

YouKnow

Circuit-Modelled Synth for Reason 14+

User Guide - 1.3.5f5



Direct subtractive synthesis, 100 original patches, polyphonic MIDI, monophonic Note/Gate CV, stereo chorus, and scalable rear-panel engine quality.

Install and first sound

Install and update YouKnow through your Reason Studios account and the Reason Rack Extension browser. After installation, find **YouKnow** under Instruments in the device palette.

1. Create YouKnow and play MIDI notes. The Init patch loads by default, and Reason creates a sequencer track and routes stereo audio when a suitable destination is available.
2. Use the patch display and browse controls to explore the 100 patches. Categories include Bass, Leads, Keys, Brass, Pads, Strings, and Effects.
3. Shape the sound on the front. Flip the rack to adjust processing quality, Unit Character, Aging, or CV connections.
4. Save sounds with Reason's normal patch command. Unit Character is saved with the patch; Aging and processing quality are saved with the song.

Init and **Reset Device** use a plain 8' saw with the filter fully open, resonance and modulation off, a gated VCA with calibrated Level, and chorus off. To shape notes with Attack, Decay, Sustain and Release, switch the VCA to **ENV**.

Front panel

Section titles and control captions have more vertical separation; captions sit closer to the controls they name. Thicker colour bars distinguish the section titles on both faces.

White fader ticks sit beside the moving caps so they remain visible. Align the centre of a cap with an adjacent tick to select its marked value.

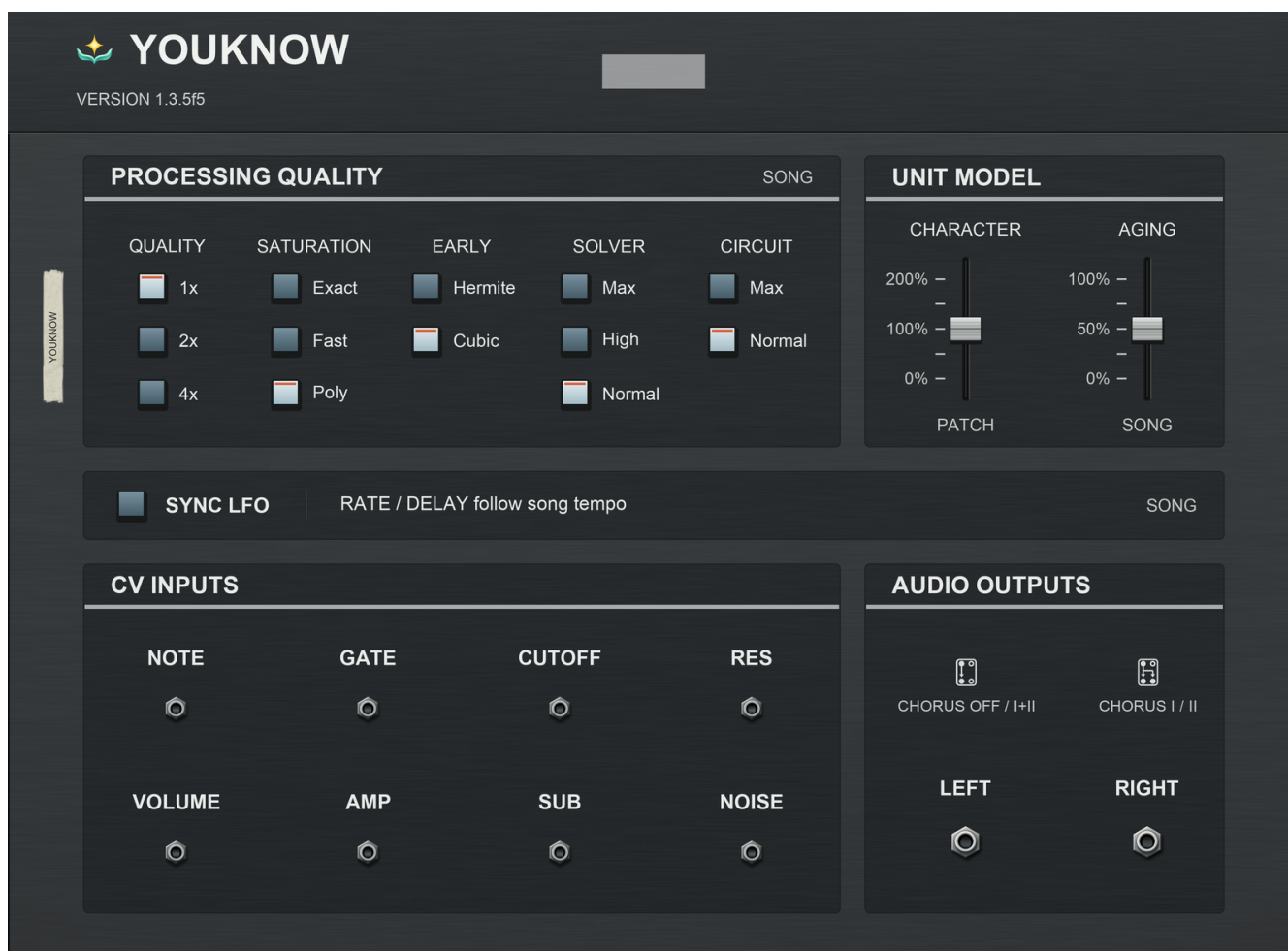
LFO sets modulation rate and delayed onset. **DCO** selects octave range, PWM source and depth, and oscillator modulation. **MIXER** contains the pulse/saw switches and sub/noise levels. **HPF** provides four positions; the lowest, labelled 0, retains the bass-boost setting.

VCF controls cutoff (FREQ), resonance (RES), envelope polarity (POL) and amount (ENV), LFO amount (LFO), and keyboard tracking (KYBD). POL is labelled N for negative at the top and P for positive at the bottom. At high resonance the filter can self-oscillate. **VCA** chooses envelope or gate behavior and sets the amplifier level. **ENV** supplies attack (A), decay (D), sustain (S), and release (R). **CHORUS** offers Off, I, II, and a dedicated narrow I+II combination; NOISE sets its hiss level. The background chorus hiss is 30% of the preceding amplitude (-10.46 dB) at the same setting. The MIXER NOISE source keeps its level. An engaged chorus hisses whether or not a note is playing, so a cabled YouKnow keeps processing its chorus while idle. With Chorus Off, NOISE at zero or no output cable, it goes quiet about 0.2 seconds after its last note and stops processing until the next one.

Performance contains the pitch and modulation wheels, Volume, and performance modulation depths. Volume is the master output control. VCA Level balances the stored sound. In its native range it changes amplifier drive before the chorus; its software extension is described under Patches. **Keyboard** contains glide, key mode, transpose, master tune, velocity response (VEL), and the 1-16 voice limit. At VOICES=1, the newest held note takes priority in every key mode. Releasing it returns to the most recently pressed note that is still held. Glide follows these pitch changes; releasing an older key does not interrupt the current note. Clicking the already-selected Poly 1, Poly 2, or Unison button repeats the held-key reassignment gesture. With multiple voices, Poly 1 and Poly 2 glide from each voice's own pitch history. Poly 2 reuses available voices sooner, making the glide more apparent. Unison also preserves each voice's glide history; the original six voices start with middle-C pitch memories. A newly pressed key takes over the stack. Releasing any held key retriggers the highest remaining held key. Whenever Unison is selected, final output is scaled to 80% (-1.94 dB), with a short smooth transition when changing modes. This is a product convenience, not original hardware behavior.

The seven-cell status strip reports processing quality, Character, and Aging. Their editable controls are on the rear.

Rear panel and engine quality



Rear section bars are gray and match the front PERFORMANCE bar's thickness. Every Unit Model scale value carries a percent sign.

The rear groups five Processing Quality selectors, two Unit Model controls, a Sync LFO switch, eight CV inputs, and stereo audio outputs. Settings occupy the upper half; connections sit below them so downward cable runs leave the settings clear.

The two flat routing symbols above the audio jacks show the mono and stereo output paths. YouKnow's voice bus is mono: with Chorus Off or I+II both jacks carry the same signal, and with Chorus I or II the chorus spreads it into stereo. When only one jack is cabled, as when Reason auto-routes YouKnow to a mono channel, that jack carries the mix of both channels, as the original instrument's L/MONO jack does; with both jacks cabled each carries its own channel.

Sync LFO makes LFO RATE and DELAY follow the song tempo. It defaults to Off and is saved with the song, so browsing patches leaves it unchanged. With Sync LFO On, the front RATE slider selects **4/1, 2/1, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, or 1/64**, from slow to fast; the front readouts show Free/Sync and the selected note lengths. A whole note is four quarter-note beats, independent of the time signature. DELAY (labelled DLY on the front panel) selects **Off, 1/64, 1/32, 1/16, 1/8, 1/4, 1/2, 1/1, 2/1, or 4/1**, from short to long. The selected length is the wait before DCO/VCF modulation, followed by a fade-in of the same length. For example, 1/4 waits one beat and fades in over the next beat; Off applies the modulation immediately. The original note/retrigger behavior is retained, and PWM has no delayed onset. With Sync LFO Off, both blue RATE and DLY readouts stay blank. With Sync LFO On, they show the selected note divisions. The fader tooltips identify the controls and explain the synced readouts. Tempo and rate changes preserve the current LFO phase; starting or seeking the transport does not retrigger it. This synchronizes DCO/VCF/PWM modulation; chorus timing is separate.

PWM retains the stored positions used by existing Rack patches and automation. Positions above about 82.7% now hold the physical panel maximum, so high manual settings and full LFO depth cannot drive the pulse comparator into its former out-of-range mute. Settings below that limit keep their previous pulse widths.

Unit Character varies circuit tolerances across a 0-200% range. It is stored with each patch.

Aging models service drift and noise changes across a 0-100% range. New devices start at 50%; set it to 0% for the freshly serviced state. Aging is stored with the song, so patch browsing leaves it unchanged and existing songs recall their saved value.

- **Oversample (Quality): 1x, 2x, 4x.** The default is 1x. Higher settings request more internal processing and increase CPU use; an already-high host sample rate can limit the applied factor. Changes, including automation, wait for voices and output tails to become quiet, then use a short fade.
- **Saturation (VCF Tanh): Exact, Fast, Poly.** Poly is the efficient default. Fast and Exact provide alternative filter calculations at higher CPU cost.
- **Early Model (Fast Early): Hermite, Cubic.** Cubic is the default; Hermite provides an alternative interpolation for the fast filter path.
- **Filter Solver (VCF Solver): Max, High, Normal.** Normal is the efficient default. High and Max spend more processing on the filter.
- **Circuit Rate: Max, Normal.** Normal is the efficient default: the filter, voice amplifier and chorus run their high-rate stages at half the Max rate, and voices that are not sounding rest those stages. Max keeps the full rate, which removes the highest distortion products instead of folding them back; on bright open chords Normal measures up to 0.33 dB more level above 14 kHz. Max costs about 1.4 times Normal's processing with six voices sounding. At 4x, or at 2x when Reason runs at 88.2 or 96 kHz, those stages already run at the internal rate, so both settings sound and cost the same. Changes wait for voices and tails to become quiet, like Oversample.

The shared SONG heading applies to all five quality settings; they survive patch changes. Start with 1x, Poly, Cubic, Normal and Normal for a busy rack. The combination of 16 voices and 4x is the heaviest configuration. An idle instance with its chorus hiss running costs about a fifth of its processing with one note sounding; turn Chorus NOISE to zero on instances that should rest between notes.

Automation and Remote

All 43 sound, performance, and quality controls support Reason sequencer automation and Remote mapping. This includes Chorus Hiss, Unit Character, Aging, Sync LFO, and all five rear quality selectors. Existing automation lanes retain their assignments. The pitch and modulation wheels and sustain use Reason's standard performance automation.

Rear controls and their readouts show Reason's automation indication; the front status strip remains read-only. Automating Quality or Circuit Rate follows the same quiet-tail transition policy as changing it manually.

The held-key reassignment press is a transient gesture available to Remote. It has no separate sequencer lane. Preset balance is stored on visible VCA Level and can be edited or automated directly.

CV, tuning, and timing

The rear CV sockets form two rows: NOTE, GATE, CUTOFF, RES above VOLUME, AMP, SUB, NOISE. The Note/Gate pair plays a monophonic CV part; MIDI remains polyphonic up to the selected voice limit.

- **NOTE and GATE:** Note sets pitch; Gate triggers and releases the note. Changing Note while Gate remains high retargets the held note legato.
- **CUTOFF and RES:** CV adds to the corresponding normalized panel value. The result is limited to the control's 0-100% range. For example, a 50% cutoff setting with +0.25 CV becomes 75%; -0.25 CV makes it 25%.

- **VOLUME, AMP, SUB, and NOISE:** CV scales the normalized travel of Volume, VCA Level, Sub and Noise respectively. CV is limited to 0-1: 1 leaves the setting unchanged, 0.5 halves its travel and 0 selects its lowest position. The resulting level follows the control's modeled or extended response; halving travel does not necessarily halve amplitude. VCA's minimum is attenuation, not mute.

Disconnected modulation inputs leave their panel values unchanged. Panel edits and automation remain the base values that CV modulates. CV responds to Reason's control updates; these inputs are not an audio-rate modulation path.

YouKnow follows Reason's master tuning preference alongside its panel Tune setting. It reports 120 samples of latency below 176.4 kHz and 41 samples at higher sample rates, consistently across every Quality setting at that rate.

Patches

The supplied bank contains 99 Protocodus sounds and a plain Init patch. The factory bank retains the 1.3.2f6 preset levels and musical settings. Current engine and MIDI fixes remain, while all 100 visible VCA Level settings return to the established f6 balance. Init and Reset Device use the same restored value.

The retained f6 calibration targets -7 dBFS sample peak, within 0.1 dB, for the louder of separate Reason C1 (MIDI 36) and C3 (MIDI 60) notes at velocity 127, with Chorus I selected only for measurement. Volume remains 80%, Aging 50%, at 48 kHz with the shipped processing defaults. Other notes, chords, chorus modes and edited sounds can produce different levels and peaks. The calibration protocol records the reference and compatibility policy.

Each preset's calibrated balance is stored on visible VCA Level. Its range extends from -36 to +24 dB. The extra low range occupies only the lowest 1/128 (about 0.78%) of the slider travel; higher stored positions keep their exact preceding response. The very lowest saved settings and level CV can now attenuate further. The original hardware gain path is retained from about -16 to +5 dB; beyond those endpoints, the extra level scales the final output, including noise. Both parts follow the same visible control, so you can change any preset's level directly. Master Volume remains available for overall adjustment. There are no hidden preset gain factors and no limiter. The VCA law, output calibration and hidden-field behavior match f6. Changes from releases before f6 remain part of that earlier version history. Reason's categories and tags help find sounds by type and character.

Use Reason's patch browser and patch files to manage sounds. MIDI Program Change and SysEx file import/export are not supported.

Troubleshooting

- **Notes arrive but there is no sound:** load Init, verify Volume and VCA Level, check any connected level CV sources, and confirm the audio outputs are connected.
- **High CPU:** select 1x, Poly, Cubic, and Normal on the rear. Reduce Voices for dense arrangements.
- **A Quality change seems delayed:** release all notes and let the output tail settle so the requested change can take effect.
- **No CV response:** check the intended socket and the source range. A pitched CV sequence needs both Note and Gate connections; level CV scales the current panel setting, so it cannot raise a control already set to zero.
- **A problem persists:** visit protocodus.cz/product/youknow or email protocodus@proton.me. Include the YouKnow and Reason versions, operating system, computer model, audio sample rate, patch name, and steps to reproduce the problem.

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Audio and control data are processed inside Reason on the user's computer. Reason may store YouKnow settings in songs and patches. Reason Studios handles accounts, licensing, purchases, downloads, host diagnostics, and any related network activity under its own settings and privacy terms.

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Privacy questions and requests can be sent to protocodus@proton.me. Product and company information is available at the [YouKnow support page](#). An updated notice will accompany a release if YouKnow's data practices change.

Third-party notices and provenance

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The Rack Extension is built with the separately licensed Reason Rack Extension SDK and is intended for distribution through the authorized Reason Studios channel. Reason SDK material is not relicensed by either source license. The Rack build compiles the instrument's DSP core; it does not compile the native JUCE or CLAP plug-in frontends or include their factory tone-memory bank.

SDK standard artwork supplies the pitch/mod wheels, audio/CV sockets, device-name tape, placeholder and patch-browser group. These remain under SDK terms. Current panel labels, section titles and the YouKnow wordmark are rasterized from locally installed Arial Regular and Arial Bold. These system fonts are render inputs only; their files are neither committed nor shipped. Reason supplies native Arial styles for patch/status text and tempo readouts. Earlier artwork through the delivered 1.3.2f8 used Barlow Condensed Bold and Barlow Semi Condensed Bold 1.408, Copyright 2017 The Barlow Project Authors (<https://github.com/jpt/barlow>). Those historical inputs remain in `Design/Fonts/` under the SIL Open Font License 1.1 (`ThirdParty/OFL-Barlow.txt`). Exact inputs, hashes, mappings, and adapted sample scaffolding are recorded in `Docs/release/asset-provenance.md`.

Generated faceplate material

The current Graphite Studio front, rear and folded artwork uses a deterministic procedural satin finish. No sampled material image is incorporated in this finish. Earlier panels incorporated a charcoal-plastic texture generated for YouKnow with OpenAI built-in image generation in new-image mode. The loose historical texture remains a source asset and is not shipped in the U45. `Docs/release/asset-provenance.md` retains its source image, SHA-256, upstream notice and generation prompt.

Modelling references

YouKnow is an independent implementation informed by published virtual-analog research. It does not copy or include the reference implementations associated with these publications.

- Vadim Zavalishin, *The Art of VA Filter Design* - topology-preserving transforms and ladder-filter analysis.
- Tim Stilson and Julius O. Smith, *Analyzing the Moog VCF with Considerations for Digital Implementation* (1996) - ladder root-locus analysis.
- Antti Huovilainen, *Non-linear digital implementation of the Moog ladder filter* (DAFx-04), and Stefano D'Angelo and Vesa Valimäki, *Generalized Moog Ladder Filter: Part II* - nonlinear delay-free-loop methods.
- Vesa Valimäki, Jussi Pekonen and Juhan Nam, *Perceptually informed synthesis of bandlimited classical waveforms using integrated polynomial interpolation* (JASA, 2012) - bandlimited waveform synthesis.
- Martin Holters and Julian Parker, *A Combined Model for a Bucket Brigade Device and its Input and Output Filters* (DAFx-18) - bucket-brigade delay modelling.

Patches

The shipped bank contains 100 patch names and parameter states created for YouKnow by Protocodus. No third-party factory tone-memory records or archival factory labels are included. The source-history and sound-state comparison behind this inventory are recorded in the patch provenance audit.

No firmware, ROM image, sample, impulse response, captured audio, or separately sold sound-bank data is included.

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