2A03



KautenjaDSP

KautenjaDSP 2A03 v1.0.0

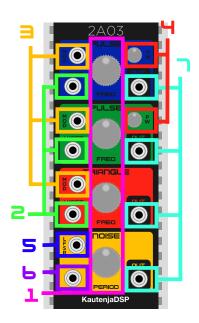
1 Overview

2A03 is an emulation of the 2A03 sound chip from the Nintendo Entertainment System (NES) for VCV Rack. The 2A03 chip contains two pulse wave generators, a quantized triangle wave generator, and a noise generator. The original chip featured a DMC loader for playing samples that has been omitted in this emulation.

2A03 provides the key features of the 2A03 chip, namely,

- **Dual pulse wave generator:** Dual 8-bit pulse waves with four duty cycles: 12.5%, 25%, 50%, and 75%;
- Quantized triangle wave generator: Generate NES style triangle wave with 16 steps of quantization;
- Noise generator: generate pseudo-random numbers at 16 different frequencies; and
- Linear Feedback Shift Register (LFSR): for that old-school 8-bit randomness!

2 Panel Layout



- 1. Coarse frequency control over the four channels.
- 2. V/Octave inputs for pulse1, pulse2, and triangle waveform generators.
- 3. linear CV frequency modulation for pulse1, pulse2, and triangle waveform generators.
- 4. Pulse width selector. Chooses between four duty cycles: 12.5%, 25%, 50%, and 75%.
- 5. CV LFSR gate, high at 2V. Holds the LFSR generator as long as the input voltage is > 2V.
- 6. Period of randomness $\in [0, 15]$ for the noise generator. See https://wiki.nesdev.com/w/index.php/APU_Noise for approximate frequency and pitch mappings.
- 7. Channel outputs, $\approx 10V_{pp}$.

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References & Acknowledgments

Green, S. (2003). Nes_Snd_Emu. http://www.slack.net/~ant/libs/.