

Sound Effects with BFXR

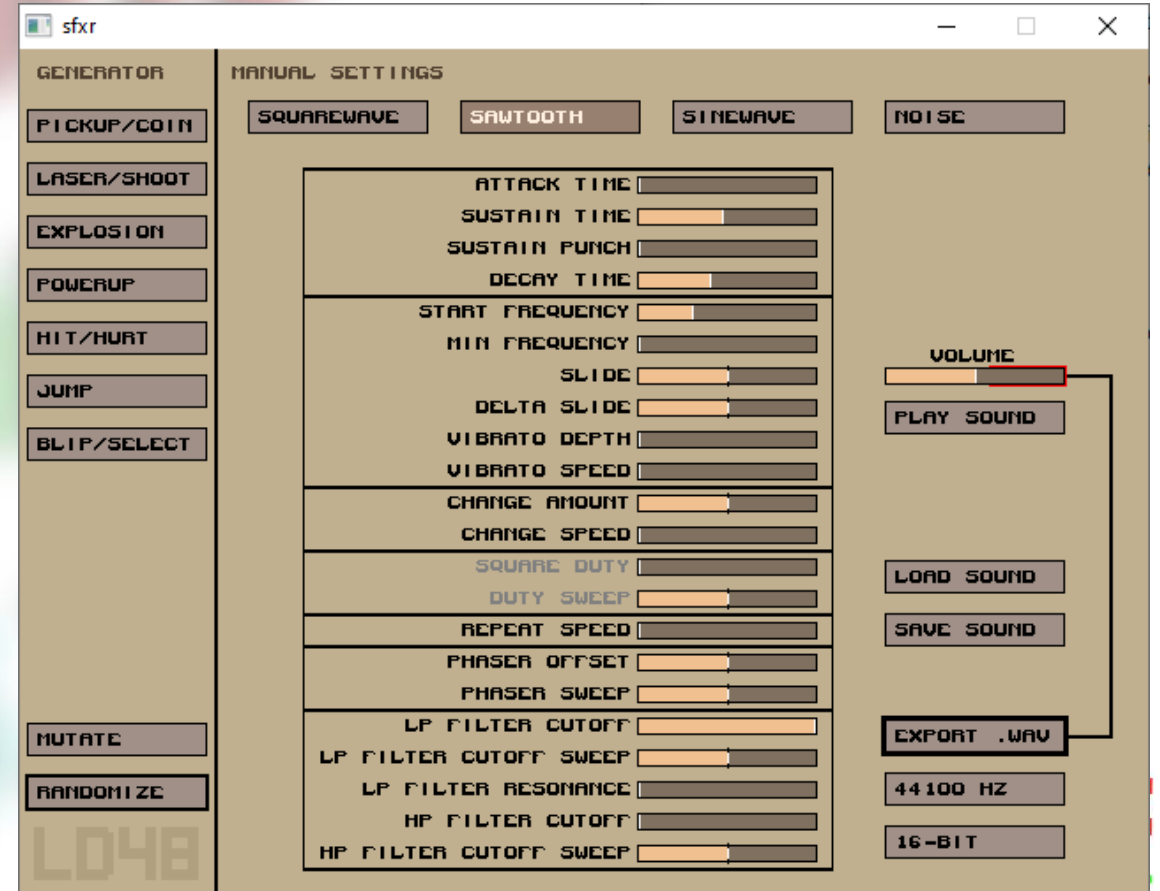
Knox Game Design

June 2021

Levi D. Smith

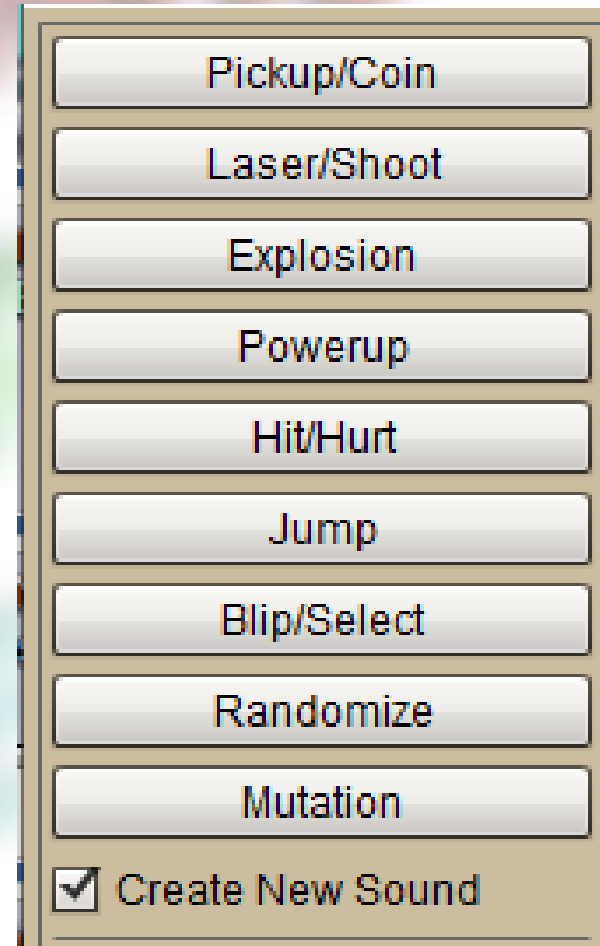
History

- Originally SFXR
 - By Dr Petter (Tomas Pettersson)
 - For Ludum Dare 10 (December 2007)
 - http://drpetter.se/project_sfxr.html
- BFXR an elaboration of SFXR
 - By increpare (Stephen Lavelle)
 - <https://www.bfxr.net/>



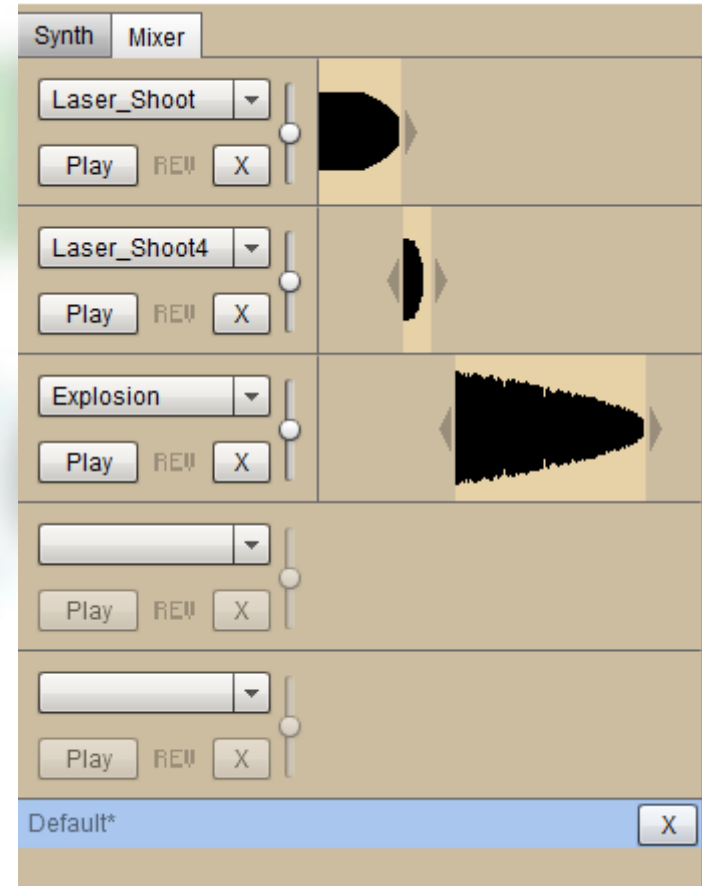
Auto Generated Sound Effects

- Pickup/Coin
- Laser/Shoot
- Explosion
- Powerup
- Hit/Hurt
- Jump
- Blip/Select
- Randomize
- Mutation
 - Alter the current sound effect



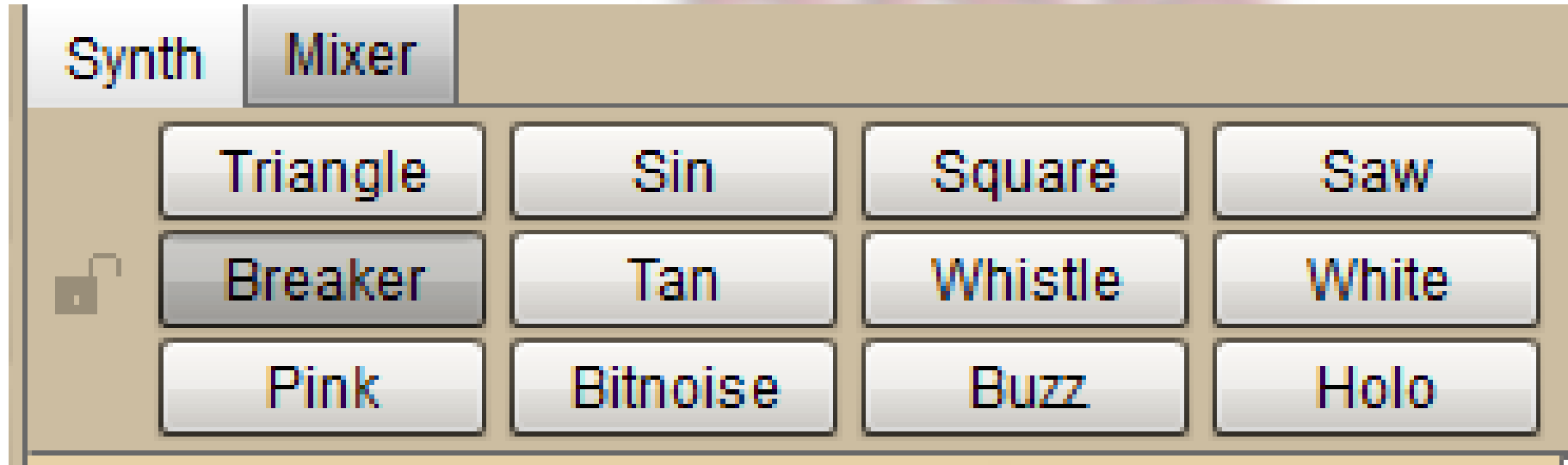
Mixer

- Combine multiple sound effects together



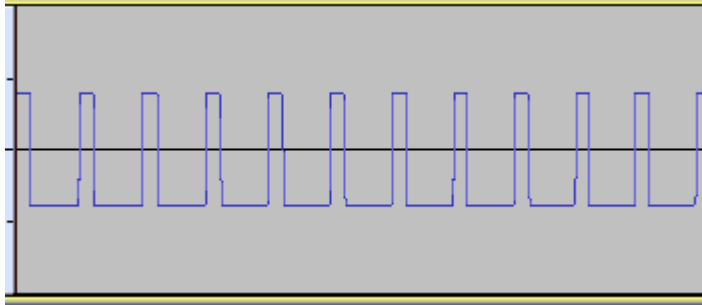
KNOX
GAME
DESIGN

Wave forms

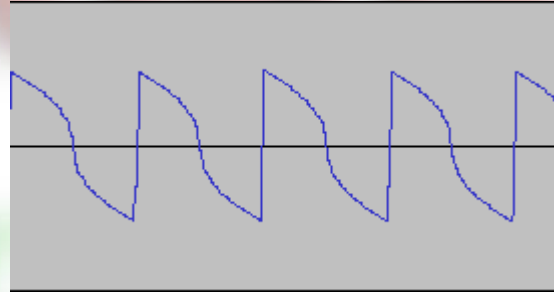


Wave form Examples

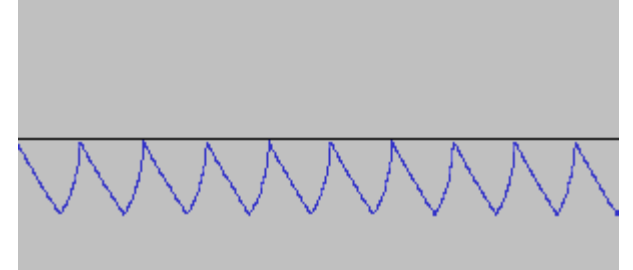
Square



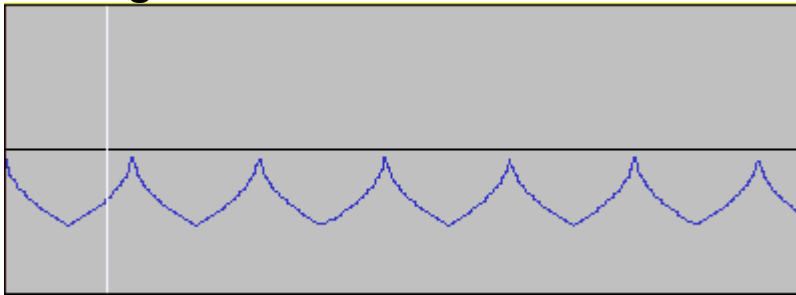
Saw



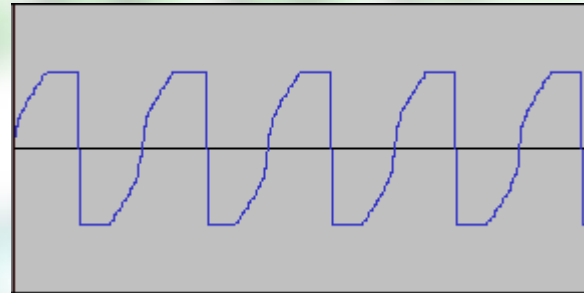
Breaker



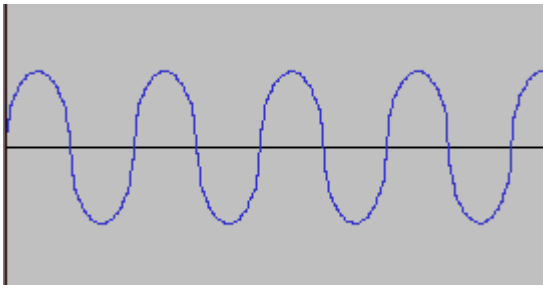
Triangle



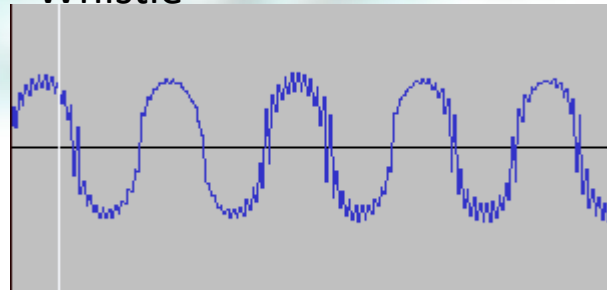
Tan



Sin



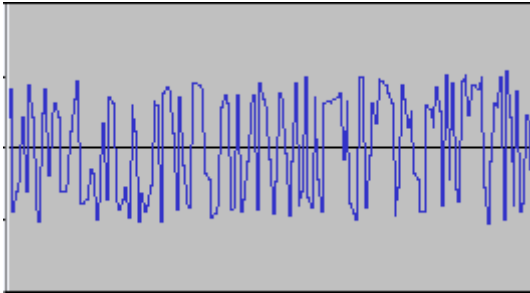
Whistle



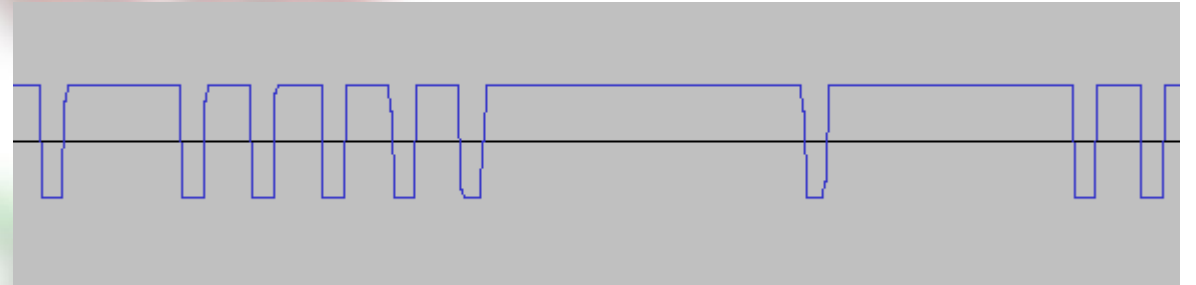
KNOX
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DESIGN

Noise and Other Examples

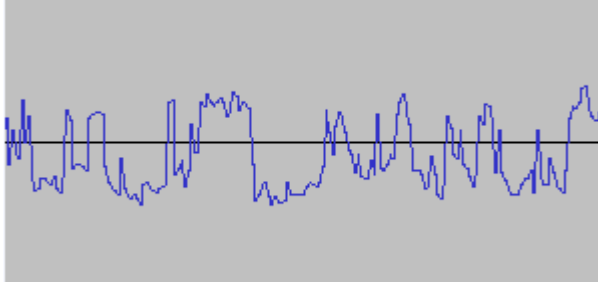
White



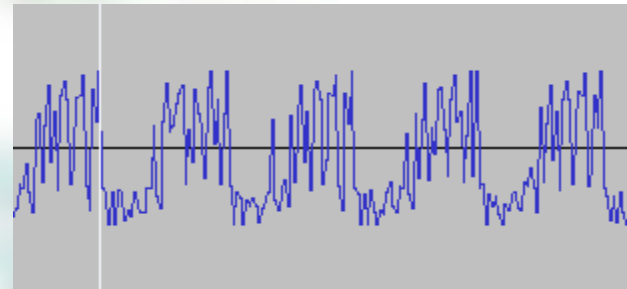
Buzz



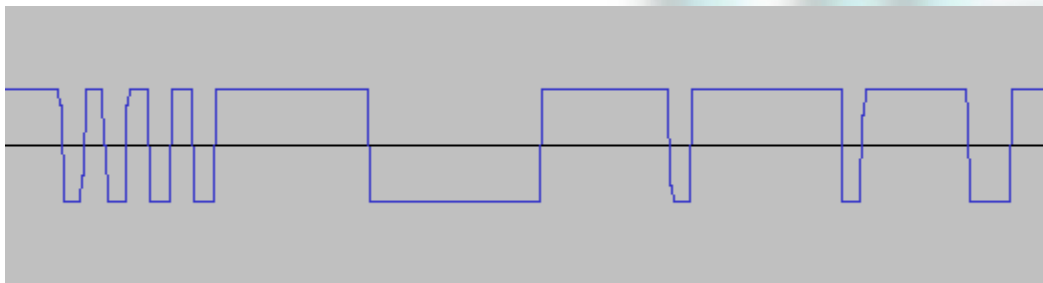
Pink



Holo

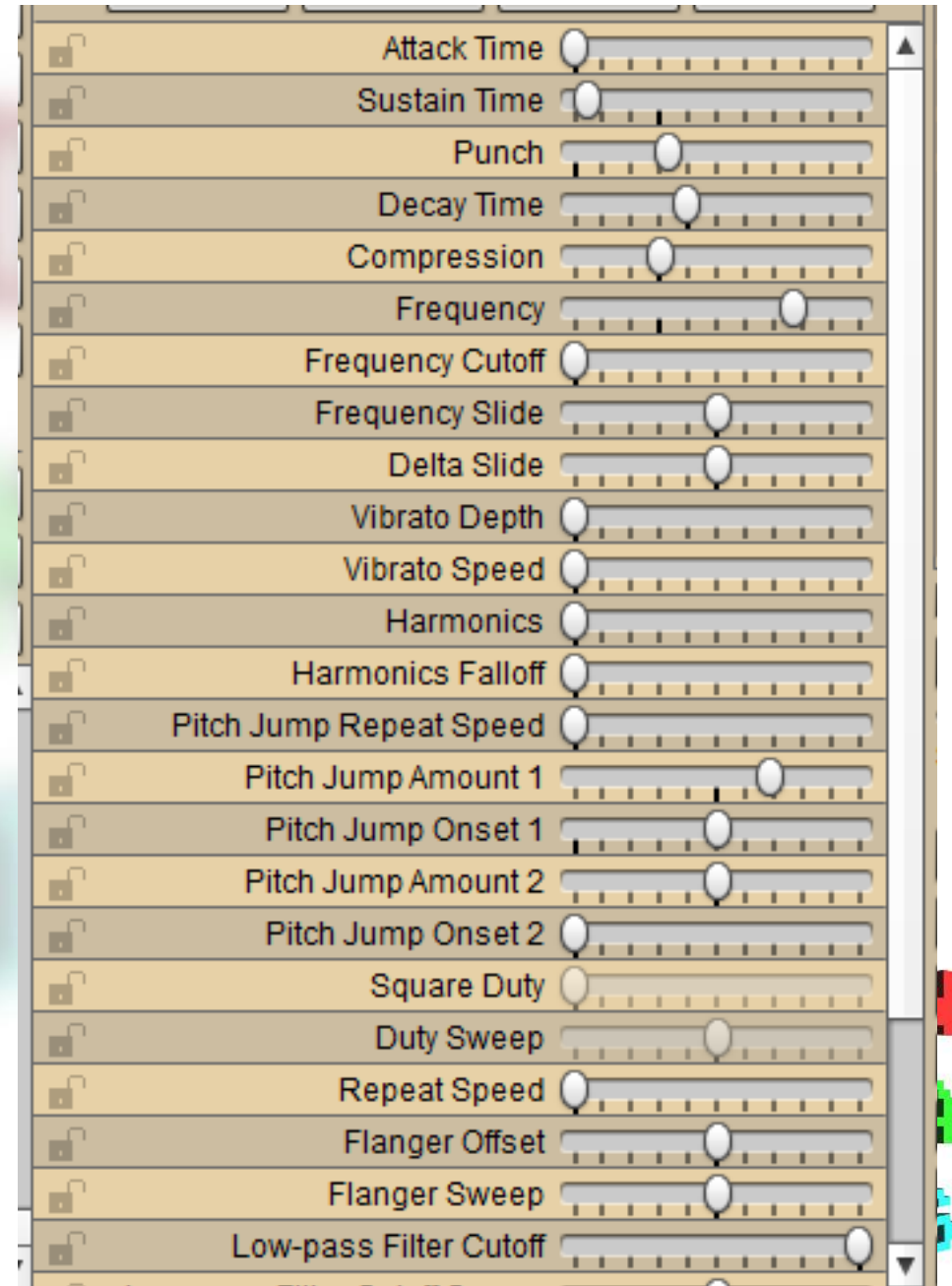


Bitnoise



Modifiers

- Modify length of sound effect
 - *Attack Time, Sustain Time, Decay Time*
- Modify pitch
 - *Frequency*
- Slide
 - *Frequency Slide, Delta Slide*



Definitions

- Envelope (ADSR)
 - Attack time - how long it takes for the volume of the sound to go from silence to maximum level
 - Decay time - How quickly the sound drops to the sustain level after the initial peak.
 - Sustain time - the period of time during which the sound is held before it begins to fade out
 - Punch - tilts the sustain envelope for more pop
 - Release time - How quickly the sound fades when a note ends

Definitions continued

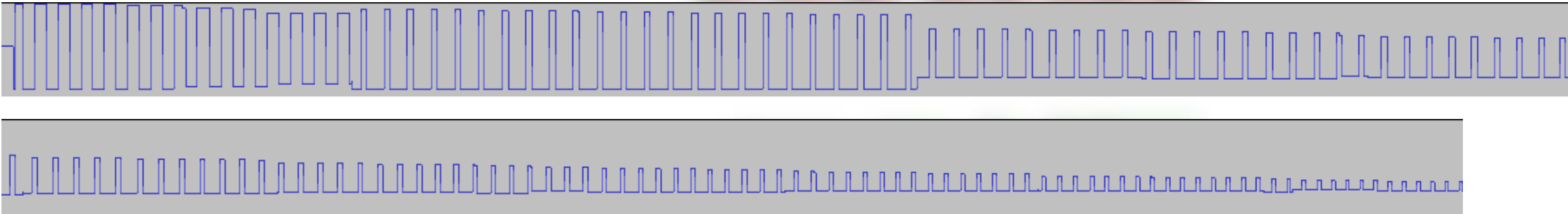
- Frequency - base note of the sound (can only use 0 to 1, not actual frequency)
 - Frequency Slide - slides the frequency up or down
 - Frequency cutoff - if sliding, the sound will stop at this frequency
 - Delta slide - accelerates the frequency slide
- Vibrato
 - Vibrato Depth - Strength of the vibrato effect
 - Vibrato Speed - Speed of the vibrato effect
- Harmonics - Overlays copies of the waveform with copies of multiples of its frequency
 - Harmonics falloff - the rate at which higher overtones should decay

Definitions continued

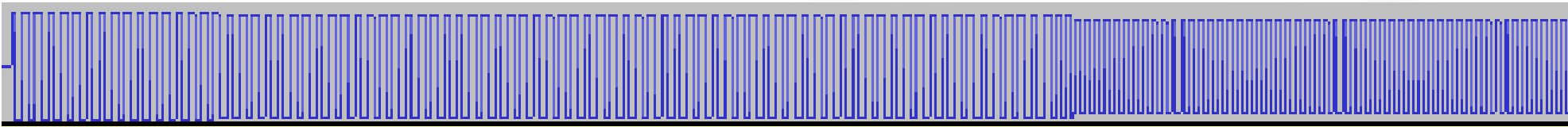
- Repeat Speed - Speed of note repeating
- Flanger Offset - Offsets a second copy of the wave by a small phase
- Flanger Sweep - Sweeps the phase up or down
- Bit Crush - Resamples the audio at a lower frequency
 - Bit Crush Sweep - Sweeps the bit crush filter up or down
- (Square waveform only)
 - Square Duty - controls ratio of up and down states of the wave
 - Duty sweep - sweeps the duty up or down

Examples

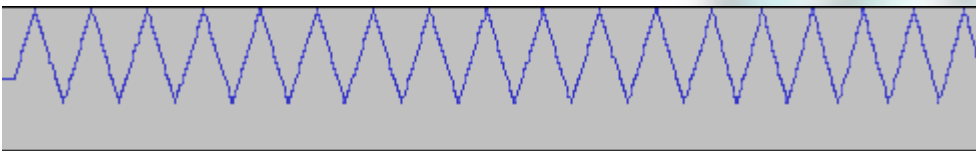
Mario jump (Super Mario Bros 1)



Coin pickup (Super Mario Bros 1)

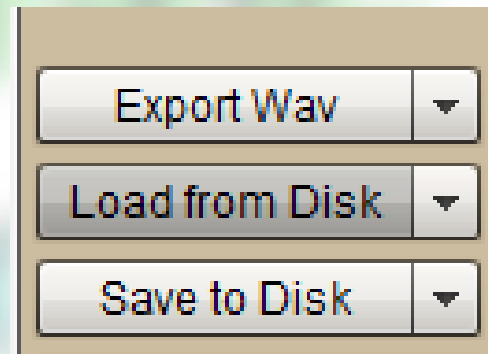


Skid (Super Mario Bros 1)



Saving

- *Export Wav* - Save as WAV file (remember to add the .wav extension)
- *Save to Disk* - Save in BXFR format (for modification later)



References

- Sound Theory by Dr Petter
 - http://drpetter.se/article_sound.html
- <https://www.sweetwater.com/insync/attack/>
- <https://www.teachmeaudio.com/recording/sound-reproduction/sound-envelopes>
- <https://www.boomboxpost.com/blog/2016/10/17/8-bit-twice-shy-creating-retro-game-sound-effects-with-bfxr>
- <https://www.wikiaudio.org/adsr-envelope/>
- <https://www.sounds-resource.com/nes/>