Marsupial Dual Voltage-Controlled Filter User's Manual

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Technical Specifications (Eurorack)
Width: 8hp
Depth: 25mm
Current Draw: 36mA @ +12V; 35mA @ -12V

Hello and thank you for using the Marsupial Dual Voltage-Controlled Filter for Eurorack. We hope you will find its tones most pleasing!

1. Connecting your Marsupial

Use a typical 10-16-pin Eurorack ribbon power cable to connect the rear header of your Marsupial module to your Eurorack case's power bus. The -12V (red stripe) side of the ribbon cable must be aligned with the white silkscreen indicator stripe for proper use. This module is reverse diode protected, but it is still not recommended that you plug it in backwards to see what happens.

2. Theory of Operation

The Marsupial began life as a smaller filter meant primarily for Stereo use, with an IC at its core (the AS3350 Dual Filter chip) geared toward this use. As such, it is a very effective Stereo filter over the entire frequency range in Parallel mode with the B Offset knob set in the center, useful for processing stereo sounds through simple manipulation of the Global Cutoff and Resonance controls and patching of CV into Filter A's controls with nothing patched to Filter B, thus creating normalized control of both filters.

However, upon testing various early prototypes it became apparent that the Marsupial's true sonic power and much of its most interesting behavior comes from interaction between the two filters, and to this end the module's relatively simple controls are designed to establish interesting relationships between the cutoff frequency of each. Simple offset of Filter B is a powerful tool to create timbral "movement" by controlling the sharpness to which harmonics are removed at each of the two filters' cutoff frequencies, and then the attenuverters on each CV Input can be used to play with the space between each cutoff. Interesting and otherworldly sounds can come from overlapping the two filters using nothing more than a simple envelope or LFO for modulation.

Once the relationship between the two filters has been established via the Offset knob and CV inputs, the whole configuration can be shifted across the whole frequency spectrum using the Global Cutoff knob, or 1V/Octave Input A with nothing patched into 1V/Octave Input B. This creates easily-controllable complex filter sounds, especially once multiple outputs are mixed together.

Both filters in the Marsupial contain an enhanced Resonance circuit which allow the filter's tone to go from subtle tone-shaping, to powerful sympathetic resonance, to a clean sine-wave which tracks 1V/Octave signal well over approximately 5 octaves when self-resonating. Self-resonance will mix with any audio input.

3. Summary of Functions

Audio goes into the Marsupial via the two jacks labeled "A-Audio In-B". If audio is patched to the A input, it will be normalized to the B input. Each audio input is routed to a discrete single-supply JFET buffer pre-filter. The buffers will introduce a subtle saturation/clipping sound to the audio inputs once the signal level reaches approx. 8Vp-p, providing some nice added harmonic material for the filters when driven. If a

clean sound is desired, simply turn the input level down using a passive attenuator; a higher Resonance setting will reduce the filter's amplitude somewhat as well.

The outputs of each buffer are routed to the Marsupial's two separate filters, referred to on the panel as "A" and "B". Each Filter has an Control Voltage input with attenuverter, unattenuated 1V/Oct control input, and Bandpass and Lowpass outputs. The Global Cutoff and Resonance knobs provide master control over the cutoff and resonance of both filters respectively, while the B Offset knob positions Filter B's cutoff relative to that of Filter A, providing an offset of approximately 2.5 Octaves on either side of center. The LEDs labeled "A" and B" are purely cosmetic and indicate substantial audio output from the Lowpass output of the corresponding filter.

Arrows on the panel between each input indicate normalization from Filter A to Filter B, with any signal inserted into a Filter A input automatically being routed to the corresponding input on Filter B unless the normalization is broken by the insertion of a separate Audio or Control Voltage signal for Filter B.

As an added performance feature, the Series/Parallel switch changes the input of Filter B between its Audio Input jack and the output of Filter A. The Filter A output routed to the Series/Parallel switch is selected via the rear 3-pin header. (For maximum available bandwidth, we recommend using the Lowpass output, and ship our units in this configuration by default.)

4. Patch Ideas

"Simple Stereo"
Set "B Offset" to 12 O'Clock and set the switch to Parallel. Patch the Left component of a stereo sound to Input A, and the Right component to Input B. The Marsupial will now operate as a resonant stereo filter with Lowpass and Bandpass outputs.

"Pinged Voice"
Patch a trigger input into Audio Input A and set switch to Series. Adjust the resonance so that it produces a "tail" with decay on a Filter A's LP output, then patch a CV such as envelope or LFO to Filter B's CV input. Adjust B Offset and the CV B attenuator to filter and create sympathetic resonance of the pinged Filter A. (Bonus: patch an LFO or VCO input into Filter A CV input to FM your pinged voice. Sounds great!)

"Intelligent Filtering"

Patch a mono audio input to Input A, set switch to Series, and take audio from Filter B's Lowpass or Bandpass outputs. Set B Offset towards the CW side and patch an envelope into the CV A input. Set the CV A attenuator to the positive side and set the CV B attenuator correspondingly negative, with nothing patched into this input. This will simultaneously "open" Filter A and "close" Filter B, creating interesting timbres as the distance between each filter cutoff changes.

"Complex Oscillator?!"

Set switch to Parallel and Resonance to Full CW. Patch LP A output to CV In B and LP B output to CV In A. Adjust attenuators and B Offset to create cross-modulation between the two filters, then control the "oscillator" with the Global Cutoff knob and 1V/Oct A input.

These are but four patch ideas, and a thorough exploration of the Marsupial can surely yield many more.