appendices: "Random Weighting Curves." (p.50)

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the Rhythm Pools:

Rhythm Pool values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	longer	shorter
Exp-S/Log-S	middle	shorter/longer

Random Weighting Parameters - Ties

The Random Weighting Parameters - Ties are made available when at least one step in the Rhythm Pattern contains a Random Tie. Whenever this step is encountered in playing through the pattern and a random choice must be made, the likelihood of a tie occurring can be favored by the use of a weighting table.



Ties-Random Factor [-99...+99]

Controls the degree of slope to the Weighting Curve. **0** = a Linear Curve with any Weighting Curve. Negative values not only invert but rotate the curve. When the value is **+99**, the choices are "locked" to no ties whatsoever; when the value is **-99**, the choices are "locked" to ties always (and the effect is the same as if absolute ties were selected). For more information, see the Appendices: "Random Weighting Curves." (p.50)

Ties-Weighting Curve [0, 1]

0: Exponential **1: Logarithmic**

2 different shapes are available, which affect the likelihood of a tie occurring when a random choice is made. For more information, see the Appendices: "Random Weighting Curves." (p.50)

0: Exponential

With a **positive Factor (+)**, choices will be exponentially weighted towards rhythm values more often. With a **negative Factor (-)**, choices will be exponentially weighted towards ties more often.

1: Logarithmic

With a **positive Factor (+)**, choices will be logarithmically weighted towards the rhythm values more often. With a **negative Factor (-)**, choices will be logarithmically weighted towards the ties more often.

note While exponential and logarithmic curves may seem to have a similar shape, they have slight differences which can affect the outcome of the random choices. For more information, see the Appendices: "Random Weighting Curves." (p.50)

▲ A Factor of **0** with any shaped curve yields a linear table (straight diagonal line), and a random tie or a rhythm value in the pool will have an equal chance of getting chosen.

The following table summarizes the effect of the various Weighting Curves and the Factor field on random ties:

Values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	less ties	more ties

Associated Parameters

Rhythm Multiplier [1...800 (%)]

Multiplies the selected Rhythm Pattern by the percentage. Useful for poly-rhythmic and fractal effects, such as using the same Rhythm Pattern at different multiplications. For example, if a Pattern is {16th, 8th, 8th}, then using a "Rhythm Multiplier" of 50% changes it to {32nd, 16th, 16th}; using a "Multiplier" of 200% changes it to {8th, Quarter, Quarter}.

Straight Multipliers [0...5]

0: 25% **2: 100%** **4: 400%**
1: 50% **3: 200%** **5: 800%**

Selects from a quantized set of "straight" values for the Rhythm Multiplier field. In other words, when applied to a Rhythm Pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc.

Straight/Trip Mults [0...10]

0: 25% **4: 100%** **8: 400%**
1: 34% **5: 136%** **9: 544%**
2: 50% **6: 200%** **10: 800%**
3: 68% **7: 272%**

Selects from a quantized set of "straight & triplet" values for the Rhythm Multiplier field. In other words, when applied to a Rhythm Pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc. or various triplet values.

Strt/Dot/Trip Mults [0...15]

0: 25%	4: 68%	8: 150%	12: 400%
1: 34%	5: 75%	9: 200%	13: 544%
2: 37%	6: 100%	10: 272%	14: 600%
3: 50%	7: 136%	11: 300%	15: 800%

Selects from a quantized set of “straight, triplet & dotted” values for the Rhythm Multiplier field. In other words, when applied to a Rhythm Pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc., various triplet values, or various dotted values.

Template [0...63]

Selects from 64 different Rhythm Pattern Templates (shared by both Phase 1 and 2), and loads the parameters into the current Phase’s Pattern Grid and associated parameters.

A Rhythm Pattern Template consists of:

- the configuration of the Rhythm Pattern Grid;
- Random Weighting Parameters - Pools
- Random Weighting Parameters - Ties

Duration Group

Overview

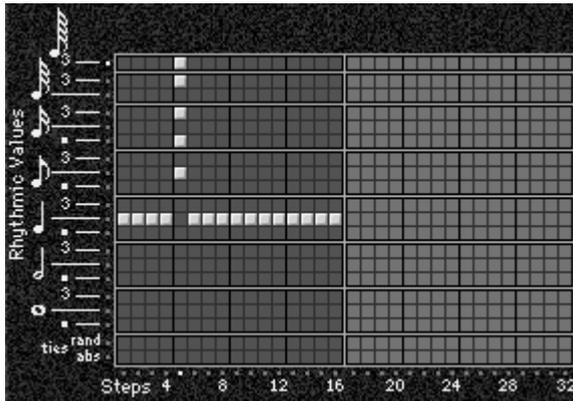
The **Duration Group** contains the parameters that control the duration of the notes in a Generated Effect.

About Duration Patterns

Duration Patterns control the duration of notes for each "rhythm event" that is generated according to the settings in the Rhythm Group. Choices can be made from "Random Pools" of values as described in detail later on. Furthermore, values can be tied to each other; such ties can be absolute or random.

A Duration Pattern will loop as long as note generation continues. It normally will not reset to the beginning of the Pattern unless a new Trigger is received, or the Phase Pattern has been configured to restart it at the beginning of certain Phases. That means that a 4 step Duration Pattern can be looping while an 8 step Velocity Pattern and a 12 step Cluster Pattern are also independently looping, for example.

Pattern Grid & Associated Parameters



Duration Pattern

A Duration Pattern controls the durations that the notes are generated with according to a grid of rhythmic values. It has any number of steps up to 32, with each step being represented by one column on the grid. The first column always contains at least one value; unused columns appear disabled. The top part of the grid corresponds to 18 different rhythmic values; the bottom 2 rows are special purpose rows:

[ties: rand]- Random Tie: randomly ties the rhythmic value in the same column to the previous column's rhythmic value. For example, a 16th note in the first column followed by a 16th note and a random tie in the 2nd column yields either an 8th note or two 16th notes. When at least one random tie has been selected, a weighting curve is available which allows choices to be slanted towards more ties or less ties, as described later.

[ties: abs]- Absolute Tie: always ties the rhythmic value in same column to the previous column's rhythmic value. For example, a 16th note in the first column followed by a 16th note and an absolute tie in the 2nd column yields an 8th note.

The 2 tie rows are mutually exclusive; only one at a time can be used in any given column.

⚠ If the "Duration Mode" is **3: Timed**, **4: Rhythm Overlap**, or **5: Rhythm %**, the Duration Pattern Grid is not utilized.

⚠ Pattern grids cannot be viewed and edited in the KARMA Music Workstation.

Associated Parameters

Duration Mode [0...7]

- | | |
|------------------------------|---------------------------|
| 0: Poly Extend | 4: Rhythm Overlap |
| 1: Poly Extend/Damped | 5: Rhythm % |
| 2: Mono Extend | 6: Pattern Overlap |
| 3: Timed | 7: Pattern % |

Selects one of several modes of operation for generating durations in the current Phase:

⚠ Based on the current setting, Duration Value, Duration Pattern Grid, and Random Weighting Parameters may not be available.

0: Poly Extend

Each note will sustain until the next generation of the same note, or until that note is no longer a part of the Note Series (caused by playing a new chord, for example). For example, if the notes to a CMaj chord are sustaining and the chord is changed to a CMinor, only the Es will be damped. Especially useful for finger-picked and strummed guitar effects. Certain steps may be "damped" by using the Duration Pattern to indicate a duration value shorter than the current Rhythm Pattern value. For example, if the Rhythm Pattern is generating quarter notes, any step in the Duration Pattern shorter than a quarter note will cause the notes (and all sustaining notes at that time) to have the selected duration. This is useful for simulating the technique of strumming and damping certain chords within the progression. Any value in a Duration Pattern step that is longer than the current Rhythm Pattern value will be ignored, and the notes will sustain as described above.

1: Poly Extend/Damped

The same as above, except all sustaining notes will be damped when the chord changes, not just notes that are no longer in the Note Series.

2: Mono Extend

Each note or cluster is sustained until the next note or cluster (of any pitch or pitches) is generated.

3: Timed ["Duration Value": 1...5000 (ms)]

Makes available the "Duration Value" parameter, (p.18) where you specify in milliseconds the duration of the generated notes. All notes will therefore have the same length. Note that this is independent of the current tempo - if it is set to 50 ms, it will always be 50 ms, regardless of tempo.

4: Rhythm Overlap ["Duration Value": -500...+500 (ms)]

Makes available the "Duration Value" parameter, where you specify in milliseconds an amount by which each note or cluster will overlap or be separated from the next note or cluster. Note that this relates to the Rhythm Pattern values. **Positive values** cause overlapping; **negative values** cause separation. For example, a setting of -20

ensures that all notes will extend and be separated from the next notes by 20 ms regardless of the actual rhythm the notes are generated with, or the current tempo. Note that while the Rhythm Pattern values themselves are relative to tempo, the value specified here is not. Using the example setting of **-20**, there will always be a gap of 20 ms between notes regardless of the tempo.

5: Rhythm % ["Duration Value": 1...800 (%)]

Makes available the "Duration Value" parameter, where you specify a percentage of the rhythmic value a note is generated with to use as a duration. Note that this relates to the Rhythm Pattern values. The actual time is then calculated on the fly, taking into account the current tempo. For example, with a setting of **50%**, if the Rhythm Pattern specifies a string of **8th notes**, they will appear to be generated as a string of **16th notes** separated by **16th note rests** (each 8th note will have the duration of a 16th note, or 50%). Note that this value is therefore relative to tempo.

6: Pattern Overlap ["Duration Value": -500...+500 (ms)]

The Duration Pattern is used to construct a Duration Pattern, in a similar fashion to the Rhythm Pattern. Each step in the pattern indicates the duration for notes that are currently to be generated. Makes available the "Duration Value" parameter, where you specify in milliseconds an amount by which to increase or decrease the pattern values. This can be used to set up a certain Duration Pattern, and then vary in real-time the "gate-time" of each note in the pattern simultaneously. For example, if the Duration Pattern is generating 16th - 8th at a tempo of **120 BPM**, the notes would have the durations of **125 ms, 250 ms**, etc. If the "Duration Value" parameter, (p.17) is **-20**, they would be generated as **105 ms, 230 ms**, etc. Note that while the Duration Pattern values themselves are relative to tempo, the value specified here is not. Using the example setting of **-20**, the notes will always be **20 ms shorter** regardless of the tempo.

7: Pattern % ["Duration Value": 1...800 (%)]

The Duration Pattern is used to construct a Duration Pattern, in a similar fashion to the Rhythm Pattern. Each step in the pattern indicates the duration for notes that are currently to be generated. Makes available the "Duration Value" parameter, where you specify a percentage by which to increase or decrease the pattern values. This can also be used to set up a certain Duration Pattern, and then vary in real-time the "gate-time" of each note in the pattern simultaneously, similar to the previous option. For example, if the Duration Pattern is generating **16th - 8th** at a tempo of **120 BPM**, the notes would have the durations of **125 ms, 250 ms**, etc. If the "Duration Value" is **80%**, they would be generated as **100 ms, 200 ms**, etc. Note that this value is therefore relative to tempo.

Duration Value [-500...+5000]

The range and function of this parameter depend on the setting of Duration Mode. See the descriptions above under "Duration Mode". When the Duration Mode menu is changed, this value will be set to a default value appropriate for the mode (if it is out of range).

 Not available if "Duration Mode" = **0: Poly Extend**, **1: Poly Extend/Damped**, or **2: Mono Extend**.

Random Weighting Parameters - Pools

The Random Weighting Parameters - Pools are made available when at least one step (column) in the Duration Pattern has multiple rhythmic values selected (constituting a "random pool" of values).

p.14 Rhythm Group: Random Weighting Parameters - Pools

Pools-Randm Factor (Pools-Random Factor) [-99...+99]

p.14 Rhythm Group: "Pools-Random Factor"

Pools-Weight Curve (Pools-Weighting Curve) [0...3]

0: Exponential **2: Exp-S**
1: Logarithmic **3: Log-S**

p. 14 Rhythm Group: "Pools-WeightingCurve"

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the Duration Pools:

Duration Pool values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp / Log	longer	shorter
Exp-S / Log-S	middle	shorter/longer

Random Weighting Parameters - Ties

p.15 Rhythm Group: Random Weighting Parameters - Ties

Ties-Randm Factor (Ties-Random Factor) [-99...+99]

p.15 Rhythm Group: "Ties-Random Factor"

Ties-Weight Curve (Ties-Weighting Curve) [0, 1]

0: Exponential **1: Logarithmic**

p.15 Rhythm Group: "Ties-Weighting Curve"

The following table summarizes the effect of the various Weighting Curves and the Factor field on random ties:

Values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp / Log	less ties	more ties

Associated Parameters

Template [0...63]

Selects from 64 different Duration Pattern Templates (shared by both Phase 1 and 2), and loads the parameters into the current Phase's Pattern Grid and associated parameters.

A Duration Pattern Template consists of:

- the configuration of the Duration Pattern Grid;
- Random Weighting Parameters - Pools
- Random Weighting Parameters - Ties

Random Weighting Parameters

The Random Weighting Parameters are made available when at least one step in the Index Pattern has multiple values selected (constituting a “random pool” of values).

☞ p.14 Rhythm Group: Random Weighting Parameters - Pools

Pools-Random Factor [-99...+99]

☞ p.14 Rhythm Group: “Pools-Random Factor”

Pools-Weighting Curve [0...3]

0: Exponential **2: Exp-S**

1: Logarithmic **3: Log-S**

☞ p.14 Rhythm Group: “Pools-WeightingCurve”
p.50 Appendices: “Random Weighting Curves”

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the Index Pattern Pools:

Index Pool values that receive priority:		
Weighting	Factor	
Curve	+ (Positive)	- (Negative)
Exp/Log	higher in grid	lower in grid
Exp-S/Log-S	middle	higher/lower

Associated Parameters

Cluster Mode [0, 1]

0: Single **1: Multi**

0: Single-1 Step Per Cluster

Each time a note, cluster of notes, or group of drum notes is generated one Index Pattern Value will be chosen for the resulting note or cluster of notes, after which the Index Pattern advances to the next value. For example, a cluster of 6 notes will all be generated from the next 6 adjacent notes in the Note Series (or Drum Pattern) and advance the pattern by 1 to the next step. In other words, when a cluster is about to be generated, the index in the Note Series will first move an amount determined by the previous Step’s Index Pattern Value; then all the notes in the cluster will be generated from adjacent indexes, after which the Pattern will again advance by 1. This is useful for creating clusters of notes which jump around following the Index Pattern exactly; the bottom note of each cluster essentially follows the path that would be taken by a cluster size of 1, with the effect that cluster size has no effect on how quickly the Index Pattern moves through the Note Series and Phase (or Drum Pattern). Also useful for randomizing Drum Patterns, since it will cause the index into the Drum Pattern to jump around and not move forward in a linear fashion.

Index pattern= 2, Cluster size = 6

Note Series : C2 E2 G2 B2 C3 E3 G3 B3 C4 E4 G4 B4

Step1 : C2 E2 G2 B2 C3 E3

Step2 : G2 B2 C3 E3 G3 B3

Step3 : C3 E3 G3 B3 C4 E4

Step4 : G3 B3 C4 E4 G4 B4

1: Multi-1 Step For Each Note In Cluster

For every note in a cluster or group of drum notes generated simultaneously, a separate Index Pattern Value will be chosen after which the Index Pattern advances to the next value. For example, a cluster of 6 notes will be generated with the next 6 Index Pattern Values (with a net advance of 6 steps). This means that each note in the cluster will not necessarily be the adjacent note in the Note Series (or Drum Pattern), but a certain distance from the previous note as specified by the pattern value. This is useful for creating clusters of notes with different voicings, or randomizing Drum Patterns in a manner different than above. Another effect of this is that after each cluster, the next cluster starts where the previous cluster left off, in effect advancing through the Phase and the Note Series (or Drum Pattern) much more quickly.

Index pattern= 2, Cluster size = 6

Note Series: C2 E2 G2 B2 C3 E3 G3 B3 C4 E4 G4 B4 C5 E5 G5 B5 C6 E6 G6 B6 ...

Step1 : C2 G2 C3 G3 C4 G4

Step2 : C5 G5 C6 G6 ..

⚠ When the “GE Type” (☞p.4) is **0: Generated - Rif**, setting this to **1: Multi** will have no effect unless there is a Cluster Pattern containing values of more than just 1.

⚠ When the “GE Type” is **2: Generated-Drum**, setting this to **1: Multi** will have no effect unless at least one Drum Pattern has the “[c] (clusters)” button turned on in the Phase Pattern and there is a Cluster Pattern containing values of more than just 1.

Invert [0, 1]

0: Off **1: On**

When On, the index will be inverted with regards to the overall Note Series (taking into consideration the “Beginning and End Offsets” in the Phase Group) and used to generate an additional note, thereby generating twice as many notes at a time. This will also cause any clusters to be inverted.

0: Off

Index pattern = 2, Cluster size= 2

Note Series: C2 E2 G2 B2 C3 E3 G3 B3

Step1 : C2 E2

Step2 : G2 B2

Step3 : C3 E3

Step4 : G3 B3

1: On

Index pattern = 2, Cluster size= 2

Note Series: C2 E2 G2 B2 C3 E3 G3 B3

Step1 : C2 E2 G3 B3

Step2 : G2 B2 C3 E3

Step3 : G2 B2 C3 E3

Step4 : C2 E2 G3 B3

Double

[0, 1]

0: Off **1: On**

When **1: On**, the “Double Amount” parameter becomes available, and the index will be doubled by the interval indicated and generated again, thereby generating twice as many notes at a time. This will also cause any clusters to be doubled.

note When using “Double” and “Invert” (p.19) at the same time, 4 times as many notes will be generated.

Double Amount

[0...12]

0: Auto **1...12: indexes**

When “Double” is **1: On**, the “Double Amount” parameter becomes available, and the index will be doubled as explained above. When set to **0: Auto**, a pleasing interval is automatically calculated depending on the number of notes in the Note Series. The other settings specify exact distances from the current index (forward) within the Note Series, at which to generate the additional note.

“Double”: **1: On**, “Double Amount”: **2**

Note Series: **C2 E2 G2 B2 C3 E3 G3 B3 C4 E4 G4 B4**
Step1: **C2 G2**
Step2: **E2 B2**
Step3: **G2 C3**
Step4: **B2 E3**

Template

[0...63]

Selects from 64 different Index Pattern Templates. (shared by both Phase 1 and 2), and loads the parameters into the current Phase’s Pattern Grid and associated parameters.

An Index Pattern Template consists of:

- the configuration of the Index Pattern Grid;
- Random Weighting Parameters

Pools-Weight Curve (Pools-Weighting Curve) [0...3]

0: Exponential **2: Exp-S**
1: Logarithmic **3: Log-S**

☞ p.14 Rhythm Group: "Pools-WeightingCurve"
p.50 Appendices: "Random Weighting Curves"

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the Cluster Pattern Pools:

Cluster Pool values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	larger	smaller
Exp-S/Log-S	middle	smaller/larger

Associated Parameters

Template [0...63]

Selects from 64 different Cluster Pattern Templates (shared by both Phase 1 and 2), and loads the parameters into the current Phase's Pattern Grid and associated parameters.

A Cluster Pattern Template consists of:

- the configuration of the Cluster Pattern Grid;
- Random Weighting Parameters

Velocity Group

Overview

The **Velocity Group** controls most of the aspects that affect the velocities of the notes in the Generated Effect.

About Velocity Patterns

A Velocity Pattern represents amounts to be subtracted from the initial velocities of notes as they are about to be generated. This can therefore be used to provide patterns of accents in the generated notes, while retaining some of the original velocity information if desired. Choices can be made from "Random Pools" of values as described in detail later on.

Initial velocity is determined by the setting of the "Velocity Mode," and how hard the notes are played when providing input notes. If "Velocity Mode" was set to **Constant - 124**, then all of the generated notes would have an Initial Velocity of **124**. Playing them with a Velocity Pattern of {0, -20, -40} would produce the following accented velocities:

124, 104, 84, 124, 104, 84 etc...

Velocity Patterns are additive to Velocity Envelopes, and are compressed to the degree that the envelope approaches zero. In other words, a wide Velocity Pattern will become less wide as the envelope approaches zero to prevent notes from disappearing.

A Velocity Pattern will loop as long as note generation continues. It normally will not reset to the beginning of the Pattern unless a new Trigger is received, or the Phase Pattern has been configured to restart it at the beginning of certain Phases. That means that a 4 step Note Pattern can be looping while an 8 step Velocity Pattern and a 12 step Cluster Pattern are also independently looping, for example.

Global Parameters

Velocity Mode [0...2]

0: Actual 1: Average 2: Constant

0: Actual

The actual velocities received are used as the "initial velocity" for each note as they are generated. Loud notes (and their generated counterparts) will play loud, and vice versa. (The "Velocity Value" parameter) allows you to scale the amount of sensitivity, where the value entered is the bottom of the range and the top of the range is **127**. For example, if the value is **1**, then the velocities would be exactly as played. If the value is **64**, the velocities would be half as sensitive, because any velocity received from **1-127** will be scaled into the range of **64-127**.

1: Average

The notes received as input have their velocities averaged, and this is then used as the initial velocity at which to generate notes. (The "Velocity Value" parameter) allows you to scale the amount of sensitivity, where the value entered is the bottom of the range and the top of the range is **127**. For example, if the value is **1**, then the velocity average would be calculated exactly as played. If the value is **64**, the velocities would be half as sensitive, because the calculated velocity average **1-127** will be scaled into the range of **64-127**.

Using this mode allows the velocities received as input to control the overall volume of the resulting effect. For example, you might use this mode so that playing chords hard make the strumming of a guitar a bit louder overall, but where the resulting velocities in each note of a cluster are the same.

2: Constant

The velocities of the notes received as input are ignored; the initial velocity value at which to generate notes is directly entered in the number field. For example, entering **124** will generate all notes with an initial velocity of **124**.

Velocity Value [1...127]

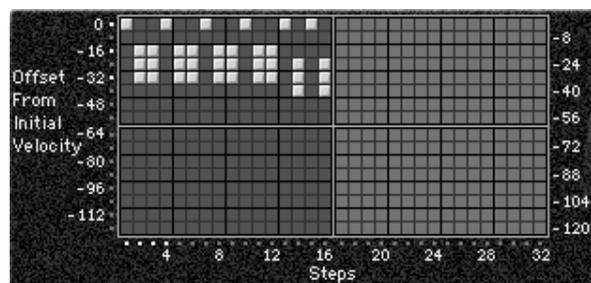
Controls how the actual velocities of the notes received as input source material affect the velocities of the notes as they are generated. This parameter has different functions depending on which "Velocity Mode" is selected, as described above.

Randomize Bottom [-12...+12]

Randomize Top [-12...+12]

Sets a range of randomization to be applied to each note's velocity as it is generated. Note that this can be used to make the velocity of each note in a cluster slightly different, while using the Velocity Pattern to generate random velocities applies to each cluster as a whole. Useful for more human-sounding effects, with less machine-like precision.

Pattern Grid & Associated Parameters



Velocity Pattern

A Velocity Pattern has any number of steps up to 32, with each step being represented by one column on the grid. The first column always contains at least one value; unused columns appear disabled. The 16 rows represent increasing amounts of velocity offsets to be subtracted from the initial velocity specified by the Velocity Mode,

starting from the top. It is important to note that the reason the pattern operates with negative, subtractive values rather than absolute positive values is so that it can be applied to the actual initial velocities of the input source material, thereby superimposing a pattern of accents while not destroying already existing velocity nuances (if desired).

 Pattern grids cannot be viewed and edited in the KARMA Music Workstation.

Random Weighting Parameters

The Random Weighting Parameters are made available when at least one step (column) in the Velocity Pattern has multiple values selected (constituting a “random pool” of values).

 p.14 Rhythm Group: Random Weighting Parameters - Pools

Pools-Randm Factor (Pools-Random Factor) [-99...+99]

 p.14 Rhythm Group: “Pools-Random Factor”
p.50 Appendices: “Random Weighting Curves”

Pools-Weight Curve (Pools-Weighting Curve) [0...3]

- 0: Exponential** **2: Exp-S**
- 1: Logarithmic** **3: Log-S**

 p.14 Rhythm Group: “Pools-WeightingCurve”

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the Velocity Pools:

Velocities that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	louder	softer
Exp-S/Log-S	middle	louder/softer

Associated Parameters

Cluster Mode [0, 1]

- 0: Single-1 Step Per Cluster**
- 1: Multi-1 Step For Each Note In Cluster**

0: Single-1 Step Per Cluster

Each time a note, cluster of notes, or group of drum notes is generated one Velocity Pattern Value will be chosen for the current step, after which the Velocity Pattern advances to the next step. For example, a cluster of 6 notes will all be generated with the same velocity and advance the Velocity Pattern by 1 to the next step. This is useful for creating very noticeable “accented patterns” within effects using large clusters of notes such as gated techno effects.

1: Multi-1 Step For Each Note In Cluster

For every note in a cluster or group of drum notes generated simultaneously, a separate Velocity Pattern Value will be chosen after which the Velocity Pattern advances to the next value. For example, a cluster of 6 notes will be generated with the next 6 Velocities indicated by the pattern, with a net advance of 6 steps. This means that each note in a cluster or each note of a drum pattern that is generated simultaneously can be given its own velocity. This is useful for more subtly shifting accents within clusters of notes, and adding more human-like velocity randomness to drum patterns.

 When the “GE T ype” (p.4) is **0: Generated-Rif**, setting this to **1: Multi** will have no effect unless there is a Cluster Pattern containing values of more than just 1.

 When the “GE T ype” is **1: Generated-Gated** the number of notes being generated is considered the Cluster Size, and setting this to **1: Multi** will cause the pattern to advance by the number of notes being generated.

 When the “GE T ype” is **2: Generated-Drum**, setting this to **1: Multi** will have no effect unless at least one Drum Pattern has the “[c] (clusters)” button turned on in the Phase Pattern and there is a Cluster Pattern containing values of more than just 1, or more than one drum note is being generated at a time (by using Drum Patterns in “Poly” mode).

Scale [-999...+999 (%)]

Sets a percentage by which the chosen Velocity Pattern is scaled before being applied. Notes can be made to disappear or drop out using large positive values; large negative values with a very soft initial velocity can create interesting “reversed” effects.

Note that this can be used to “increase the resolution” of the Velocity Pattern Grid; for example, at **+100%** the offsets match the values displayed on the vertical axis; at **+50%** the offsets would be divided by 2, for a difference of 4 between each value rather than 8 and an overall range of **0 to -60**; at **+25%** the offsets would be divided by 4 for a difference of 2 between each value and an overall range of **0 to -30**. Conversely, at **+200%** the offsets would be multiplied by 2, for a difference of 16 between each value and an overall range of **0 to -240**, meaning that some notes will drop out and leave “holes” in the sequence of notes (since any note with a velocity less than 1 is ignored).

 Not available if “GE T ype” (p.4) = **2: Generated-Drum**; each pattern in the Drum Group has a separate Velocity Scaling parameter.

Template [0...63]

Selects from 64 different Velocity Pattern Templates (shared by both Phase 1 and 2), and loads the parameters into the current Phase’s Pattern Grid and associated parameters.

An Velocity Pattern Template consists of:

- the configuration of the Velocity Pattern Grid;
- Random Weighting Parameters

CCs Group

Overview

The **CCs Group** allows the editing of parameters that control generation of **CC (Control Change) messages**. For example, this can control the panning (CC #10) of the notes in the Generated Effect (stereo placement left to right). Any other CC data may also be generated to control any MIDI controllable characteristic of your synthesizer, such as resonance, filter frequency, vibrato, etc. You may also use the CC Pattern to generate stepped Pitch Bend messages, technically not a "CC."

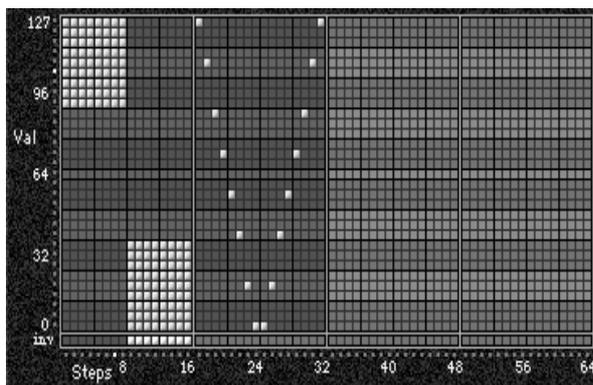
About CC Patterns

A value derived from a CC Pattern is a MIDI Control Change value from 0–127 (or Pitch Bend, if selected). The values are sent out as each note or cluster of notes is generated. Choices can be made from "Random Pools" of values as described in detail later on.

If the selected CC is 10 (Pan), a CC Pattern such as {0, 127} would cause every other note to pan to the opposite side of the stereo spectrum. A CC Pattern of {0, 0, 0, 127, 127, 127, 127} would play 4 notes left, then 4 notes right. A CC Pattern may be inverted at any time (causing the values to "flip around," 127–0) by using the "Polarity" Parameter, which is an easy way to invert the direction of the pattern.

A CC Pattern will loop as long as note generation continues. It normally will not reset to the beginning of the Pattern unless a new Trigger is received, or unless the Phase Group has been configured to restart it at the beginning of certain Phases. That means that a 4 step CC Pattern can be looping while an 8 step Velocity Pattern and a 12 step Cluster Pattern are also independently looping, for example.

Pattern Grid & Associated Parameters



CC Pattern

A CC Pattern represents a series of values indicating a MIDI Control Change (or Pitch Bend) value to be generated. It has any number of steps up to 64, with each step being represented by one column on the grid. The first column always contains at least one value; unused

columns appear disabled. Each row represents a CC or Pitch Bend value in multiples of 4 (0, 4, 8, 12 etc.). The special bottom row ("inv") indicates whether or not to invert the Random Weighting Curve (discussed later on) for any pools within that column.

 Pattern grids cannot be viewed and edited in the KARMA Music Workstation.

Associated Parameters

Fixed/On [0...128]

0...127: fixed CC value **128: Pattern**

When set to 128, the Pattern Grid becomes operative, and the Pattern is sent out. When set to any other value, a single CC or Pitch Bend value corresponding to the fixed value is sent, and the Pattern Grid becomes inoperative. This allows you to override the Pattern with a fixed value.

Pattern Type

0: Pattern **3: Note# 32...96**
1: Note# 0...127 **4: Note# 0...64**
2: Note# 24...108 **5: Note# 64...127**

0: Pattern

The Pattern Grid will be operative.

Note Number

The pitch of a note (about to be generated) is compared to the minimum and maximum notes in the Note Series, and scaled into a value from 0–127 so that low notes generate 0 and high notes generate 127, with notes in between being scaled accordingly. The "Polarity" parameter can invert this for the opposite effect (127–0). Can be useful for simulating stereo miking of an instrument like a piano or harp (with Pan data), or for simply tracking the pitch of the notes with any other CC data. The Pattern Grid will not be operative.

1: Note# 0...127

Scales generated notes into CC or Pitch Bend values 0–127.

2: Note# 24...108

Scales generated notes into CC or Pitch Bend values 24–108.

3: Note# 32...96

Scales generated notes into CC or Pitch Bend values 32–96.

4: Note# 0...64

Scales generated notes into CC or Pitch Bend values 0–64.

5: Note# 64...127

Scales generated notes into CC or Pitch Bend values 64–127.

Polarity

[0, 1]

0: Regular (+)

1: Inverted (–)

0: Regular (+)

The CC Pattern is sent out as originally created.

1: Inverted (–)

The CC Pattern is inverted; i.e. 0 is sent out as 127, 127 is sent out as 0, 96 is sent out as 32, etc. This allows the same pattern to be used in two different directions.

Random Weighting Parameters

The Random Weighting Parameters are made available when at least one step (column) in the CC Pattern has multiple values selected (constituting a “random pool” of values).

☞ p.14 Rhythm Group: Random Weighting Parameters - Pools”

Pools-Rand Fact (Pools-Random Factor) [-99...+99]

☞ p.14 Rhythm Group: “Pools-Random Factor”

Pools-WeightCrv (Pools-Weighting Curve) [0...3]

0: Exponential **2: Exp-S**
1: Logarithmic **3: Log-S**

☞ p.14 Rhythm Group: “Pools-WeightingCurve”
 p.50 Appendices: “Random Weighting Curves”

The following table summarizes the effect of the various Weighting Curves and the Factor field on the choices from the CC Pools:

CC Pool values that receive priority:		
Weighting	Factor	
Curve	+ (Positive)	- (Negative)
Exp/Log	higher in grid	lower in grid
Exp-S/Log-S	middle	higher/lower

Note: turning on the Weighting Curve Inversion Row button causes the opposite behavior specified above (in that step).

Global Parameters

CC-A [-1...126]

CC-B [-1...126]

-1: Off **96...125: [N/A]**
0...95: CC#00...CC#95 **126: Pitch Bend**

Selects one of the supported Control Change messages, in addition to **126: Pitch Bend**

note CC-A and CC-B may be generated simultaneously, with the same or different values, in alternation, and other variations depending on internal settings of the GE.

! Even if CC-A or CC-B are properly activated, you may not be hearing any effects if the “TxFilter: GE CC-A/CC-B” parameters (☞PG p.29) have been set to filter out the data that KARMA is generating.

Associated Parameters

Cluster Mode [0, 1]

0: Single **1: Multi**

0: Single-1 Step Per Cluster

Each time a note, cluster of notes, or group of drum notes is generated one CC Pattern Value will be chosen for the current step, after which the CC Pattern advances to the next value. For example, a cluster of 6 notes will be generated with a single CC value preceding it, and advance the pattern by 1 to the next step.

1: Multi-1 Step For Each Note In Cluster

For every note in a cluster or group of drum notes generated simultaneously, a separate CC Pattern Value will be chosen after which the CC Pattern advances to the next value. For example, a cluster of 6 notes will be generated with each note preceded by the next 6 CC values indicated by the pattern, with a net advance of 6 steps. This means that each note in a cluster or each note of a drum pattern that is generated simultaneously can be given its own CC value - but only if your synth supports this type of behaviour.

This will also affect the “Note Number” Pattern Type options. If **0: Single** a cluster of notes will be preceded by one CC value according to the pitch of the first note; if **1: Multi**, each note will get a corresponding CC value. For example, if generating pan data, this can be used to pan each note of a cluster across the selected range according to its pitch (but only if your synth supports this type of behavior).

! When the “GE Type” (☞p.4) is **1: Generated-Gated** the number of notes being generated is considered the Cluster Size.

! When the “GE Type” is **0: Generated-Rif**, setting this to **1: Multi** will have no effect unless there is a Cluster Pattern containing values of more than just 1.

! When the “GE Type” is **2: Generated-Drum**, setting this to **1: Multi** will have no effect unless at least one Drum Pattern has the “[c] (clusters)” button turned on in the Phase Pattern and there is a Cluster Pattern containing values of more than just 1, or more than one drum note is being generated at a time (by using more than one Drum Pattern, or by using a single Drum Pattern in “Poly” mode).

Template [0...63]

Selects from 64 different CC Pattern Templates (shared by both Phase 1 and 2), and loads the parameters into the current Phase’s Pattern Grid and associated parameters.

An CC Pattern Template consists of:

- the configuration of the CC Pattern Grid;
- Random Weighting Parameters
- “Polarity”.

Env (Envelope) Group

Overview

Each Generated Effect has **3 envelopes** which can be applied to various options such as Velocity, Tempo, Pitch Bend, Duration, and any CC (Control Change).

About Envelopes

For those of you familiar with synthesizer envelopes, these are standard **ADSR Envelopes**, with the addition of a Start Level. For those who are not, ADSR stands for "Attack, Decay, Sustain, Release". When the envelope is triggered in some fashion like a key being depressed, the envelope starts at the Start Level and moves to the Attack Level in the amount of time specified by Attack Time. This is the "Attack Phase" of the envelope. Once the envelope reaches the Attack Level, it then immediately continues to the Sustain Level in the amount of time specified by Decay Time. This is the "Decay Phase". When it reaches the Sustain Level, it will remain there until some event causes it to enter the "Release Phase", typically a key being released. The envelope then moves to the Release Level in the amount of time specified by Release Time.

An envelope simply describes the shape of some function, and the time that it takes. In the case of KARMA GE, the function is either a crescendo/decrescendo of the velocity levels of the notes in the phrase, an accelerando/ritard of the speed at which the notes are generated, an overall sweeping of the pitch, a continuous varying of a selected CC (Control Change), etc.

Note that in the case of Velocity Envelopes, the envelope's shape is subtractive to the Initial Velocity Level generated according to the "Velocity Mode" Parameter. (p.24) The loudest value the envelope will produce is the Initial Velocity received. However, when low Initial Velocities are received, the Envelope is automatically scaled so that a consistent shape is maintained regardless of the value. In other words, the Envelope will be compressed to the degree that the Initial Velocity is less than 127. For more information on Initial Velocity, see Velocity Group/ "Velocity Mode."

When and how the Envelopes will be triggered is determined by the Envelope Trigger Parameters ("Env1 Trigger/Env2 Trigger/Env3 Trigger") in the KARMA Module parameters. (PG p.31 6.2-2a)

In addition to being triggered by the keyboard, the envelopes can also be selectively triggered at Phase Changes according to settings in the Phase Group.

Parameters

The parameters are the same for all three of the envelopes, and are discussed below.

Env On/Off (Envelope On/Off) [0, 1]

0: Off **1: On**

Turns on the corresponding envelope, and makes its parameters operative.

Note that even if the envelope is properly activated, you may not be hearing any effect if the "TxFilter: GE Env.1/Env.2/Env.3" parameters (PG p.29) have been set to filter out the data that KARMA is generating.

Env Type (Envelope Type) [0...127]

- 0: [VE] Velocity**
- 1: [TA] Tempo-Absolute**
- 2: [TR] Tempo-Relative**
- 3: [PB] Pitch Bend**
- 4: [DU] Duration**
- 5...100: [#00...#95] CCs (Control Changes)**
- 101...127: [N/A]**

0: [VE] Velocity

Controls the crescendo and decrescendo of the phrase, much like an Amplitude Envelope controls the volume on a synthesizer. The envelope's range of 0-99 is scaled into 0-127, which is then combined with the actual velocities of the notes being generated, to impart an overall velocity shape while maintaining the accents within the individual notes.

1: [TA] Tempo-Absolute

Controls the speed of the phrase, for accelerando and ritard effects. When active, the effect does not sync to the Internal Master Clock or External Sync, but runs on its own clock, controlled by the Tempo Envelope. This means that the envelope is in absolute control of the tempo, and changing the KARMA Tempo has no effect.

2: [TR] Tempo-Relative

Controls the speed of the Riff, for accelerando and ritard effects. When active, the effect does not sync to Internal or External MIDI Clock, but runs on its own clock, controlled by the Tempo Envelope. However, this option takes into account the KARMA Tempo, so if the tempo is slower the Tempo Range of the envelope will also be slower. Note that this does not mean the time over which the envelope operates, which is a different option discussed below under the "Tempo Relative" parameter. (p.30)

3: [PB] Pitch Bend

Controls an overall pitch bend on the entire effect. Note that the overall range of the Pitch Bend is set in the Bend Group.

4: [DU] Duration

Controls an overall shortening of durations of generated notes. In other words, the normal calculated duration of the note becomes the maximum duration length, and the shape of the envelope scales the durations between 0-100% of the minimum duration length and that value. The minimum and maximum duration values depend on the "Duration Mode" setting in the Duration Group. (p.17)

5...100: [#00...#95] CCs (Control Change)

Send the selected CC value according to the shape of the envelope - the envelope's range of 0-99 is scaled into 0-127 and sent as the selected controller. This is especially useful when you loop the envelopes to get slow, sweeping LFO effects, for controlling various tone generation characteristics on synthesizers and effects devices that support this type of control. Note that for looping to work, you must set the **Loop On** and Envelope Latch modes (6.2-2a: "Env1 Latch/Env2 Latch/Env3 Latch" PG p.31) properly - see the "Loop Mode" parameter below.

The following Level and Time parameters may also be controlled in various combinations by parameters discussed later on in this section.

Start Level [0...99]

The level at which the envelope begins.

Attack Time [0...99]

The time it will take to reach the "Attack Lvl (Attack Level)." The overall time for each segment is specified by the "Time Scale" parameter described below.

Attack Lvl (Attack Level) [0...99]

The first level which the envelope reaches in the amount of time specified by "Attack Time."

Decay Time [0...99]

The time it will take to reach the "Sustain Lvl (Sustain Level)." The overall time for each segment is specified by the "Time Scale" parameter described below.

Sustain Lvl (Sustain Level) [0...99]

The second level which the envelope reaches in the amount of time specified by "Decay Time." The envelope will remain at this level until the keys depressed on the keyboard are released, or some other function causes the envelope to enter the Release Phase.

Rel. Time (Release Time) [0...99]

The time it will take to reach the "Rel. Level (Release Level)." The overall time for each segment is specified by the "Time Scale" parameter described below.

Rel. Level (Release Level) [0...99]

The final level the envelope reaches in the amount of time specified by "Rel. Time (Release Level)."

Amp Amount (Amplitude Amount) [0...99]

Represents the maximum level that the envelope will reach. The rest of the envelope is scaled accordingly.

Time Scale [0...10]**0: R-Riff Length****1...10: 1 to 10 seconds in 1 second increments**

Specifies the overall amount of time that each segment will take when set to its maximum value. The envelopes in KARMA GE are 3 segment envelopes; they have an attack segment, decay segment, and release segment. For example, if the attack segment time ("Attack time") was set to 99 and the "Time Scale" to 1 second, the attack segment will take 1000 ms; if "Attack time" was set to 50, then the attack segment will take 500 ms. If the times of all 3 segments were set to 99, the total time of the envelope would be approximately 3 seconds (not taking into account any time spent at the sustain level). When set to 0: **R-Riff Length**, the Time Scale is automatically scaled to the length of the Generated Effect. This can be useful for such things as harp glissandos, where supplying more/less notes as input will cause the resulting envelopes to be slower/faster. Note that if the Phase "Length Mode" is set to 1: **TS-Time Signature**, then the length of a Phase is determined by the Time Signature and not the number of notes played, so the results of setting this to 0: **R-Riff Length** may not be noticeable in that case.

Att Smooth (Attack Smooth) [0, 1]**0: Off 1: On**

When set to 0: **Off**, retriggering an envelope will start it at its preset Start Level regardless of its current position. When set to 1: **On**, the envelope will restart from its current position, not the Start Level. This can be used to "smooth" the repeated retriggerings of the envelope.

Loop Mode [0...3]**0: Off****1: S-Start Level ↔ Sustain Level****2: R-Start Level ↔ Release Level****3: A-Attack Level ↔ Release Level****0: Off**

Envelope will proceed through all its segments in a normal fashion.

1: S-Start Level ↔ Sustain Level

Upon reaching the Sustain Level, the envelope will loop back to the Start Level and start over. Requires Envelope Latch Mode ("Env1 Latch/Env2 Latch/Env3 Latch" in the KARMA Module parameters) to be set to **Off**, **Sus1**, or **Sus2**. For continuous looping after key release, you must have **Sus2** selected - see the table below. (PG 6.2-2a)

2: R-Start Level ↔ Release Level

Upon reaching the Release Level, the envelope will loop back to the Start Level and start over. Requires Envelope Latch Mode ("Env1 Latch/Env2 Latch/Env3 Latch" in the KARMA Module parameters) to be set to **Rel1** or **Rel2**. For continuous looping after key release, you must have **Rel2** selected - see the table below. (PG 6.2-2a)

3: A-Attack Level ↔ Release Level

Upon reaching the Release Level, the envelope will loop back to the Attack Level and start over. Requires Envelope Latch Mode (“Env1 Latch/Env2 Latch/Env3 Latch” in the KARMA Module parameters [PG p.31](#)) to be set to **Rel1** or **Rel2**. For continuous looping after key release, you must have **Rel2** selected - see the table below. ([PG 6.2-2a](#))

The following table illustrates the relationship between the 3 Envelope Loop Modes described above, and the Envelope Latch Modes (set in the KARMA Module parameters [PG 6.2-2a](#))

Envelope Loop Mode	Envelope Latch Mode (Env1 Latch/Env2 Latch/Env3 Latch)				
	Off	Sus1	Rel1	Sus2	Rel2
S-Start Level ↔ Sustain Level	key release ends loop	key release ends loop	n/a	loop continuously	n/a
R-Start Level ↔ Release Level	n/a	n/a	key release ends loop	n/a	loop continuously
A-Attack Level ↔ Release Level	n/a	n/a	key release ends loop	n/a	loop continuously

Tempo Reltv (Tempo Relative) [0, 1]

0: Off **1: On**

Makes the selected envelope’s time scale relative to tempo. This means that the envelope can “track” the notes being generated, or a particular length of time. If you have it set to make a particular shape over 1 bar of 4/4, then changing the tempo will maintain this relationship by scaling the tempo range of the envelope accordingly.

For example, assume you have an envelope timed to produce a sweep over 1 bar of 4/4 at 120 BPM. If you change the tempo to **60** and the “Tempo Reltv” parameter is **0: Off**, the envelope will still operate for the same length of time, therefore sweeping over 1/2 of the bar of 4/4. If you set tempo to **240**, it would sweep over 2 measures of 4/4.

With “Tempo Reltv” **1: On**, the time scale of the envelope is changed according to the tempo. Therefore, it will always sweep over 1 bar of 4/4 regardless of the tempo.

Note that you can use this with the **2: [TR] Tempo - Relative** Envelope Type (described above), so that it not only has a range that is influenced by the tempo, but its “Time Scale” is also influenced by the tempo.

Note Trig (Note Trigger) [0, 1]

0: Off **1: On**

When set to **0: Off**, the envelope is triggered normally as specified by the settings of the Envelope Trigger (“Env1 Trigger/Env2 Trigger/Env3 Trigger” [PG p.31](#)) in the KARMA Module parameters, Dynamic MIDI, and the Envelope Triggering settings of the Phase Pattern. When set to **1: On**, every single note that is generated will retrigger the selected envelope. For example, this can be useful for adding Vibrato to individual notes (using an envelope set to **CC #01 (Mod Wheel)**), or fading in/out individual notes (using an envelope Type of **CC #07 (Volume)** or **CC #11 (Expression)**).

The following parameters control various combinations of the Levels or Times for a selected Envelope.

Level Combinations

Sta/Att Lvl (Start/Attack Level) [0...99]

Controls an Envelope’s Start and Attack Levels at the same time - both will be set to the same value.

Sta/Sus Lvl (Start/Sustain Level) [0...99]

Controls an Envelope’s Start and Sustain Levels at the same time - both will be set to the same value.

Sta/Rel Lvl (Start/Release Level) [0...99]

Controls an Envelope’s Start and Release Levels at the same time - both will be set to the same value.

Att/Sus Lvl (Attack/Sustain Level) [0...99]

Controls an Envelope’s Attack and Sustain Levels at the same time - both will be set to the same value.

Att/Rel Lvl (Attack/Release Level) [0...99]

Controls an Envelope’s Attack and Release Levels at the same time - both will be set to the same value.

Sus/Rel Lvl (Attack/Release Level) [0...99]

Controls an Envelope’s Sustain and Release Levels at the same time - both will be set to the same value.

St/At/Su Lvl (Start/Attack/Sustain Level) [0...99]

Controls an Envelope’s Start, Attack and Sustain Levels at the same time - all will be set to the same value.

St/At/RI Lvl (Start/Attack/Release Level) [0...99]

Controls an Envelope’s Start, Attack and Release Levels at the same time - all will be set to the same value.

St/Su/RI Lvl (Start/Sustain/Release Level) [0...99]

Controls an Envelope's Start, Sustain and Release Levels at the same time - all will be set to the same value.

At/Su/RI Lvl (Attack/Sustain/Release Level) [0...99]

Controls an Envelope's Attack, Sustain and Release Levels at the same time - all will be set to the same value.

All Levels [0...99]

Controls an Envelope's Start, Attack, Sustain and Release Levels at the same time - all will be set to the same value.

Time Combinations**Att/DecTime (Attack/Decay Time) [0...99]**

Controls an Envelope's Attack and Decay Times at the same time - both will be set to the same value.

Att/RelTime (Attack/Release Time) [0...99]

Controls an Envelope's Attack and Release Times at the same time - both will be set to the same value.

Dec/RelTime (Decay/Release Time) [0...99]

Controls an Envelope's Decay and Release Times at the same time - both will be set to the same value.

All Times [0...99]

Controls an Envelope's Attack, Decay and Release Times at the same time - all will be set to the same value.

Repeat Group (Melodic Repeat)

Overview

Melodic Repeat allows any note to be repeated in a delay-like fashion, with many additional features and enhancements.

Melodic Repeat allows any note to be repeated in a delay-like fashion, with many additional features and enhancements. Based on a familiar technique known as “MIDI Delay,” MIDI notes are repeated at certain time intervals while their velocities decrease, thus imitating the effect of delay in an external effects processor. However, as typically implemented, this causes severe polyphony problems, and the creative options are few. In KARMA, many sophisticated enhancements and improvements have been added, including:

- Slow down the Master Tempo and the repeated notes can remain in time with the original notes.
- Use a Tempo envelope to create drastic accelerandos and ritards and then lock the repeated notes to the envelope.
- Unique “Duration Modes” not only save polyphony, but create interesting performance options.
- Delayed pitches may be transposed and melodically shifted using Chord Recognition.
- Transposed notes may be rebounded or wrapped around within a range. The range may be an absolute range, or a “sliding” range that tracks the input notes.
- Only notes within certain a certain velocity range can trigger repeated notes, while others will not.
- The Rhythm Patterns, Index Patterns, Velocity Patterns, etc. may be used to control when and how the repeated notes are generated.

When the “GE Type” (p.4) is one of the **Generated** types (i.e. **0: Generated-Riff**), the notes as they are generated may each start strings of repeating notes. When the “GE Type” is **3: Real-Time**, the actual input notes may each start strings of repeating notes.

Repeats can not be generated when “GE Type” = **1: Generated-Gated** and “Gate Type” (p.4) is one of the CC Types, since notes are not actually generated in this mode, but a sustained set of notes is manipulated by a selected CC, i.e. “chopped” by CC #11 (**Expression**).

General Parameters

Rhythm Value [0...25]

0: None (Instant)	10: 8th triplet	20: Whole
1: 64th triplet	11: 8th	21: Whole dotted
2: 64th	12: 8th dotted	22: 2 bars
3: 64th dotted	13: Quarter triplet	23: 3 bars
4: 32th triplet	14: Quarter	24: 4 bars
5: 32th	15: Quarter dotted	25: Pattern
6: 32th dotted	16: Half triplet	
7: 16th triplet	17: Half	
8: 16th	18: Half dotted	
9: 16th dotted	19: Whole triplet	

Sets the rhythm (repeat time) for each repeated note (16th note, dotted 16th, etc.). When one of the note rhythms is chosen, the same rhythmic value is used for each repeated note. When **25: Pattern** is selected, the Rhythm Pattern in the Rhythm Group is used, so that repeated notes can have different rhythms. All rhythms chosen here lock to the Global Tempo, or to the Tempo Envelope if “Tempo Lock” (p.34) is **1: On**, described below. When the first item in the menu is chosen (**0: None**), the repeated notes are put out simultaneously with the generated/input notes, without any delay. This can be used to generate clusters of repeated notes, while using Repeat “Transpose” (p.33) to change the pitch intervals between them, for creating harmonies and other effects.

Straight Rhythm Values [0...11]

0: None (Instant)	4: 8th	8: 2 Wholes
1: 64th	5: Quarter	9: 3 Wholes
2: 32nd	6: Half	10: 4 Wholes
3: 16th	7: Whole	11: Rhythm Pattern

Selects a setting for the “Rhythm Value” parameter from a subset of the entire range. The subset consists of the straight values (no triplets or dotted values) along with **0: None** and **11: Rhythm Pattern**. This is used to provide real-time control of the “Rhythm Value” parameter while excluding certain of the in-between values.

Dotted Rhythm Values [0...8]

0: None (Instant)	3: 16th Dotted	6: Half Dotted
1: 64th Dotted	4: 8th Dotted	7: Whole Dotted
2: 32nd Dotted	5: Quarter Dotted	8: Rhythm Pattern

Selects a value for the “Rhythm Value” parameter from a subset of the entire range. The subset consists of the dotted values along with **0: None** and **8: Rhythm Pattern**. This is used to provide real-time control of the “Rhythm Value” parameter while excluding certain of the in-between values.

Triplet Rhythm Values [0...8]

0: None (Instant) **3: 1 6th Triplet** **6: Half Triplet**
1: 64th Triplet **4: 8th Triplet** **7: Whole Triplet**
2: 32nd Triplet **5: Quarter Triplet** **8: Rhythm Pattern**

Selects a setting for the “Rhythm Value” parameter from a subset of the entire range. The subset consists of the triplet values along with **0: None** and **8: Rhythm Pattern**. This is used to provide real-time control of the “Rhythm Value” parameter while excluding certain of the in-between values.

Selected Rhythm Values [0...13]

0: None (Instant) **5: 8th dotted** **10: 2 Wholes**
1: 64th **6: Quarter** **11: 3 Wholes**
2: 32nd **7: Quarter dotted** **12: 4 Wholes**
3: 16th **8: Half** **13: Rhythm Pattern**
4: 8th **9: Whole**

Same as “Straight Rhythm Values,” except adds the two most musically useful dotted values also.

Use Swing [0, 1]

0: Off **1: On**

Sets whether the repeated notes will take on the swing feel that is set in the Rhythm Group. If **0: Off**, the generated notes may be swung but the repeated notes will not be. Note that triplet rhythm values are not affected by swing.

 When the Rhythm Group “Swing %” parameter (p.13) is **0**, this parameter has no effect.

Repetitions [0...100, 101: ∞]

The maximum number of repeated notes to generate. Note that due to other settings and circumstances, not all of them may actually be generated. A setting of **101: ∞** causes the notes to repeat indefinitely, unless something else stops them.

Decay [-126...+126]

The amount by which each successive repeated note changes in velocity. **Negative numbers** cause the delayed notes to decrease in volume (more common), while **positive numbers** cause the delayed notes to increase in volume. Interesting effects can be created by a combination of a **high negative** “Initial Velocity” (i.e. **-120**) and a **small positive** “Decay” (i.e. **+4**). Note that this operates in conjunction with the Velocity Pattern specified in the Velocity Group.

Initial Volume [-126...+126]

The velocity above or below the original note that the first repeated note is generated at, after which the “Decay” parameter is added to them with each successive repetition. Note that this operates in conjunction with the Velocity Pattern specified in the Velocity Group.

Transpose [-24...25]

-24...24: -24...+24 semitones
25: Index Pattern

The amount by which each successive repeated note is transposed in pitch. When one of the semitone values is selected, the same value is used for each repeated note. When the Pattern option is selected, the **25: Index Pattern** in the Index Group is used, so that each repeated note can transpose a different amount from the previous repeated note. Depending on the input notes, anything other than **0** or multiples of **12** may produce atonal results; these can be shifted to tonal results using “Chord Shift,” described below.

Chord Shift [0...2]

0: Off **1: Scalic** **2: Scalic2**

When repeated notes are being transposed in pitch, atonal results may occur depending on the “Transpose” setting. When “Chord Shift” is **0: Off**, no change occurs in the transposition. Setting “Chord Shift” to **1: Scalic** or **2: Scalic2** causes chord recognition algorithms to shift the notes to musically correct ones, even in pending repeated notes that haven’t yet sounded.

Note that a certain area of the keyboard may need to be assigned as a Control Area for Chord Scan (in the Dynamic MIDI) to produce the desired results.

0: Off

The transposed notes are repeated with no further modification from this setting.

1: Scalic

As the notes are repeated, notes which may be “atonal” based on the analyzed chord (due to being transposed) are shifted to tonal notes. Especially useful when “Transpose” (discussed above) is set to something other than **0** or multiples of **12**. The note tables used to shift the notes have fewer passing tones than **2: Scalic2** (described below), and therefore, may produce more pleasing results.

2: Scalic2

Same as **1: Scalic** (above), except that the note tables used to shift the notes have more passing tones for each chord; therefore, **2: Scalic2** sounds more modal in nature.

Stop Mode [0...2]

0: Off

1: Any-Any Note

2: AKR-1st Note After Key Release

Allows pending repeated notes which haven’t sounded yet to be discarded (stopped) by various actions, such as playing the keyboard.

0: Off

Playing new chords or notes do not affect pending repeated notes - they will continue repeating as the parameters specify. This allows previously started repeats to overlap newly started repeats.

1: Any-Any Note

Playing any new chords or notes will cause all pending repeated notes to be discarded, and only the new notes will be repeated.

2: AKR-1st Note After Key Release

Playing any new notes while still sustaining at least one note will not cause any repeats to be discarded; all keys must first be released, and then the next chord/note will discard any pending repeated notes.

note A MIDI Controller can also be assigned to perform the stopping of Repeats by using the “Repeat Stop” Dynamic MIDI Destination (PG p.237) When a Dynamic MIDI destination (6.4–3: “Destination”) is set to “Trig Notes” or “Trig Nt&Env”, Stop Mode also applies to whether the repeats will be stopped when triggered by the Dynamic MIDI action.

Rebound

[0...2]

0: Off **1: Wrap** **2: Rebound**

When using “Transpose” (p.33) with repeated notes and many repetitions, eventually the pitches of the repeated notes may go beyond a certain range. This can be an absolute overall range, or a small range designed to track the hands around the keyboard. The range and functioning of it is determined by the settings of the “Range Mode” and “Range Bottom/Top” parameters described above. When the pitches of the repeated notes go beyond the selected range, one of several options may be selected:

0: Off

When repeated notes go beyond the specified range, they will cease to repeat, regardless of the number of repetitions left.

1: Wrap

When repeated notes go beyond the specified range, they will drop up or down an algorithmically determined interval (depending on which end of the range they exceed) and continue until the required number of repetitions have been generated. This will cause an up/down back-and-forth “cycling” effect over the entire range.

2: Rebound

When repeated notes go beyond the specified range, they will reverse their direction (essentially by inverting the current Transpose values) and continue in the opposite direction until the required number of repetitions have been generated. This will cause an up/down back-and-forth “cycling” effect over the entire range.

Tempo Lock

[0, 1]

0: Off **1: Lock**

When a Tempo Envelope is being used (in the Env (Envelope) Group), setting this to **1: Lock** causes the repeated notes to lock their rhythms to the Tempo Envelope; i.e. as the Tempo Envelope speeds up the times between them get smaller. Setting this to **0: Off** causes the size to remain relative to the KARMA Tempo; even though the Tempo Envelope may be speeding up or slowing down the effect, the repeat times remain the same.

 When a Tempo Envelope is “Off” or not in use, this parameter has no effect.

Range Parameters

Range Mode

[0...3]

0: Absolute

1: Lowest Note Relative

2: Highest Note Relative

3: Lowest/Highest Note Relative

Selects one of several options for how the “Wrap Bottom” and “Wrap Top” values are used, which specify a range within which repeated notes will be maintained. This can be either an “absolute range,” or a “sliding range” that tracks your hands around the keyboard. When notes go beyond this range, they will either stop repeating, wrap around or rebound, as determined by the “Rebound” setting.

0: Absolute

The “Wrap Bottom” and “Wrap Top” parameters are Note Number values that specify the absolute bottom and top of the pitch range for repeated notes. For example, **36** is C2 and **72** is C5.

1: Lowest Note Relative

The “Wrap Bottom” and “Wrap Top” parameters define a “sliding range” with regards to the lowest note played, represented as +/- semitones. For example, if you set bottom to **-12** and top to **+12**, this means that the notes will be kept in range from an octave below the lowest note played to an octave above the lowest note played.

2: Highest Note Relative

The same as above, but relates to the highest note played.

3: Lowest/Highest Note Relative

The “Wrap Bottom” parameter relates to the lowest note played, and the “Wrap Top” parameter relates to the highest note played. Therefore, you control the overall range according to the spread of the notes that are played. For example, if you set both “Wrap Bottom” and “Wrap Top” to **0** in this mode, then repeated notes would never be generated outside of the range of the lowest to highest note that were provided as input.

Wrap Bottom

[0...127/-64...+63]

Wrap Top

[0...127/-64...+63]

0...127: C-1...G7 when Range Mode is 0: Absolute
-64...+63: otherwise

Chooses a pitch range within which to keep repeated notes which are being transposed. The values selected here have different meanings depending on the Range Mode described above. When the pitches of repeated notes exceed this range, the setting of the “Rebound” comes into effect.

Vel. Range Bottom [1...127]

Vel. Range Top [1...127]

When "GE Type" (p.4) is **3: Real-Time**, these specify a velocity range within which input notes will trigger the generation of repeated notes. Notes outside of the velocity range will not generate repeats. This is an easy way to allow the velocity with which you play to control the triggering of repeated notes.

When "GE Type" is any of the other options, these specify a velocity range within which generated notes (such as notes from the Note Series, or Drum Pattern notes) will trigger the generation of repeated notes. Notes outside of the velocity range will not generate repeats. This allows only certain notes within certain velocity ranges to trigger the generation of repeated notes, while others will not.

note Repeats can not be generated when "GE Type" (p.4) = **1: Generated-Gated** and "Gate Type" (p.4) is one of the CC Types, since notes are not actually generated in this mode, but a sustained set of notes is manipulated by a selected CC, i.e. "chopped" by **CC#11 (Expression)**.

Real-Time Parameters

If the "GE Type" is **3: Real-Time**, these additional parameters are also available.

Duration Mode (RT) [0...4]

0: As Played

1: Fixed

2: As Played-No Overlap

3: Fixed-No Overlap

4: As Played-Delay No Overlap

Chooses one of 5 different modes for the durations of the repeated notes, which not only can greatly reduce problems with polyphony, but provide some interesting performance options.

0: As Played

Each delayed note will have the same duration as the initial note, with the exception that if "Transpose" (p.33) is **0**, then notes of the same pitch will not overlap. If "Transpose" is other than **0**, and many notes are sustained, this can quickly eat up a lot of the polyphony of your sound modules.

1: Fixed

The original note will have the duration as played, but each repetition will have a fixed length, set by the "Duration Value (RT)" parameter, in milliseconds. This can be used so that holding long notes will have repeated notes with short durations, saving polyphony or creating useful effects.

2: As Played-No Overlap

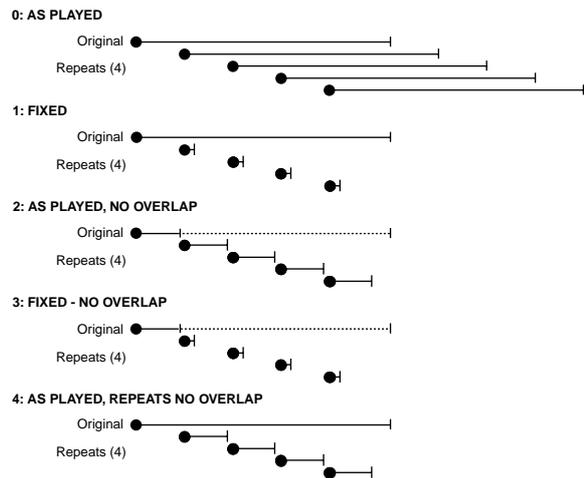
If the original note is shorter than the repeat time, each delayed note will have the same duration as the initial note. If the original note is longer than the repeat time, it will be cut-off by the first repeat, and each repeat will cut-off the preceding one. Therefore, all notes including the original one will not have a duration longer than the repeat time.

3: Fixed-No Overlap

If the original note is longer than the repeat time, it will be cut-off by the first repeated note. Furthermore, each repeated note will have a fixed value in milliseconds, set by the "Duration Value (RT)" parameter.

4: As Played-Delay No Overlap

The original note will have the duration as played, and so will the delays, as long as they are shorter than the repeat time. If the original note is longer than the repeat time, it will not get cut-off, but the delays will limit their lengths to the repeat time.



Duration Value (RT) [2...1000 (ms)]

Specifies the length of the durations of the repeated notes (in milliseconds).

Only available when the "Duration Mode (RT)" is **1: Fixed** or **3: Fixed-No Overlap**.

Key Mode (RT) [0, 1]

0: Down

1: Up

0: Down (Key down)

Generation of the repeated notes starts immediately upon receiving a note according to the settings of the parameters.

1: Up (Key up)

Generation of the repeated notes is not started until the input source note(s) are released. This allows you to trigger the start of a repeated effect with the release of the keys.

Chord Quantize (RT) [0, 1]

0: Off

1: On

Causes one of two different types of behavior, depending on the setting of the "Key Mode (RT)" parameter above.

When "Key Mode (RT)" is **0: Down**:

When a chord is played on the keyboard, there is a certain amount of "slop" associated with hitting the keys: the fingers arrive at slightly different times, there is a built in amount of MIDI timing inaccuracy, etc. When using **Melodic Repeat** to repeat the chord a number of times, you will hear the same slop it was received with repeated exactly. This corresponds to the "Chord Quantize (RT)" setting of **0: Off**. This may or may not be desirable;

sometimes you may want it, other times you may not. When “Chord Quantize (RT)” is set to **1: On**, the notes in the first repeat of the chord will be hard quantized so that they generate simultaneously. All subsequent repeats will be based on those quantized notes, and therefore will also be quantized.

When “Key Mode (RT)” is 1: Up:

The repeats will be triggered when the key(s) are released, so they will be quantized together at that point to occur simultaneously anyway, with no “slop.” But depending where you released them overall in time, they may be “out of sync” with the rhythm or groove that may be being generated. This corresponds to the “Chord Quantize (RT)” setting of **0: Off**. When “Chord Quantize (RT)” is set to **1: On**, the release (and generation of the first repeats) will be quantized to correspond to the nearest rhythmic division of note generation. This will either be a 16th note, or the rhythm value chosen in the “Rhythm Value” parameter, whichever is longer.

Bend Group

Overview

The **Bend Group** allows various shapes of automatic pitch bending to be applied to notes as they are generated. However, no bending will actually occur unless the Phase Pattern has been configured to allow it. This allows effects to be set up where bending only occurs in one or more steps of the Phase Pattern, while other steps have no bending.

Bending is also affected by the Rhythm Pattern's "no bend" row. Bending will normally be triggered with every single generated note or cluster within a Phase Pattern step where bending is activated; by using the "no bend" row, you can specify that bends will not occur on various steps of the Rhythm Pattern. See Rhythm Group: "Pattern Grid & Associated Parameters". (p.14)

Note that even if bending is properly activated, you may not be hearing any bending effects if the "TxFilter: GE-Bend" parameter (PG p.29, 60) has been set to filter out the pitch bend that KARMA is generating.

General Parameters

On/Off [0, 1]

0: Off **1: On**

Allows the bending effects to be turned on or off. While there are several other ways to disable bending effects, this is mainly provided to allow the RT Params to control this in real-time. Note that this has no effect if there are no Phase Pattern Steps with bending enabled, or every step of the Rhythm Pattern has a "no bend" row activated.

Amount [-12...18]

0: Random

-12...12: -12...+12 Semitones

13: Next Note

14: Next Note +1

15: Next Note +2

16: Prev Note

17: Prev Note -1

18: Prev Note -2

Sets the size in semitones of the bends, or selects one of several special bending options. Note that the actual resulting size of the bend also depends on the setting of the "Bend Range" parameter, described later on. The following descriptions apply when the "Bend Range" (p.39) value is 12 (an octave). If the "Bend Range" was 6, the semitones would actually be half-semitones; if the "Bend Range" was 24, the semitones would actually be whole tones.

0: Random (-12...12)

Each bend selects a random semitone size from -12-12 (excluding 0).

-12...12: -12...+12 (Semitones)

Bends each note the selected semitone size.

13: Next Note

Bends each note to what will be the next note. For example, if the notes to be generated were {C, E, G, B, C...}, then the C will bend to the E, the E will bend to the G, etc. This is very useful for simulation of portamento, or effects like sliding from one bass note to another within a phrase.

14: Next Note +1

Bends each note to what will be the note 2 notes from the current note. For example, if the notes to be generated were {C, E, G, B, C...}, then the C will bend to the G, the E will bend to the B, etc.

15: Next Note +2

Bends each note to what will be the note 3 notes from the current note. For example, if the notes to be generated were {C, E, G, B, C...}, then the C will bend to the B, the E will bend to the second C, etc.

16: Prev Note

Bends each note to what was the previous note. For example, if the notes to be generated were {C, E, G, B, C...}, then the E would bend to the C, the G would bend to the E, the B would bend to the G, etc. In this case, if C was the first note to be generated, a bend to E would be calculated since there is no actual "previous" note.

17: Prev Note -1

Bends each note to the note that was two notes previous. For example, if the notes to be generated were {C, E, G, B, C...}, then the G will bend to the C, the B will bend to the E, etc.

18: Prev Note -2

Bends each note to the note that was three notes previous. For example, if the notes to be generated were {C, E, G, B, C...}, then the B will bend to the C, the second C will bend to the E, etc.

For the 3 Previous Note settings, when no notes have yet been played, KARMA extrapolates what it thinks the bends would have been for the first few notes, based on various settings. Most of the time this will produce a "musical-sounding" bend.

For the Next and Previous Note settings, a bend of 0 is not allowed, even if the next or previous notes to be generated are the same pitch. In this case, a bend to the next or previous note in the Note Series will be used, in order to preserve the illusion of continuous bending. If all possibilities are exhausted, a bend of an octave (12) will be used.

 13, 14, 15, 17 & 18 not available when "GE Type" (p.4) is 3: Real-Time.

Shape [0...2]

0: Bend **1: Hammer** **2: Hammer Bend**

Choose one of 3 different overall shapes for the resulting bend. See the Appendices: "Using Auto Bend". (p.48)

0: Bend

Bends the current note to whichever note or by whichever semitone size is selected in the "Amount" parameter. The timing and length of the bend is determined by the "Length," "Start" and "End" parameters. (p.38) Useful for portamento simulation and ethnic bending effects, among others.

1: Hammer

Bends the current note to whichever note or by whichever semitone size is selected in the "Amount" parameter, then back to the current pitch. The timing and length of the bend is determined by the "Length", "Start" and "End" parameters, and the "Width" parameter. Useful for guitar hammer-on effects, among others.

2: Hammer Bend

Bends the current note to whichever note or by whichever semitone size is selected in the "Amount" parameter (⌘p.36), then back to the current pitch, then again to the note or pitch selected in the "Amount" parameter. The timing and length of the bend is determined by the "Length", "Start" and "End" parameters, and the "Width" parameter. Useful for ethnic bending effects, among others.

Alternation

[0, 1]

0: Off

1: Alternating

When set to **1: Alternating**, causes alternate bends to flip back and forth between the + and -. For example, if the "Amount" parameter is set to +12, then the bends produced with a series of notes will be {+12, -12, +12, -12...} etc. When **Next/Previous Note Bending** is selected, it will alternate between Next and Previous. For example, if **13: Next Note** is selected in the size Menu, then the bends will be {Next, Prev, Next, Prev...} etc.

Step

[0...12]

0: Smooth

1...12: 1 ST...12 ST

0: Smooth

Bends will be continuous, with a value sent out every "n" milliseconds as specified by the Rate parameter.

1...12: 1 ST...12 ST (Semitones)

Bends will be quantized to the semitone step size selected, producing "glissando" bends. For example, if the "Amount" parameter is set to 12 and Step Mode is set to 2: 2 ST, then the resulting bend will be **quantized to 6 steps of 2 semitones** each. When one of the Semitone settings is selected, the Rate parameter is not available.

Length

[0...25]

0: 64th triplet	9: 8th triplet	18: Whole triplet
1: 64th	10: 8th	19: Whole
2: 64th dotted	11: 8th dotted	20: Whole dotted
3: 32th triplet	12: Quarter triplet	21: 2 bars
4: 32th	13: Quarter	22: 3 bars
5: 32th dotted	14: Quarter dotted	23: 4 bars
6: 16th triplet	15: Half triplet	24: Fixed-ms
7: 16th	16: Half	25: Note Duration
8: 16th dotted	17: Half dotted	

Specifies an overall length for a "bend window" within which the bend will take place, based on the "Start" and "End" parameters. See the Appendices: "Using Auto Bend". (⌘p.48)

0...23: Note Values

Sets the overall length of each bend window to the selected rhythm value; each bend will be therefore be the same length. Note that this is tempo dependent, so changing tempo changes the length of the bend and keeps the effect locked to tempo. If the length of the bend is longer than the actual duration of the note with which it is generated, part or all of the bend will not be heard.

24: Fixed-ms

Makes available the "Fixed-ms" parameter. A length of absolute time may then be specified in milliseconds for each bend window. Note that this is independent of any tempo settings. You might use this to keep the same length and speed of a bend regardless of the tempo.

25: Note Duration

The duration of the note as it is generated is used as the bend window, with the "Start" and "End" parameters specifying where in the note's duration the bend will start and end. Each bend may therefore be a different length, depending on the durations of the notes. A 16th note duration will have a bend that is half the length and twice as fast as an 8th note duration.

⚠ Not available when "GE Type" (⌘p.4) is **3: Real-Time**, since the duration of the note is determined by actually playing the keyboard. If selected, this setting will act the same as **7: 16th**.

Fixed-ms

[0...5000 (ms)]

A fixed length of absolute time may be specified in milliseconds for each bend window. Note that this is independent of any tempo settings. You might use this to keep the same length and speed of a bend regardless of the tempo. Has no effect unless the **24: Fixed-ms** setting is selected for the "Length" parameter.

Start

[0...100 (%)]

Specifies the start point of the bend in the overall bend window (set by the "Length" parameter). The value is a percentage of the overall bend window. For example, if 0%, the bend will start as soon as the note begins to play; other values will cause a certain "delay" before the start of the bend.

End

[0...100 (%)]

Specifies the end point of the bend in the overall bend window (set by the "Length" parameter). The value is a percentage of the overall bend window. For example, if 100%, the bend will extend all the way to the end of the bend window; other values will cause the bend to reach the destination pitch and "hang there" for a period of time.

Width

[0...100 (%)]

Specifies the width of the "hammer" when the **1: Hammer** or **2: Hammer Bend** shape is selected. This controls the amount of bend at each end of the hammer (the "back-and-forth" bend). For example, 0% creates a triangle wave shape, and 100% creates a square wave shape, with other values somewhere in between. Width also controls the length of the final bend when the Hammer Bend shape is selected. See the Appendices: "Using Auto Bend". (⌘p.48)

⚠ Has no effect when **0: Bend** is selected in the "Shape" parameter.

Drum Bend Mode [0, 1]

0: Generated **1: Arpeggiated**

If the “GE Type” (p.4) is **2: Generated-Drum**, the “Drum Bend Mode” parameter specifies one of two different bending effects:

0: Generated-generate shape for each note

Causes bending to be generated for each drum note the same as with any other “GE Type”. All of the parameters described above operate as described.

1: Arpeggiated-use Note Series for stepped bends

Disables most of the other bend parameters, and instead uses the pitches of the notes in the Note Series to generate stepped “pitch bend sequences.” The riff or arpeggio that would normally be being produced if the “GE Type” was **0: Generated-Riff** is still being generated internally, even though the Drum Pattern(s) are being played. This internal riff or arpeggio can be applied to the resulting drum rhythms as Pitch Bend values. The Index Pattern controls the order of the pitch bend values, which are selected from within the Note Series, just as if the “GE Type” was **0: Generated-Riff**. This results in “Wave-Sequencing” effects and other unique sounds.

 Not available when “GE Type” is not **2: Generated-Drum**.

Bend Range [0...24 (semitones)]

Sets the overall bending range of the whole GE. This also affects pitch bend envelopes, CC-A/CC-B if generating pitch bend, etc. Note that this must be set to **12** for the semitone-related bend parameters described above to actually be semitones.

Real-Time Parameters

If the “GE Type” is **3: Real-Time**, the following parameters will also be available.

Key Mode (RT) [0, 1]

0: Down **1: Up**

0: Down

The bend window specified by the “Length” (p.38) setting starts immediately upon receiving a note according to the settings of the parameters.

1: Up

The bend window is not started until the input source note is released. Note that for this kind of bend effect to be audible, you must either be using a synth program with a long release, or set the “Rel. Delay Length (RT)” parameter below to something other than **0: Off**.

Direction (RT) [0, 1]

0: From **1: To**

0: From

The bend starts at a pitch of fset equal to the Amount setting, and ends at the current pitch (i.e. Joystick center). For example, if “Amount” = **-12** and “Shape” = **0: Bend**, it would be the same as starting a note with the Joystick all the way in the pitch down position, and then moving it to the center.

1: To

The bend starts at the current pitch (i.e. Joystick center), and ends at a pitch of fset equal to the Amount setting. For example, if “Amount” = **-12** and “Shape” = **0: Bend**, it would be the same as starting a note with the Joystick in the center position, and then moving it all the way to the pitch down position.

For more information on practical uses for this, see the Appendices “Using Auto Bend: Next/Previous Note Bending: Realtime”. (p.48)

Rel. Delay Length (RT) [0...24]

- | | | |
|------------------------|----------------------------|--------------------------|
| 0: 64th triplet | 9: 8th triplet | 18: Whole triplet |
| 1: 64th | 10: 8th | 19: Whole |
| 2: 64th dotted | 11: 8th dotted | 20: Whole dotted |
| 3: 32th triplet | 12: Quarter triplet | 21: 2 bars |
| 4: 32th | 13: Quarter | 22: 3 bars |
| 5: 32th dotted | 14: Quarter dotted | 23: 4 bars |
| 6: 16th triplet | 15: Half triplet | 24: Off |
| 7: 16th | 16: Half | |
| 8: 16th dotted | 17: Half dotted | |

Allows the release (note-offs) of notes to be delayed by certain amounts (various rhythmic durations at the current tempo). This is mainly to allow bends to be produced when you release the keys (with “Key Mode (RT)” set to **1: Up**). When **Off**, no delay is added.

Rel. Delay Damping (RT) [0, 1]

0: Off **1: On**

When **1: On**, starting new notes while others are still sustaining (because of a delayed note-off from the “Rel. Delay Length (RT)” parameter above) will shut the sustaining notes off. This is useful for creating monophonic style bending effects using “Key Mode (RT)” and “Rel. Delay Length (RT)”. When **0: Off**, the notes are allowed to overlap.

Drum Group

Overview

The **Drum Group** allows up to 3 separate **Drum** or **Melodic Patterns** (of equal or different lengths) to be created, edited, and simultaneously looped, while being separately modified by various other parameters. Many of these modifications are controlled by settings in the Phase Group. This allows you to set up effects where various things happen only on certain steps of the Phase Pattern; such as a 4 bar Drum Pattern which is randomized with a Cluster Pattern every 4th time through (bars 13–16).

About Drum Patterns

A Drum Pattern is a special type of “fixed” pattern that contains Note Numbers. These can be used to construct Drum and Percussion Patterns, or Melodic Patterns of a more fixed nature than what is generated by using the Note Series Group.

Drum Patterns with more than one sound turned on in a column can operate either “polyphonically” (generating more than one drum note at a time) or as random “pools”, where a random choice will be made from one of the drum sounds in the column. The bottom row of each grid allows a rest to be placed as a step, or added to the pools for the possibility of a rest.

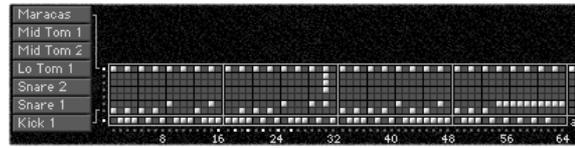
A Drum Pattern consists of only Note Numbers and rests; there are no durations, no velocities, no rhythms. The other information is supplied by the Rhythm, Velocity, Cluster, and other Patterns.

A Drum Pattern will loop as long as note generation continues. The 3 separate Patterns are independently loopable, so they can be of different lengths; a 4 bar Kick/Snare Pattern can be used with a 2 bar Hi-hat Pattern and a 3 bar Percussion Pattern, etc. They normally will not reset to the beginning of the Pattern unless a new Trigger is received, or unless the Phase Pattern has been configured to restart them at the beginning of certain Phases. This also means that a 64 step Drum Pattern can be looping while an 8 step Velocity Pattern and a 12 step Cluster Pattern are also independently looping, for example.

The riff or arpeggio that would normally be being produced if the “GE Type” (p.4) was **0: Generated-Rif** is still being generated internally. Therefore, if Index Patterns, Cluster Patterns, or Velocity Patterns are being used by the GE, these can be applied to the Drum Patterns with very interesting results, causing randomization and quasi-improvisational effects. These randomizations are controlled by settings in the Phase Pattern. This allows effects where various things happen only on certain steps of the Phase Pattern; such as a 4 bar Drum Pattern which is randomized with a Velocity Pattern every 4th time through (bars 13–16).

Also, the same riff or arpeggio can be applied to the resulting drum rhythms as Pitch Bend values, on the Bend Group. This results in “Wave-Sequencing” effects and other unique sounds. Each step in the Phase Pattern can have Pitch Bend activated for that particular step. This means that you can do something like have no Pitch Bend through 3 steps and then have Pitch Bend on the 4th step.

Pattern Editing Grid & Associated Parameters



Drum Pattern

A Drum Pattern is a grid of 8 rows by 64 columns. The bottom row of the grid is the “Rest” row; the other 7 rows correspond to 7 Drum Sounds or Notes that have been chosen to construct the pattern. A Drum Pattern may have any number of steps up to 64, with each step being represented by one column on the grid; unused columns appear disabled.

The example above shows a kick, snare, toms and maracas pattern, where the bottom two rows in the top part of the grid have their corresponding Drum Sound menus set to kick and snare. The bottom row of rests are interleaved with the kick and snare choices to form a groove to be played with a straight 32nd note Rhythm Pattern. Therefore, the entire grid represents a 2 bar phrase of 4/4 time, with every 8 columns representing 8 32nd notes (1 quarter note).

Also shown above is a 65th column, known as the “Always Column” and indicated by the abbreviation “a” underneath it. When a row is selected in this column, it will cause any values in that row of the Drum Pattern to always be played, regardless of any randomization that is going on, or regardless of the “Poly/Pools” setting (discussed later on).

Pattern grids cannot be viewed and edited in the KARMA Music Workstation.

Associated Parameters

Play On/Off [0, 1]

0: Off **1: On**

When **1: On**, the Drum Pattern is played during Note Generation. When **0: Off**, the Grid may contain values but will not be played during Note Generation. This can be used to temporarily “mute” one or more patterns during playback.

On/Off Combinations [0...7]

Controls all 3 Drum Pattern On/Off at the same time, in various combinations. The values 0–7 select one of 8 different combinations, shown in the following table:

Value	Pattern 1	Pattern 2	Pattern 3
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	Off	Off	On
4	On	On	Off
5	Off	On	On
6	On	Off	On
7	On	On	On

Row 1...7 Note [0...127]**0...127: C-1...G9**

Selects a Drum Sound /MIDI Note Number for each of the 7 rows of the selected Drum pattern.

Row 1...7 Vel. Offset [-127...+127]

Allows the velocity for notes from that row only to be offset with regards to other rows. For example, you can use this to make a snare softer overall than a kick. Note that this is subtractive/additive: "0" leaves velocities at the Initial Velocity they would normally be generated with based on the Velocity Group settings. So setting positive amounts may interfere with the Velocity control that you have specified elsewhere. One example is controlling the velocity sensitivity of the Drum Pattern with the keyboard. Regardless of your Velocity Group settings, if the Row Velocity Offset here was a large positive value, you would get no apparent velocity sensitivity from the keyboard for this row, since this value would be added and effectively cancel out the effects of the Velocity Mode and Value.

Rhythm Multiplier [1...800 (%)]

Multiplies the current Rhythm Pattern. Note that this is entirely independent of the same parameter in the Rhythm Group. This means that each Drum Pattern can have a different "Rhythm Multiplier." (PG 15) For example, if you set the Rhythm Pattern to 32nds, you could drive one Drum Pattern with a "Rhythm Multiplier" of 100% at 32nd note speed, and another Drum Pattern at 200% for 16th note speed. If they were the same number of steps, it would take twice as long to perform the entire 16th-based pattern as the 32nd-based pattern. This also means that the Rhythm Pattern driving the underlying Riff (that may be applied as Pitch Bend or used to randomize the Drum Patterns) can be operating at a different rhythmic relationship. For example, if the Rhythm Pattern was set to 16ths, and the Drum Pattern "Rhythm Multiplier" to 50%, the Drum Pattern would be generated as 32nd-based, while any arpeggiated pitch bend would be 16th-note based, or 1 bend every 2 steps of the Drum Pattern.

Straight Multiplier [0...5]

0: 25 %	2: 100 %	4: 200 %
1: 50 %	3: 200 %	5: 800 %

Selects from a quantized set of "straight" values for the "Rhythm Multiplier" field of the associated Drum Pattern(s). In other words, when applied to a Rhythm pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc.

Straight/Trip Mults [0...10]

0: 25 %	3: 68 %	6: 200 %	9: 544 %
1: 34 %	4: 100 %	7: 272 %	10: 800 %
2: 50 %	5: 136 %	8: 400 %	

Selects from a quantized set of "straight & triplet" values for the "Rhythm Multiplier" field of the associated Drum Pattern(s). In other words, when applied to a Rhythm pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc. or various triplet values.

Strt/Dot/Trip Mults [0...15]

0: 25 %	4: 68 %	8: 150 %	12: 400 %
1: 34 %	5: 75 %	9: 200 %	13: 544 %
2: 37 %	6: 100 %	10: 272 %	14: 600 %
3: 50 %	7: 136 %	11: 300 %	15: 800 %

Selects from a quantized set of "straight, triplet & dotted" values for the "Rhythm Multiplier" field of the associated Drum Pattern(s). In other words, when applied to a Rhythm pattern containing values such as 16th notes, the resulting rhythmic values will be straight values such as 8th notes, quarter notes, etc., various triplet values, or various dotted values.

Velocity Offset [-127...+127]

Subtracts or adds a constant amount to the velocities for each Drum Pattern. Allows a Pattern's relative volume to be raised or lowered with regard to the other Patterns. Note that this is subtractive/additive: 0 leaves velocities at the Initial Velocity they would normally be generated based on the Velocity Group settings. So setting positive amounts may interfere with the Velocity control that you have specified elsewhere. One example is controlling the velocity sensitivity of the Drum Pattern with the keyboard. Regardless of your Velocity Group settings, if the Pattern Velocity Offset here was a large positive value, you would get no apparent velocity sensitivity from the keyboard, since this value would be added and effectively cancel out the effects of the Velocity Mode and Value.

Velocity Scale [-999...+999 (%)]

A percentage by which the Velocity Pattern selected in the Velocity Group is scaled before being applied. Notes can be made to disappear or drop out using large positive values; large negative values with a very soft Initial Velocity can create interesting "reversed" effects. The same field in the Velocity Group itself is disabled for Drum Effects, since each Pattern here has its own "Velocity Scale."

Pattern Transpose [-36...+36]

Allows each Drum Pattern to be individually transposed in semitones. This is additive to the transpose in the KARMA Module. (PG 6.2-1a)

Octave Transpose [-36...+36]

Allows the Drum Pattern Transpose value to be quantized to the nearest octave, so that when being changed by a KARMA Realtime Control, only transposition by octaves is possible. In this case, the value of the parameter changes by semitones, but the actual transpose value will only change at certain points within the range:

-36 to -31	= -36	(-3 octaves)
-30 to -19	= -24	(-2 octaves)
-18 to -7	= -12	(-1 octave)
-6 to +5	= 0	(no transpose)
+6 to +17	= +12	(+1 octave)
+18 to +29	= +24	(+2 octaves)
+30 to +36	= +36	(+3 octaves)

Oct/5th Transpose

Allows the Drum Pattern Transpose value to be quantized to the nearest octave or fifth, so that when being changed by a KARMA Real-time Control, only transposition by octaves or fifths is possible. In this case, the value of the parameter changes by semitones, but the actual transpose value will only change at certain points within the range:

-36 to -33	=	-36	(-3 octaves)
-32 to -27	=	-29	(-3 octaves +5th)
-26 to -21	=	-24	(-2 octaves)
-20 to -15	=	-17	(-2 octaves +5th)
-14 to -9	=	-12	(-1 octave)
-8 to -3	=	-5	(-1 octave +5th)
-2 to +3	=	0	(no transpose)
+4 to +9	=	+7	(+5th)
+10 to +15	=	+12	(+1 octave)
+16 to +21	=	+19	(+1 octave +5th)
+22 to +27	=	+24	(+2 octaves)
+28 to +33	=	+31	(+2 octaves +5th)
+34 to +36	=	+36	(+3 octaves)

Use Riff Length

[0, 1]

0: Off 1: On

When **1: On**, the Pattern uses the GE's actual Note Series Length as the length of the Drum Pattern. For example, if the Note Series Group was set to "Replications" (p.7) 4.0 with "Symmetry" (p.7) Off, and 4 notes were played, a **16 note** Note Series would normally be created. The Drum Pattern would restart after **16 steps** of it have been played. Playing 1 note would change the Note Series Length to **4**, and the Drum Pattern would restart after **4 steps**. This can be used to change the apparent length or time signature of the groove or phrase in real-time. When this is **0: Off**, the Drum Pattern loops through its full length.

Random Weighting Parameters - Pools

The Random Weighting Parameters - Pools are made available when at least one step (column) in the Drum Pattern Grid contains multiple buttons turned on in the upper 7 rows (not counting the "rest" row), and the "pools" button is on. This step then constitutes a "random pool" of Drum Sounds/Notes.

For example, you can influence whether a tom will be played at a certain step more often than a snare.

p.14 Rhythm Group: Random Weighting Parameters - Pools

Pools-Random Factor

[-99...+99]

p.14 Rhythm Group: "Pools-Random Factor"

Pools-WeightingCurve (Pools-Weighting Curve)

[0...3]

0: Exponential 2: Exp-S
1: Logarithmic 3: Log-S

p.14 Rhythm Group: "Pools-WeightingCurve"
p.50 Appendices: "Random Weighting Curves"

The following table summarizes the effect of the various Weighting Curves and the Factor field on Drum Sound choices:

Drum Pool values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	higher in grid	lower in grid
Exp-S/Log-S	middle	higher/lower

Random Weighting Parameters - Rests

The Random Weighting Parameters - Rests are made available when at least one column in the grid has a rest and at least one other Drum Sound turned on. This will happen with either the **1: pool** or **2: poly** selected, since you can have random rests in both modes; they just operate differently (see description above under "Pools/Poly").

Whenever this step is encountered in playing through the pattern and a random choice must be made, the likelihood of a rest occurring can be favored by the use of a separate weighting curve.

Rests-Random Factor

[-99...+99]

Controls the degree of slope to the Weighting Curve. **0** = a **Linear Curve** with any Weighting Curve. Negative values not only invert but rotate the curve. For examples, see the Appendices: "Random Weighting Curves". (p.50)

Rests-WeightingCurve (Rests-Weighting Curve) [0, 1]

0: Exponential

1: Logarithmic

2 different shapes are available, which affect the likelihood of a rest occurring when a random choice is made. For more information, see the Appendices: "Random Weighting Curves". (p.50)

0: Exponential

With a **positive Factor (+)**, choices will be exponentially weighted towards the Drum Sounds/Notes more often. With a **negative Factor (-)**, choices will be exponentially weighted towards the rests more often.

1: Logarithmic

With a **positive Factor (+)**, choices will be logarithmically weighted towards the Drum Sounds/Notes more often. With a **negative Factor (-)**, choices will be logarithmically weighted towards the rests more often.



A Factor of **0** with any shaped curve yields a linear table (straight diagonal line), and each of the values in the pool will have an equal chance of getting chosen.

The following table summarizes the effect of the various Weighting Curves and the Factor field on random rests:

Values that receive priority:		
Weighting Curve	Factor	
	+ (Positive)	- (Negative)
Exp/Log	less rests	more rests

Associated Parameters

Pools/Poly

[0, 1]

0: Poly **1: Pools**

Chooses one of 2 modes of operation for the entire grid when columns contain more than one Drum Sound and/or a rest.

0: Poly

If there is more than one Drum Sound selected in a column (and no rest), then all of the Drum Sounds at that step will be played; if you had a kick, snare, and hi-hat in the same column, all 3 would be played when that step was reached. This is the typical operation of most grid-based rhythm pattern software. However, if a rest is also selected, then there will be a random possibility of a rest or a Drum Sound for each of the Drum Sounds; in other words, if you had a kick, snare, hi-hat and rest in the same column, for each of the 3 Drum Sounds a choice between the sound and the rest would be made (subject to the Random Rest Weighting Curve described previously). This would result in one of 8 possible combinations:

kick, snare, hi-hat	→	kick, snare, hi-hat
(rest), snare, hi-hat	→	snare, hi-hat
kick, (rest), hi-hat	→	kick, hi-hat
kick, snare, (rest)	→	kick, snare
(rest), snare, (rest)	→	snare
(rest), (rest), hi-hat	→	hi-hat
kick, (rest), (rest)	→	kick
(rest), (rest), (rest)	→	rest (nothing)

1: Pools

If there is more than one Drum Sound selected in a column, then those sounds form a “pool” of choices from which only one will be chosen at random. If a rest is also selected, then there will be a possibility of a rest or only one of the Drum Sounds. For example, if you had a kick, snare, hi-hat and rest in the same column, there would first be a choice of one of the 3 Drum Sounds (subject to the Random Pool Weighting Curve described previously), then a choice as to whether to play the single chosen Drum Sound or a rest (subject to the separate Random Rest Weighting Curve described previously). This would result in one 4 possible choices:

kick
snare
hi-hat
rest

Track Keyboard

[0, 1]

0: Off **1: On**

When set to **0: Off**, the Drum or Melodic Pattern is “fixed” - it doesn't matter what notes you play on the keyboard. The pattern will always produce the same pitches, according to the settings of the Drum Sound/Note settings. This is most typical for Drum Patterns. When **1: On**, the pitches of the notes generated “track” the lowest key played on the keyboard (or other input device), related to **C2 (MIDI Note #36)**. This is most useful for Melodic Patterns. In other words, when you play a **C2**, the pattern will be produced using the Note Numbers as specified by the Drum Sound/Note settings, and any other applicable parameters. If you then play an **E2**, the notes being generated will be transposed up by **4 steps**.

Assuming the Notes that are assigned are in the **key of C**, this puts the resulting pattern in the **Key of E**. This is often useful in conjunction with the “NTT - Note Table Transposition” parameter, described next.

NTT (Note Table Transposition)

[0, 1]

0: Off **1: On**

When **0: Off**, different chords played on the keyboard (or other input device) have no effect on the pitches of the notes. When **1: On**, Chord Analysis is performed on the input chord, and certain pitches as they are generated may be shifted to other notes to fit the chord. This is useful in conjunction with the “Track Keyboard” parameter described above. If you have created a Melodic pattern that is being transposed, you can also have the tonality of the pattern shift to match different chords as you play them, similar to popular auto-accompaniment keyboards. In other words, you can write a pattern that plays a musical phrase in a major key, and have it change to a minor key when you play minor chords, automatically.

Link To Next

[0, 1]

0: Off **1: On**

The 3 Drum Patterns can be linked together to form longer Drum Patterns; in this case, they do not play simultaneously, but “back-to-back.” Drum Pattern 1 can be linked to Drum Pattern 2. Drum Pattern 2 can be linked to Drum Pattern 3. If both Drum Pattern 1 and 2 are linked, then all 3 are linked. This can be used to create lengthy drum grooves or melodic phrases, have drum kits change for parts of a phrase, have melodic patterns change to using different pitches or octaves, etc.

Wrap Bottom

[0...127]

Wrap Top

[0...127]

0...127: C-1...G9

Sets an overall range within which notes from all 3 Drum Patterns will be limited. Notes going beyond the range will be transposed by however many octaves necessary to keep them within the specified range. This is mainly intended for use with melodic patterns that are being transposed by using the Keyboard Track feature.

Template

[0...191]

Selects from 192 different Drum Pattern Templates, and loads the parameters into the selected Drum Pattern Grid and associated parameters.

A Drum Pattern Template consists of:

- the configuration of the Drum Pattern Grid;
- “poly/pools” setting;
- the 7 choices in the Drum Sounds menus;
- Random Weighting Parameters - Pools (if applicable)
- Random Weighting Parameters - Rest (if applicable)
- the setting of the “Always Column.”

Direct Index Group

Overview

Direct Index means to take a controller and map it into the Note Series directly, so that notes can be directly indexed and generated in real-time. One use is to take an area of a keyboard and map it into the Note Series, so that when you play the keys you are not generating the true note, but are selecting notes from within the Note Series. You can set up one area of the keyboard to supply the input notes to the Note Series, and another area to perform the Direct Indexing. This can allow you to “solo” with musically correct notes, without really thinking about what you are doing. Another use is to take a controller like a Joystick and map it into the Note Series, so that sweeping the controller sweeps through the Note Series and generates glissandos and flurries of notes. This can be done in addition to the normal effect that the GE may be programmed to generate.

Note that to perform Directing Indexing, a controller must be selected as a “Source” in 6.4: DynMIDI page, and one of two different options selected as a “Destination”:

- Direct Index
- DI & MdlStop (Direct Index & Module Stop)

For more information, see “Dynamic MIDI Sources & Destinations”. (PG p.234)

General Parameters

Index Shift [0...3]

- | | |
|------------------|------------------|
| 0: Top | 2: Center |
| 1: Bottom | 3: Skip |

Selects one of several options for shifting the indexes coming from the controller, if the Note Series at any given time is longer than the range of the selected controller. For example, if you specified an octave of keys (12 keys) as a controller, and there were 24 notes in the Note Series, those 12 potential indexes can be directed to different areas of the Note Series.

If the number of steps in the range of the selected controller is less than or equal to the number of notes in the Note Series, this parameter has no effect and KARMA automatically maps the indexes to the proper notes. If the number of steps is equal, there will be a predictable one-to-one correspondence between the controller and the Direct Index notes. If there are fewer notes in the Note Series than, KARMA automatically maps the indexes in a way that prevents adjacent controller indexes from selecting the same note. Also, in the case of using a CC to sweep through the Note Series, values that would cause duplicate notes will be filtered out. This means you can comfortably use a CC with a range of 0–127 to sweep through a 15 note Note Series.

0: Top

If the length of the Note Series is greater than the range of the selected controller, the indexes will be shifted to the top, so that the highest Direct Index note will be the highest note in the Note Series.

1: Bottom

If the length of the Note Series is greater than the range of the selected controller, the indexes will be shifted to the bottom, so that the lowest Direct Index note will be the lowest note in the Note Series.

2: Center

If the length of the Note Series is greater than the range of the selected controller, the indexes will be centered around the middle note of the Note Series.

3: Skip

If the length of the Note Series is greater than the range of the selected controller, the indexes will be scaled into the Note Series so that the lowest Direct Index note will be the lowest note in the Note Series, the highest Direct Index note will be the highest note in the Note Series, and the other indexes will be spread out over the Note Series, resulting in one or more notes in the Note Series being skipped (cannot be indexed from the controller).

Trill Mode [0...5]

- | | |
|---------------------------|---------------------------|
| 0: Off | 3: 3 Note Or More |
| 1: 1 Note Or More | 4: 4 Notes Or More |
| 2: 2 Notes Or More | 5: 5 Notes Or More |

When holding down a certain number of Direct Index notes, an automatic randomized trill/arpeggio can be produced. The rate at which the notes are generated is automatically calculated based on the tempo. This can be used to simulate fast soloing riffs while performing Direct Indexing.

0: Off/DynMIDI

No trill effect will be introduced, no matter how many Direct Indexing notes are held down simultaneously.

1...5: 1 Note Or More...5 Notes Or More

Specifies the required number of notes that must be held down before the trill/arpeggio starts. When set to “1 Note Or More,” playing even a single note causes it to start repeating at the automatically calculated rate. Other notes may then be added to become part of the trill/arpeggio.

Held Note Trig Mode [0...3]

- | | |
|--------------------------|---------------------|
| 0: Off | 2: Retrigger |
| 1: Bend/Retrigger | 3: Mute |

Selects one of several options for deciding what happens when you are sustaining Direct Index note(s), and the chord is changed so that the sustained note(s) no longer “fit” with that chord (i.e. are no longer part of the Note Series). Part of the concept with this parameter is to allow soloing only within a “correct” key or Note Series.

0: Off

Nothing is done. The note(s) remain sustained, even if they are “wrong.”

1: Bend/Retrigger

If only one Direct Index note is being sustained, it is bent (with pitch bend) down to the nearest pitch in the new Note Series (if it is no longer present in the Note Series). If more than one note is being sustained, they will all be changed to the nearest notes in the new Note Series and retriggered. If several are sustained, and only one is “incorrect,” they will all be retriggered.

2: Retrigger

All sustaining Direct Index notes will be changed to the nearest notes in the new Note Series and retriggered. If several are sustained, and only one is "incorrect," they will all be retriggered.

3: Mute

Any sustaining Direct Index notes not present in the new Note Series will be shut off.

Transpose [-36...+36 (semitones)]

Transposes the pitch of the Direct Indexing notes as they are selected from the Note Series. This separate setting allows you to choose the octave for Direct Indexing independent of where the rest of the current GE is designed to work. Note that this is completely separate from the "Transpose" setting in the KARMA module parameters, so changing the octave there will have no effect on Direct Indexing.

Vel. Sensitivity [1...127 - bottom of range]

Sets the overall velocity sensitivity range for the indexes received from the controller source (when it is a note range type such as notes from a keyboard range). This controls the velocities of the Direct Index notes as they are generated. The value entered is the bottom of the range and the top of the range is 127. For example, if the value is 1, then the velocities would be exactly as played. If the value is 64, the velocities would be half as sensitive, because any velocity received from 1-127 will be scaled into the range of 64-127. Therefore, if you want the velocities of the Direct Index notes to be exactly as played by a keyboard, set this value to 1. Note that if the controller is a CC such as a joystick, there is no velocity associated with moving it, so the last received keyboard velocity is used, or a default.

Duration Parameters

Duration Control [0...2]

0: GE 1: Kbd-Poly 2: Kbd-Mono

Determines whether the durations of the Direct Index notes will be controlled by the other parameters in this section, or by the user (through the controller doing the Direct Indexing). The notes that may be generated normally by the GE are still independently controlled by the settings in the Duration Group.

0: GE

Direct Index notes will have the duration specified by the other two parameters in this section, the "Duration Mode" and the "Duration ms" (if applicable). The actual duration of the controller keys are not taken into account. For example, you might set up an effect with a short duration which then uses Melodic Repeat to generate further notes; setting this to "GE" ensures that the user's release of a key has no effect on the actual durations.

1: Kbd-Poly

Direct Index notes will have the actual duration of the controller keys - pressing a key starts a note and releasing it ends a note. The "Duration Mode" and "Duration ms" become unavailable. This allows the user to control the duration, especially useful for simulating soloing. The controller will act polyphonically - multiple notes can be played and held down simultaneously.

2: Kbd-Mono

Same as 1: Kbd - Poly above, except the keys act monophonically - you cannot play more than one note at a time. Useful for certain types of simulations such as saxophone and synthesizer solos.

Duration Mode [0...3]

0: Poly Extend 2: Mono Extend
1: Poly Extend/Damped 3: Timed

Selects one of several modes of operation for controlling durations of the Direct Index notes, when the "Duration Control" parameter is set to 0: GE.

0: Poly Extend

Each note will sustain until the next generation of the same note, or until that note is no longer a part of the Note Series (caused by playing a new chord, for example). For example, if the notes to a CMaj chord are sustaining and the chord is changed to a CMinor, only the Es will be shut off.

1: Poly Extend/Damped

The same as above, except all sustaining notes will be damped when the chord changes, not just notes that are no longer in the Note Series.

2: Mono Extend

Each note is sustained until the next note (of any pitch) is generated.

3: Timed (1...5000 ms)

Makes available the "Duration ms" parameter, where you specify in milliseconds the duration of the generated notes. All notes will therefore have the same length. Note that this is independent of the current tempo - if it is set to 50 ms, it will always be 50 ms, regardless of tempo.

 Not available if "Duration Control" is not set to 0: GE.

Duration ms [1...5000 (ms)]

When the "Duration Mode" above is 3: Timed, specifies in milliseconds the duration of the generated notes. All notes will therefore have the same length. Note that this is independent of the current tempo - if it is set to 50ms, it will always be 50ms, regardless of tempo.

 Not available if "Duration Control" is not set to 0: GE, or Mode is not set to 3: Timed.

Repeat Parameters

Melodic Rpt On/Off [0, 1]

0: Off 1: On

Allows Melodic Repeat to be independently controlled for Direct Indexing. When this is 1: On, the Direct Index notes will have Repeat Group. The settings for Melodic Repeat in the Phase Pattern do not affect Direct Indexing. This allows you to have a GE set up where the normally generated effect has Melodic Repeat while Direct Indexing does not, and vice versa, or other variations.

Bend Parameters

Most of the following parameters have the same functionality as those described in the Bend Group. However, the bend specified here will only happen for Direct Indexing notes. This means that a GE can have one type of Auto Bend effect for notes that are being generated, and a different Auto Bend effect for Direct Index notes. Or Direct Indexing notes can have bending while notes generated by the same GE do not, etc.

There are several differences between Direct Index Auto Bend and Auto Bend for generated notes (set in the Bend Group):

- It is not possible for the length of the bend to be set to “Note Duration” since in most cases the duration is not known ahead of time. Therefore, this option is not available in the Bend Group “Length” parameter.
- The **Next and Prev Note** bending options are replaced with **Next and Prev Index** options. The difference is that when notes are being generated, it is possible to calculate ahead of time what will be the next note. With Direct Indexing, it is impossible to know what the next note is since you chose it yourself. Therefore, when set to **Next Index**, it will bend from the currently chosen index in the Note Series to the next adjacent index in the Note series. The same difference applies for **Prev Index**. These differences are explained further below.

Bend On/Off [0, 1]

0: Off **1: On**

When set to 0: Off, Direct Index notes will have no bending, but the GE can still generate Auto Bend according to the Bend Group settings when triggered normally. When set to 1: On, Direct Index notes will have bending according to the parameters in this Group - the settings in the Bend Group do not affect them (other than Bend Range).

Bend Amount [-12...18]

0: Random
-12...12: -12...+12 Semitones
13: Next Index
14: Next Index+1
15: Next Index+2
16: Prev Index
17: Prev Index-1
18: Prev Index-2

p.37 Bend Group: “Amount”

0: Random

p.37 Bend Group: “Amount”

1: -12...12: -12...+12 Semitones

p.37 Bend Group: “Amount”

3: Next Index

Bends each note to the next index in the Note Series (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the E is Direct Indexed it will bend to the G.

4: Next Index+1

Bends each note to the index in the Note Series that is 2 indexes forward (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the E is Direct Indexed it will bend to the B.

5: Next Index+2

Bends each note to the index in the Note Series that is 3 indexes forward (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the E is Direct Indexed it will bend to the second C.

6: Prev Index

Bends each note to the previous index in the Note Series (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the B is Direct Indexed it will bend to the G.

7: Prev Index-1

Bends each note to the index in the Note Series that is 2 indexes backward (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the B is Direct Indexed it will bend to the E.

8: Prev Index-2

Bends each note to the index in the Note Series that is 3 indexes backward (note that this may be an up or down bend depending on how the Note Series is constructed and sorted). For example, if the Note Series contains {C, E, G, B, C...}, then when the B is Direct Indexed it will bend to the first C.

Bend Shape [0...2]

0: Bend **1: Hammer** **2: Hammer Bend**

p.37 Bend Group: “Shape”

Bend Alternation [0, 1]

0: Off **1: Alternating**

p.38 Bend Group: “Alternation”

Bend Step [0, 1]

0: Smooth **1...12: 1 ST...12 ST**

p.38 Bend Group: “Step”

Bend Length [0...25]

0: 64th triplet	9: 8th triplet	18: Whole triplet
1: 64th	10: 8th	19: Whole
2: 64th dotted	11: 8th dotted	20: Whole dotted
3: 32th triplet	12: Quarter triplet	21: 2 bars
4: 32th	13: Quarter	22: 3 bars
5: 32th dotted	14: Quarter dotted	23: 4 bars
6: 16th triplet	15: Half triplet	24: Fixed (ms)
7: 16th	16: Half	
8: 16th dotted	17: Half dotted	

⌘p.38 Bend Group: "Length"

Bend Fixed-ms [0...5000 (ms)]

⌘p.38 Bend Group: "Fixed-ms"

Bend Start [0...100 (%)]

⌘p.38 Bend Group: "Start"

Bend End [0...100 (%)]

⌘p.38 Bend Group: "End"

Bend Width [0...100 (%)]

⌘p.38 Bend Group: "Width"

Appendices

Using Auto-Bend

Auto-Bend refers to a feature of KARMA that can generate a bend along with every generated note. It can be used to create gliding effects between notes (simulating portamento), to automatically bend each note to a preset step size, to produce guitar “hammer-on” effects (where a fret is pressed with a finger to a new note after the note has already been picked, without restriking the note), ethnic bending, and other unique effects.

note There are several other ways of producing Pitch Bend data in KARMA, including using Pitch Bend Envelopes, and generating stepped Pitch Bend with the CCs Group. This chapter does not apply to those additional methods.

Next Note/Previous Note Bends

Generated

When the “GE Type” (p.4) is **0: Generated-Riff** or **1: Generated-Gated**, **Next Note Bending** allows the current note to bend to what will be the next note, the note two away, or the note three away. **Previous Note Bending** allows the current note to bend to what was the previous note, the note two notes previous, or the note three notes previous.

When beginning a riff with **Previous Note bends** selected, since the first notes have not actually been played yet, KARMA extrapolates what they would have been based on the settings of various parameters. Most of the time this will produce a correct bend.

When using **Next Note bend** with **Random Modes**, KARMA actually does know what the next Note(s) will be, even though they are “Random”.

If the note to be bent to is the same note as the current note (a bend of 0) KARMA automatically chooses a bend to another note nearby to maintain the illusion of continuous bending.

note The maximum bend size is controlled by the Bend Range setting (usually 12 semitones), even if the next/previous note is farther away.

Also, although KARMA knows what the next notes will be while it is playing a riff, it can’t know when you are going to change a chord and start a new riff. Therefore, the last notes before a chord change may not bend to the correct notes at the start of a new riff, since they will bend to what would be the next note if you hadn’t changed chords. Most of the time this is not a problem and still sounds musically correct.

When using Next/Prev Note Bending with Clusters, Clusters will appear to bend from their bottom note to whatever the next/previous note is.

Real-Time

When the “GE Type” (p.4) is **3: Real-Time**, only **Previous Note bending** is available, since KARMA cannot know which note you will play next. However, by using the Bend Direction parameter, you can bend either “To” the previous note, or “From” the previous note to the one you are playing now. The Bend Shape you are using probably determines which one makes more sense. For example, for Hammer-ons you will probably want to bend “To” the previous note (because the Hammer Shape bends it back afterwards); while for the Bend Shape, you will probably want to bend “From” the previous note to the one you have played now, since that is where the bend will end up to the ear. However, it’s up to you!

Length Of Bends

“GE Type” 0: Generated-Riff, 1: Generated-Gated, or 2: Generated-Drum

Bend Group “Length” is 0...23: Note Values

The bend length is determined by the chosen note value and will be the same regardless of the actual duration or rhythm of the notes. For example, if the Bend Group “Length” is **7: 16th**, then the overall Bend will be within a 16th note, even if you are generating a pattern with quarter notes, eighth notes, and 16th notes mixed together. This allows each bend to be the same length, yet maintain a relationship to tempo, since slowing down the tempo will also lengthen the bend, for example. This also allows the durations of the notes to be varied in real-time without changing the position or length of the bends.

Bend Group “Length” is 24: Fixed-ms

The overall bend is determined by a fixed value in milliseconds, and will be the same length regardless of the tempo setting. For example, this allows an absolute bend length to be determined that does not change with the tempo, so that a guitar line with a bend in it will play slower at a slower tempo, but not bend any slower. This also allows the durations of the notes to be varied in real-time without changing the position or length of the bends.

Bend Group “Length” is 25: Note Duration

The length of the bend is a percentage of the note’s duration. Therefore, if you have the Duration Group parameters set to produce very short durations, then very short bends (almost inaudible) will be produced. However, with normal length durations, using this mode allows the bend to be scaled with each note - longer notes get longer bends, shorter notes get shorter bends, etc. Changing the durations of the notes in real-time changes the length and position of the bends.

Note that a bend will never be longer than the rhythm of the generated note itself, even if you are creating overlapping notes. In other words, the start of a new note stops the current bend, and potentially starts another one. The diagram in the next section illustrates the resulting bend when the shape is “Bend”, and shows the difference between using Note Duration and one of the other “Bend Length” settings.

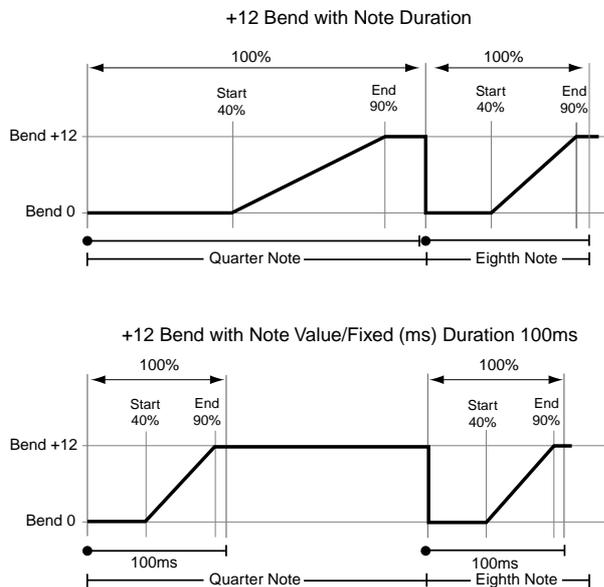
“GE Type” 3: Real-Time

Since the duration of the note is determined by actually playing the keyboard, Bend Group “Length” 25: Note Duration is not available for this GE Type, and will act the same as 7: 16th if selected. The other Bend Length settings operate as described above.

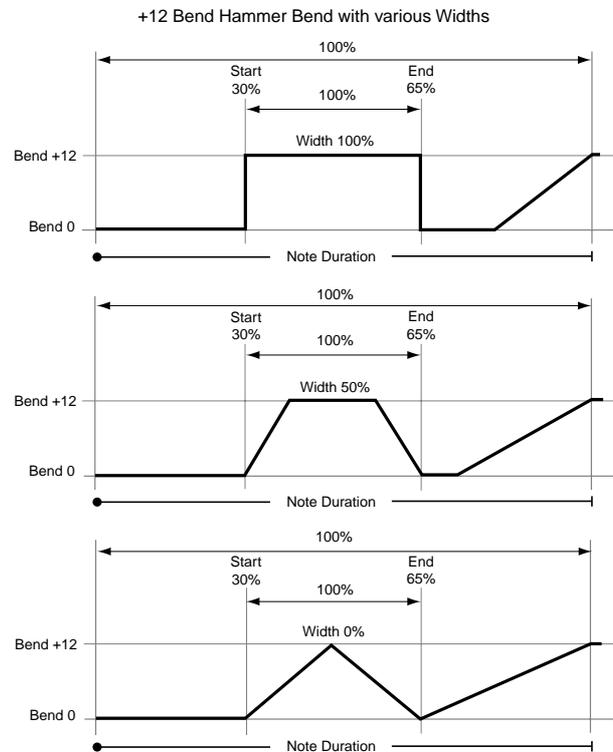
The Different Bend Shapes

Bend

When the “Bend” Shape is selected in the Shape Parameter, the Start Parameter specifies where in the note’s duration the bend will start, and the End Parameter specifies where in the note’s duration the bend will end. The following diagram illustrates the resulting bend when the shape is “Bend”, and also the difference between Note Duration and Fixed/Note Values settings.



The following diagrams illustrate the shape of a Hammer Bend. A Hammer is the same thing, without the final 3rd bend at the end. Hammers and Hammer Bends follow the same behavior with Duration as discussed in the previous section Length Of Bends.



Hammer, Hammer Bend

When the “Hammer” or “Hammer Bend” Shape is selected, the Start and End Parameters function a bit differently. Start specifies where in the note’s duration the 1st bend will start and go to the bend’s highest value (Hammer-On), and End specifies where in the note’s duration the 2nd bend will start and return to zero (Hammer-Off). Additionally, a 3rd bend is generated for Hammer Bends.

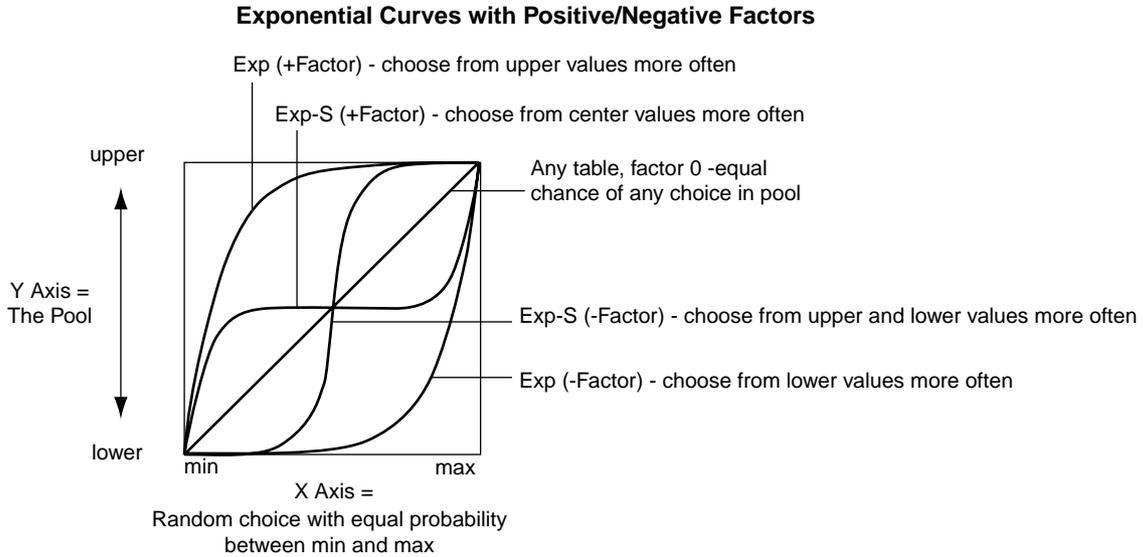
Also, when the “Hammer” or “Hammer Bend” Shape is selected, the Width Parameter is available. Width is a percentage of the amount of time between the Start and End points, and therefore controls how long the Hammer-On and Hammer-Off bends will be. You can also think of Width as being the amount of time the bend stays at it’s highest value before returning to zero. A Width of 100% gives you a Square Shape, while a Width of 0% gives you a Triangle Shape.

In a Hammer Bend, the 3rd bend starts at a point in the note’s duration following the End setting, and is determined by a ratio of the Width. Even when Width is at 100% and the Hammer-On and Hammer-Off Bends are instantaneous, the final 3rd bend will still be an audible bend.

Random Weighting Curves

Weighting Curve Shapes and Their Effects

When using the various grid-based Patterns, more than one value selected in a column creates a “pool” of random choices. Different areas of the pool may be selectively favored using a Weighting Curve. 4 different shapes are available, which act to favor certain areas of the pool over others when each random choice is made. The actual shape of the curve depends on the setting of the “Factor” parameter.



Exponential (Exp)

With a **positive Factor(+)**, choices will be exponentially weighted towards the upper values in the pool. With a **negative Factor(-)**, choices will be exponentially weighted towards the lower values in the pool.

Logarithmic (Log)

With a **positive Factor(+)**, choices will be logarithmically weighted towards the upper values in the pool. With a **negative Factor(-)**, choices will be logarithmically weighted towards the lower values in the pool.

Exponential S (Exp-S)

With a **positive Factor(+)**, choices will be exponentially weighted towards the center values in the pool, and away from the lower and upper values in the pool. With a **negative Factor(-)**, choices will be exponentially weighted towards the lower and upper values in the pool, and away from the values in the center of the pool.

Logarithmic S (Log-S)

With a **positive Factor(+)**, choices will be logarithmically weighted towards the center values in the pool, and away from the lower and upper values in the pool. With a **negative Factor(-)**, choices will be logarithmically weighted towards the lower and upper values in the pool, and away from the values in the center of the pool.

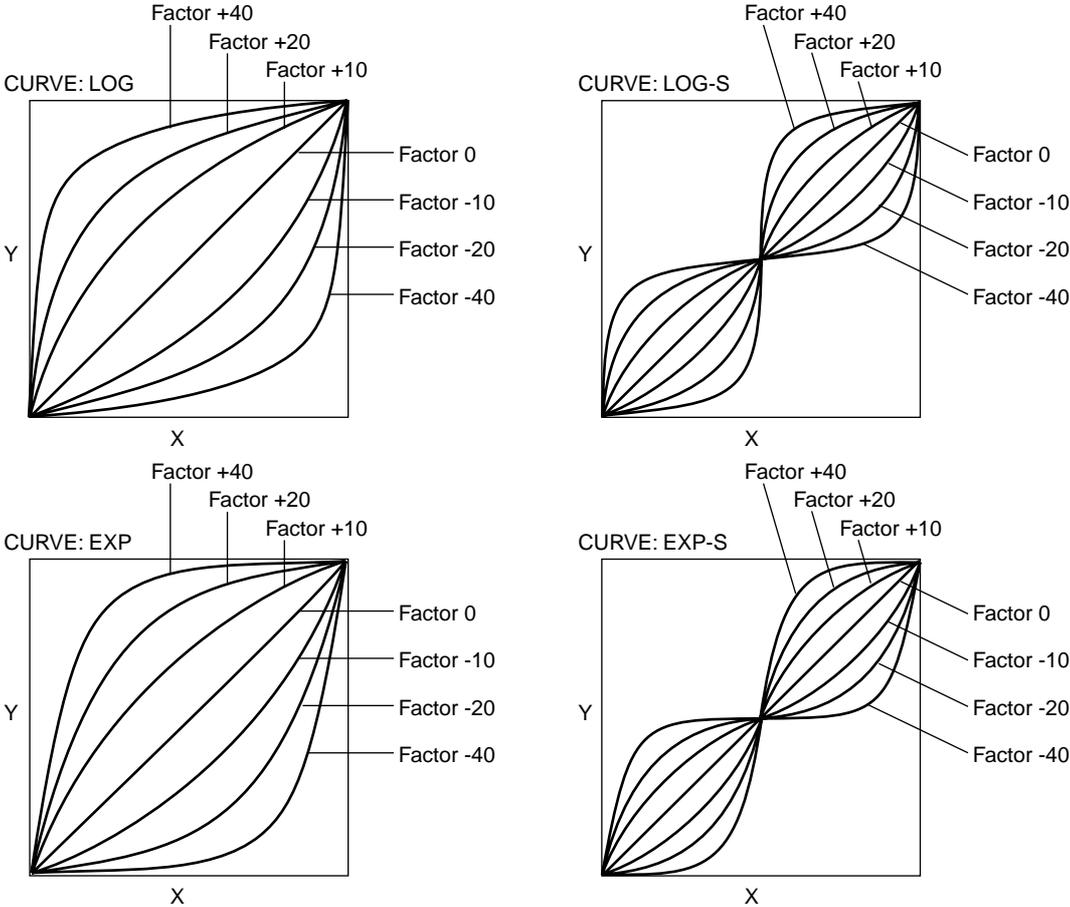
⚡ Using negative Factors not only inverts but rotates the curve.

The following table summarizes the effect of the Factor field on the curves and the pools:

Weighting Curve	Pool values that receive priority:	
	Factor	
	+ (Positive)	- (Negative)
Exp/Log	upper	lower
Exp-S/Log-S	ctr	lowupper

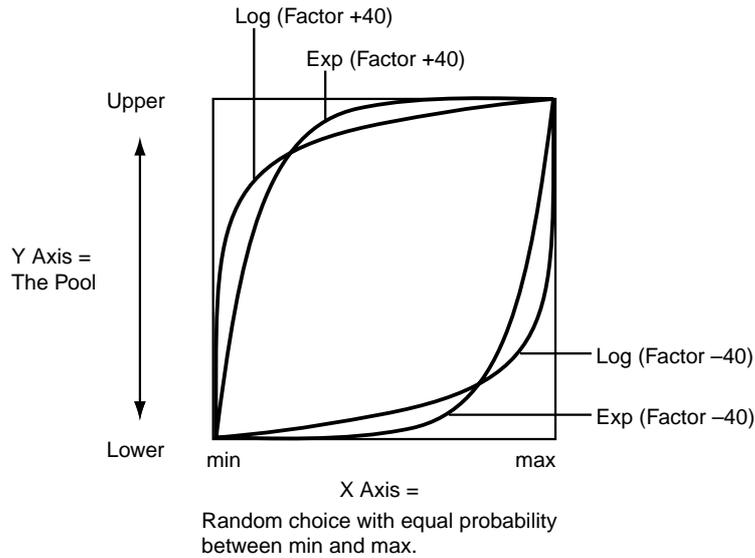
Comparison of Exponential and Logarithmic Curves

Exponential Curves and Logarithmic Curves have similar shapes. They are different, however, as the following diagram illustrates:



X Axis = random choice with equal probability between min and max. Y Axis = the Pool.

This characteristic can be used to even more finely tune the effect you are trying to achieve. For example, the top and bottom curves in both the Log and Exp diagrams (Factor 40 and -40) above are shown together below:



With a Positive Factor (+40):

Exponential Curve (Exp)

75% chance of a choice from the upper 10% of the pool;
25% chance of a choice from the lower 90% of the pool.

Logarithmic Curve (Log)

90% chance of a choice from the upper 25% of the pool;
10% chance of a choice from the lower 75% of the pool.

In general, as the positive factor increases, the Exp Curve will produce choices more from the very highest part of the pool, with a choice from the remaining portion more likely to occur than with the Log Curve. In contrast, the Log Curve will produce choices more from the mid high to highest part of the pool, with a choice from the remaining portion less likely to occur than with the Exp Curve.

Therefore, while both curves will weight the random choices toward the upper values in the pool, the Log Curve provides less of a chance of the lower and center values ever occurring, while allowing a more even distribution among the upper values. The Exp Curve provides more certainty that the highest values will be chosen, while still allowing a more even distribution among the center and lower values than the Log Curve.

With a Negative Factor (-40):

Exponential Curve (Exp)

75% chance of a choice from the lower 10% of the pool;
25% chance of a choice from the upper 90% of the pool.

Logarithmic Curve (Log)

90% chance of a choice from the lower 25% of the pool;
10% chance of a choice from the upper 75% of the pool.

In general, as the negative factor decreases, the Exp Curve will produce choices more from the very lowest part of the pool, with a choice from the remaining portion more likely to occur than with the Log Curve. In contrast, the Log Curve will produce choices more from the mid low to lowest part of the pool, with a choice from the remaining portion less likely to occur than with the Exp Curve.

Therefore, while both curves will weight the random choices toward the lowest values in the pool, the Log Curve provides less of a chance of the higher and center values ever occurring, while allowing a more even distribution among the lower values. The Exp Curve provides more certainty that the lowest values will be chosen, while still allowing a more even distribution among the center and upper values than the Log Curve.

▲ A Factor of 0 with any shaped curve yields a linear table (straight diagonal line), and each of the values in the pool will have an equal chance of getting chosen.

How GE parameter names are displayed

For some GE parameters, the following information is shown in addition to the parameter name.

- **Parameter name [Phase]**

This indicates the phase for which the parameter is valid.

Display example

Rhythm: Template [B]
[Phase]

- [1]: Phase 1 is valid
- [2]: Phase 2 is valid
- [B]: Both phases 1 and 2 are valid

This is shown for the following parameters.

TransGroup

Direction	Transpose
Octave Transpose	Oct/5th Transpose
TSig Numerator	TSig Denominator
Beginning Offset %	End Offset %
Events	

RhythmGroup

Swing Use Multiplier	Pools-Random Factor
Pools-WeightingCurve	Ties-Random Factor
Ties-Weighting Curve	Rhythm Multiplier
Straight Multipliers	Straight/Trip Mults
Strt/Dot/Trip Mults	Template

DurationGroup

Duration Mode	Duration Value
Pools-Randm Factor	Pools-Weight Curve
Ties-Randm Factor	Ties-Weight Curve
Template	

IndexGroup

Pattern Type	Random Walk Max Step
Pools-Random Factor	Pools-Weighting Curve
Cluster Mode	Invert
Double	Double Amount
Template	

CurveGroup

Pools-Random Factor	Pools-Weight Curve
Template	

VelocityGroup

Pools-Randm Factor	Pools-Weight Curve
Cluster Mode	Scale
Template	

CCGroup

Fixed/On	Pattern Type
Polarity	Pools-WeightCrv
Pools-Rand Fact	Cluster Mode
Template	

- **CCs: parameter name #No. #No.**

Parameters of the CCs Group also indicate the MIDI message that are controlled by CC-A and CC-B.

Display example

CCs: Fixed/On [B] 010 074
[Phase] #No. #No.

000...125: CC#000...CC#125
PB: Pitch Bend

- **Env: parameter name [Env] #No. #No. #No.**

Parameters of the Env (Envelope) Group also indicate the envelope for which that GE parameter is valid, and indicate the parameter or MIDI message that is controlled by the Envelope.

Display example

Env: Env On/Off [3] 010
[Env] #No.

[Env]:

- [1]: Valid for Envelope 1
- [2]: Valid for Envelope 2
- [3]: Valid for Envelope 3
- [1, 2]: Valid for Envelopes 1 and 2
- [2, 3]: Valid for Envelopes 2 and 3
- [1, 3]: Valid for Envelopes 1 and 3
- [A]: Valid for all Envelopes 1, 2, and 3

#No.:

- VE:** Velocity
- TA:** Tempo-Absolute
- TR:** Tempo-Relative
- PB:** Pitch Bend
- DU:** Duration
- 000...122: CC#000...122**

- **Drum: parameter name [Pat]**

Parameters of the Drum Group also indicate the drum pattern for which that GE parameter is valid. (Some parameters in the Drum Group that are not related to the individual Drum Patterns will not display this information.)

Display example

Drum: Row 1 Note [1]
[Pat]

- [1]: Valid for Pattern 1
- [2]: Valid for Pattern 2
- [3]: Valid for Pattern 3
- [1, 2]: Valid for Patterns 1 and 2
- [2, 3]: Valid for Patterns 2 and 3
- [1, 3]: Valid for Patterns 1 and 3
- [A]: Valid for all Patterns
- [B]: Valid for Patterns 1 and 2 (displayed only for Link to Next)