Algorithms overview

Classic analog waveforms

Wave	Description	Timbre	Color
CSAW	*CS-80 imperfect saw*	*Notch width*	*Notch polarity*
/\/\-_-_	*Variable waveshape*	*Waveshape*	*Distortion/ filter*
/\/\-_-_	*Classic saw-tooth/square*	*Pulse width*	*Saw <-> square*
SYNC	*2 square VCOs with hardsync*	*VCO frequency ratio*	*VCO balance*
FOLD	*Sine/triangle into wavefolder*	*Wavefolder amount*	*Sine <-> triangle*

Digital synthesis

_|_|_	*2 detuned harmonic combs*	*Smoothness*	*Detune*
/\/\ X3 -_ X3	*Triple saw and triple square*	*Osc. 2 detune*	*Osc. 3 detune*
RING	*3 ring-modulated sine waves*	*2/1 frequency ratio*	*3/1 frequency ratio*
/\/\/\/\	*Swarm of 7 sawtooth waves*	*Detune*	*High-pass filter*
/\/_|_|	*Comb filtered sawtooth*	*Delay time*	*Neg./pos. feedback*
TOY*	*Low-fi, circuit-bent sounds*	*Sample reduction*	*Bit toggling*

ZLPF	*Direct synthesis of low-pass filtered waveform*	*Cutoff frequency*	*Waveshape*

ZPKF, ZBPF, ZHPF are variants of ZLPF with peaking, band-pass, and high-pass filters

Vocal synthesis and formants

VOSM	*Sawtooth with 2-formants*	*Formant 1 frequency*	*Formant 2 frequency*
VOWL	*Speaking-toy vowel synthesis*	*a, e, i, o, u*	*Gender*
VFOF	*Vowel synthesis*	*a, e, i, o, u*	*Gender*
FM	*2-operator FM*	*Modulation index*	*Frequency ratio*
FBFM	*2-operator FM with feedback*	*Modulation index*	*Frequency ratio*
WTFM	*Chaotic 2-operator FM*	*Modulation index*	*Frequency ratio*

Physical simulations

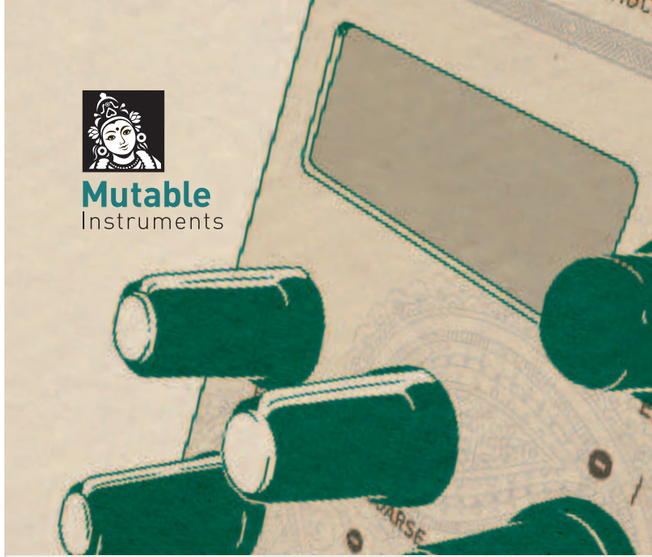
BELL. DRUM	*Bell and metallic drum simulations*	*Decay*	*Inharmonicity*
PLUK	*Plucked string*	*Decay*	*Plucking position*
BOWD	*Bowed string*	*Friction*	*Bowing position*
BLOW FLUT	*Reed and flute simulations*	*Air pressure*	*Instrument geometry*

Wavetables

WTBL	*21 wavetables*	*Smooth wavetable position*	*Quantized wavetable selection*
WMAP	*16x16 waves*	*X position*	*Y position*
WLIN	*Linear wavetable scanning*	*Wavetable position*	*Interpolation quality*
WTX4	*Quad wavetable synthesis*	*Wavetable position*	*Chord type*

Noise

NOIS	*Tuned noise (2-pole filter)*	*Filter resonance*	*Response, LP to HP*
TWNQ	*Noise sent to 2 resonators*	*Resonance*	*Resonators frequency ratio*
CLKN	*Clocked digital noise*	*Cycle length*	*Quantization*
CLOU	*Sinusoidal granular synthesis*	*Grain density*	*Frequency dispersion*
PRTC	*Droplets granular synthesis*	*Grain density*	*Frequency dispersion*
QPSK	*Modem noises*	*Bit-rate*	*Modulated data*



Mutable Instruments

Braids

Macro oscillator



Installation

Braids requires a **-12V / +12V / +5V power supply** (2x8 pin connector). The ribbon cable connector must be aligned so that the red stripe of the ribbon cable (-12V) is on the same side of the module's power header as the "Red stripe" marking on the board.

The power consumption is as follows:
-12V: 15mA; +12V: 15mA; +5V: 85mA.

Online manual and help

The full manual can be found online at
mutable-instruments.net/modules/braids/manual

For help and discussions, head to
mutable-instruments.net/forum/

Calibration

Calibrating Braids is as easy as playing a C2 and a C4 note from an accurate **MIDI>CV** interface or **CV source**. Read more about this in the online manual!



Front panel

Controls

A. Display and encoder - when the module starts, they show and modify the oscillator model.

B. C. Fine and coarse **frequency controls**.

D. FM attenuverter. Adjusts the amount and polarity of frequency modulation from the FM input.

E. F. Timbre control, and **timbre modulation attenuverter**. Principal dimension of sound motion and waveshaping.

G. Color. Secondary dimension of waveshaping. The function of Timbre and Color depends on the oscillator type. Refer to the table on the other side!

Inputs and Outputs

1. Trigger input. Resets the oscillator phase. For the physical modeling algorithms this input needs to be triggered to "excite" the oscillator (or it won't produce any sound).

2. V/Oct. Main frequency control input, with V/Oct scale.

3. 4. 5. Frequency, timbre, and color modulation CV inputs.

6. Audio output.

Settings

Click the encoder to display a list of settings. Scroll through the settings and click to modify one of them. Once the value has been modified, click to confirm and get back to the menu. Selecting the first option (*WAVE*) saves all the current settings in memory and brings you back to the module's initial state (oscillator model selection).

An overview of the available settings:

BITS / RATE is the bit-depth and sample rate of the audio output, for digital grit and crunchiness!

QNTZ applies a semitone or quartertone quantization to the V/Oct input.

FLAT/DRFT/SIGN create various VCO-like instabilities.

TRIG allows a simple AD envelope (6 preset shapes) to shape the sound whenever a trigger is received on the TRIG input.