GenerativeGenerator

Character Sheet & Technical Grimoire

Generative Melodic Instrument

Jeff Lytle

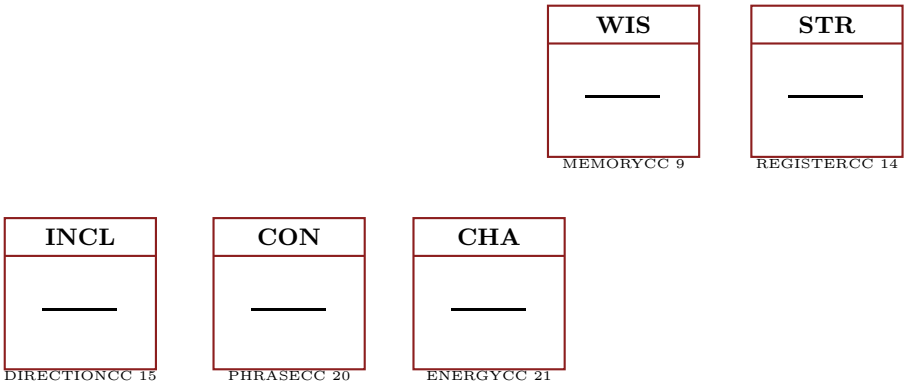
Version 1.0 — Firmware Build 99820

Class:	Generative Melodic Instrument
Race:	Algorithmic Entity
Level:	v1.0 (76% Flash Capacity)
Alignment:	Chaotic Creative
Hit Points:	16d8+48 (Learning Buffer)
Speed:	48kHz sample rate, 30Hz display

Contents

1 Ability Scores

1.1 Primary Abilities (Page 0)



1.2 Dexterity (MOTION)

CC 3 — Default: 64 (50%)

Dexterity governs the character's preference for smooth stepwise motion versus dramatic intervallic leaps. This stat shapes the overall melodic contour—from lyrical and flowing to angular and disjunct.

Mathematical Formula:

$$w_{\text{step}} = (1.0 - p_{\text{MOTION}}) \cdot 0.5 \tag{1}$$

0–40 (Low): Predominantly stepwise motion (1–2 semitones), smooth melodic contours

40–80 (Mid): Balanced mix of steps and leaps, natural variety

80–127 (High): Frequent large leaps (5–12 semitones), angular motion

1.3 Wisdom (MEMORY)

CC 9 — Default: 64 (50%)

Wisdom represents pattern recognition and recall. A sliding window of the last 8 generated notes is maintained, and this stat controls how often the character revisits familiar material versus exploring new territory.

Memory Buffer:

$$\text{recent\_notes} = [n_{i-7}, n_{i-6}, \ldots, n_{i-1}] \tag{2}$$

Recall Probability:

$$P(\text{use recent note}) = p_{\text{MEMORY}} \cdot 0.4 \tag{3}$$

0–40: Maximum novelty, constant exploration

40–80: Occasional returns to familiar notes

80–127: Highly repetitive, cycles through recent material

1.4 Strength (REGISTER)

CC 14 — Default: 64 (50%)

Strength determines vertical range and octave-displacement power. After interval selection, notes may be transposed by ±12 or ±24 semitones based on this stat.

Displacement Probability:

$$P(\text{octave displacement}) = p_{\text{REGISTER}} \cdot 0.25 \tag{4}$$

0–40: Stays within learned register

40–80: Occasional octave jumps

80–127: Frequent octave displacements, wide tessitura

1.5 Inclination (DIRECTION)

CC 15 — Default: 64 (50%)

Inclination biases ascending versus descending melodic motion. This stat blends learned directional tendency with user preference.

Blended Bias:

$$\theta_{\text{final}} = \frac{\theta_{\text{learned}} + \theta_{\text{param}}}{2} \tag{5}$$

0–40: Descending bias, phrases trend downward

40–80: Follows learned tendency

80–127: Ascending bias, phrases trend upward

1.6 Constitution (PHRASE)

CC 20 — Default: 64 (50%)

Constitution represents the endurance of melodic ideas. It controls expected phrase length through soft probabilistic targeting.

Target Length:

$$L_{\text{target}} = 2 + \lfloor p_{\text{PHRASE}} \cdot 14 \rfloor \in [2, 16] \tag{6}$$

0–40: Short phrases (2–5 notes)

40–80: Medium phrases (6–10 notes)

80–127: Long phrases (11–16 notes)

1.7 Charisma (ENERGY)

CC 21 — Default: 64 (50%)

Charisma governs expressiveness and intensity. This is a *macro parameter* that scales multiple systems simultaneously.

Interval Scaling:

$$I_{\text{scaled}} = I_{\text{base}} \cdot (0.5 + p_{\text{ENERGY}}) \tag{7}$$

0–40: Calm, small intervals, subdued

40–80: Balanced intensity

80–127: Intense, large intervals, dramatic

2 Secondary Attributes

2.1 Stability (Law vs. Chaos)

CC 22 — Default: 64 (Neutral)

Stability determines adherence to learned scale degrees. High values favor diatonic conformity; low values introduce chromatic exploration.

Lawful (80–127):	Diatonic conformity
Neutral (40–80):	Balanced consonance
Chaotic (0–40):	Chromatic exploration

2.2 Entropy (FORGETFULNESS)

CC 23 — Default: 64 (50%)

Entropy controls the decay rate of learned tendencies. As this stat increases, the character gradually forgets its training.

Weight Decay:

$$w_i[n] = w_i[n-1] \cdot (1 - p_{\text{FORGET}} \cdot 0.01) \tag{8}$$

2.3 Leap Shape (Agility Modifier)

CC 24 — Default: 64 (50%)

Leap Shape controls exponential decay of interval size probability.

Exponential Decay:

$$P(I = i) \propto w_i \cdot \exp(-\lambda \cdot i) \tag{9}$$

2.4 Direction Memory (Momentum)

CC 25 — Default: 64 (50%)

Momentum governs persistence of melodic direction.

2.5 Home Realm (HOME REGISTER)

CC 26 — Default: 64 (Mid)

The gravitational center of the character's melodic domain.

Gaussian Gravity:

$$G(n) = \exp\left(-\frac{(n - r_{\text{center}})^2}{2\sigma^2}\right) \tag{10}$$

2.6 Exploration Radius (RANGE WIDTH)

CC 27 — Default: 64 (50%)

Range Width sets variance of register gravity.

3 Equipment & Inventory

3.1 Input Ports

Port	Description
MIDI In	Channel 1, Note On/Off, CC 3–31
Gate Input 1	Note Trigger (rising edge)
Gate Input 2	Clock/BPM Detection
4× Potentiometers	Analog control, 0–1.0

3.2 Output Ports

Port	Description
MIDI Out	Generated notes, velocity 100
CV Out	12-bit, 0–5V, 1V/octave
Gate Out	50% duty cycle, 20–500ms
OLED Display	128×64, 30Hz visual

4 Special Abilities

4.1 Live Phrase Injection

Instantaneous learning transition

4.2 Register Gravity

Soft pitch constraint

Notes are attracted to the HOME REGISTER center via Gaussian probability weighting.

4.3 Tendency Extraction

Ritual of analysis

The character analyzes captured notes and extracts:

- Interval histogram $H[0..12]$
- Directional statistics
- Register center r_{center}
- Most common intervals

5 State Machine

State	Behavior
IDLE	Awaiting input, dormant
LEARNING	Capturing notes (L:1...L:16)
GENERATING	Creating variations (G:X)

Transitions:

$$\text{IDLE} \xrightarrow{\text{MIDI}} \text{LEARNING}$$

$$\text{LEARNING} \xrightarrow{\text{timeout}} \text{GENERATING}$$

$$\text{GENERATING} \xrightarrow{\text{MIDI}} \text{LEARNING}$$

6 MIDI Control Change Reference

CC#	Parameter	Page	Default
3	MOTION	0	64
9	MEMORY	0	64
14	REGISTER	0	64
15	DIRECTION	0	64
20	PHRASE	1	64
21	ENERGY	1	64
22	STABILITY	1	64
23	FORGETFULNESS	1	64
24	LEAP SHAPE	2	64
25	DIRECTION MEMORY	2	64
26	HOME REGISTER	2	64
27	RANGE WIDTH	2	64
28	LRN TIME	3	20 (2.0s)
29	ECHO	3	0 (OFF)

Fillable Character Sheet

GenerativeGenerator

Generative Melodic Instrument

Ability Scores

Ability	Score	Modifier	CC#
Dexterity (MOTION)	[redacted]	[redacted]	3
Wisdom (MEMORY)	[redacted]	[redacted]	9
Strength (REGISTER)	[redacted]	[redacted]	14
Inclination (DIRECTION)	[redacted]	[redacted]	15
Constitution (PHRASE)	[redacted]	[redacted]	20
Charisma (ENERGY)	[redacted]	[redacted]	21

Current State

State: ☐ IDLE ☐ LEARNING ☐ GENERATING

Notes Learned: _____ / 16

Current BPM: _____

Register Center: _____

Performance Notes

Write observations about character behavior, favorite patterns, or parameter combinations...