

USER MANUAL

_JUN-6 V

ARTURIA

_The sound explorers

Special Thanks

DIRECTION

Frédéric Brun Kevin Molcard

DEVELOPMENT

Raynald Dantigny	Samuel Limier	Timothée Behety	Antoine Moreau
Kevin Arcas	Corentin Comte	Mathieu Nocenti	Markus Bollinger
Rasmus Kurstein	Marie Pauli	Simon Conan	
Alexandre Adam	Pierre-Lin Laneyrie	Loris De Marco	
Yann Burrer	Baptiste Aubry	Cyril Lepinette	

DESIGN

Edouard Madeuf	Florian Rameau	Baptiste Le Goff
Morgan Perrier	Shaun Ellwood	

SOUND DESIGN

Jean-Michel Blanchet	Lily Jordy	SolidTrax	Thomas Koot
Maxime Audfray	Simon Gallifet	Sonar Traffic	

QUALITY ASSURANCE

Maxime Audfray	Florian Marin	Benjamin Renard
Thomas Barbier	Aurélien Mortha	Christophe Tessa

BETA TESTING

Dan Tinen	Gustavo Bravetti	Guillaume Hernandez	Andrew Henderson
Terry Marsden	Chuck Zwicky	Pagnier	Dwight Davies
Marco Correia	Peter Tomlinson	Fernando Manuel	Angel Alvarado
Gary Morgan	David Harman	Rodrigues	Paolo Negri

USER MANUAL

Roger Lyons (writer)	Jimmy Michon	Gala Khalife-Andrade	Jose Rendon
Fernando Manuel	Florence Bury	Minoru Koike	Holger Steinbrink
Rodrigues (writer)	Camille Dalemans	Vincent Le Hen	Jack Van

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26 avenue Jean Kuntzmann
38330 Montbonnot-Saint-Martin
FRANCE
www.arturia.com

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Thank you for purchasing Arturia's Jun-6 V!

This manual covers the features and operation of the Jun-6 V.

Be sure to register your software as soon as possible! When you purchased Jun-6 V you were sent a serial number and an unlock code by e-mail. These are required during the on-line registration process.

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications or features without notice or obligation.

IMPORTANT:

The software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

Introduction

Congratulations on your purchase of Arturia's Jun-6 V

Since the late 1990s, Arturia has received acclaim from players and reviewers alike for designing state-of-the-art software emulations of the venerable analog synthesizers from the 1960s to the 1980s. From the [Modular V](#), back in 2004, to Origin, a modular system introduced in 2010, to the [Matrix 12 V](#) (2015), the [Synclavier V](#) (2016), followed by the [CMI V](#) and the [DX7 V](#) (2017) and, last but not the least, [Pigments](#), our first original software synthesizer, Arturia's passion for synthesizers and sonic purity has given demanding musicians the best software instruments for professional audio production.

Recently, Arturia launched its latest emulation, this time covering one of the most celebrated polysynths of the pre-MIDI era. This was the [Arturia OP-Xa V](#).

With the launch of a new version of the V (Vintage) Collection, Arturia consolidates its position as a leader in the field of modeled vintage instruments software.

The ARTURIA Jun-6 V is one of the new instrument emulations included in the current version of our acclaimed bundle, and it benefits from more than twenty years of experience in recreating the most iconic tools of the past.

ARTURIA has a passion for excellence and accuracy. This has led us to conduct an extensive analysis of every aspect of one of the most famous and iconic synthesizers of the eighties. It was also a synth which definitely marked that era and has lately achieved 'vintage' status, with prices rising up in the second-hand market. We have carefully studied and reproduced the behavior of its electrical circuits and modules. We have also added many features, some even unimaginable in the days that unit was first launched.

Jun-6 V runs as a stand-alone virtual instrument, as well as a plug-in in all major formats inside your DAW. It has an easy MIDI learn functionality for hands-on control of most parameters, and as a plug-in also allows parameter automation for greater creative control.

DISCLAIMER: All manufacturer and product names mentioned in this manual are trademarks of their respective owners, which are in no way associated or affiliated with Arturia. The trademarks of other manufacturers mentioned are used solely to identify the products of those manufacturers whose features and sound were studied during Jun-6 V development. All names of equipment inventors and manufacturers have been included for illustrative and educational purposes only and do not suggest any affiliation or endorsement of Jun-6 V by any equipment inventor or manufacturer.

The Arturia team

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1. WELCOME TO JUNO-6 V

1.1. What is the Juno-6?

In 1982, the Juno-6 - a relatively cheap single oscillator synth - was Roland's answer to the Korg Polysix, which dominated the lower-end segment of the market at the time. After launching the high-end Jupiter-8, Roland felt the need to fill the gap for that segment. With a reduced but very clever set of features, a great built-in chorus unit that contributed to giving it a very big and fat sound (and stereo), the Juno-6 had everything to become a success.

1.2. Some historical facts

Back in 1981, Roland created one of the best analog polyphonic synthesizers that ever existed - the Jupiter-8. Already a major player in the synth world, the company had launched several synths since its foundation in 1972, including modular systems like the System-100m and System-700. These contributed to establishing Roland as one of the main contenders in the market for this new type of electronic musical instruments.

Roland's first polyphonic synthesizer was the Jupiter-4, but with the launch of the Jupiter-8, they firmly established their position as a leader in the polyphonic synth segment, directly competing with big names such as Moog, Sequential Circuits and Oberheim.

Yet, the Jupiter-8 was expensive - unaffordable for most musicians. That's where the Juno-6 came into play.



Greatly simplified when compared with the monster that was the Jupiter-8, the Juno-6 nevertheless offered six-voice polyphony for a fraction of the price of its flagship brother. Sure, it was simple, but that simplicity, based on a carefully selected set of features and a control panel which was beautiful, clear and well designed, invited musicians to also create their own sounds. In fact, the Juno-6 is one of the simplest synths ever built. Yet, it sounds great.

Much of this great sound is due to the presence of a gorgeous chorus unit. This chorus unit was so important and sounded so big that some jokingly describe the Juno-6 as a chorus unit with a synth attached.

Shortly after the launch of the Juno-6, Roland introduced the Juno-60, which was basically the same synth, with added memory slots for patch storage, and the new DCB port, which allowed interconnectivity with several devices. This DCB port, already present in the Jupiter-8 as well, served as the basis for the MIDI technology that would appear shortly after that. Roland played a big role in the definition of that standard.

As a matter of fact, the Juno-6/Juno-60 were the last synths Roland launched in the pre-MIDI era.

1.2.1. Whos' who of Juno users

Sure, the Juno does not have as extensive a list of famous users as other synths. After all, it was a lower-end synth. But still, there were some.

Madonna (the Juno-6 was featured in "Borderline", in 1983), A-Ha (they reportedly used a Juno-60 in the smash hit "Take On Me", layered with a DX7), Enya (featured in "Caribbean Blue"), Duran Duran (featured in "Save a Prayer"), The Cure, Sean Lennon, Faithless, Astral Projection, Vince Clarke, Men At Work, Flock of Seagulls, Eurythmics, Mr. Fingers (featured in "Can You Tell It"), Niels Frahm... these are some of the big names who used the Juno-6/ Juno-60.

More recently, we can mention the British band Metronomy. It is also used by many producers pretty much worldwide.

1.3. Does a Juno emulation still make sense?

The original Juno was the polyphonic synth for the masses. Very easy to program and operate, great-sounding and relatively cheap, it immediately conquered its place. And it has been gaining vintage status lately.

The Jun-6 V preserves the best qualities of the Juno, like the immediacy and convenience of programming, and the great sound. Arturia's goal was to create a synthesizer that everyone would feel compelled to program and be comfortable creating their own sounds with.



The advantages of a software version of the Juno over its hardware counterpart are considerable. For example:

- It's much cheaper than its hardware counterpart (which is still a very sought-after synth, with prices rising);
- You can use as many instances as you wish;
- The instrument has been modernized and supplemented with some welcome features, such as expanded polyphony (up to 36 voices), unison, a second envelope and LFO, velocity sensitivity, aftertouch, etc.;
- You can use MIDI to control and automate several parameters. Actually, you can use MIDI to play it, something you cannot do with the original.
- You will still have a very simple and great-sounding synth;
- Due to its immediacy and simplicity, it is a great tool to start learning synthesis;

1.4. Arturia's Jun-6 V

That's why we, at Arturia, believe that a Juno emulation still makes sense. We felt truly compelled to create the Jun-6 V. Of course, being an Arturia product, it wasn't enough to simply model the original hardware. As usual, we pushed it further, adding some tasteful new features that honor the original while making it more useful in a modern context.



For example, you have two extra effect processors - a Delay and a Reverb. Together with the luscious chorus, they contribute to creating a really big sound. You also have an extra envelope. This was a feature that was very much missed in the original Juno. This second envelope can be assigned to the VCA, leaving Envelope 1 free to modulate the filter. This way, you can have a filter contour that is independent of the volume contour, which is really important on countless occasions.

You also have a second LFO. LFOs are very important modulation sources, and we can never have enough of them. Yet the original hardware unit was restricted to just one, limited to a single waveform at that. Here, you have a second one, enriched with a choice of six waveforms.

These two extra modulation sources can also process several other parameters. Courtesy of mini modulation matrices, you have two extra freely assignable destinations for each of the two modulators. Besides that, the second Envelope Generator is also hard-wired to the VCA, where it is one of the choices.

There are also assignable slots for the Mod Wheel, Velocity and Aftertouch. Last but not least, the oscillators can be calibrated to emulate different aging stages (from Good to Poor), and you have a Chord player, which allows to play chords with a single note.

We hope you are as excited about this great instrument as we are. Now, it's time to play it and get some sound. Let's go!

2. ACTIVATION AND FIRST START

2.1. System Requirements

The Arturia Jun-6 V plug-in works on computers equipped with Win 8+ and macOS 10.13+.

You can use the Jun-6 V as an AAX, Audio Unit, VST2 or VST3 plug-in (64-bit only).



2.2. Activate the Arturia Jun-6 V license

Once the software has been installed, the next step should be to activate your license, so that you can use it without limitations.

This is a simple process which involves a different software program: the Arturia Software Center.

2.2.1. The Arturia Software Center (ASC)

If you have not already installed the ASC, go to this web page: [Arturia Downloads & Manuals](#)

Look for the Arturia Software Center at the top of the page, and then download the version of the installer that you need for your system (macOS or Windows).

Follow the installation instructions and then:

- Launch the Arturia Software Center (ASC)
- Log into your Arturia account
- Scroll down to the My Products section of the ASC
- Click the Activate button

That's all there is to it!

2.3. Jun-6 V as a plug-in

Jun-6 V comes in VST2, VST3, Audio Unit (AU) and AAX plug-in formats for use in all major DAW software such as Ableton Live, Cubase, Logic, Pro Tools, Studio One, REAPER, Bitwig Studio, and many more. When using Jun-6 V as a plug-in, all audio and MIDI device settings are handled by the host music software. Please refer to your host music software's documentation if you have any questions about loading or using plug-ins.

Note that when you load Jun-6 V as a plug-in instrument inside your host software, its interface and settings work the same way as in standalone mode, with a few small differences:

- Jun-6 V will synchronize to your DAW's host tempo/BPM rate where appropriate
- You can automate numerous parameters using your DAW's automation system
- You can use more than one instance of Jun-6 V in a DAW project (in standalone mode, you can only launch one instance of Jun-6 V)

- You can run the output of Jun-6 V through any additional audio effects available to your DAW such as delay, chorus, filters, etc.
- You can route Jun-6 V's audio outputs more creatively inside your DAW using the DAW's own audio routing system.

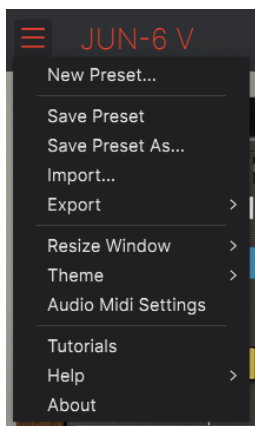
2.4. Initial setup for Standalone Use

If you would like to use Jun-6 V in standalone mode, you will need to set up your instrument and ensure that MIDI and audio signals are flowing properly through the software. You generally only need to do this one time unless you make major changes to your computer. The setup process is the same on both Windows and macOS computers.

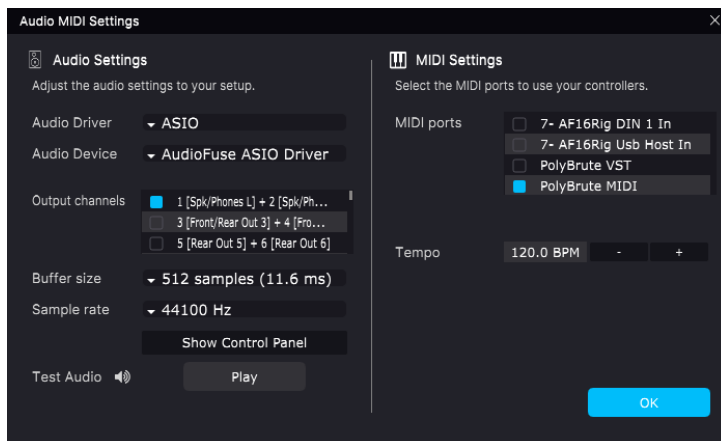
i ! This section only applies to readers that plan to use Jun-6 V in standalone mode. If you are only going to use Jun-6 V as a plug-in inside a DAW or other host music software, you can safely ignore this section.

2.4.1. Audio and MIDI settings

At the top left of Jun-6 V is a pull-down menu. Click it to reveal the following:



Select **Audio MIDI Settings** to bring up the following window. (This option will not be available on this menu when using Jun-6 V as a plug-in.)



The **Audio Settings** section, on the left side of the window, contains the following settings:

- **Audio Driver** selects which audio driver will handle playback of Jun-6 V. This can be your computer's internal driver, or an external soundcard driver.

i On macOS devices, including external audio interfaces, use the built-in CoreAudio driver. The device can be selected from the second menu.

- **Audio Device** shows the name of your hardware interface, selected from a drop-down menu if you have more than one device connected to your computer.
- **Output Channels** lets you select which of the available device outputs will be used for playback. If your selected device only has one stereo output, then this setting will not appear. If your device has more than two outputs, you can select one or more here by checking the appropriate boxes.
- **Buffer Size** menu lets you select the size of the audio buffer your computer uses to calculate sound.

i If your computer is an older, slower model, or you're running a lot of CPU-heavy software, set a larger buffer size to lighten the CPU load. Be aware that this could result in significant *latency*: a time delay between pressing a key and hearing a sound, which can be problematic while performing. (The latency is shown in parentheses next to the buffer size setting.) If you have a relatively new and fast computer, you can use a much smaller buffer size to reduce latency. If you start to hear clicks, pops, or interruptions in your audio, then you should increase the buffer size a bit, and play with it until you have the smallest buffer that gives you click-free sound.

- **Sample Rate** menu lets you set the sample rate at which audio is sent out of the instrument. The options listed here will depend on the capability of your audio interface hardware.



♪ Virtually all audio hardware can operate at 44.1 or 48 kHz, which is perfectly fine for most applications, including Jun-6 V. Higher sample rates place greater loads on the CPU, so we recommend staying at 44.1 or 48 kHz unless you have a specific reason to work at high sample rates.

- **Show Control Panel** button will jump to the system control panel for whatever audio device is selected.



♪ Note that this button is only available in the Windows version. On the rare occasions when device control be needed in macOS and the interface maker has not provided a control panel app, you can work with your output device in the Audio MIDI Setup utility that comes with every Mac.

- **Play Test Tone** plays a simple test tone to help you troubleshoot audio issues. You can use this feature to confirm that the instrument is routed correctly through your audio interface and audio is playing back where you expect to hear it (your speakers or headphones, for example).

The **MIDI Settings** section, on the right side of the window, has the following options:

- Your connected MIDI devices will appear in the **MIDI Ports** menu. (Note that this menu is only displayed if at least one MIDI device is connected to your computer.) There will be a check box beside each connected MIDI device. You can use as many as you like to control Jun-6 V – simply click the check boxes for each device you want to use. (In the screenshot above, a keyboard and separate control surface are being used to control Jun-6 V together.)
- **Tempo** sets the tempo of the Jun-6 V arpeggiator and other clocked parameters like LFO rates. When using Jun-6 V inside a host music software as a plug-in, the instrument gets tempo information from your host software.

2.5. Taking Jun-6 V for a Test Drive

Now that you have Jun-6 V up and running, let's take it for a quick test drive!

If you haven't done so already, launch Jun-6 V as a plug-in or as a standalone instrument. If you have a MIDI controller set up, use it to play some notes on Jun-6 V.

The up and down arrows next to the patch name in the Upper Toolbar let you step through all of Jun-6 V's available Presets. Try playing a few, and when you find one that you like, try adjusting some of the other on-screen controls to see how they affect the sound.

You don't have to worry about playing around with any of the controls – nothing you do will be saved unless you specifically save a Preset (we'll get to that later), so there is no chance of messing up any of Jun-6 V's factory Presets.

Now you're ready to dive in and start learning your way around Jun-6 V. The rest of this User Manual will help you work your way through all of the Jun-6 V features. You'll be creating and playing amazing sounds in no time!

3. JUN-6 V OVERVIEW

3.1. What can you do with Jun-6 V?

3.1.1. The original Juno's limitations

The Juno-6 was a very simple synth, intended as a polyphonic synth for the masses. The original manufacturers cut corners wherever they could, yet the final product was still a great-sounding synth. Despite its deceptively simple appearance, it is capable of great string sounds, great brass sounds, powerful basses and leads, amazing pads, and even some very convincing percussion sounds and special synthesizer sound effects.

Even more amazing: all that is achieved with a single oscillator! Indeed, the Juno only has a single analog oscillator (digitally controlled), though it is capable of summing several waveforms to create a fatter and more varied sound. By adding a variable pulse (controllable manually or automated through the envelope or the LFO) and a very bright saw, you can already produce many sounds. You can also add to this a sub-oscillator (square wave) pitched one octave lower, and an independent noise source (white noise).

The sub-oscillator and the noise source have their own volume control fader, which means you can control their volumes independently.

The multiple sound sources are then sent through the filter section. This section has two filters, as was already the case for the Jupiter-8. First, there is a -24 dB resonant Low-Pass Filter, followed by a -6 dB High-Pass Filter (although the control panel may suggest otherwise). The LPF wasn't exactly the same as that of the Jupiter-8 (whose Low-Pass filter was capable of switching between -12 dB and -24 dB per octave, for example), but it was based on the same chip, so it is a very powerful and high-quality filter as well.

The Low-Pass Filter is resonant up to self-oscillation, and may be controlled by key-follow, envelope (both positively and negatively) and LFO. All these controls may be active simultaneously, and each has its own fader to control the modulation intensity. Again, this is a detail which gives a lot of versatility to the sound.

Finally, the VCA may be controlled through a Gate triggered by the keyboard (which means that the sound will be On as soon as a key is pressed, and Off as soon as it is released) or through the Envelope Generator.

As far as controls are concerned, you only have one LFO and one Envelope Generator. This is maybe the biggest limitation. The synthesizer also features a very simple but very effective arpeggiator, with a range of up to three octaves, and configurable between Up, Down or Up and Down. Arpeggio rate is variable.

Last but not the least, Roland introduced an effect in the synth for the first time: a gorgeous Chorus unit, with three possible settings (I, II and I + II). This chorus unit is mostly responsible for the fat and huge sound the synth is capable of. It also masked the fact that the synth only had one oscillator, because the chorus gives it a sound depth and stereo image which create the illusion that it has much more. In fact, the chorus is so important for the sound that some jokingly said the Juno is a chorus unit with a synth attached.



To sum it up, despite its simple appearance and reduced set of features (when compared to other polyphonic synthesizers on the market, like the Prophet-5, the Oberheims and Juno's big brother Jupiter-8), the Juno was a great-sounding synth which offered a lot of 'bang for the buck'. It had everything to become popular, and so it did.

3.1.2. The Jun-6 V's main features

With the Jun-6 V, you will be able to use all the features that made the Juno-6 a great synth, and some more. As usual, Arturia expanded the options with some additions that, while preserving the simplicity and immediacy of the synthesizer, greatly expand its potential.

Sound generation rests upon an emulation of the same single DCO that was featured in the original. Although it was an analog oscillator, it was controlled digitally for the sake of stability and to prevent it from going out of pitch. That's why the Juno-6 was so stable, and great to use on stage. But besides that, it preserved all the qualities inherent to a real analog oscillator.

This DCO has two main waveforms. The first one is a variable pulse which can produce any waveform from a plain square to the narrower pulse waveform (without reaching silence). Pulse width can be changed manually, or dynamically modulated by the LFO or the Envelope. This means that the Jun-6 V has true Pulse Width Modulation (PWM) which, by the way, sounds beautiful and allows for great string and pad sounds.

Adding to this, you have a very bright saw waveform, which beautifully complements the variable pulse. These two waveforms can be summed to achieve a bigger sound (especially when the pulse waveform is being modulated).

But that's not all. You also have a sub-oscillator, which sounds an octave lower than the main oscillator, and produces a fixed square wave. This may be important, for example, to produce percussive sounds like kicks, add "oomph" to the basses, or create a pitch anchor when using sounds with self-oscillating resonance.

Finally, you have a white noise source, also independent. The sub-oscillator square and the noise have their own independent volume fader control.

These sound sources are then routed to the filter section, where the main -24 dB resonant Low-Pass Filter is placed before a -6 dB non-resonant High-Pass Filter. (This allowed Roland to put a single high-pass, instead of per voice filter, as on the Jupiter.) This filter is a great sounding one, capable of resonance up to self-oscillation, and greatly contributes to the overall sound. The original, although not the same filter as in the Jupiter-8 (that one was capable of -12 dB and -24 dB per octave cutoff), was also a very good sounding analog filter, and based on the same chip.

Finally, the Jun-6 V's main modulation sources, as is the case with the original, are an ADSR envelope (labeled ENV) and an LFO.



The envelope has very fast Attack and Decay segments which, when set to the zero position, produce an audible "click" that may be used very effectively in organ sounds, percussive sounds, pianos, etc.

The LFO produces a single triangle waveform and doesn't go very fast, but it works very well with the rest and is very good and effective when used as a modulation source for the filter or for PWM (Pulse Width Modulation).

The filter may be modulated by the envelope, the LFO and also by the keyboard position. The filter envelope modulation can even be inverted - another nice feature that adds more possibilities.

In the hardware, key-follow cannot be in tune for the entire keyboard. We simulate bad calibration with our voice dispersion, so if you are in setting 2 or 3 for the voice calibration, you will experience this out-of-tune key-follow. However, if you are in voice calibration setting 1, you will have the key-follow apply properly to the whole keyboard.

The VCA can be controlled by the same envelope or by a Gate, triggered by the keyboard. When set to Gate, the sound is triggered as soon as you press a key, and stops as soon as you release the key. This is another uncommon feature inherited from the modulars and which could help in some situations, since you only had one envelope in the original.

However, as we have said, the Jun-6 V has some added features that may override the original's limitations. The main ones are the addition of a second envelope and a second LFO (with several waveform choices).

It also has assignable destination slots for the Mod Wheel, Velocity, Aftertouch, and two modulation destinations for the second Envelope and the second LFO (besides the hardwired VCA destination for the envelope 2).

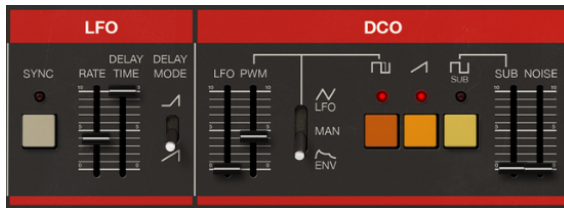
Finally, besides the original chorus, the Jun-6 V also features two additional effects: Delay and Reverb.

3.2. Getting hands-on with the Jun-6 V

3.2.1. Oscillator Basics

To get an idea of Jun-6 V's oscillator capabilities, we suggest you try the following:

- Open the Jun-6 V in standalone mode;
- If you haven't done it yet, define the Audio and MIDI settings to be able to work with the instrument. For more information about the Audio and MIDI Settings, please read the [entry \[p.8\]](#) in Chapter 2 of this manual;
- Load the "Default" preset;
- Play some notes with your MIDI keyboard. If everything was set up properly, you should hear a saw sound playing;
- Now click the saw button to turn it Off. Jun-6 V doesn't produce a sound anymore. Click the square/pulse button. This activates the variable pulse waveform. Since the pulse depth is at zero (the PWM fader is in the lowest position), you'll hear a square wave;
- PWM modulation is set to manual, so if you drag the fader up, you'll see the sound becoming "buzzier", "narrower", and more nasal. The higher the pulse, the more narrow and nasal the sound becomes. This is very effective for string-like sounds, for oboe-like, harpsichord-like, and also for pads, especially when coupled with filtering and resonance;
- Now let's experiment with PWM, using the LFO. Place the PWM fader at half (value 0.500). Now turn the PWM switch from manual to LFO. You'll hear a vibrato sound, caused by the LFO modulating the pulse value. You may drag the LFO rate down, to get a subtler modulation. 2.00 Hz may be a good value.



Jun-6 V LFO (Low Frequency Oscillator) and DCO (Digitally Controlled Oscillator)

- Now to make the sound a little heavier, you may add a small amount of low frequencies. This can be done with the sub-oscillator. Click the Sub button, and drag the fader up slowly, until you become satisfied with the results;
- To make the sound a little more "atmospheric", you may also add a small amount of noise. This may sound strange, but some noise added to pad-like sounds can produce wonderful sounds. Please try it to hear if the result pleases you.
- We haven't touched the envelope yet. This is a very important modulation resource, since the envelope may transform a sound completely, turning a string sound into a piano sound, for example. Right now, you are using a kind of neutral envelope contour which lets the sound pass basically unaltered. Let's transform this into a kind of string envelope with a little room reverb. First drag the Attack up to around 75 ms. Then, drag the Decay down to 0. Now, drag the Release up to around 300 ms (this gives a little "tail" to the sound);



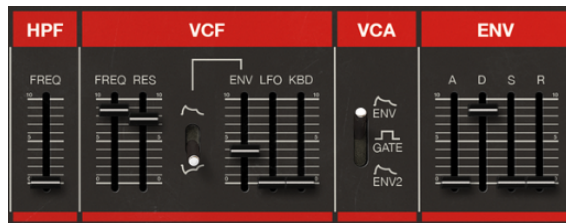
To manage a precise editing of the different values, you may use "Ctrl + Drag". This way, the values change more slowly, allowing you to reach the precise value you want.

- Now that we have a string-like envelope, and since our sound is somehow "atmospheric" (assuming you added some noise), let's make it more "pad"-like. Raise the Attack up to 300 ms. Raise the Decay up to the maximum value. Lower the Sustain to around middle position. Raise the Release up to around 700 ms. If you play a few notes, you'll notice a whispering atmospheric sound coming out. And we haven't yet touched the filter (nor the chorus);

3.2.2. Filter Basics

Now that you have experienced some of the capabilities of the oscillator section, it's time to move on to the filter section. This section of Jun-6 V is very good. Although the Low-Pass filter only has a -24 dB per octave configuration, it is a very good-sounding filter, with resonance up to self-oscillation. And the High-Pass filter, although with a roll-off of only 6 dB per octave and no modulation capabilities, is good to act as a kind of EQ filter in some situations.

- Let's keep going with the whispering sound. This sound is good to discover the capabilities of the Low-Pass filter. First, drag down the filter fader to around 750 Hz. The sound becomes mellower, and the "whispering" quality disappears;
- Now let's turn on the envelope modulation. This is a very important resource, since it allows the filter to act dynamically over time. Drag the envelope fader to around 0.350. The sound will regain some of its "whispering" quality, but this time with a softer feel;
- Experiment with the Resonance parameter. If you drag it up, you'll notice the sound becoming narrower, and the noisy part of the sound becoming more prominent. This is because the frequencies around the Cutoff point are increasing with the Resonance;
- Now add a little LFO modulation. Remember that the LFO doesn't start immediately, since we raised the Delay parameter. If you place the LFO modulation at around 0.100, a nicer vibrato effect will appear after a little while;



Jun-6 V Filter (both the High-Pass Filter and the Voltage Controlled Low-Pass Filter) and Envelope Generator

3.2.3. More Envelope Features

We have already seen the Oscillator and Filter sections. We have also seen the LFO and the Envelope in action. But there is more to the Envelope that we would like to cover here. Let's try something else:

- First, let's start with a completely different sound. Turn the Sub and the Noise all the way down. We will just keep the PWM part of the Oscillator;
- Now, change the PWM modulation from the LFO to the Envelope. The Envelope contour will now also control the PWM depth;
- In the filter section, drag the LFO fader modulation down to 0. The sound is now static, though it still has the pad-like character. This is because we haven't touched the Envelope contour yet. That's what we will do next, to get a sound more like a harpsichord;
- Drag the Attack down to 0. Place the Decay at around 10.000 s. Sustain will also be dragged down to 0. Release will be placed at around 40 ms, to try to mimic the noise of the key releasing;
- Now, you have to tweak the filter a little. Drag the Cutoff value to around 1000 Hz. Resonance should be at around 4.80. Now, to give it the final touch, loom for the best filter Envelope modulation setting. We chose 0.370;
- Play a few notes, You'll hear what's called an Analog Synth Harpsichord. But we're not finished yet. It's time to experience the power of an inverted Envelope modulation;
- Drag the Envelope polarity switch down (to the position with an inverted envelope picture). You'll hear basically no sound. Drag the Release fader to 0;
- Now drag the filter to around 23500 Hz and the Resonance value to around 7.50. Now, you have a sound with an EP-like Attack, followed by a filter sweep. You may try to add the Saw wave to beef up the sound a little. This is just an example of the transformation power that an inverted modulation has over the sound;
- You may now try different Envelope modulation values, and also check the keyboard position modulation. Both have a very noticeable effect on the sound. Play at will with these two until you find something that interests you;

3.2.4. Chorus and Arpeggiator

Let's move on to the Chorus and the Arpeggiator:

- We will start with a completely different sound. Turn the Sub and the Noise all the way down. We will just keep the PWM part of the Oscillator;
- Now click the On button of the Arpeggiator. Change the mode to Up & Down and the Range to two octaves. Play a chord. You'll start to hear a relatively fast arpeggio playing up and down;



Jun-6 V Hold button, the new Chord Selector and Chord button (added by Arturia), and the Arpeggiator controls, including the new Sync button also added by Arturia.

- Turn Sync Off. The rate will now be manually controlled. You'll hear the arpeggio playing at a much slower speed. Raise the rate value until you reach more or less the same speed as before (it should be around 8.50 Hz). When the arpeggiator is playing in sync, it will synchronize to the tempo of the host, which is very welcome. The rate is defined with musical values;
- If you turn the Hold button On, the current chord will remain, and you will have your hands free to play another instrument over that chord. You only need to get back to the Jun-6 V when you want to change chords. The Hold feature is also great to have the synth play while you are programming sounds;
- Now that you have the arpeggio playing, you can experiment a little more with the envelope and the filter. Start by raising the Release value. You'll notice a certain tail to the sound. Raise the Envelope value, and also experiment with different Cutoff and Resonance values;
- Raise the KBD (keyboard position) fader. This changes the way the filter acts along the keyboard.
- Now, it's time to turn On the famous Chorus. Press the I button. You'll notice the sound "opens" in the stereo field. This is because the chorus, when in position I and II, works in Stereo. We'll give more details in **Chapter 4**;
- Press the I button to turn it Off and press the II button to turn it On. This is a different chorus setting, with a little more modulation and also Stereo;
- Now press button I again. The two buttons are now On. This is position III. In this position, the Chorus becomes mono and adds a kind of vibrato to the sound. Turn the II button again to turn it Off. We will just keep Chorus I for now;



ⓘ: The Arpeggiator, when used with the Hold button, is great to have a sound playing while you experiment with the synth controls to program your own sounds.



Jun-6 V Chorus and Master sections. The chorus unit featured in the original was one of the most famous features of the synth. This Chorus faithfully emulates that unit.

3.2.5. Using the Advanced Section Modulations

Now that you have experimented with the Arpeggiator and the Chorus, it's time to try out the extra features we have added to this synth. We aimed to keep it very simple and inviting, for the users to feel comfortable programming it, but we decided that a few more features wouldn't hurt. To access these, press the **"Advanced"** button in the right corner of the Upper Toolbar. So, let's go a little deeper:

- Start by changing the VCA envelope to Envelope 2. The original Juno only had one envelope, so the same values were used to control the filter and the VCA. Sometimes, this wasn't so good, and we felt the need for a second envelope. Here, you can finally use a second envelope, and have different envelope values for the Filter and the VCA;
- Set all values to zero. You would expect the sound to stop completely. Well, not quite. The Juno envelope is very fast and produces "clicks" when set this way. You'll notice them immediately;
- Now raise the Decay a little. The tail will disappear, and only the EP-like attack will remain. Select VCF Frequency in the first Destination slot for the Envelope. You now have both envelopes modulating the Filter. Turn the amount knob all the way to the right;



Having an extra Envelope and LFO, as well as a Delay and a Reverb, adds a lot more variety and possibilities to the Jun-6 V, although it remains very simple to program.



Jun-6 V Advanced Panel modulators section, with all the advanced options available to modulate the synth.

- Finally, click the LFO 2's first destination slot and select VCA level. Turn the knob to the right. You'll hear a vibrato added to the sound. You may control the vibrato sound. If you want, you can now save your new preset. To do that, click the Arturia button in the Upper Toolbar and choose the option "Save Preset As", giving it a new name. You can also define tags.

3.2.6. Using the effects

Now let's play with the effects a little. The Jun-6 V only has a Delay and a Reverb (besides the Chorus that was included in the original), but these can do a lot for the sound:

- Let's activate the extra effects. Raise the Delay Dry/Wet fader value. Although the Delay and the Reverb are turned On, the Dry/Wet fader is in the Dry position, which means they are not being heard. By raising the fader, you'll hear the Delay effect. Raise it up halfway;
- Do the same with the Reverb. Now you have both Reverb and Delay added to the Chorus. You could never have gotten this sound with the original Juno, unless you were using external effect units.



The two extra effects added by Arturia to the Jun-6 V, present in the Advanced Panel: Delay and Reverb.

i Almost all effects have a Dry/Wet control which allows to balance the mix between processed and unprocessed sound. The Jun-6 V effects come turned On but with the Dry/Wet fader in the Dry position, which means their effect is not felt. To 'activate' them you just need to raise the Dry/Wet fader. But you can also turn them Off, of course.

And that's it. We have traveled through many of the main features of the Jun-6 V. You are now ready to use the instrument, and create some great sounds with it. But you may want to add some MIDI control...

3.2.7. Automating the Jun-6 V with MIDI

It is now time to see how you can control the different features of the Jun-6 V through MIDI.

- You may leave the instrument exactly where you were just now. Click the "cog wheel" icon in the right-hand corner of the Upper Toolbar. This opens a new section on the right side of the GUI. There are four Tabs in this section: Settings, MIDI, Macro, and Tutorials;
- You want to use the "MIDI Learn" function, so please click the "MIDI" tab.
- Now, many of the controls in the Jun-6 V become purple, which means they are ready to "learn" MIDI automation controls. You may also notice that some controls are red instead of purple. It means those controls are already assigned. If that's the case, the parameter names appear listed in the right-side panel, with the MIDI Channel and CC (Continuous Control) already assigned. By default, no controls come pre-assigned in the Jun-6 V.



Volume is usually controlled by MIDI Controller #7, so you may want to assign this controller to the Volume, as we did.

- We will now automate the PWM fader control through MIDI. This fader controls either the PWM depth (if the switch is set to manual) or the modulation that is introduced by the modulator assigned (either the Envelope or the LFO). Click the PWM control to make it ready to "learn" a MIDI controller and automate it. A black box contour will appear around that control.



Jun-6 V ready to "MIDI learning" (several controls are purple). Notice the black box contour around the PWM control. That control is set to learn, as soon as a MIDI control is moved. Notice also that several controls are red- it means they are already assigned. In the panel to the right, you can see which MIDI Continuous Controllers are assigned, and the control ranges.

- Now move the control knob/fader of the MIDI controller you want to use to control that parameter. If the connections are well established, you should see the parameter assigned to the PWM control. If your controller offers that possibility, and the control you selected is of the right type, you should select "Is Relative" to make sure that when you touch that parameter the control will not jump suddenly. For more information about this feature, refer to the section on [Relative Control option \[p.28\]](#) in the USER INTERFACE chapter.
- You may assign as many parameters as you want. You just need to have enough MIDI CC available and, if you want to use your keyboard controller, enough controllers to assign them to;

This hands-on tutorial is now finished. You may keep reading this manual or go on playing the Jun-6 V.

4. THE USER INTERFACE

In this chapter we'll start with an overview of the Jun-6 V user interface. This will give you an idea of how the instrument is organized and where to find things. The point here is to establish how the interface is composed at a high level.

4.1. High-Level Overview

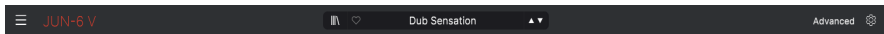


Jun-6 V Upper Toolbar

The Jun-6 V is neatly subdivided into three sections.

1. **The Upper Toolbar:** This is where you handle administrative tasks such as saving, loading and browsing presets, editing various setup and configuration parameters, adjusting MIDI mappings and accessing advanced features.
2. **The Main Panel:** Here is where you will likely spend most of your time when working with Jun-6 V. It contains a detailed reproduction of the Jun-6 V panel and features.
3. **The Lower Toolbar:** This section provides quick access to a number of important parameters and useful bits of information such as CPU usage, panic button, undo history and 4 macro knobs.

4.2. The Upper Toolbar

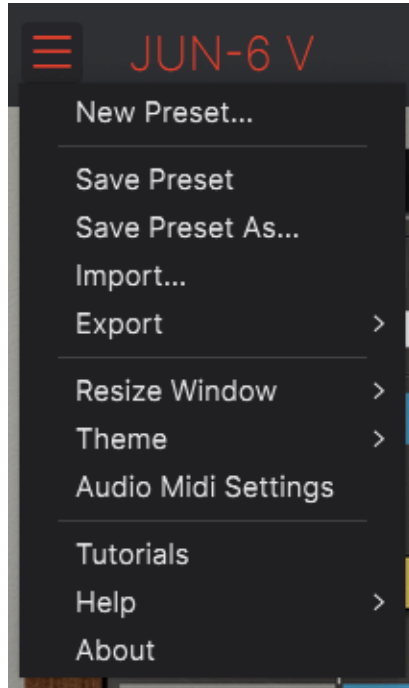


Jun-6 V Upper Toolbar

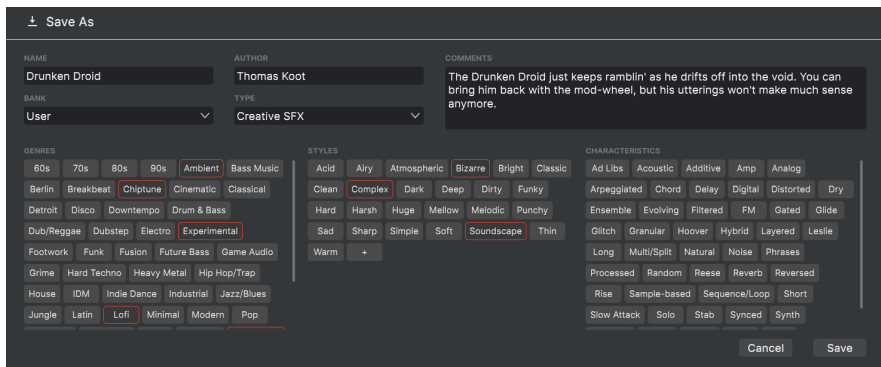
The toolbar that runs along the top of the instrument provides access to many useful features including the Jun-6 V menu, preset browsing features, access to the "Advanced" Screen mode and lastly the gear button which opens the side panel giving access to various MIDI functions including global MIDI channel and mapping features.

4.2.1. The Jun-6 V menu

Clicking the Jun-6 V box at the top-left corner opens a drop-down menu and lets you access ten important features.



- **New Preset:** This option creates a new preset with default settings on all parameters. It is a good place to start if you would like to create a new sound from scratch.
- **Save Preset:** This option will overwrite the currently loaded preset with any changes you have made. If you would like to save the current preset under a different name, use the "Save As..." option below.
- **Save Preset As...** This lets you save your preset under a different name. Clicking this option reveals a window where you can name your preset and enter information about it.



Jun-6 V "Save As" dialog box

i Jun-6 V's powerful browsing system lets you save much more than just a preset name. For example, you can enter the Author's name, select a Bank and Type, select tags that describe the sound, and even create your own Bank, Type, and Characteristics. This information can be read by the preset browser and is useful for searching the presets banks later. You can even enter freeform text comments in the Comments field, which is handy for providing a more detailed description of a sound. This can help you remember a sound or to provide context to other users with which you are collaborating.

- **Import:** This command lets you import a preset file, which can be either a single preset or an entire bank of presets.
- **Export Menu:** You can export presets in two ways: as a single preset or as a bank.
 - **Export Preset:** Exporting a single preset is handy when you want to share a preset with someone else. The default path to these files will appear in the "save" window, but you can create a folder at another location if you like. The saved preset can be reloaded using the *Import Preset* menu option.
 - **Export Bank:** This option can be used to export an entire bank of sounds from the instrument, which is useful for backing up or sharing presets. Saved banks can be reloaded using the *Import Preset* menu option.
- **Resize Window:** The window can be resized from 50% to 200% of its original size without any visual artifacts. On a smaller screen such as a laptop you may wish to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor you can increase the size to get a better view of the controls. The controls work the same at any zoom level but smaller controls can be easier to see at higher magnification levels.

i While working with Jun-6 V, you can also use the keyboard shortcuts Ctrl & +/- (or Cmd & +/-) to quickly adjust the window size.

- **Audio Settings: (only available in Standalone mode)** Here you manage the way the instrument transmits audio and receives MIDI. See the section Audio and MIDI settings for more information about this topic.

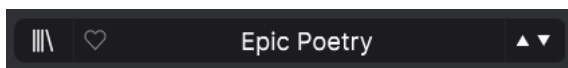


! The Audio Settings menu is only available in when using Jun-6 V in Standalone mode. When using it as a plugin, the host software handles all of the parameters in this menu including audio and MIDI routing, buffer size settings, and more.

- **Tutorials:** Jun-6 V comes with tutorials that walk you through different features of the instrument. Select one of the tutorials to get step-by-step descriptions of how to make the most of the Jun-6 V features.
- **Help:** This section provides handy links to the Jun-6 V User Guide and Frequently Asked Questions page on Arturia's website. Note that accessing these pages will require an Internet connection.
- **About:** Here you can view the Jun-6 V version and developer credits. Click the About window again to close it.

4.2.2. Browsing Presets

Jun-6 V comes packed with lots of great-sounding factory presets and we hope you'll create many more of your own custom presets. To help you search through large numbers of presets, we have a powerful preset browser with a number of features to help you find sounds quickly.



The browsing features of the Toolbar (shown above) include the following:

- The **Preset Browser** (on the left) opens and closes the preset browser. This is covered in detail in the next section of this guide
- The **Like Button** allows you to tag presets as favorites. Click the like button to like or unlike the preset.
- The **Preset Name** is listed next in the toolbar. Clicking on the name reveals a pull-down menu with other available presets. Click on any name to load that preset or click away from the menu to close it.
- The **Arrow icons** select the previous or next preset in the filtered list. This is the same as clicking on the preset name and selecting the next option in the list, but does it with only one click.



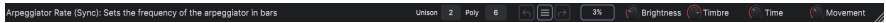
! The Previous and Next arrows can be MIDI mapped. This means you can use buttons on your MIDI Controller to easily step through the available presets without having to use the mouse at all.

4.2.3. Side Panel



At the far right of the Toolbar, you will find the Gear icon which when pressed opens up the Side Panel. The Side Panel gives access to various MIDI related options. In here you can set the global MIDI channel, set up MIDI controller mapping to virtually any parameter of the Jun-6 V, select either a generic MIDI keyboard controller OR one of Arturia's own MIDI controllers, set up the Macros and access the tutorials.

4.3. The Lower Toolbar



The Lower Toolbar runs along the bottom of the user interface and provides quick access to several important parameters and useful bits of information.

- **Parameter Name** on the left displays the name of the parameter as you adjust controls. The current value of the control is listed in a tooltip that appears next to the control.
- **Undo** undoes the last change.
- **Redo** redoes the last change.



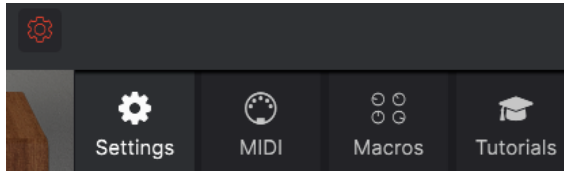
! The Undo and Redo buttons only become visible AFTER you have started editing on the Main Panel. Try moving the Freq (or any other) control now and you'll notice the Undo button will magically appear.

- **Undo History** lets you to see a list of recent changes. Click on a change to restore the patch to that state. This can be useful in the event you happened to go too far in your sound design and want to revert to an earlier configuration.
- **CPU Meter-Panic Button** displays the current CPU usage of the instrument and when pressed it resets all MIDI signals in the event of stuck notes or other issues.



! If the CPU meter is high, you may hear clicks, pops and other audible glitches in playback. In this case, consider increasing the audio buffer size setting. This is found under Audio Settings when working in Standalone Mode or in your host music software's preferences menu. Alternatively, you can limit polyphony with the Poly and Unison settings.

4.4. Side Panel



The Gear icon at the top right side of the upper toolbar opens up the Side Panel.

Settings: this sets the global MIDI channel for the Jun-6 V

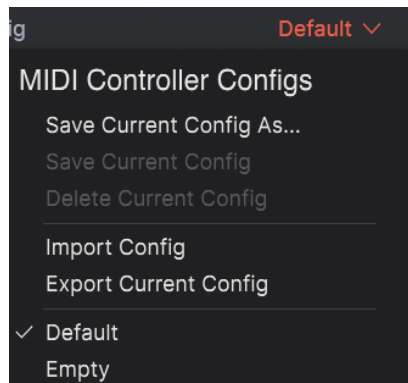


By default, Jun-6 V will receive MIDI data on all 16 MIDI channels (All setting). You can change this by selecting a specific channel here. You will need to do this if, for example, you want to use an external controller with multiple instances of Jun-6 V. In this situation, every instance can be set to a unique channel, and you can change the preset or MIDI channel on your controller to control the different instances of Jun-6 V.

4.4.1. MIDI tab

MIDI: this section lets you set the MIDI controller you are using and setup the mapping of MIDI CC commands.

4.4.1.1. MIDI controller configuration



If you click on the drop-down menu to the right of where it says MIDI Controller you can set whether your using a generic MIDI controller or one of Arturia's own. Underneath this you have the MIDI configuration dropdown menu. Here you can manage different setups of MIDI mappings for controlling Jun-6 V. For example, if you have multiple hardware controllers (small "live performance" keyboard, large "studio" keyboard, pad based controller, etc.), you can create a profile for each of them just once and then quickly load it here. This saves you from having to redo the MIDI mapping assignments from scratch each time you swap hardware.

Once you have created a profile, you can save, delete, import or export it using the options in this menu.

Your MIDI Mapping profiles are listed at the bottom of this pull-down menu and the currently active profile has a checkmark next to it.

Underneath this you will see all the MIDI mappings currently setup. MIDI-assignable parameters are shown highlighted and you can map physical controls on your MIDI Controller to them. A typical example might be to map a real expression pedal to the Master Volume control, or a physical knob on the MIDI controller to the Frequency knob of the Filter module.



Purple controls are unassigned whereas red ones have already been assigned to an external MIDI control.

4.4.1.2. Assigning / Un-assigning controls

When MIDI Learn mode is switched on, click on any purple control to select it. Then turn a knob, move a slider or push a button on your MIDI controller. Your selected on-screen control will change from purple to red, indicating that a link has been made between your hardware control and the on-screen software parameter.



! Pitch Bend is a reserved MIDI controller that cannot be assigned to other controls.

4.4.1.3. Min / Max value sliders

By default, a hardware control will span the entire range of the on-screen control (i.e., from 0 to 100%). The minimum and maximum value sliders let you restrict the range something other than 0%-100%. This is very useful for making sure you cannot accidentally make the sound too quiet or too loud when performing.

4.4.1.4. Relative control option

If you right click on a mapped parameter in the list, you can make a parameter "absolute" or "relative". Only change to "relative" if your hardware MIDI control is sending "relative" MIDI messages. If the MIDI controller is sending out "absolute" messages, leave it set to "absolute" (this is the more common behavior).

A "relative" change instructs the receiving device to increase or decrease its current value. The receiving device (Jun-6 V in this case) interprets this command as "increase/decrease your current value." This type of control is often implemented on "endless" or "360 degree" knobs that do not have hard stops at the ends of their range. The advantage of this is that physical knobs always remain in sync with on-screen controls. However, not all hardware devices support this mode of operation which is why both options are available in Jun-6 V.

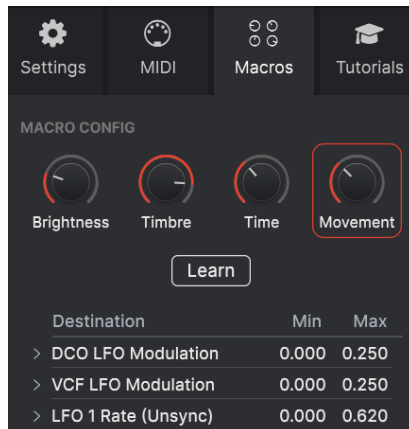
i There are two common types of messages when working with MIDI knobs: Absolute and Relative. Absolute positioning sends the exact position of the knob as a specific numerical value (i.e., "Set value to 54, 55, 56, etc.") when you turn the knob on your hardware controller. This is the most common implementation and is almost always used when using potentiometer knobs with "hard" stops at the ends. One downside to this implementation is that if you change presets, your physical knob and on-screen control will be "out of sync" with each other and turning the physical control can cause the on-screen control to suddenly jump to that position.

4.4.1.5. Unassigning or "un-learning" a MIDI mapping

Click on an assigned parameter to highlight it then press the delete button on the keyboard to disconnect.

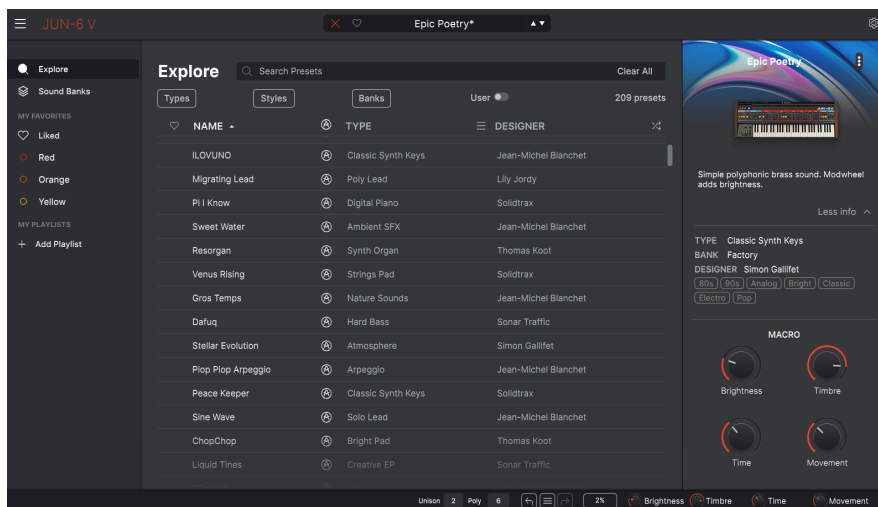
4.4.2. Macro tab

Macro: this function lets you setup the functionality of the macro section. Basically a macro lets you change a group of parameters together and there are 4 available (you can see the status of the 4 macros along the lower toolbar). The macro is selected using the back or forward arrows either side of the name and if you click on the name it can be changed.



You can add extra controls into the macro by selecting "add control" and clicking on the desired control on the panel. You will see it get added to the macro control list and you can set upper and lower limits for each control. When you tweak one of the macro controls in the lower toolbar you will see all the link controls move. Very handy indeed!

4.5. The Preset Browser in Detail



The Preset Browser (shown above) is where you can search through all of the presets. Open the Preset Browser by clicking the library symbol on the toolbar. To close the Preset Browser and return to the main screen, click the "X" that appears in the Toolbar.

To narrow down your choice and help you find the sounds you want, you can enter keywords in the search bar. You can narrow your search further by clicking on one of the drop down menus under the search bar which lists categories and has tags to point you in the right direction. You can cancel the list by pressing "clear all".

The results of your search are listed in the middle column. You can easily audition any displayed preset by clicking on it and playing a connected MIDI keyboard. You can sort the list results in various ways by clicking the column headers directly above the preset names. If you're feeling spontaneous, click the Shuffle button at the top right to randomly select one preset from the results list. This is a fun and quick way to audition sounds without having to step through the list one-by-one.

Details about the currently selected preset are listed in the right column.

i: Factory presets cannot be modified, deleted or overwritten. Only "User" (user generated) presets can be deleted, overwritten or saved under a different name. This is done by using the "Delete" "Save" or "Save As" buttons at the top of the right column. If you have modified a Factory preset and would like to save it, you must save your modified preset under a different name (only the "Save As" option appears in this case since you cannot delete or overwrite factory sounds).

4.5.1. Browse Presets With MIDI Controller

This option allows you to browse presets using the Browse knobs on Arturia MIDI Controllers. This makes it incredibly efficient to quickly audition sounds without having to reach for the mouse. To use this feature, select your Arturia controller from the menu and its Browse knob will be automatically mapped to preset browsing.

4.5.2. Playlists

In the lower left corner of the Preset Browser window is a feature titled Playlists. This is used to collect presets into collection groups, such as a set list for a particular performance or a set of presets related to a particular studio project.

4.5.2.1. Add a playlist

To create a playlist, click the **+ New Playlist** button. Give the playlist a name and it will appear in the Playlists menu. To rename the playlist at any time, right-click on the name.

4.5.2.2. Add a preset to the playlist

You can use the Search window to locate the presets you want to add to your playlist. Once you have found the right preset, click and drag it onto the playlist name on the left.

To view the contents of a playlist, click on the playlist name.

4.5.2.3. Re-order the presets in the playlist

Presets may be reorganized within a playlist. For example, to move a preset from slot 3 to slot 1, drag and drop the preset to the desired location.

This will move the preset into the new location.

4.5.2.4. Remove a preset from the playlist

To remove a preset from a playlist, right click on the preset name.

4.5.2.5. Delete a playlist

To delete a playlist, right click on the playlist name.

5. MAIN PANEL

5.1. Overview

The Jun-6 V instrument default window mimics the aspect of the original Juno. Therefore, you only have a small control panel, with the controls for the LFO, DCO, Filter, Envelope, Arpeggiator, and the famous Chorus.

Besides this simple main panel, which we consider inviting to editing, and a great tool to be introduced to analog synthesis, you have some more features in the advanced panel, like a second LFO, a second Envelope, some modulation matrices, Delay and Reverb effects, etc. This Advanced Panel is positioned above the Main Panel and closed by default. To open it, you need to press the "ADVANCED" button in the Upper Toolbar.

We will look deeper into these when we reach the [Advanced Panel \[p.46\]](#) entry.

The Jun-6 V main control panel only has a few controls. Just like the original keyboard, it is a very simple control panel, since the synth itself has a simpler set of features when compared to other synths like the Jup-8 V which is also part of the Arturia V Collection.



i Just like its hardware counterpart, the Jun-6 V is a very simple synth. This makes it ideal to learn (and teach) the basics of synthesis. However, you shouldn't be fooled by its simplicity. Thanks to a very cleverly selected set of features, and an amazing chorus unit, the original has a great sound, which we preserved in this emulation.

Several waveforms can be mixed, including a variable Pulse with Pulse Width Modulation. There are even some great extras, like sensitivity to velocity, aftertouch, and the possibility to automate waveform mixing and modulation of the Pulse Width. Also, being a MIDI instrument (which wasn't the case of its ancestor), the Jun-6 V responds to many realtime controls through MIDI, which greatly contributes to the expressiveness of the instrument.

5.2. Hold Button

In the original, this button, when pressed, maintains the sound even after you release the keys. The number of notes that can be held depends on the polyphony. If the notes being held exceed the polyphonic capacity, only the latest played keys will remain sounding.

Also, volume depends on the VCA control. If the VCA is being controlled by an envelope with a Sustain value of 0, the sound will still fade to 0, despite the Hold key being pressed.

This key is great to keep a chord or an arpeggio playing while you are programming sounds.

5.3. Chord Mode

In the original, this feature (and control) didn't exist. It is one of several new features introduced by Arturia. When the Chord button is pressed, the keys play chords instead of single notes. The chord root note is defined by the key being played (the chord builds over that note). If you play more than one note, you will hear juxtaposed chords.

There is a pre-defined number of chords (and intervals). First choice is Octave (plays single octaves), then Fifth (plays octaves and fifths), then Suspended (Sus4 chords), minor, Major, etc.

Finally, there is a Custom button which allows you to define your own chords. So, if you want diminished or augmented chords, be aware that you will be able to have at least one of them added.



Jun-6 V Chord Selection screen.

5.3.1. On

Selects the Chord option. When the button is On, any key you press will play the chosen chord type over that key. By default, Chord button is Off.

5.3.2. Select

This button opens the chord choice dialog box. This is where you select which chord will play. To close the window, just click the **Esc** key on your computer keyboard.

If the Chord key is On and the Arpeggiator is also On, the chord will be played arpeggiated. If more than one note is held, you will hear two or more chords being arpeggiated simultaneously.

5.4. Arpeggio

The Juno's arpeggiator offers the usual configuration options, but lacks one of the nicest functions: a random mode. Basically, it was the same arpeggiator you could already find in the Jupiter-4/8 and the Roland 100M keyboard.

The arpeggiator of the Jun-6 V has the same range as the original, but offers some more variety, thanks mainly to the Sync option (one of the advantages of being a virtual instrument and having MIDI capabilities).



Jun-6 V Hold and Chord buttons, and the Arpeggiator section

5.4.1. On

This button turns the arpeggiator On and Off. When On, the red LED lights up. By default it is Off.

5.4.2. Mode

This sets the behavior Mode of the arpeggiator. Just like the original, it can be positioned to go Up, go Down, or Up and Down. Up plays notes from the lowest to the highest. Up and Down plays notes from the lowest to the highest and back. Down plays notes from the highest to the lowest. The default position is Up.

5.4.3. Range

This switch defines how many octaves are played by the arpeggiator. The range can be set to 1 (one octave only), 2 (two octaves) and 3 (three octaves). The starting note is always the lowest note played, and the arpeggio always plays according to the notes being held. Therefore, if you play a bass note, and then a chord one octave higher, the arpeggio will start with that bass note, and then jump to the lowest note of the chord.

Many interesting patterns can be obtained by combining the chords being played with the range. For example, with a range of 2 and two notes in the lower region, you can establish very interesting *ostinato* bass patterns.

It can be even more fun if you combine these patterns with a carefully set Delay, and syncing *tempi* with the host.

5.4.4. Rate

This defines the speed at which the arpeggiator plays. When not in Sync, the speed is expressed in Hz and is absolute. In this mode, the Rate goes from 1.36 Hz up to 45.0 Hz. Just to give you an idea, the lowest value can be compared to quarter-notes played at around 60 BPM. The highest value is a cloud of notes almost impossible to differentiate. Default value is 8.0 Hz, which is equivalent to sixteenth notes at around 80 BPM.

5.4.5. Sync

This is another new feature introduced by Arturia. The original arpeggiator couldn't be synchronized (except by using an external clock like those produced by hardware sequencers, for example - in that case, the external clock would take over the Rate control), but you have that possibility here.

When in Sync, Rate is expressed in musical values, ranging from 1 (a whole note, or an entire 4/4 bar) up to 1/64 (a 64th note). Default is 3/16 (dotted eighth note).



ⓘ: An arpeggio can only play if some keys are being held, unless you are using the Hold button, in which case you can release the keys. In this case, the arpeggio will keep playing until the Hold button is turned Off. If you are using a MIDI keyboard controller with a Sustain pedal, or use the MIDI CC #64, these will have the same effect as the Hold button. With the arpeggio On, voice allocation is set to Cycle. If you use the synth with noticeable dispersion levels (for example, by switching the Voice Calibration to Poor) this can create interesting results.

5.5. LFO

LFO is an acronym for "Low Frequency Oscillator". As the name implies, an LFO is an oscillator which produces low frequencies. These are usually inaudible (below the audible low threshold, which is around 40 Hz). Therefore, an LFO isn't used to produce sound. Yet, an LFO may be used for several important tasks in a synthesizer environment. Its main use is for modulation purposes - either modulating the Pulse Width, the cutoff frequency, the oscillator pitch, etc.

The main LFO in Jun-6 V can only produce a triangle waveform. That's why you don't have a choice for the waveform.

5.5.1. Sync

Again, you have the possibility to sync the rate with the host tempo. Sync times are much slower than in the arpeggiator. Here, the lowest sync value is 8, which means 8 whole notes, or eight 4/4 bars. The highest value is 1/32 (a 32nd note). Default is 1/16 (a 16th note, which may be quite fast, depending on the purpose and the host tempo).

You can also use dotted values and triplets. For example, 3/4 is a dotted half-note, 1/3 is a dotted quarter-note, 1/6 is a quarter-note triplet, 1/12 is an eight-note triplet. And so on.

5.5.2. Rate

Rate is where you define the speed of the LFO. There are two modes: Absolute and Sync (which we just referred to above). In Absolute mode, rate is expressed in Hz, as expected, and has a range from 0.038 Hz up to 21.5 Hz, which is already quite fast. Default value in Absolute mode is 1.000 Hz.

5.5.3. Delay Time

This is where you define the time it takes for the LFO to start working. It applies a fade to the LFO amplitude after a key is pressed. When the LFO is modulating the Pulse Width (PWM), the Delay setting is not applied.

Delay Time range goes from 0.007 up to 2.89 seconds. It is also influenced by the LFO delay mode. Default value is the minimum value (basically: no delay).

5.5.4. Delay Mode and Retrigger

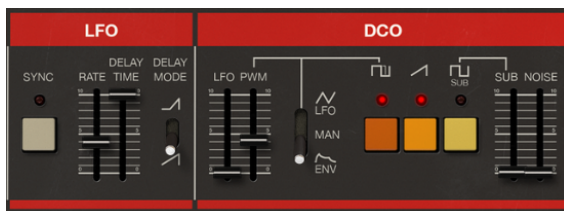
This parameter determines how the LFO behaves and is retriggered. Unlike the hardware unit, which had a button to retrigger the LFO, here you have two keyboard trigger modes.

When set to the higher position, the LFO delay is triggered by each key, with two phases: an initial Auto Delay plus a soft rise (tempo defined by the Delay Time parameter).

The lower position retriggers the LFO each time a key is pressed too. Once triggered, the LFO wave curve starts rising immediately, with NO initial delay, according to the tempo defined in the Delay Time parameter.

5.5.5. LFO Mod Wheel

This wheel, which is hardwired to the Mod Wheel of any MIDI keyboard controller, as well as the MIDI CC #01, controls two other parameters: DCO and VCF. For more information about this, please refer to the [Virtual Keyboard LFO Mod Wheel \[p.53\]](#) entry later in this chapter.



Jun-6 V LFO and DCO.

5.6. DCO (Digitally Controlled Oscillator)

The Jun-6 V, just like its hardware counterpart, features a single oscillator. The original analog oscillator was Digitally Controlled, hence the name DCO. Digital controlling prevented it from going out of tune, meaning that the Junos were the first analog synths that could go on stage and play an entire gig without drifting out of tune. Besides being great-sounding, they were also stable and reliable.

The Jun-6 V DCO has three waveforms plus white noise (which means four sound sources in total). Although you cannot tune them individually, you can however control the volumes of the sub-oscillator and the noise source independently, and switch On and Off each of the other two waveforms. This, coupled with the PWM capabilities, can lead to very interesting sounds.

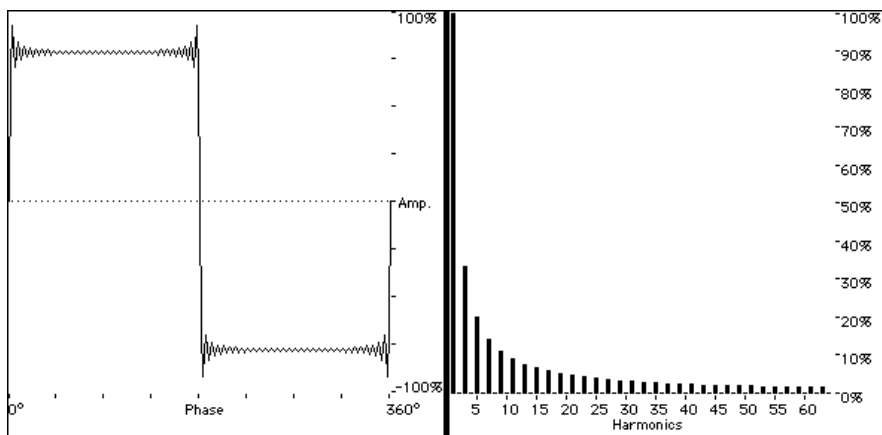
5.6.1. LFO

This fader defines the depth of the vibrato effect (pitch modulation intensity) applied to the DCO by the LFO. This parameter is independent of the modulation applied by the Mod Wheel, which may also affect the DCO pitch. For more information about this, please read the [Virtual Keyboard LFO Mod Wheel \[p.53\]](#) entry later in this chapter.

Modulation intensity goes from 0.00 up to 1.00. Default is 0.00 (no modulation).

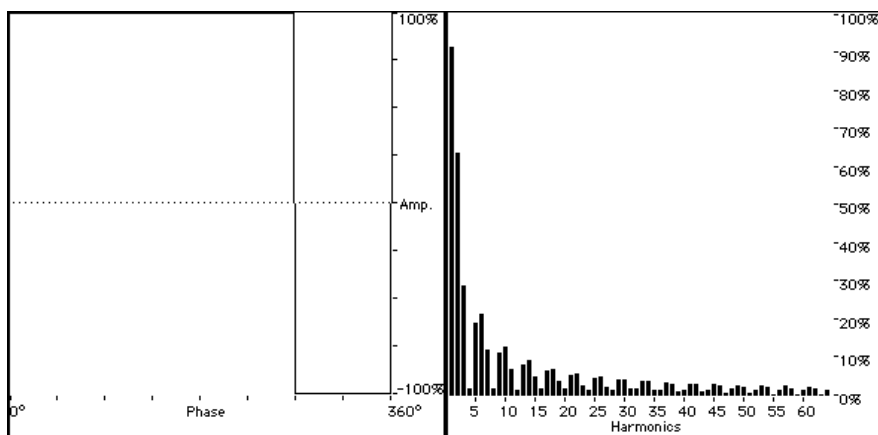
5.6.2. PWM

One of the most desirable features in any synth, PWM is an acronym for Pulse Width Modulation. A pulse wave is a rectangle wave. When the pulse value is at 0, both periods of the waveform have an equal length, so the waveform produced is a square wave (pulse value is 50% of the waveform length). If you expand one of the periods, consequently shortening the other, the waveform starts sounding more and more "narrow" and "nasal". This is where the "pulse" name comes from, and changing the periods' duration is called "changing the pulse". The change of waveform is caused by the change of harmonic spectrum. At 50% pulse (0 value in the case of the Jun-6 V), the waveform contains the fundamental and the odd-numbered harmonics with an amplitude relation where each n th harmonic amplitude is $1/n$ of the fundamental (first harmonic) amplitude. This is what produces a perfect square waveform.



A square waveform, and the corresponding harmonic spectrum graphic. The square is a particular case of the pulse wave, where both positive and negative periods have the same value (50%). The harmonic graphic clearly shows the absence of even-numbered harmonics (only odd-numbered harmonics are present)

When the pulse value rises, the harmonics "shift", creating "pulses" (zones of harmonics followed by zones with no harmonics). For example, when the pulse is at around 1/3 (33%), the second harmonic replaces the third, the fifth replaces the sixth, and so on. With a pulse of 3/4 (75%), every fourth harmonic is basically suppressed, as shown below.



A pulse waveform, with a pulse relation of 3/4 (75%/25%), and the corresponding harmonic spectrum graphic. Notice the three harmonic "pulses" followed by a fourth very attenuated harmonic

A square wave sound is very similar to the sound produced by a clarinet. A pulse wave at 1/3, on the other hand, may sound similar to an oboe. With a pulse of 3/4 or higher, the resulting waveform sounds similar to a harpsichord (if you hear the sound with the correct envelope contour).

When the Pulse Width is being modulated, the waveform's harmonic content varies according to the modulation index. Consequently, the waveform also varies, creating a sound that changes continuously, in a lively manner. This is great to produce string sounds, pad-like sounds, brass sounds, etc.

The PWM fader acts both as a manual controller for the Pulse Width value (when the switch is set to manual) as well as a modulation intensity controller, when the PWM is set to another source (LFO or Envelope).

5.6.3. PWM Switch

This switch selects the modulation source for the pulse width. By default, it is set to Manual. In this position, the pulse width is defined manually with the PWM fader.

5.6.4. Manual

Manual PWM range goes from 0.00 up to 1.00. In the 0 position, it produces a square wave. At maximum value, a very narrow pulse wave is produced. Contrary to what you might expect, the Juno pulse doesn't go up to silence, even in the maximum position.

Default position is 0.00 (square wave - no PWM).

5.6.5. LFO

In this position, the pulse width is modulated by the LFO rate (frequency). Modulation intensity is set by the PWM fader, which changes from setting the pulse to controlling the modulation intensity.

5.6.6. Envelope

In this position, the pulse width is modulated by the main ADSR Envelope (ENV). Modulation intensity is, once again, set by the PWM fader, which changes from setting the pulse to controlling the modulation intensity. Modulation rate is set by the envelope contour.

i: When it is set to MAN, the Pulse Width is fixed, unless you move the PWM fader. When it is set to LFO or ENV, the Pulse Width is controlled by the corresponding signal from the LFO or the Envelope Generator. In that case, the PWM fader sets the modulation intensity.

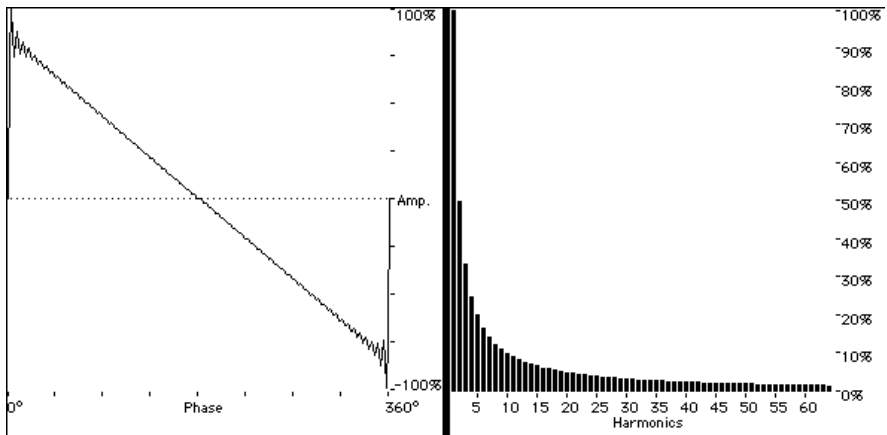
5.6.7. Pulse Wave On/Off Button

This activates the Pulse waveform on the DCO.

5.6.8. Saw Wave On/Off Button

This activates the Saw waveform. The saw waveform is a very rich and buzz-sounding waveform. This one is a very bright saw (with a very extended harmonic content), which combines very well with the pulse. Saw waveforms are the fundamental synth waveforms, and the base source sound for things like string sounds and brass sounds (with or without the addition of a pulse waveform), synth leads, synth basses, etc.

Saw waveforms contain all the harmonics, in a proportional amplitude relationship. The level of each harmonic is as shown in the picture below. When the fundamental is 1, each n th harmonic amplitude level is $1/n$.



A saw (sawtooth) waveform, and the corresponding harmonic spectrum graphic. The saw wave has all the harmonics, in a special amplitude relationship.

When combined with dynamic filtering, you can produce great synth pads, synth sweeps, etc.

5.6.9. Sub-Osc Wave On/Off Button and Fader

The "Sub" oscillator produces a square waveform tuned one octave below the two main waveforms (Pulse and Saw). This square wave is great when you want to create sounds with more bass content (like bass drums, synth basses, etc.), to enrich and make fuller ensemble sounds like strings and brass, and finally to support thinner sounds (like the ones produced by the self-resonating filter, for example).

The Sub-Oscillator volume can be controlled individually, and even dynamically (through MIDI). The volume is controlled manually by the fader positioned to the right of the Sub button. This fader can be modulated.

5.6.10. Noise Fader

Besides the two main waveforms and the sub-osc square waveform, the Juno also had an extra noise source. This can be used to add some "atmosphere" to pad sounds or to simulate the breath in the attack of some sounds, like wind instruments for example.

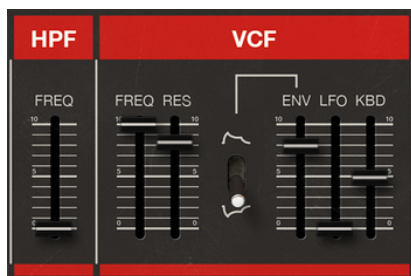
This noise source produces white noise, and the intensity is controlled by its own fader. Again, in the Jun-6 V you have the possibility to control this dynamically, for example through MIDI, using the MIDI Learn button.

5.7. HPF (High-Pass Filter)

The High-Pass Filter is a -6 dB filter (a soft filter) which cuts the low frequencies. As the filter is not voltage controlled, cutoff point can only be changed by moving the control fader. Therefore, this is another great candidate for MIDI modulation control.

In its lowest position, the DCO output passes through unchanged. As you raise the knob, the frequencies around the cutoff point will be slightly boosted and frequencies below that point are cut according to the filter roll-off.

The High-Pass Filter is great to soften the content of sounds that have a lot of low end. It may also create an artificial narrowness to leads, strings and pads. Finally, it is fundamental for bell-like sounds.



5.8. VCF [Voltage-Controlled Filter]

This is the classic synthesizer resonant low-pass filter. Cutoff slope is fixed at -24 dB. This is the main difference between this filter and the Jupiter one, which could be changed between -12 dB and -24 dB. Apart from that, they work pretty much the same way, as they were based on the same chip. And, what's even more important, both are great-sounding. In a synth, the filter acts by changing the spectrum content of the oscillator waveforms.

5.8.1. Freq [Cutoff]

This is where you define the filter cutoff point. Frequencies above the cutoff point will be attenuated at a slope of -24 dB per octave. Contrary to what happens with the HPF, this cutoff point may be modulated in several ways, and with several sources. You have three main modulation sources: Envelope Generator, LFO and Keyboard Position. To make things even more interesting, the Envelope modulation polarity may be inverted.

All modulation sources may be active at the same time.

5.8.2. Res [Resonance]

Resonance emphasizes the frequencies around the cutoff point, creating a resonant node. The more resonance is added, the more prominent this node becomes. At values nearing maximum, it could even start self-oscillating, producing a sound similar to a sine wave. This wave may be tuned using the cutoff control.

Resonance adds brightness to the sound. The higher the cutoff point, the higher the resonant node, and the brighter the sound. On very low cutoff points, resonance can produce a strong "thump" that sounds great on drum sounds and basses.

On pads and strings, it contributes to making the sounds "shine". If you add some noise to the sound, resonance may turn the noise into a "whoosh".

Of course, all these effects may also be controlled dynamically. Since resonance is tied to the cutoff point, by modulating the cutoff you automatically modulate the added resonances. Resonance is perhaps the most idiosyncratic effect produced by a synthesizer.

5.8.3. Env Polarity Switch

This is another great feature that was introduced by Roland in the Jupiter, and was kept in the Juno for the filter. When the polarity is positive, the Envelope Generator works as usual - it starts rising as set in the Attack time segment, reaches the top, then starts decaying as set in the Decay time segment, until it reaches the Sustain level. It will then remain there until the key is released, when it starts fading to 0 as set in the Release time segment.

When the polarity is negative, instead of rising, all Envelope segments will fall. Therefore, if you have a low cutoff point, you will not hear anything, since it will be subtracting from a value that was already near zero. That's why, to use the inverted polarity, it's better to have a high cutoff value. With a high enough value, you will hear the filter close, then open again up to the Sustain, and then rise up to 0 modulation.

5.8.4. Env [Modulation Intensity Control]

This is where you set the filter modulation intensity commanded by the Envelope Generator. The way the filter responds to the Envelope Generator was described above - there are two, depending on the polarity in use, but any of them is a very important source of modulation and sonic variety. The well-known filter sweep effect, for example, is achieved by a slow Attack envelope with a high Sustain level (with maybe a small Decay, if the Sustain level is not near the top). In this case, the EG polarity must be positive.

5.8.5. LFO [Modulation Intensity Control]

The LFO modulation works differently from the envelope. While the latter is a one-way travelling modulator, the former is a periodic modulator (after all, it's an oscillator). Being periodic means that it constantly loops at the frequency you set. This leads to different results depending on the oscillation speed. Lower frequencies (slower oscillation) leads to long and very slow changes in timbre. This is good for sounds like strings, pads, brass, etc. The filter sweep may also be obtained by modulating the cutoff with a slow oscillating LFO (in this case, the sweep will be periodic and even in sync with the music tempo thanks to the changes introduced by Arturia).

Faster oscillations may lead to special effects, and are a fertile field for experimentation.

5.8.6. Kbd [Keyboard Position Modulation Intensity Control]

Keyboard position (also known as Key Follow) is not always seen as a modulator, especially for the filter. Yet it can be very good to achieve some results, especially when used in conjunction with the Envelope Generator.

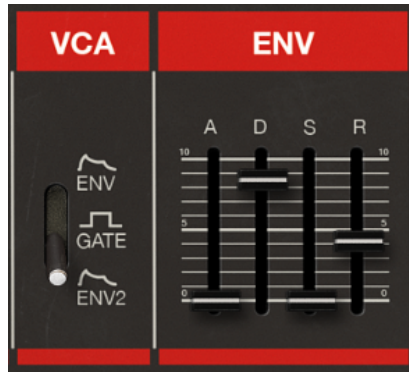
Key Follow may prevent unexpected changes in timbre due to filtering. When modulating the filter cutoff with the Keyboard position, the cutoff frequency will follow the pitch frequencies, this way creating a flexible filtering point that automatically adjusts to note frequency.



i You can use the Low-Pass Filter as a sine oscillator. To get this, set the resonance and Key-follow to the max, use an external sound reference to get A 440 (the A above the central C) and adjust the cutoff until the resonance peak reaches that same frequency (440 Hz). You now have the self-oscillation tuned, and you can get a sine out of the filter, perfectly in tune.

5.9. VCA [Voltage-Controlled Amplifier]

VCA is where the volume amplitude of the synth is controlled. Usually, the volume contour is dynamically controlled by an Envelope Generator, but the Juno also had the option to have the output gated (when we press a key, it would activate the VCA, while the "Off" would deactivate it, turning off the sound). The source control is set by the VCA switch.



Jun-6 V VCA section and Envelope 1 (Main Envelope)

5.9.1. Env

When the switch is set to the ENV position, the output volume is controlled by the main Envelope Generator (Envelope 1). This is the Default setting.

5.9.2. Gate

When the switch is set to the Gate position, the output volume is controlled by the keys. Each time a key is pressed, it activates the VCA output. In analog synthesizers, the keys trigger a voltage Gate, hence the name. The output Gate remains open for that key sound until the key is released. This is an On/Off action.

5.9.3. Env2

Another novelty introduced by Arturia. When the switch is set to this position, the VCA Output is controlled by Envelope Generator 2 (which is the EG featured in the Advanced Control Panel).

5.10. ENV [Envelope Generator]

An Envelope Generator is a module which generates a control voltage that can be applied to the VCF or the VCA of a synthesizer, creating a contour which controls the volume or tone of the sound over time. The Juno envelope was very fast and "snappy", with the ability to produce "clicks" even when all segments were set to zero. This feature is reproduced in the Jun-6 V.

5.10.1. A [Attack Time]

Attack sets the time the sound takes to reach its maximum volume after the key is triggered. Range goes from 1 ms to 2.970 seconds (almost three seconds). Default value is 1 ms (minimum value).

5.10.2. D [Decay Time]

Decay sets the time required for the sound to drop from the maximum point to the Sustain level. Range goes from 2 ms to 19.000 seconds (nineteen seconds). Default value is 2 ms (minimum value).

5.10.3. S [Sustain Level]

This segment sets the volume for the sustained part of the sound. Once this level is reached, the sound remains there until the key is released. Default sustain level is 1.00 (maximum value).

5.10.4. R [Release Time]

This segment sets the time needed for the sound to reach zero after the key is released. Range goes from 2 ms to 17.000 seconds (seventeen seconds). Default value is 10 ms.

5.11. Chorus



Jun-6 V Chorus and Mater sections

The Chorus is one of the most important features of the Juno, and consequently of the Jun-6 V. It adds spaciousness and richness to the sound, and transforms the sound from mono to stereo. Having a single oscillator, the Juno could have sounded much thinner than the other Roland synths.

The chorus effect, by creating a stereo image and adding detuning and spaciousness to the sound, works as if the synth effectively had more than one oscillator.

The chorus effect works by sending a signal to two hard-panned delay lines. The amount of delay is modulated with an LFO, which causes gradual changes in the frequency of the resulting signal, thus varying the copied signal's pitch. By altering the left and right channels' delay rates inversely and then combining the wet signal with the dry signal, this achieves a stereo chorus effect. As a result, the chorus effect creates a thicker sound, to almost make it sound as though there were more than one oscillator slightly detuned from one another.

The Juno-6 chorus effect made a remarkable impression when the synth was first released, and remains one of its most notable characteristics. It was (is) noisy, but much-loved for its swirling spatial textures.

The Jun-6 V chorus noise can be deactivated in the small section in the upper left part of the Main Control Panel, hidden by the trap door. When the noise button is Off, there will be no noise produced by the Chorus.

5.11.1. I

In this position, the chorus LFO has a lower frequency and less modulation, which leads to a lighter chorusing effect.

5.11.2. II

This position produces a thicker, more modulated chorus signal.

5.11.3. I + II

This position produces a different kind of effect. The two delays lines are no longer panned, which means the signal remains mono. The LFO also oscillates much faster, which creates a kind of vibrato effect.

5.12. Tune

This is the Master Tune of the synth. By default, it is set to 440 Hz, which is the reference tuning used in Western music, but you can set it to whatever master tuning you want.

Range goes from 400 Hz to 480 Hz.

5.13. Volume

This is the Master Volume. Range goes from -60 dB up to 0 dB. Default volume is set to -15 dB.

5.14. Voice Calibration

This panel is usually hidden behind a trap door in the upper left part of the Main Control Panel. Clicking it opens the door, while clicking again will close it.

When the door lid is open, it reveals a set of four buttons. Three are for voice calibration, while the fourth is to turn off the noise produced by the Chorus.

Analog synthesizers are subject to calibration drifts, component aging and tolerance. These phenomena introduce disparities between the voices at several levels, like the oscillators' volumes, waveforms, the filters' cutoff and resonance, the envelopes' times, etc... This is part of what makes the analog synths sound organic.

There are three voice calibration positions:

1. The position labeled Good produces a sound that can be associated with a pristine unit, coming out of the factory.
2. The position labeled Avg (Average) produces a sound that can be associated with a unit that has already been used for some time, but is still in workable condition.
3. The position labeled Poor produces a sound typical of a unit in need of servicing and calibrating.

Please feel free to experiment. At least, you may be sure that you don't really need to take your synth to a repair service facility. And, who knows, maybe you happen to like the sound of a "poor"-sounding synth.

6. ADVANCED PANEL

The Advanced control panel is where the majority of extra features added by Arturia can be accessed. You can reach it by pressing the "Advanced" button in the top right corner of the Upper Toolbar. When the Advanced Panel is open, that button is "lit up" (white letters over a black background). When the Advanced Panel is closed, the button is grayed out.

Let's take a look at the extra features you can access in the Advanced Control Panel:



6.1. Assign [Modulation Matrix]

This is a set of three slots to assign different keyboard controls to destinations. The source modulators are pre-assigned, but you have a choice of 35 destinations, among them several parameters of the DCO, VCF, Envelopes, LFOs, and even the effects (Delay and Reverb).

6.1.1. Mod Wheel

The Modulation Wheel is a parameter present in many synths. Yet, there wasn't one on the original Juno - just a trigger button for the LFO. The Juno-6 V has a real Mod Wheel, hardwired to the DCO and the VCF, and a slot to assign it to an extra destination.

That one is a bipolar modulation slot, which means that it can have positive or negative modulation values. The knob on the right sets the modulation intensity, and goes from -1.00 to 1.00. Default is 0.00 (no modulation).

6.1.2. Velocity

Another parameter we take for granted today. Yet, when the Juno was launched, only a few synths were velocity sensitive. This slot allows to assign velocity to one destination among the 35 you have to choose from. VCF Cutoff is a great option for that.

This is also a bipolar modulation slot, which means that it can have positive or negative modulation values. The knob on the right sets the modulation intensity, and goes from -1.00 to 1.00. Default is 0.00 (no modulation).

6.1.3. Aftertouch

Another keyboard parameter that only a few (usually high-end) synthesizers featured. Even today, not many synths respond to aftertouch (and many MIDI controllers also don't have this feature).

Before trying to use this modulator, please make sure that your keyboard is capable of transmitting aftertouch messages (also known as pressure). If it can, you have an extra source of expressivity. You can assign here a destination to use that control.

Again, this is a bipolar modulation slot, which means that it can modulate the destination both positively or negatively. The knob on the right sets the modulation intensity, and goes from -1.00 to 1.00. Default is 0.00 (no modulation).

 The original Juno didn't respond to velocity or aftertouch. It didn't have MIDI control either. The Jun-6 V is velocity sensitive, responds to aftertouch, and can even have a variable mix (MIDI-controlled) of the sub-oscillator and the noise source. Although the original was (and still is) a great and reliable synth, the Jun-6 V is much more expressive and allows much more sound creativity, especially when automated through MIDI.

6.2. LFO 2

This is the advanced panel for the second LFO, which was added to the synth by Arturia. LFOs are very important modulation sources, and you never have too many of them.

Besides, this second LFO is much more complete. You have a choice of six waveforms, among them the Sample & Hold which is a very important feature in synthesizers (in modular systems, Sample & Hold modules were even usually a module on their own).

6.2.1. Sync

As with all the time sensitive parameters in the Jun-6 V, you also have a sync option here, to give you the possibility to sync the rate with the host tempo. The sync values available are identical to those available in LFO 1. The lowest sync value is 8, which means 8 whole notes, or eight 4/4 bars. The highest value is 1/32 (a 32nd note). Default is 1/16 (a 16th note, which may be quite fast, depending on the purpose and the host tempo).

Triplets and dotted values are also available, but are indicated in fractions. For example, 3/4 is a dotted half-note, 1/3 is a dotted quarter-note, 1/6 is a quarter-note triplet, 1/12 is an eighth-note triplet. And so on.

When in sync, the default value for the LFO 2 rate is 1/16 (a sixteenth-note).

6.2.2. Rate

Rate is where you define the speed of the LFO. When in sync, the LFO speed is defined in musical values, as stated above. When not in sync, the LFO speed (rate) is defined in Hz, as expected.

Rate speed in Hz starts at 0.038 Hz (exactly the same lower value as LFO 1), but goes up to 30 Hz. This is considerably faster than the maximum rate for LFO 1. Default value in absolute mode is 1.000 Hz, the same value used for the first LFO.

6.2.3. Waveforms

Contrary to LFO 1, which has a fixed waveform, LFO 2 offers you six choices. This is much better, of course, and a great addition to the modulation options available.

So, besides the sine wave, you have triangle, saw and ramp (inverted saw), square and sample & hold. These extra waveforms add a lot of versatility to the LFO. Also, it isn't hardwired to any destination. To assign it, you need to use the two destination boxes to the right.

6.2.4. Retrigger

This switch defines if and how the LFO phase is retriggered. It has three positions: Off, Mono and Poly. Off means the LFO oscillates freely and doesn't retrigger at all. Mono means that the LFO phase is retriggered each time a key is pressed. In this position, the LFO is monophonic.

Finally, you have the Poly position. In this mode, the LFO is polyphonic but it is still retriggered each time a key is pressed.

6.2.5. Destination

As with the keyboard modulation options, you also have a choice of 35 destinations here, among them several parameters of the DCO, VCF, Envelopes, LFOs, and even the effects (Delay and Reverb). By default, the destination boxes are set to None.

To the right of each destination box, you have a knob to control the modulation intensity. These modulations are bipolar, which means that they can be positive or negative. The knob sets the modulation intensity between positive or negative values, and goes from -1.00 to 1.00. Default is 0.00 (no modulation).



Jun-6 V advanced modulation sections, including the mini modulation matrices, LFO 2 and Envelope Generator 2.

6.3. ENV 2

This envelope is a duplication of Envelope 1. Each segment has exactly the same characteristics and ranges.

As with the original, it is very fast and "snappy", with the ability to produce "clicks" even when all segments are set to zero.

The envelope is hardwired to the VCA (it is one of the options to modulate it). This allows you to have different contours for the filter and amplitude, something that's not possible with the original Juno.

Besides that, you have two extra destinations available to choose, through destination boxes similar to those of LFO 2.

6.3.1. A [Attack Time]

Attack sets the time the sound takes to reach its maximum volume after the key is triggered. Range goes from 1 ms to 2.970 seconds (almost three seconds). Default value is 1 ms (minimum value).

6.3.2. D [Decay Time]

Decay sets the time required for the sound to drop from the maximum point to the Sustain level. Range goes from 2 ms to 19.000 seconds (nineteen seconds). Default value is 2 ms (minimum value).

6.3.3. S [Sustain Level]

This segment sets the volume for the sustained part of the sound. Once this level is reached, the sound remains there until the key is released. Default sustain value is 1.00 (maximum value).

6.3.4. R [Release Time]

This segment sets the time needed for the sound to reach zero after the key is released. Range goes from 2 ms to 17.000 seconds (seventeen seconds). Default value is 10 ms.

6.3.5. Destination

This sections is similar to that of LFO 2. Therefore, you have the same choice of 35 destinations, among them several parameters of the DCO, VCF, Envelopes, LFOs, and even the effects (Delay and Reverb). By default, the destination boxes are set to None.

To the right of each destination box, you have a knob to control the modulation intensity. These modulations are bipolar, which means that they can be positive or negative. When using negative values, the behavior of the envelope modulation is similar to what was [described in the filter section \[p.40\]](#), so please refer to that section to better understand it.

The knob sets the modulation intensity between positive or negative values, and goes from -1.00 to 1.00. Default is 0.00 (no modulation).

6.4. Delay

This Delay is a simplified version of the same effect Arturia has been using in its other synthesizers, like for example our celebrated [Pigments](#) synthesizer.

It has a reduced set of parameters, to make it simple to operate. This way, we remain faithful to the principle that everything in this synth should be simple and easy to program.

6.4.1. On Button

This button switches the Delay On and Off. By default, it is On.

6.4.2. Time

This defines the delay time. It may be in sync with the host tempo, in which case it assumes musical values. When not in sync, the time is displayed in absolute terms, and ranges from 2.00 ms up to 2000 ms. Default is 250 ms.

6.4.3. Sync

When the sync button is switched on, the delay tempo is synchronized with the host tempo. When this is the case, the Time parameter values are displayed in musical values. Minimum delay time in this case is 1/32 (32nd note) and maximum delay time is 2 bars.

Sync values may also be set to triplets and dotted, using the bar reference. In this case, 3/4 is a dotted half-note, 1/3 is a dotted quarter-note, 1/6 is a quarter-note triplet, 1/12 is an eighth-note triplet, etc.

6.4.4. Feedback

Feedback is the parameter that sets the amount of signal that is reinjected into the delay channel. The more feedback, the stronger the effect. Range goes from 0.00 to 1.00 (you can think of this as a percentage value). Default value is 0.300.

6.4.5. Stereo

This sets the amount of stereo dispersion (spread) of the delay signal. This is another percentage parameter, ranging from 0.00 to 1.00. Here too, the default value is 0.300.

6.4.6. Dry/Wet

One of the most important parameters. This allows to balance the mix between processed and unprocessed signal. When the Dry/Wet parameter is set to 0.00 you will not hear any effect - just the Dry signal. When the parameter is set to 1.00 only the processed signal will be heard.

Range is again between 0.00 and 1.00. Default, in this case, is 0.00 (no effect, just dry signal).



Jun-6 V extra effects: Delay and Reverb.

6.5. Reverb

As with Delay, Reverb is a simplified version of the same effect Arturia has been using in its other synthesizers, like for example our [Pigments](#) synthesizer.

This also has a reduced set of parameters, to make it simple to operate.

6.5.1. On Button

This button switches the Reverb On and Off. By default, it is On.

6.5.2. Size

This parameter sets the size of the room or space (basically, the reverb "body"). The bigger the size, the more reverb is added.

Range goes from 0.00 to 1.00, which may not mean much to you in this case. So, think of it this way: a value close to 0 is a very small and dry space, with almost no reverberation. A value close to 1 is a very large space, that will mask the sound a lot and has a very long reverberation tail.

Default value is 0.643 which may be considered a Large Hall. A value close to a Small Hall will be around 0.400.

6.5.3. Damp

This parameter determines how much and how fast the higher frequency content is attenuated. The higher the damping, the faster the high frequencies will decay. In a room, this parameter defines the absorption coefficient of the reflective surfaces.

Range goes from 0.00 to 1.00. Default value is set to 0.600.

6.5.4. Decay

This parameter controls the length of the reverb effect (how much time it will last). It should be articulated with the Damp parameter for a more realistic effect.

Range goes from 0.00 to 1.00. Default value is set to 0.460.

6.5.5. Predelay

This controls the time between the original signal and the first echoes (early reflections). This parameter is set in milliseconds.

Range goes from 0.00 s to 0.200 s. Default value is set to 0.020 s.

6.5.6. Dry/Wet

Dry/Wet works pretty much the same way as the Dry/Wet parameter for Delay. It allows to balance the mix between processed and unprocessed signal. When the Dry/Wet parameter is set to 0.00, you will not hear any effect - just the Dry signal. When the parameter is set to 1.00 only the processed signal will be heard.

Range is again between 0.00 and 1.00. Default, in this case, is 0.00 (no effect, just dry signal).

6.6. Virtual Keyboard

This virtual keyboard, which is positioned at the bottom of the window, allows you to play the instrument with your mouse. You may also play it with the computer keyboard, using the middle row keys (the row that starts with A key) for the white keys, and the row above it (the one that starts with the Q key) for the black keys.

Z and X keys (the first two keys in the lower row) allow to transpose the keyboard range.

Arturia also included the performance controls present in the original synthesizer, located on the left side of the keyboard.

6.6.1. Bender (Keyboard Side Panel)

Bender is the Roland version of the Pitch Wheel. It "bends" horizontally, contrary to the usual vertical movement of the Pitch Wheel often seen in other brands' synthesizers. This wheel has two hardwired destinations: DCO and VCF, just as in the original unit.

Default position is zero (middle position), and the wheel resets to default position when released.

6.6.1.1. DCO Modulation Fader

This controls the modulation intensity applied to the DCO by the Bender. It will modulate the pitch.

Modulation range is 12 semitones. Default position is 2 semitones.

6.6.1.2. VCF Modulation Fader

This controls the modulation intensity applied to the VCF by the Bender. It will modulate the low-pass filter cutoff.

Range goes from 0.00 to 1.00. Default position is 0.00.

6.6.2. LFO Mod Wheel [Keyboard Side Panel]

The original synthesizer didn't have a modulation wheel. Instead, it only had a button to retrigger the LFO. However, we decided that a modulation wheel should be included, as it is a standard performance control on pretty much every analog synthesizer ever launched.

When the modulation wheel is moved up, it increases the amount of modulation applied by the LFO to the hardwired destinations (DCO and VCF) according to the modulation intensity set by the respective faders. This wheel doesn't reset to zero when released.

It will also modulate a third parameter, if there is one set in the [Advanced Panel \[p.46\]](#).

6.6.2.1. DCO Modulation Fader

This controls the modulation intensity applied to the DCO by the Mod Wheel. It will modulate the pitch.

Modulation range is from 0.00 to 1.00. Default position is 0.020.

6.6.2.2. VCF Modulation Fader

This controls the modulation intensity applied to the VCF by the Mod Wheel. It will modulate the filter cutoff.

Range goes from 0.00 to 1.00. Default position is 0.00.

6.6.3. Unison Switch

The Unison switch turns On unison for the Jun-6 V. Unison stacks slightly detuned voices in each note, to make it sound "fatter". This is a feature that was present in many analog synthesizers, but not in the original Juno. Yet, we added it to the Jun-6 V.

6.6.4. Unison Detune

Detune determines the amount of pitch variation between each voice. Depending on whether Unison is On or Off, it works as follows:

If Unison is On, it controls the amount of detuning for each unison stacked voice, to create anything from a subtle unison effect to heavily detuned aggressive stacked voices.

If Unison is Off, the range is scaled to add an analog feel to the DCO pitch tracking.

6.6.5. Portamento

Portamento creates a kind of "glissando" between two played notes. The control sets the time it takes for the pitch to transition between the first note and the second note.

Pitch transition is triggered when the second key is pressed. At this moment, pitch transition doesn't stop until it reaches the destination pitch.



i: This is a **Time** portamento. This method is more suitable for chords, as each note will take the same time to go from pitch A to pitch B.

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