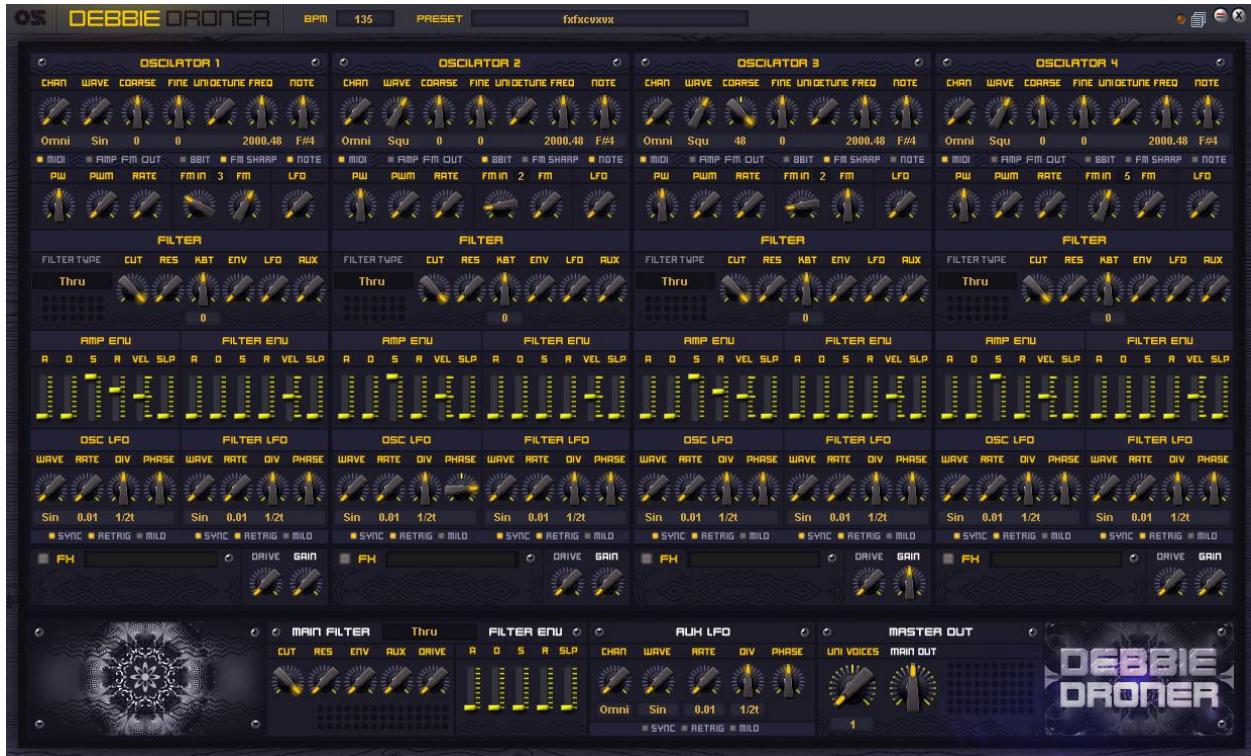# Ocean Swift Synthesis
Debbie Droner

More than a mere typical synth, Debbie is a subtractive and fm sound design platform. Rich in options and ideal for the creation of drones and soundscapes, but because of it's design can also be used for creating pretty much anything from bass lines to leads and effects. Easy to chain instances and/or interact with other synths in order to realise complex fm matrixes, big synth ensembles or intricate ambient platforms. Use Debbie Droner as an array of simple synths or as one big playground, scratch the surface or go down the rabbit hole - the flexibility is there to let you run with your ideas. Think creative, think Debbie Droner!

- 4 synth sections each with its own synthesis chain and extensive modulations.
- Each section consists of an osc, a filter and an insert effect slot.
- Each section has its own modulation path with an amp envelope, filter envelope, filter lfo and pitch lfo.
- Each section's osc can be frequency modulated by the other oscs or by itself or by 4 possible inputs.

I/O

Midi In: Midi input for the device.
Osc Inputs: Each osc's waveshape can be set to process incoming audio instead of the provided internal shapes. Each Input numbered 1-4 corresponds to the osc of the same number.

FM Inputs: Four inputs that are routed to the FM In choice of the osc sections. These inputs go to ALL sections and are represented as choices 5-8 on the FM In knob.

Osc Outputs: Separate output for each osc section. The gain on each of these outputs corresponds to the value of the gain knob of each osc.

Sine Outputs: Separate direct output for each osc's sine shape (regardless of the waveform choice). this sine does not go through the rest of the section's synthesis chain (other than through the ADSR Envelope when in midi mode and the Amp to FM button turned on) - meaning it does not pass through the filter, distortion and insert effect. BE CAREFUL CONNECTING DIRECTLY THE SINE OUTPUTS - those are always outputting with a maximum gain setting, use these ONLY FOR FM "output" (for example if you chain a number of Debbie Droners or with the Debbie Expanders).

Main Output: Main output of the device after the section mixing and main filter.

<div align="center">Oscillators</div>

Midi: Turns on and off the midi mode for the osc. When turned on, the osc pitch the ADSR Envelope triggering are controlled by incoming midi notes. Also when turned on the fm output (sine shape, see also Fm In) is routed through the ADSR Envelope. When turned off the osc pitch is controlled by the Freq knob and the ADSR Envelope is bypassed (the osc is always outputting). Also when turned off, the fm output is always outputting and does not go through an amp envelope. Note that even with midi mode turned off, the LFO retrigger function will still respond to incoming midi data based on the channel set by thec Chan knob.

Chan: The midi channel for the osc when in midi mode. Controls the osc base pitch, the triggering of the ADSR Envelope and The retriggering of the LFO.

Wave: The shape of the osc. A choice between sine, triangle, saw, square and external input When in midi mode the sine osc is always re-triggered by new notes.

Coarse: Offsets the incoming midi notes by increments of 1 semitone. Only active while in midi mode.

Fine: Offsets the incoming midi notes by increments of 100 cents. Only active while in midi mode.

Uni Detune: Amount of unison detune applied to the osc. Only active when the Uni Voices parameter in the device's main controls section is set to higher than 1.

Freq: Constant frequency control of the base pitch of the osc when midi mode is off and the note button is off.

Note Knob: Constant frequency by a selection of a note of the base pitch of the osc when midi mode is off and the note button is on.

Note Button: When midi mode is off, the button controls whether the base pitch of the osc comes from the freq knob or note knob.

PW: Static pulse width control of the osc shape when the osc is set to square shape. At the center position the shape is a square.

PWM: Depth of modulation applied to the pulse width parameter. The modulation source is a dedicated sine lfo.

Rate: The rate of modulation applied to the pulse width parameter.

FM In: Choses the source of the FM modulation. Can be one of the other oscs or self modulation. Regardless of the chosen osc shape on the modulating osc, the fm modulation is always sent from the sine output.
FM: Amount of FM modulation applied to the osc.
Amp FM Out: Turns on and off the signal flow of the outputting fm signal from the osc - both in regards to the internal destinations and to the sin outputs. When off, the fm signal output is constant in volume. When on, the fm signal passes through the amp envelope before output.
LFO: Amount of modulation applied to the osc pitch from its dedicated pitch LFO.
FM Sharp: Changes the behavior of the FM modulation
8bit: Turns on and off and 8bit mode for the osc. Use for crunchy sounds.

Amp ADSR Envelope: Attack, decay, sustain and release amp envelope.
Amp Slope: The slope of the decay and release of the ADSR Envelope.
Amp Env Vel: Amount and polarity of incoming midi velocity information control over the overall volume of the envelope. At the center position there is no modulation

Pitch LFO

Wave: The waveform of the LFO. The wave is a choice between a sine, square, saw up, saw down, triangle, and random - 6 shapes in total.
Rate: The speed of the lfo when not in sync mode. From 0.01 to 400hz.
Div: The speed of the lfo when in sync mode. Measure divisions based on the device's BPM setting. Provided are 19 divisions: 64bar, 32bar, 16bar, 8bar, 4bar, 2bar, 1bar, 1/2p, 1/2, 1/2t, 1/4p, 1/4. 1/4t, 1/8p, 1/8, 1/8t, 1/16p, 1/16, 1/32.
Phase: The starting phase of the lfo. Noticeable when the LFO is in retrigger mode.
Mild: Tames the lfo's waveform. In general only useful when the Random waveform is selected in order to avoid clicks (smooth the steps).
Sync: Turns sync mode on and off.
Retrig: Retriggers the osc to start at the point specified by the phase knob with each new midi gate.

Filter

Type: Choice of 25 filter types.
Cut: The cutoff point of the filter.
Res: The resonance quality of the filter.
KBT: Keyboard note tracking of the filter. On Center position no tracking occurs.
ENV: Amount of modulation applied to the filter by its dedicated Filter ENV.
LFO: Amount of modulation applied to the filter by its dedicated Filter LFO.
Aux: Amount of modulation applied to the filter by the Aux LFO.
Drive: Mild distortion on the filter output.
Filter LFO: Same controls as the Pitch LFO.
Filter ADSR Envelope: Attack, decay, sustain and release amp envelope.
Filter Env Slope: The slope of the decay and release of the ADSR Envelope.
Filter Env Vel: Amount and polarity of incoming midi velocity information control over the overall volume of the envelope. At the center position there is no modulation
Effect: Insert effect slot able to load any scope effect.

Output

Drive: Mild distortion before the output.
Gain: The volume of each section. Controls the volume both for the internal mix of the four sections sent to the main filter as well as the volume for each section's separate output from the device.

Main Filter

Type: Choice of 25 filter types.
Cut: The cutoff point of the filter.
Res: The resonance quality of the filter.
ENV: Amount of modulation applied to the filter by its dedicated envelope.
Aux: Amount of modulation applied to the filter by the Aux LFO.
Drive: Mild distortion on the filter output.

Aux LFO

Aux LFO: Same controls as the Pitch LFO.
Aux LFO Chan: The midi channel of the Aux LFO. Midi gate signals coming on this channel will retrigger the Aux LFO.

Main Controls

BPM: Sets the BPM for the synth. This is the tempo from which all the LFO divisions will divide from.
Uni Voices: The number of voices dedicated to the unison circuit. The number of voices chosen must be available to the device via Scope's live bar. Each unison voice "steals" one voice of polyphony sp for example with 9 voices set on the live bar, a 3 note chord with unison set to 3 will utilize all 9 voices.
Gain: The overall volume of the entire device after the main filter as presented on the main output of the device.

Debbie FX MS

An effects box in a mono-to-stereo configuration for use with the Debbie synths or otherwise. Each effect can be bypassed. The signal chain:
In Vol -> Distortion -> EQ -> Tremolo -> Phaser -> Chorus -> Delay -> EQ -> Distortion -> Out Vol

Credits:

Circuit Design: Yaron Eshkar
Gui Design: Fernando Abreu

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