MANUAL

[JAX : WALKING ON A RAINBOW]
- MUSICAL SPECTRUM ANALYZER -

Universal AudioUnit (AUv3)
for iOS and all Apple silicon platforms

JAX
WE ARE FRONTIERS.
You are welcome to join us.

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MANUAL

JAX

FRONTIER SERIES

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exclusive release song:

WALKING ON A RAINBOW

powered by JAX photones engine

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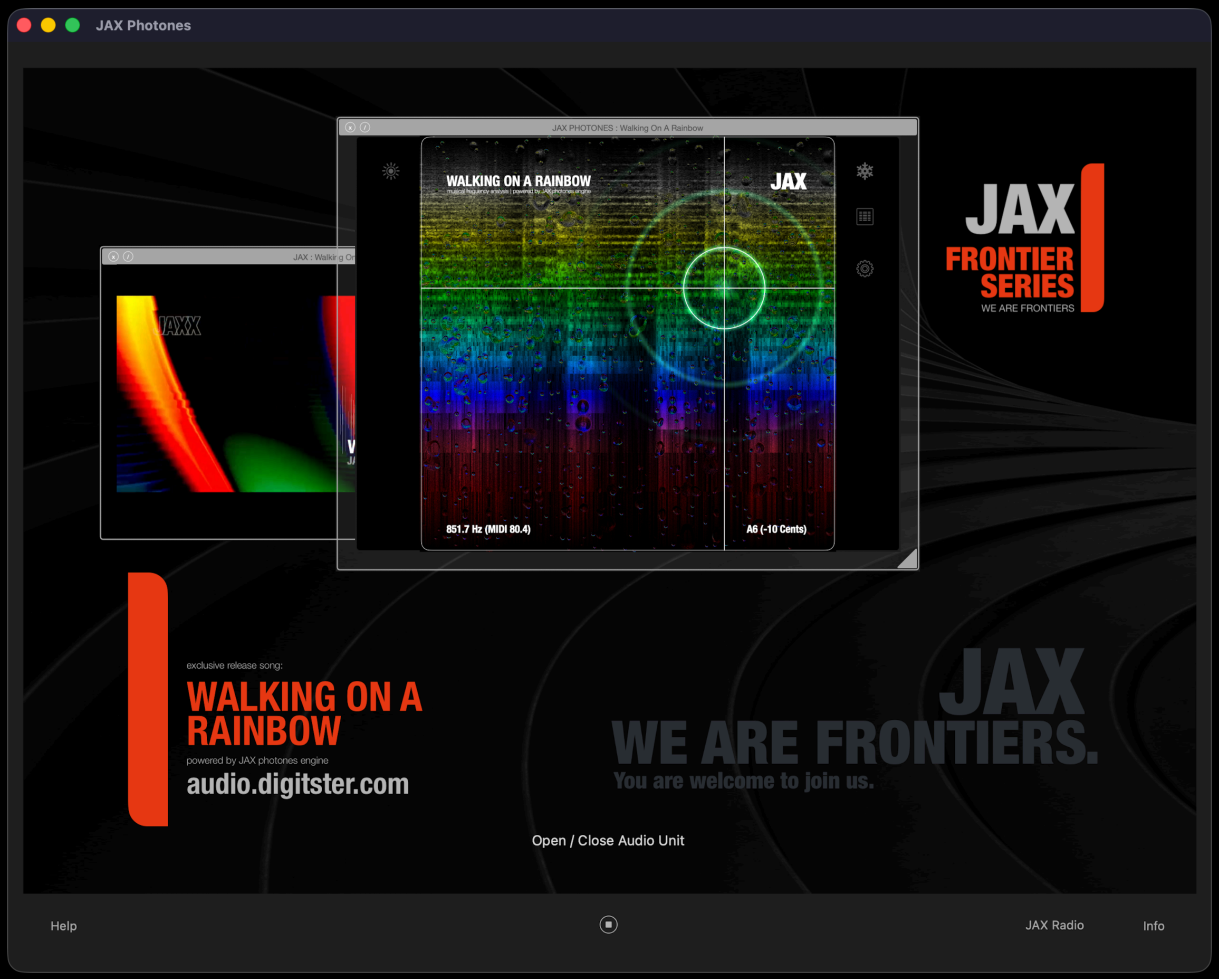

We have harnessed Apple's cutting-edge hardware and programming frameworks to create an Audio Unit that is truly unparalleled. From floating-point vector registers and Metal Performance Shaders to shared memory between the Audio DSP kernel and the GPU...

However—since all of this might sound a bit too technical — we didn't simply use these technologies as a means to an end; instead, we wrapped them in a musically meaningful and beautiful concept.

JAX 'Walking On A Rainbow' - rather a concept - is our answer to classic frequency analysis tools—featuring a consistently musical implementation designed for real-time processing, imbued with a certain imaginative charm.

INTRODUCTION

Audio frequency analysis based on the FFT (Fast Fourier Transform) has a long tradition in music production. However, in most cases, the information provided by conventional analysis tools is neither particularly musical nor intuitive. Sometimes, they even obscure all musically relevant information, displaying instead useless frequency curves that only roughly reflect how we actually hear.

Moreover, the FFT is a complex mathematical process—comparable to a statistical analysis—that invariably introduces a certain amount of latency. It requires the availability of a specific data set, meaning the length of the analyzed audio block must meet a certain minimum duration to yield detailed frequency information—particularly within the audible range and the bass frequencies. Furthermore, so-called waterfall plots often demand significant CPU power to ensure a fluid visual display. The resulting latency frequently leads to a temporal discrepancy between the visual representation and the actual acoustic listening experience.

We have refined our analysis methods through highly performance-optimized floating-point vector calculations and developed a specialized algorithm for chromatic group analysis. This algorithm optimizes the analysis results, rendering them immediately and practically usable for musical purposes.

To achieve this, we leverage the GPU via Apple's modern "Metal" shader frameworks, rendering the analysis results directly into the frame buffers of the primary graphics device. The memory management between the AudioUnit kernel and the Metal GPU is designed to ensure optimal quality and performance. This offloads the CPU, leaving it fully available once again for performance-intensive audio processing tasks.

"JAX Walking On A Rainbow" is our answer to the demand for a truly musical frequency analysis—complete with an appealing visual design. The tool enables you to instantly familiarize yourself with your audio material and watch melodies visually float across your screen.

W.T.F… IS AN ‚AUDIOUNIT' ?

If you are new to the world of music production software, you might wonder how to open and use "JAX Walking On A Rainbow".

This software is not designed to be run as a standard standalone application, loading songs directly. Instead, it is an "AudioUnit Extension" (specifically, an Apple framework AUv3 plugin). You can think of it as a specialized piece of high-end equipment that needs to be installed inside a modern virtual kitchen — a so-called "Host Application."

To experience the musical frequency analysis and the fluid 60-FPS visual design, you must load the plugin inside a compatible audio host application, installed on your device.

POPULAR COMPATIBLE HOSTS INCLUDE (i.e.):

- AUM (The ultimate audio routing centerpiece)
- Steinberg Cubasis (Complete mobile music production studios)
- Logic Pro or Cubase (Professional desktop and tablet DAWs)

GETTING STARTED IN 5 SIMPLE STEPS:

1. Download and install the plugin from the App Store.
2. Open your preferred audio host application (e.g., AUM or GarageBand).
3. Create an audio track or instrument channel where your music is playing.
4. Look for the effects routing section, usually labeled "Audio Unit Extensions" or "AUv3."
5. Select "JAX Walking On A Rainbow" from the list.

The plugin window will immediately open inside your host application. Your audio data will now flow seamlessly into our optimized vector engine via shared memory, and the melodies will start floating across your screen in perfect real-time synchronization.

MANIFESTO

WE ARE FRONTIERS.

For nearly six years, we have traversed the landscape of the App Store, mapping the digital wilderness of mobile audio. We have watched the scene evolve, but we have also watched it lose its way. The market has become saturated with the sterile, the mathematical, and the absurd — an endless parade of noise generators that celebrate chaos but forget the soul. Algorithms have grown colder and marketing driven, screens have become filled with useless statistical curves, and the deep, primal emotional connection to what we create has been buried under a mountain of digital dust.

We say: Enough!

"We are Frontiers" is our line in the sand. It is a deliberate turning away from the meaningless noise and a passionate return to what truly matters: pure sound, timeless harmony, and above all — beautiful MUSIC.

When you open this plugin, you are not looking at a mere statistical calculator. You are looking at a living, breathing multimedia experience. Our unique integration of pure vDSP vector power and raw Metal GPU compute processing is designed with a single, uncompromising goal: to make the invisible visible. To let your melodies breathe, float, and flow across the glass of your screen like raindrops reflecting the light of a new dawn — while leaving your system fully unburdened to do what it was meant to do: CREATE.

We do not just build software. We explore new horizons. We create art to help you create art.

Welcome to the borderlands of sound. Welcome to the frontiers.

YOU CAN BE FRONTIER TOO.

PARAMETERS

All our AudioUnits come with an integrated parametric user interface. These parameters can be edited and automated with host applications. The JAX Walking On A Rainbow parameters have following structure:

Common:

kDisplayContrast,
Traditionally all of our AudioUnit interfaces have a ‚contrast feature'. This was even available long before Apple has introduced ‚dark mode'. With this mode you can continuously adjust screen contrast up to total inversion. It is even active now for all Metal shaders.

kBypass,
This Parameter allows to bypass the internal audio processing by direct automation for instance.

kDryWet,
The global mix parameter between input and processed audio stream is implemented into all of our plugins, if appropriate.

kGainIn,

The input gain is adjustable separately and also can be automated. This will be applied before any DSP becomes active on the audio stream.

kGainOut,
The input gain is adjustable separately and also can be automated. It is the final stage and even comes after the final limiter.

kFinalLimiter,
An automatic final limiter is switchable on or off, i.e. to prevent unacceptable signal bursts, that may be caused by adjusting parameters inside the signal flow.

kMIDIOut,
Some plugins have an integrated YX MIDI Pad and the output of MIDI controller data can be switched on or off here.

Specific:

kRainbowSpeed,
The speed of the waterfall flow can be adjusted to some extent.

kRainbowIntensity,
The visual intensity of the waterfall is adjustable to some extent.

kRainbowMagnifier,
With the magnifier Mode the rain drops on the display will be removed, unleashing a magnifier lens.

kRainbowMagnifierSize,
The size of the magnifier lens in the magnifier mode can be adjusted.

kRainbowMagnifierX,
The x screen position of the magnifier lens in magnifier mode can be automated.

kRainbowMagnifierY,
The y screen position of the magnifier lens in magnifier mode can be automated.

kRainbowMagnifierZoom,
The content of the magnifier lens in magnifier mode can be adjusted.

kRainbowProcessingMode,
This parameter selects the input signal, which is either stereo mix, left channel, right channel, mid or side. Note that side mode can become very light, as it is the correlation signal, which is completely absent in pure mono audio.

MIDI IMPLEMENTATION

Our AudioUnits are configured with MIDI support. Plugins with parametric interfaces do have an internally routed MIDI implementation. You can assign MIDI Controllers to most of the main parameters by sliding the numbers of the controller to a controller number you want. If the unit receives MIDI messages from the host, the parameters will be automated with this.

If there is also an XY control pad implemented into the plugin, the controllers directly will correspond to the numbers you edit here.

Example : If you assign MIDI controller Nr. 10 (pan) to ‚Output Pan‘ and MIDI controller Nr. 7 (volume) to ‚Output Gain‘ of the plugin inside the parametric editor, you also may assign the same controllers to the YX Pad and this way everything is automated with MIDI controllers internally. Please note that MIDI controllers have traditionally a limited 7bit resolution.

Please note, that not all parameters may make sense to be automated at all. MIDI Controllers also can be sent out, if the host application supports it.

THE SONG(S)

We are musicians at very first. There is not much sense in releasing generative noise tools at masses that do not even have any musical aspect as seen currently flooding the market.

So we will release a unique song with each AudioUnit. The song ‚Walking On A Rainbow' was written for JAX. Feel free to take a listen to our complete song list at https://audio.digitster.com/music .

With the latest update we added 2 more song versions to the app, which can be listened to one after another by repeatedly pressing the play button or just letting playing everything in a loop.

SONG TEXT

‚Open your mind and you'll find it's like magic.

When you take a step.

Oh

I'm walking on a rainbow.

Walking on a rainbow.'

CREDITS & ACKNOWLEDGEMENT

To match the sonic beauty of our Multi-Resolution Phase Vocoder core, we wanted a visual experience that feels organic and alive and also expresses the character of our ‚Walking On A Rainbow' concept and songs.

The stunning, shifting rain droplets that mirror and refract the real-time rendered waterfall spectrum are a tribute to the legendary GLSL shader art of **Martijn Steinrucken** (BigWings / The Art of Code).

By porting his brilliant mathematical concept entirely into native Metal, we achieved this breathtaking cinematic look with virtually zero CPU overhead. It is completely rendered in the fragment

shader of the GPU, while our FFT waterfall is calculated and rendered synchronously in a synchronized compute shader.

SUPPORT

If you have questions or new ideas, please contact us via mailto:support@digitster.com .