

# CV funk

CV funk Chord Caster for VCV Rack



## User Manual

Version 2.1.6

CV funk

# LICENSES

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## **## CV funk Pro ##**

Explore the vast possibilities of modular synthesis with the **CV funk Chord Caster**. The Chord Caster gives you a new level of control over your sequencing and sound. Enjoy a depth of automation options that should help you open up new possibilities and inspiration for your musical creations.

### **### Chord Caster 4**

A 6-note polyphonic voice like no other. With a fully-loaded sequencing, modulation, mixing and delay effects chain you will have the power of a full poly synth in a convenient interface. Sequence chords, voicings and rhythms per bar and much much more. Each step can recall all 42 knob parameters and 20 buttons states, letting you have precise control over the timbre, time signature, bpm and sound processing.

### **### Poly Map 11**

A companion module to Chord Caster, this maps polyphonic V/oct signals to the input of Chord Caster. It will read the number of active notes based on the high gates, and distribute them to the channels of the Chord Caster so that every channel is used.

### **### Chordy 14**

The chord sequencer section of Chord Caster, in a handy compact form. In addition to a poly output it has individual CV outs for each channel. Also features Copy/Paste, and recording of CV inputs. Also has the ability to rotate notes.

# CHORD CASTER

**RECORD** The **RECORD** section lets you select which parameters are being recorded. Edit mode allows you to load knob settings on sequence changes so they aren't automatically overwritten.

**COPY/PASTE** **COPY** and **PASTE** multiple stages at once to easily build up longer sequences.

**SLEW** Apply **SLEW** to stage changes. You can slew the V/oct and the Knob recall separately. Knob slew allows for smooth transitions between different knob settings.



**CHORD** Choose from a library of 192 hand-programmed guitar-style chord voicings. Each note in the 12-tone scale has its own voicing, so your chords will always have variation.

**BEATS** Set each channel to have its own rhythm with the **BEAT** setting. You can set the ratio per sequencer stage.

**ENVELOPES** Each channel has a unique AD envelope shape, with its length interpolated from **WIDTH I** to **WIDTH VI**. Control both the shape and curvature of the envelopes.

**MODULATION** The 6-channel modulation bay lets you modulate the parameters of each channel of the oscillator, or trigger the envelopes in **STRUM** mode.

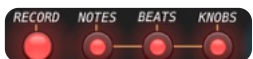
*CHORD CASTER allows you to create and sequence full compositions in VCV rack. It has a 6-note polyphonic stereo oscillator, unique chord-based quantizer, integrated rhythm section, tempo-synced modulation bus, compression, tanh saturation with antiderivative antialiasing, supersampling-based anti-aliasing, with a 3-tap fractional delay.*



# CHORD CASTER

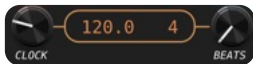


1



**Recorder Controls:** **RECORD** Buttons record the notes and knob positions, overwriting the sequencer step each time the **STAGE** is advanced. **RECORD** toggles all on/off, while the sub buttons toggle their respective channels. When **EDIT** mode is enabled, advancing the stage recalls the memory, allowing you to edit it, advancing to a new stage stores to memory and loads the next setting.

2



**Clock Controls :** **CLOCK** sets the clock rate in **BPM**. The **BEATS/STAGE** sets how many clock pulses before advancing the **STAGE**. When an external **CLOCK TRIG.** is patched, the knob is automated.

3



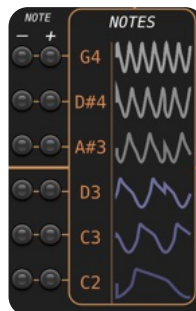
**Transport Controls:** **PLAY** starts the sequencer (blue light). **RESET** returns to the first step. **FWD** and **REV** moves the **STAGE** by one step. Shift-click on **PLAY** will loop the current **STAGE** (indicated by yellow)

4



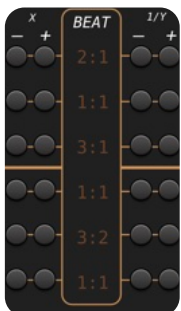
**Chord Sequencer:** **STAGE** knob sets the current sequencer stage. **MAX** knob sets the max number of sequencer stages. The current stage and max are indicated at the top display as Stage/Max. The current note/chord combo is displayed under. The keyboard allows you to specify the root note, and the buttons provide a selection of 16 chord types to choose from. In the input section (panel 15) a mono input to V/oct sets the root note, while a poly input to V/oct disables the chord and fills the 6 channels with the input (or copies of the input to make 6).

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**Notes Display:** Displays the current note in the 6 channels, to the right a scope previews the current waveshape for each channel. The **NOTE +/-** buttons allow you to increment or decrement individual notes in the voicing. Selecting a new root note in the Chord Sequencer panel (panel 4) preserves your voicing. Selecting a chord type in the Chord Sequencer (panel 4) resets all note offsets back to 0 and loads the selected chord. If a poly V/oct signal is being processed, then the chords panel buttons are not operational and **NOTE** offsets take precedent.

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**Beat Programmer:** The **X** and **1/Y** buttons to the right and left allow you to increment and decrement the numerator and denominator, and define clock divisions for each of the 6 channels. Setting **X** to 0 will turn off the gate signal for that channel. This functions exactly like a simplified Syncro, without clock rotation, swing or control over pulse width. The **BEAT** setting is stored per sequencer **STAGE**, and therefore you can program different rhythms to be played back with the sequence.

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**Envelope Controller:** Functions like **ENVELOPE ARRAY**, where **WIDTH I** sets the envelope length of channel 1, and **WIDTH VI** sets the envelope of channel 6, with the other channels interpolated. Slant and Curve change the shape of the envelope. The **GATE** outputs from the **BEAT** programmer stage trigger the 6 channels of the envelopes. The display shows a live feedback of the envelope for each channel. Individual **LEVEL** trimpots for each channel let you attenuate the envelope outputs. All knobs can be recorded and played back with the sequencer.

# CHORD CASTER



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**Modulation:** A 6-channel modulation controller related to *HEX MOD*. The **RATE** knob multiplies with the rate of the **STAGE** advancement. The **NODES** setting sets the number of modulation nodes and direction of oscillation. **WONK** modulates both **RATE** and **NODES** at the **STAGE** period, with **POS** setting the channel that modulates. **MOD DEPTH** sets the modulation depth for all modulation channels.

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**Chord Caster Oscillator:** A 6-channel stereo implementation of *Ouros*. The modulations from the **MODULATION** bus map to all 6 channels of the oscillator, with attenuators for each input and the **FM**. The display to the left shows the top channel of the stack in stereo in polar coordinates. In the **NOTES** display (panel 5), only the left channel is shown in normal cartesian coordinates.

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**Mix:** The mixer bay controls the mixing of the 6 channels into a stereo signal. The **STEREO SPREAD** allows the 6 channels to be panned from R→L to L→R. The **PRESS** knob saturates the signal similar to the Pressed Duck mixer, with lights to indicate the amount of compression. The **GAIN** knob sets the signal volume going to the final **DELAY FX** stage. The **GAIN** light indicates when distortion is occurring.

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**Delay FX:** The effects bay is a miniature version of the *TRI DELAY* module. The three-tap delay has a global **DELAY** setting, and individual offsets for the three taps. The **REVERB** setting controls the self-feedback amount. The **DRY/WET** knob controls the amount of wet signal added to the output. **VOLUME** controls the final output volume.

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**Strum Mode:** Activating **STRUM** overrides the normalization into the Envelope Controller. Instead, the 6-channels of the **MODULATION** bay are mapped to trigger envelopes instead, allowing for different strumming patterns that are synchronized to the **STAGE** advancement.

**Retrig Envelope Mode:** Allows the envelope to be retriggered before it reaches zero.

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**Copy/Paste Controls:** Controls for copy/paste add/delete and clearing of the current sequencer **STAGE**. Shift-click **COPY** will copy the whole sequence up to the current stage. The color of the **COPY** lights indicates if 1 stage (blue) or multiple (yellow) are in the copy buffer.

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**Slew Controls:** When not in **REC** mode, and **PLAY** is engaged and playing, the **CV SLEW** and **KNOB SLEW** settings can be slewed as the **STAGE** advances. The slew is linear, taking up to the length of the current stage.

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**Input Bay:** Input for the external Clock Trigger, overrides the clock knob, computed based on the last 2 triggers. V/Oct input sets the root note, a poly signal overrides the Chord controls. Inputs override the panel settings. **EXT** allows an external oscillator to be routed to VCA instead of the internal oscillator, or to for external modulation to trigger envelopes (select in context menu).

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**Output Bay:** **NOTES, GATES, ENVS, MODS** are 6-channel poly outputs of the corresponding bay. The **STAGE** output send a trigger every stage change. **AUDIO OUT** is a stereo signal, unless **DRY-poly** is specified in the context menu, then it outputs the 6 dry oscillator outputs and turns off the Mixer and Delay FX stages (saving CPU).



# CHORD CASTER

**RECORD** The **RECORD** section lets you select which parameters are being recorded. The red light indicates that at least one parameter or setting is currently being recorded:

**NOTES**, **BEATS** and **KNOBS** buttons allow you to control what is being currently overwritten or edited in the recording.

**EDIT** mode allows you to recall knob settings as the sequencer changes stages without the current knob/button settings overwriting the memory. By default **EDIT** mode is off, meaning that knob/button settings will be overwritten as the sequence is advanced.



**NOTES** **NOTES** (red) sequences the notes/chord setting and any individual **NOTES** offsets per channel. The **CV SLEW** control (top right) adds slew to the notes when the stage changes.

**BEATS** **BEATS** (green) sequences the beat settings as well as the **STRUM**, **RETRIG ENV** buttons, and the **CLOCK** and **BEATS** knobs.

**KNOBS** **KNOBS** (blue) sequences the position of all the knobs and attenuvertors on the module panel. The **KNOB SLEW** control (top right) adds slew to the knobs as they automate while the stage advances.

# CHORD CASTER

**MODULATION:** The 6-channel modulation bay provides some unique modulation possibilities.



**RATE x** Sets the modulation rate as a multiplier to the **STAGE** advancement rate. A rate of 1.0 will result in one cycle per sequencer stage. Negative rates will divide the clock, so a setting of -2.0 will result in a 1/2 clock, -3.0 a 1/3 clock up to -16 or 1/16. The range of -1...1 is a deadzone that maps to 1.0, making a larg-ish landing pad to resync the clock when performing with the module.

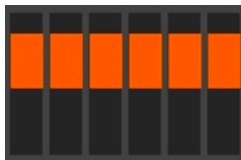
The modulation bay will reset every time a new note is played in the sequence (thus multiple stages of the same chord/note will be treated as a tie). If **WONK** is enabled past 0.5 the modulators will run free.

**MOD. DEPTH** Sets the modulation depth for all 6-channels of modulation.

**WONK** Sets the amount of self-modulation. Based on the position of **WONK POS.** a selected modulation channel will self-modulate both **RATE** and **NODES** parameters.

**WONK POS.** Sets the oscillator channel that is used for self-modulation by **WONK**.

**NODE** Controls the number of **NODES** that spread over oscillator channels 1...6. When set to 0 the channels normally oscillate in unison. The **NODES** setting is continuously variable from -3.. .3. **WONK** can change the respective phase between channels, and will make the channels get out of sync. **STRUM** mode sets the modulation bay to trigger envelopes instead of **BEATS**, in this mode the beats are not used and will be grayed out.



**NODES == 0** The channels oscillate in-sync with each other.



**NODES == -1** The channels oscillate 60° from each other. +  
**NODES == 1** Rotates them Clockwise, - Anticlockwise.



**NODES == -2** The channels are 120° from each other. This results  
**NODES == 2** in 2 copies each of 3 modulations.



**NODES == -3** The channels are 180° from each other. This results  
**NODES == 3** in 3 copies each of 2 modulation that are opposed.



## CHORD CASTER



**DELAY FX:** A 3-tap fractional sample stereo delay. 4th order Lagrange interpolation is used for buttery smooth delay effects. Designed to sound smooth even if the delay time is modulated.

**DELAY:** Sets the master delay time. Depending on the **BUFFER SIZE** selected, this will set the delay to up to 36, 360 or 3600 ms times.

**Scope:** The top (orange) wave displays the envelope of the **DRY** input sound over the selected buffer window. The bottom (blue) wave displays the envelope of the **WET** processed sound.

The three circles display the position of the three **TAPS** in the buffer window. Their relative size displays the amount of reverb feedback applied. The color of the taps indicates their **L/R Pan** position, Orange = left, Grey = center, Blue = right. The **STEREO SPREAD** knob in the mixer will effect the panning.

**REVERB:** Sets the amount of feedback into the reverb circuit. For the shortest, 36ms buffer length, higher reverbs can be used to generate Karplus Strong sounds.

**TAPS:** Bipolar trimpots set the position of the three taps relative to the master **DELAY** setting.

**Center:** Sets the imbalance of reverb applied to the three **TAPS**.



**BUFFER SIZE:** Select between 36ms, 360ms and 3600ms.

**DRY/WET:** Sets the balance of dry/wet signal to the output.

**VOLUME:** Sets the final output volume

## CHORD CASTER

### KEY MODIFIERS:

Hold down the **SHIFT** button while clicking the interface to have different options available.

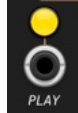
#### SHIFT



OFF



PLAY



LOOP  
STAGE

Hold down the **SHIFT** button while clicking the **PLAY** button to engage the **LOOP-STAGE** mode. The current stage will loop and play continuously, allowing you to preview the sound and rhythm of the **BEATS**.

#### SHIFT



COPY  
CURRENT  
STAGE



COPY  
ALL STAGES  
UP TO CURRENT

Hold down the **SHIFT** button while clicking the **COPY** button to copy all stages up the current stage. The light indicates that the copy buffer is full. When you **PASTE** the copy buffer will be cleared. Pasting writes over the stages after the current stage, increasing the sequence length as needed.

#### SHIFT



RECORD KNOBS  
MODE



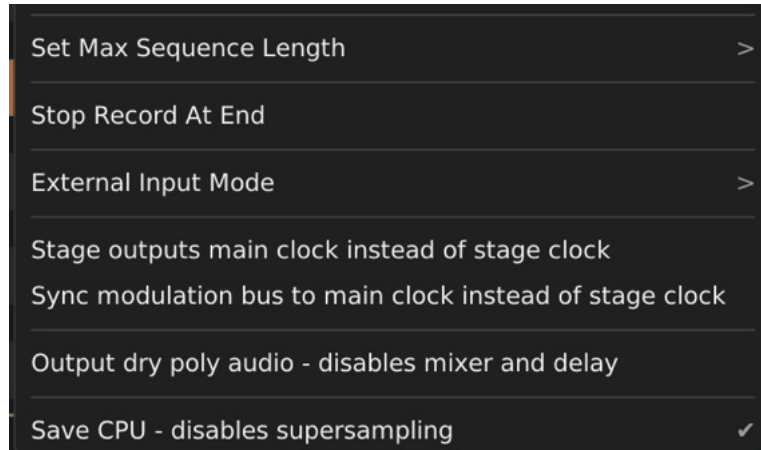
ANY  
KNOB

When in **RECORD-KNOBS** mode, **SHIFT**-clicking any knob will apply that knob setting to **ALL** stages of the sequence. This will also work on the **STRUM** and **RETRIG ENV.** Mode Buttons as well.

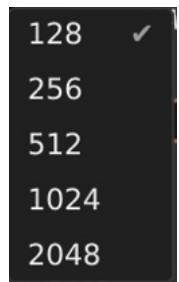
# CHORD CASTER

## CONTEXT MENU:

CHORD CASTER has a number of context menu options that allow you to customize how the module will operate.

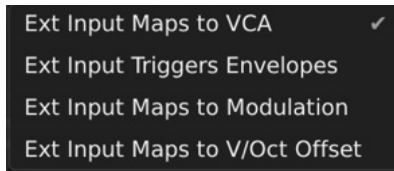


**Set Max Sequence Length:** Sets the range of the **MAX** knob. Sequence length can be lengthened to up to 2048 steps. Changing this setting does not effect the efficiency of the module, it always remembers the full 2048 steps, and any stages that aren't currently used. If you increase the length after shortening it it will recall those stages.



**Stop Record At End:** Stops all recording when the sequence loops at the end, preventing you from recording over the beginning of your sequence.

**External Input Mode:** Sets the behavior of the **EXT.** Input.



**Ext Input Maps to VCA:** Overrides the internal *OUROS* oscillator and sends the external poly input to the VCA. Channels 1-6 are the left, and 7-12 are the right. An external input in this mode also disables the internal oscillator.

**Ext Input Triggers Envelopes:** Overrides the **BEAT** or **STRUM** setting to let you manually trigger the envelopes with a poly input. Channels 1-6 trigger envelopes 1-6.

**Ext Input Maps to Modulation:** The 6 channels of the modulation stage are replaced by external modulation. If the input is fewer than 6 channels they are duplicated to make 6 channels. An external input in this mode disables the internal modulation.

**Ext Input Maps to V/Oct Offset:** The external input adds to the v/oct of each channel. A mono input will be duplicated to add to all 6 channels, a poly signal will only add to their respective channels. This enables the sequencer to be transposed by another sequence.

**Stage outputs main clock instead of stage clock:** Normally the **STAGE** output sends a trigger upon stage change. This sets it output triggers with the master clock instead.

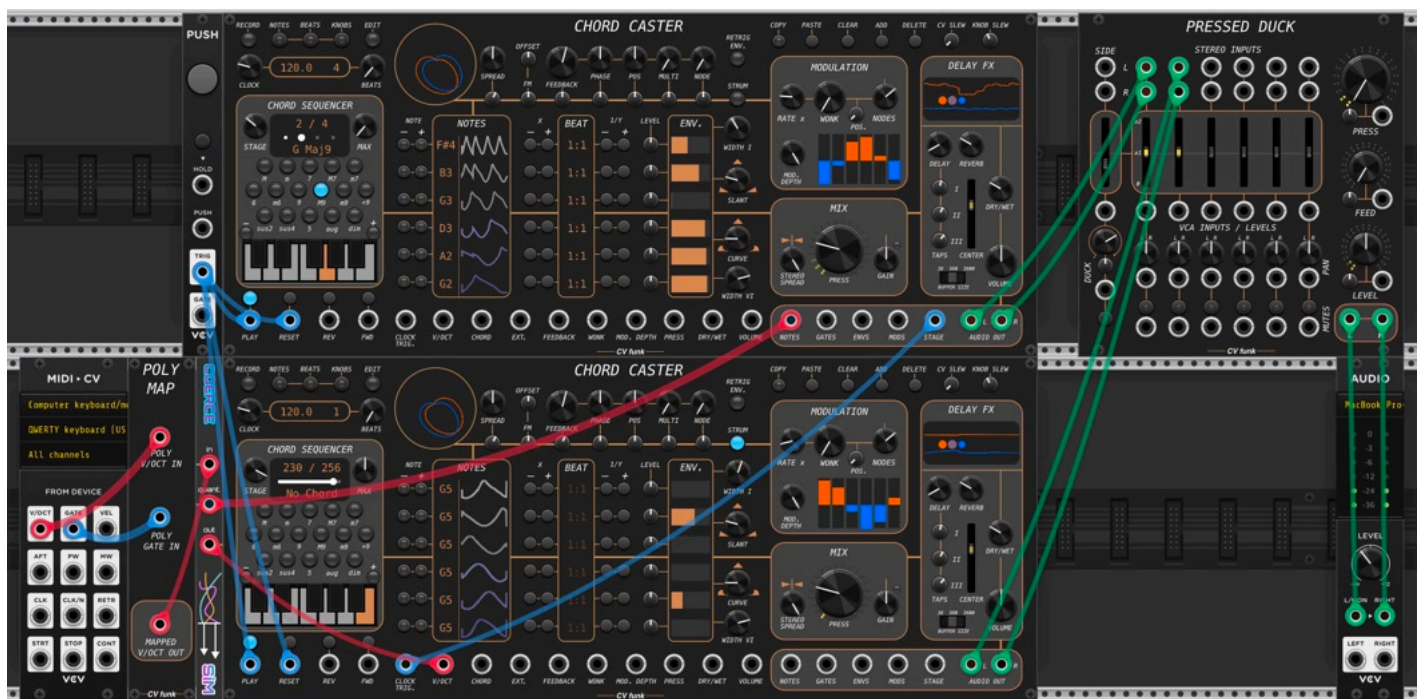
**Sync modulation bus to main clock instead of stage clock:** The **RATE x** knob in the modulation bus sets a clock division/multiple based on the stage clock. This setting changes it to be a multiple/division of the master clock instead.

**Output dry poly audio:** The **AUDIO OUT** outputs output a 6-channel poly signal from the oscialltor, disabling the VCA and FX portions of the module.

**Save CPU:** Enabled by default. Disabling it will engage 8x supersampling and envelope smoothing to reduce clicks and aliasing.

# CHORD CASTER

**PATCH EXAMPLE:** Use multiple Chord Casters in unison. Sync a MIDI keyboard to match the current chords. **NOTE:** Requires *SIM Coerce*



**Notes:** The **PUSH** is useful to sync up multiple *Chord Caster* modules. The *Poly Map* module reads a polyphonic V/oct – Gate combination to extract only the active channels as V/oct signals, converting it for *Chord Caster* to split between its 6 channels. To set this up, select 6-note polyphont in the *VCV MIDI→CV* module.



# POLY MAP

**POLY  
V/OCT IN:** Input a polyphonic V/  
Oct signal to be  
separated into the  
currently active  
notes.

**POLY  
GATE IN:** Input a polyphonic  
Gate signal to define  
the active notes.



**MAPPED  
V/OCT OUT:**

A polyphonic V/oct  
output signal contains  
only the active notes.  
If there is only 1  
note active, it gets  
doubled so that the  
poly is always at  
least 2.

***POLY MAP interfaces MIDI polyphonic signals to the Chord Caster. It reads the gate input to determine which notes in the poly signal are currently active, and then outputs only those voltages. The polyphony of the output changes dynamically, and is processed by Chord Caster to distribute the notes to make a fuller 6 note signal multiplied from the inputs.***

# CHORDY



**STAGE:** Outputs a trigger when the STAGE changes.

**MONO:** Individual CV outputs for each of the 6 notes.

**POLY:** Polyphonic output with the same 6 notes.

**ROTATE:** New ROTATE input rotate the notes by CV or with the trimpot. The red indicator light shows the first note in the chord.

*CHORDY is the chord sequencer brains of Chord Caster, in a more compact form and with a few extra features. Individual CV outs for all the notes gives more flexibility in patching, the ROTATE function makes it easy to create more timbral variation from the same chord set.*