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**JAX CHROMATIC
SERIES**

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The JAX Chromatic Series is a collection of advanced mastering audio processors, which are built on the unique concept of using a number of chromatically adjusted bandpass filters - a parallel filter bank - where the complete audio mix is passed thru and 32 attached audio processors perform specialized tasks, each one on a single frequency band.

We intentionally used a more musically senseful mapping for the analog modelled bandpass filter bank, rather than the bark filter concept, because we are not that convinced by the “critical frequency” concept behind the bark filter, which seems to be somewhat “artificial” to us.

Our bandpass filters are therefore tuned with concrete octave divisions, that directly correspond to the musical frequency range. So our 32 bandpass filter bank for instance, has an octave division of 3, meaning each of the bands covers an equally spaced range of approximately 4 half tones in the musical scale of the complete MIDI note range across the total spectrum. But these frequency bands are not sharp like for instance with FFT filters, the bands are fading into each other naturally with a variable slope. There is virtually no latency applied with this approach.

32 parallel processing filters and 32 audio processors usually need allot of CPU performance. We did our best to optimize this. So we used excessively the floating point vector instruction set on all supported platforms to realize this concept, keeping the CPU hit at reasonable levels on all, especially the mobile platforms.

These audio units are available as truly “universal” releases for all Apple systems, including macOS Catalyst (for Intel based systems), macOS Apple Silicon (ARM64/M1/M2 based systems), iPadOS and iOS (iPhones). The macOS Catalyst versions may be

sold and distributed separately, the Apple Silicon versions are usually available (packaged) with an universal iOS purchase.

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JAX CHROMATIC

Spectral Compander

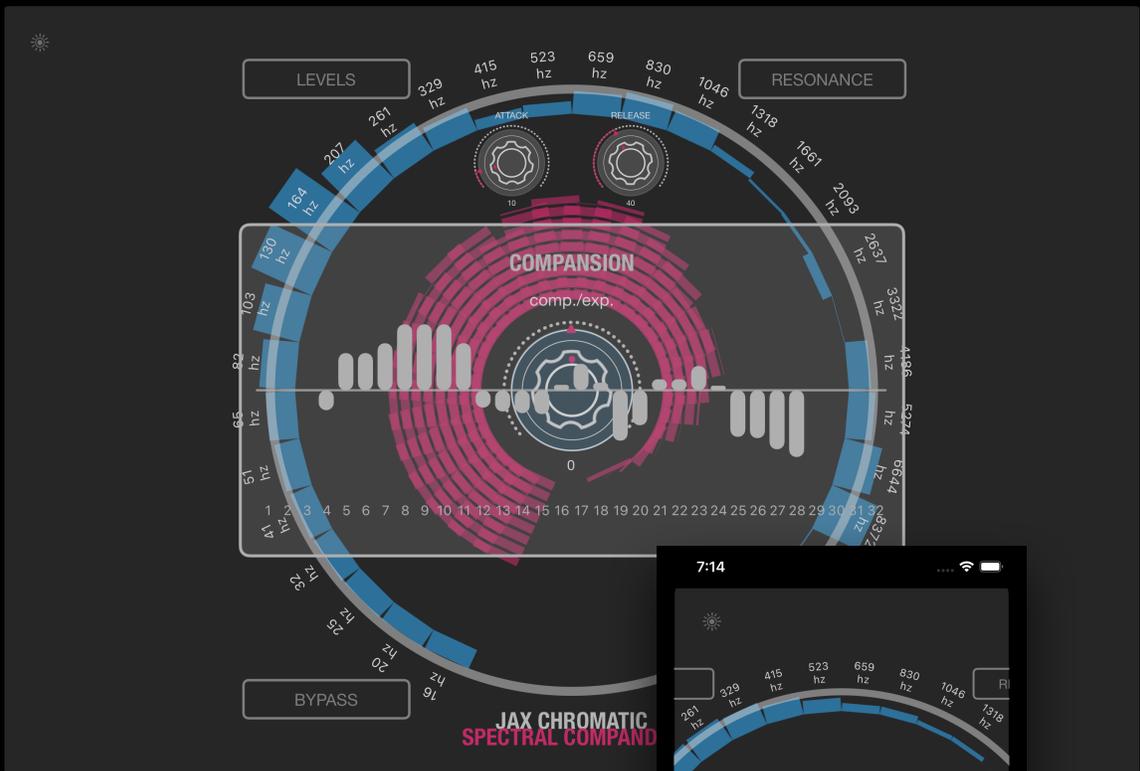
The JAX Chromatic Compander is a highly specialized spectral dynamics processor, which has a bi-directional main parameter for doing compression or expansion with a single knob.

It also can be called a “spectral enhancer” and is well suited for removing “mud” from the audio material, achieving more presence, loudness and clearness.

The direction of each band dynamics can be adjusted individually with the “**compansion**” (bi-directional) slider panel, while the main knob is the global intensity adjustment parameter (also bi-directional), which applies to all bands at same time (uniformly).

Negative adjustment performs expansion, positive adjustment performs compression of the selected frequency bands or the entire frequency range.

This allows efficient and fast dynamics adjustment of the audio material with concentration to the sound.



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Above the compander panel are 2 additional knobs for adjusting attack and release time of the 32 dynamics processors. These two values apply to all compressors uniformly.

There are 2 special slider panels for adjusting the bandpass filters directly. “**Levels**” (unidirectional) will adjust the gain of each frequency band and “**Resonance**” will adjust the filter peak response of each band. Bands can be muted completely by tweaking the slider for the band levels to zero. This is slightly different than using a usual octave band equalizer.

The entire processing engine (including the graphics update) can be suspended with the global “**Bypass**” parameter.

As you may note, our CHROMATIC series processors do not introduce any latency to the audio stream, as it would happen with FFT processors. So these are well suited for realtime recording, automation and mastering.

~~All CHROMATIC series processors have an inbuilt brick-wall limiter at the output for preventing the signal exceeding the 0 db mark. Especially higher “**resonance**” levels can boost the audio signal extremely.~~

The CHROMATIC Series processors may require an additional peak limiter at their output and some adjustment at the input, as the mixture of 32 dynamic frequency bands may exceed the 0db mark with more extreme positions and in dependence of the used audio material. An integrated peak limiter often will confuse the adjustment and the final result when extreme adjustments are made, so we removed the integrated limiter device.

With all the CHROMATIC Series processors an independent management of presets is now implemented. All preset files are based on Apples standard *.plist format, a human readable and editable XML standard file format. These preset files are x-

compatible and can be exchanged across all supported platforms.

There is now also direct MIDI controller support available. The global parameters kProcess, kAttack, kRelease can be assigned to the controllers 6, 73 and 72, which closely conforms to the YAMAHA XG / Roland GS Standard, extensions to the General MIDI Standard.

All parameters of the JAX CHROMATIC Compander are exposed to the host application and grouped. So the users also may even assign MIDI controllers to any of the 96 single band parameters for special purposes of parameter automation if the host application supports that.

Parameter Reference

Bypass (kBypass) :

This is a global parameter and allows to suspend the internal rendering. The audio stream will be passed through unchanged and the graphics update will freeze.

Note: This parameter is not saved with a preset.

Compansion (kProcess) :

This is the amount of compression / expansion applied to the 32 frequency bands. It very much works in conjunction with the bipolar compansion panel of 32 discrete values. It applies to all bands uniformly as a kind of intensity parameter. This parameter is global.

The compansion parameter can be assigned to MIDI controller 6 (hex 0x06) - Data Entry.

Dynamics Attack (kAttack) :

This global parameter adjusts the compressor's attack time uniformly across all bands. Attack describes, how fast the internal envelope followers react to level increases.

The attack parameter can be assigned to the MIDI controller value 73 (hex 0x49) - Attack Time

Dynamics Release (kRelease) :

This global parameter adjusts the compressor's release time uniformly across all bands. Release describes, how fast the level current modification is held by the internal envelope followers.

The release parameter can be assigned to the MIDI controller value 72 (hex 0x48) - Release Time

Dynamics Panel (kCompansion1-32) :

On the dynamics panel all the 32 compansion values can be adjusted by drawing a curve with the fingers or mouse. These values are bi-directional. Negative values (down) mean expansion, positive values (up) mean compression.

There are also the 2 global parameter for attack and release time above the sliders, which are described above.

Levels Panel (kLevels1-32) :

With the levels panel the output gain of each of the 32 filter bands can be adjusted. Center position is the normal position. Values above will boost, values below will cut the selected frequency band. Zero position will mute the band effectively. This parameter is uni-directional and can be drawn with the fingers or mouse.

Resonance Panel (kResonance1-32) :

On the resonance panel all 32 bandpass filters can be adjusted with their peak response behaviour. High resonance will usually emphasize the selected frequency and result in an oscillating „ringing“ effect with higher frequencies. This parameter is uni-directional and can be drawn with the finger or mouse.

If you have questions or remarks to our products, please feel free to contact us: support@digitster.com