RAMA
POLYPHONIC SYNTHESIZER

Pilot's Handbook

version 1.5.0

by Andras Haasz

Thank you and congratulations on your choice of the RAMA synthesizer. This instrument has been engineered for highest quality sounds and superb reliability. To obtain optimum performance from your new RAMA synthesizer, please read this manual carefully before using.

Table of contents

Introduction

This story begins in 1989 when I bought my very first programmable synthesizer. It was the Korg Poly-800 II, and I got it on a rather adventurous trip to West Berlin. Yes, East Germany was still under the damned Russian occupation and the Wall were still there - we lived in a very different world back then.

The Poly-800 has given me a lot of joy over the years. It was my main synth in our band and I still have it to this day. I've used many newer and better instruments over the decades - but this was my first! :)

30 years later I decided to recreate this synth as a Rack Extension... think of it as a nostalgia project. The Poly-800 has some unique features: its oscillator, the 6-point envelope generators, the paraphonic filter... and more.
I managed to implement all of these features, but I could'n stop: during its development RAMA continuously mutated and evolved, finally becoming the monster it is today - my dream synthesizer.

Features

RAMA is a classic synth on steroids. The heart of RAMA is a vintage synthesizer from the 80s, which has some unique features:
- oscillators (DCO) build the waveform from variations of 4 simple pulses
- Paraphony: polyphonic sounds with a single filter
- six stage envelope generator

These however, are only the starting points. RAMA has many other features which make it a powerful synthesizer that can hold its own in any musical style.

Additional features:

⬚ 3 oscillators with dual filters

⬚ 3 oscillator types: P-800 osc mode, wave or sampler

⬚ 33 waveforms from famous synthesizers (when P-800 mode is off)

⬚ 3 rearrangeable fx units with 12 fx types

⬚ flexible routing

⬚ synth and fx modulation matrix

⬚ XY control and mixer pad

⬚ versatile arpeggiator and step sequencer

⬚ 5 play modes: poly, mono, chord, arp, seq

RAMA has different levels of complexity, depending on your needs. Using the grouped global controls it can be simple like an axe, eg. if you want to create a simple bass. But once you've separated them, RAMA can be as complex as an airbus cockpit: it's up to you.

Signal flow

The picture below shows the basic signal flow of the synth:

Some control signals are voice level, meaning they apply to each voice individually. The synth's internal modulators (Envelope Generators, LFOs) are also voice level.

The instrument level control signals (eg. Mod wheel and other CCs) apply to the whole instrument.
Please note that all modulators of the Mod Layer (including the LFOs and EGs) provide instrument level control signal, they don't apply to each voice individually.

Front panel overview

1. Panic button
2. Patch Selector for browsing, loading and saving patches
3. Oscillator section
4. Mod panels (Synth Mod, FX Mod, Control Pad, Mix Pad)
5. EG panels / Seq Editor / Sampler
6. Main filter panel
7. LFO panels
8. Performance panel
9. FX section
10. Master out

Panel reference

1. Panic button

If you get problems with "hanging" notes, click the Panic button to send out an "All Notes Off". This button also resets the arp / sequencer.

2. Patch selector

Loading and saving patches is done in the same way as with any other internal Reason device. To select a patch, either click on the patch name, the folder icon or the arrow buttons. To save a patch, click on the disk icon.

If you [Alt]-click on the disk icon, the patch will be overwritten without question. See the "Sounds and Patches" chapter in the Reason/Reason Rack Plugin/Reason Intro/Reason Lite Operation Manual pdf for details.

As with all Rack Extensions, you can find the included patches by clicking "Rack Extensions" in the Reason browser, navigating to the "Rama Synthesizer" folder and opening it.

Controlling parameters

Knobs, faders, and numerical displays are controlled by left-clicking on them, then dragging the mouse up or down in a vertical direction. Hold down Shift while turning the knobs to slow down movement, in order to set precise values. Use [Ctrl]-click to set the controllers to the default position.

Note: some items have special features that can be accessed via modifier keys (ctrl, alt, shift). These features can effectively speed up editing and are described in the appropriate section.

3. Oscillator section

Rama has 3 identical oscillators, each with its own color: Osc X is red, Osc Y is yellow, and Osc Z is blue. We use these colors uniformly for the parameters, i.e. if you see a colored LED or button somewhere, it shows which oscillator it belongs to. The global color is gold.

Osc enable / disable button   Osc mode: P-800 or wave/sample   State-Variable Filter (pre)   Wave shaper   Osc output selector

Harmonics for P-800 mode   Pitch related controls   AMP velocity control   Osc pan and level
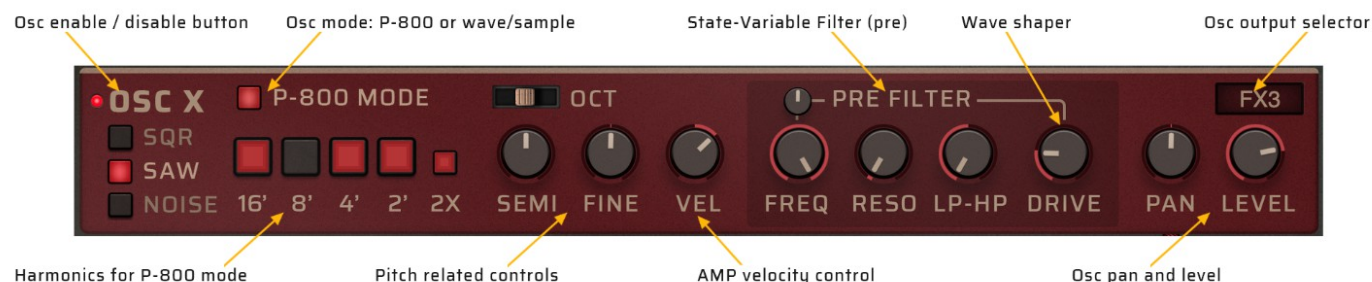
Oscillator modes: P-800 / Wave / Sampler

P-800 mode

When the P-800 mode is active, RAMA uses the original DCOs of the Korg Poly-800. All 64 combinations were accurately and meticulously multi-sampled, so in P-800 mode the oscillators sound absolutely authentic. However, this mode requires a little explanation. The Poly-800 uses 4 simple pulses to create its waveforms. At value SQUARE, the 16' – 2' harmonics are mixed at the same level, so you have a richer overtone structure.

At value SAW, the 8' harmonic is mixed at half the level of 16', 4' at 1/4 the level, and 2' at 1/8 the level. These ratios result in a stepped sawtooth waveform.

The harmonics buttons let you switch each of the individual squarewave harmonics on or off. Together with the waveform value (SQUARE or SAW), which controls the mixing ratio, your choice of harmonics helps determine the resulting waveform and timbre.

For example, if you set waveform to SAW and turn off the 8' button while leaving the other harmonics on, you will get the kind of waveform shown here:
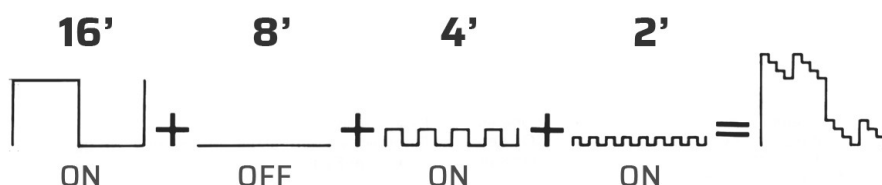
The 2X button activates a doubled version of the oscillators, resulting in a fat, unison-like effect.

Wave / Sampler mode

When the P-800 mode is inactive, the OSC panel switches to wave selector view. In this mode, you can choose from 33 different types of simple waveforms. The last 3 slots (User sample 1, 2, 3) are for the sampler. If you select any of them, an "EDIT WAVE" button will appear. Clicking it will open the Sampler editing panel.

4. MOD Panels

4.1 Synth Mod panel

The synth engine already contains some common pre-wired modulations (Amp Velocity, Filter Velocity, Key to Cutoff Filter, Mod Env to Cutoff filter). The SYNTH MOD panel extends these possibilities providing very flexible routings. On the modulation panel you can make connections between various modulation sources and destination parameters. The panel has 9 modulation slots and you can enable/disable these modulations for each oscillator by clicking the colored LEDs on the right.

Tip 1: Click on the X, Y or Z above the LEDs to enable/disable all the LEDs in the column.

Tip 2: Shift-clicking and dragging up and down changes the brightness of the LEDs.

4.2 FX Mod Panel

The FX mod panel is divided into 3 parts, corresponding to the 3 available effects. The panel monitors the selected effects, so you can always see the modulations of the active effects. Each effect has 3 modulation slots.


Please note that due to the large number of fx parameters, the settings of the effects cannot be automated. However, you can assign automatable mod sources (performance and macro controllers) to them in the FX mod panel, and in this way they become automatable.

IMPORTANT: The mod sources of the FX are all instrument level, including the Mod EGs and LFOs.

Tip: Mod EG G , X, Y, Z can be used as a modulation source regardless of whether they are active or not.

4.3 Control Pad

The Control Pad is an XY pad on which you can draw complex modulations with the mouse in two dimensions. These movements can be automated.
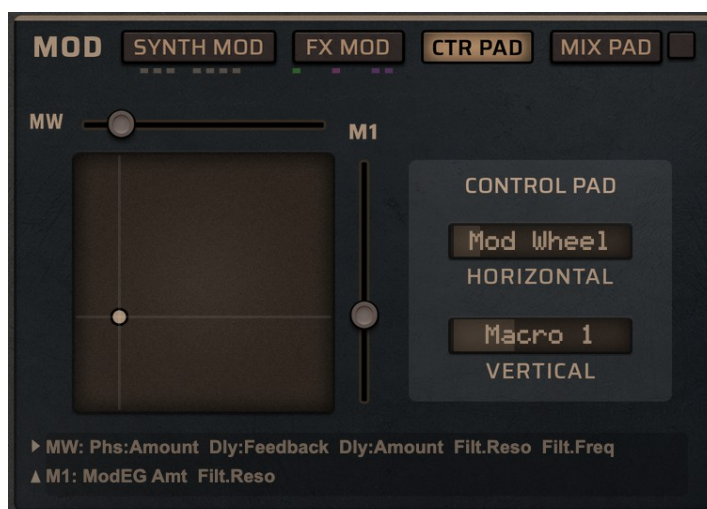

You can choose which controllers you want to use from the drop-down menus on the right.

In the lower part of the panel you can see what values are assigned to these controllers (on the synth mod, fx mod and mix pad panels).

4.4 Mix Pad

The Mix Pad (when it's active) controls the volume balance among the three oscillators.
Please note that Mix Pad is disabled by default.To turn it on, click on the XY panel or the inscription "MIXPAD OFF", or the button next to MIXPAD can also be used in the menu bar.
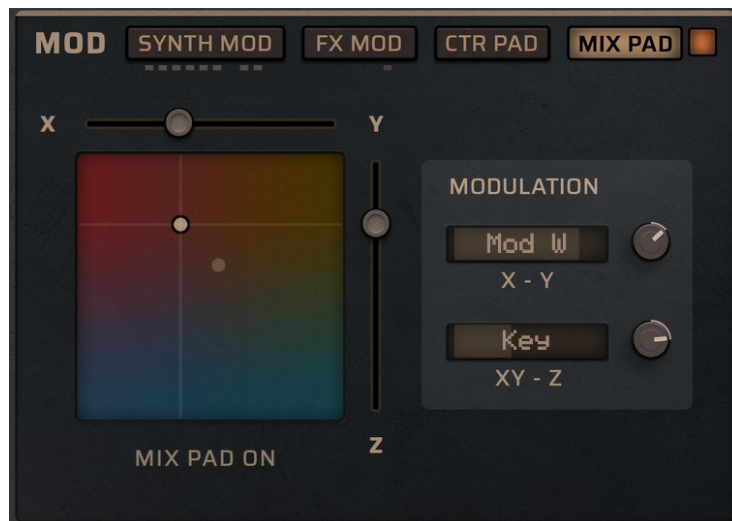
The horizontal direction defines the ratio between Osc X and Osc Y, and the vertical direction determines the volume ratio between the previous two and Osx Z. All movements on the Mix Pad can be automated.

You can modulate the Mix Pad's faders using various sources. In this case the modulated (true) value is shown as a dim little ball.

5. EG panels / Seq Editor / Sampler

5.1 EG panels

By default, AMP EG controls the volume change over time, and MOD EG determines the time course of the filter's cutoff frequency. However, both can also be used as modulation sources in the Synth mod / FX mod matrix.
The two envelope generators are formally identical, so we discuss them together.

Technically, each EG parameter has 4 versions: Global, X, Y, Z. Which of these is specifically connected to the EG of the given oscillator is determined by the setting of the GXYZ buttons at the top of the menu.
If you choose G, all oscillators will be connected to the global envelope and will work together (grouped).
If you click on the X, Y or Z button, the individual oscillators will use their respective envelope parameters (separated).

You can always edit the active (selected) EG parameters, but the values of X, Y, Z are also visible in the form of small colored spots. You can disable these color spots by shift-clicking them.

Curves knobs: you can set the curve shapes of the Attack, Slope and Release. These parameters are general.

Attack curve: determines the curve shape of the Attack. The default setting is 0, which means linear curve. Positive value will result in a convex shape, the Attack curve is "rounded", the volume starts rising fast and reaches the final value slow. Negative value results concave shape, the Attack curve starts slow and reaches the final value fast (good for sudden rising sounds).

Slope curve: sets the curve shape of the Slope. The default setting is 50, which results in natural sounding logarithmic curves. Negative values give a convex shape, which means that the decay phase starts to fall slowly and reaches the final values quickly. At setting 0 the curve is linear. Positive value will result in concave shape, so the curve will start to fall fast and then reach the final sustain level slowly. Setting between +50 and +90 gives a logarithmic fade.

Release curve: determines the curve shape of the Release. The default setting is 85, which results in a natural sounding logarithmic fade.

The following six parameters determine the volume / cutoff / modulation change:
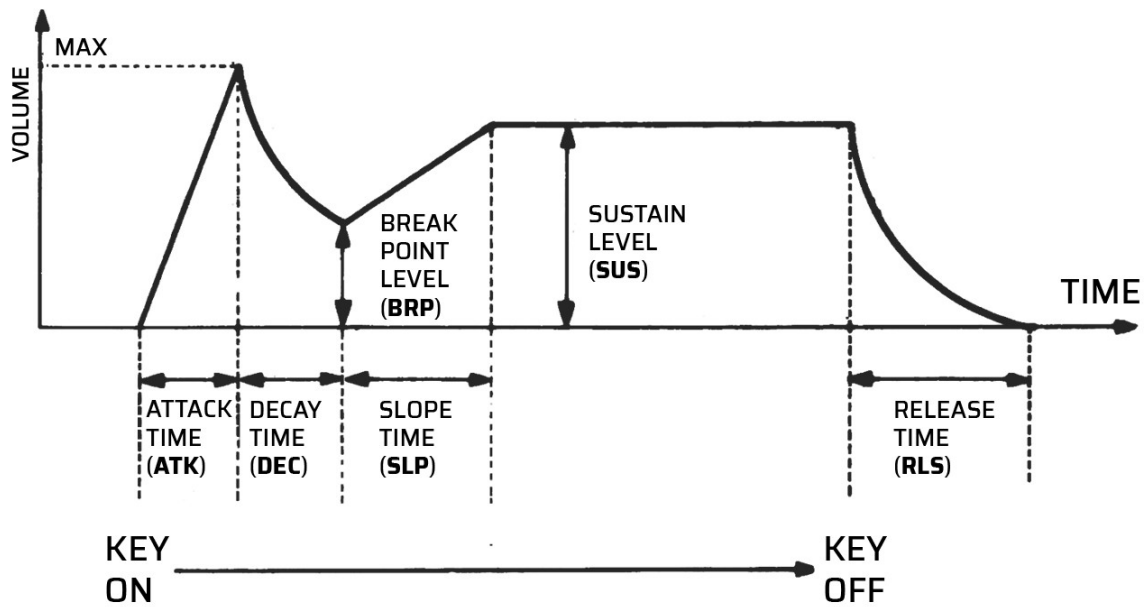
ATK = Attack: controls how long it takes the value to rise from zero to its maximum level after a note is played.

DEC = Decay: determines how long it takes for the value to fall from its maximum attack level to the break point level.

BRP = Break Point Level: determines the envelope level at which the Decay changes to the Slope rate. This allows complex two-part decay or decay/attack transients to be created. If the Break Point level is set to maximum, the extra envelope stage is effectively disabled, and the envelope becomes a conventional ADSR type. (In this case, SLOPE is used instead of DECAY to set the actual decay rate from the ATTACK peak to the SUSTAIN level.)

SLP = Slope: determines how long it takes for volume to change from the break point level to the sustain level. Note that if the break point is lower than the sustain level, then the slope functions as a second attack. If the break point is higher than sustain, then slope functions as a second decay.

SUS = Sustain: determines the level at which volume is held after the attack, decay, and slope phases are completed, for as long as the note is held down on the keyboard.

RLS = Release: determines how long it takes for the sound to fade away after you release the note on the keyboard.

Tip: if you want to use the conventional ADSR envelope, set the Decay to 0 and the Break Point to max value: in this case the Slope will act as a traditional Decay.

EG utility menu
If you click on the small triangle in the upper left corner, a drop-down menu will appear: you can copy the envelope values back and forth between the panels, you can reset the envelope, or switch to the Seq Editor / Sampler panels.

5.2 Arp / Seq Editor

It's a 16 steps pattern editor for the Step Sequencer / Arpeggiator.
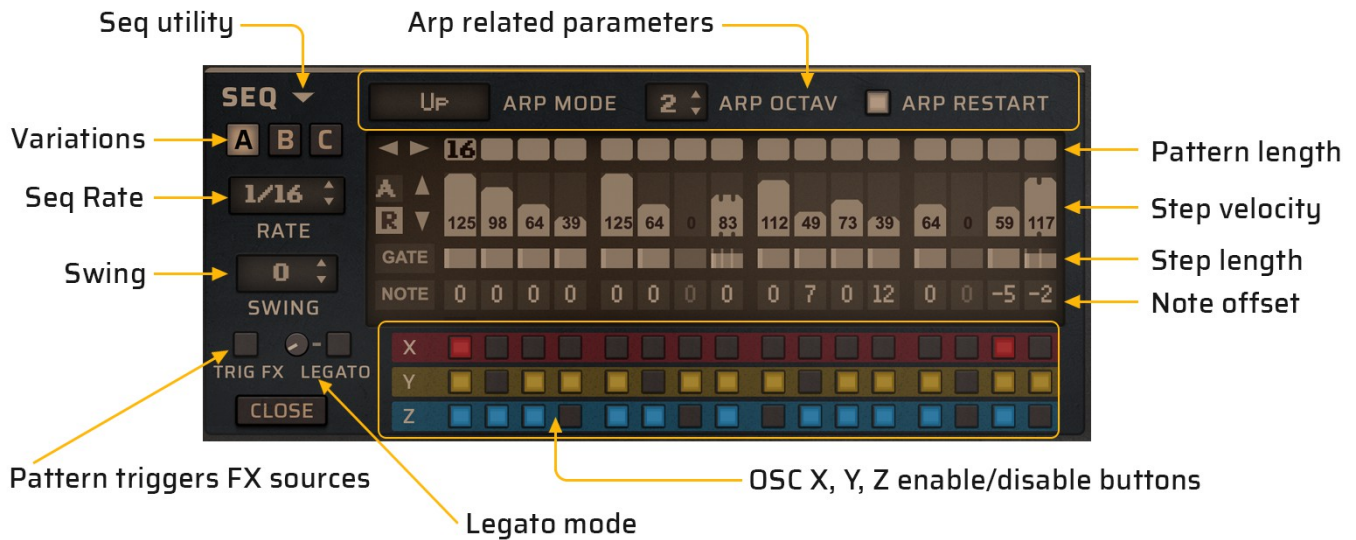
Seq utility: you can access the advanced editing options by clicking on that small triangle symbol.

Arp related parameters: Arp mode (up, down, up-down, random), Arp octave 1-4, Arp restart (restarts the arp when it reaches the beginning of the loop.)

Variations: the step sequencer has 3 variations of all its parameters, you can choose among them with these switches.

Seq Rate: you can set the desired Sequencer Rate (in relation to the main sequencer tempo in Reason).
Tip: if you Ctrl-click on the up/down arrow, the rate will double / halve.

Swing: is a rhythmic feature, that gives the music a more or less pronounced swing feel.

Trig FX source: this switch determines what triggers the sources of the mod layer (eg. Mod EG X, etc.). If it is off, only the incoming midi note will be the trigger. If you turn it on, the notes created by the sequencer will also trigger them.

Legato mode: it works like a monophonic sequencer: if you set the gate length to maximum for the given pattern, it ties the note with the next one. If the next pattern is empty (0 velocity), its value is added to the length of the previous note.

Osc enable / disable buttons: you can set which oscillator sounds at each step, in this way you can create interesting rhythms within the pattern. These settings can be automated.
Tip: by clicking on the X, Y, Z labels, the entire row of buttons can be enabled/disabled.

Pattern Length: sets the length of the currently active Pattern. Just click to the desired length or draw it horizontally. [Ctrl]-click will set the length to the default value (16). [Alt]-click will rearrange the pattern, where you click will be the first step in the pattern. For example if you [Alt]-click on the 9th step, the whole pattern will be wrapped left and the ninth step will be the first: a very quick way to rearrange the active pattern with a single click.

Step Velocity: you can set the desired velocity of each step by clicking and drawing on the grid and/or drag it up/down. [Ctrl]-click will set the value to maximum (127), [Alt]-click will set it to 0.
If you press shift while the mouse button is pressed, the editor will switch to "precise" mode. In precise mode the cursor "sticks" to the current step and you can make very precise modifications by dragging it up/down. If you release the mouse button, the editor returns to normal mode.

Step Length (GATE): you can select the desired note length for each step by clicking on the field and dragging it horizontally to adjust. The selectable values: 8, 16, 25, 33, 42, 50, 58, 66, 75, 83, 92, 100%.
Ratchet: Click and drag vertically on the gate field in the actual pattern to activate the ratchet feature. Moving up increases the number of ratchets, moving down decreases it. The function also works with Shift and Alt clicks.

Note offset: set a note offset to each step, can be used to create melodic sequences.
You can set the desired note offset by click-holding on the number and dragging up/down. The available range is +/- 24 semitones. [Ctrl]-click will set the default value (0).
Please keep in mind that in **Arp mode** the notes played will be a combination of the keys pressed and these offsets.

Pattern editing tools

You can find some useful editor tools on the LCD panel of the Step Sequencer.
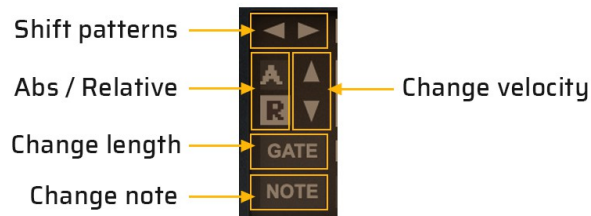
Abs / Rel: sets the handling of the incoming velocity (absolute or relative). When the switch is set to ABS (**A**), the played velocities will be ignored and taken from the columns in the pattern grid.
When the switch is set to REL (**R**), the played velocities will be scaled by the columns of the grid.

Shift Patterns: It's a left-right momentary button, it shifts/rotates the elements inside the pattern length range left or right.
Special options: [Shift]-click moves the elements of the whole pattern, [Alt]-click moves only those elements that are outside of the pattern length range.
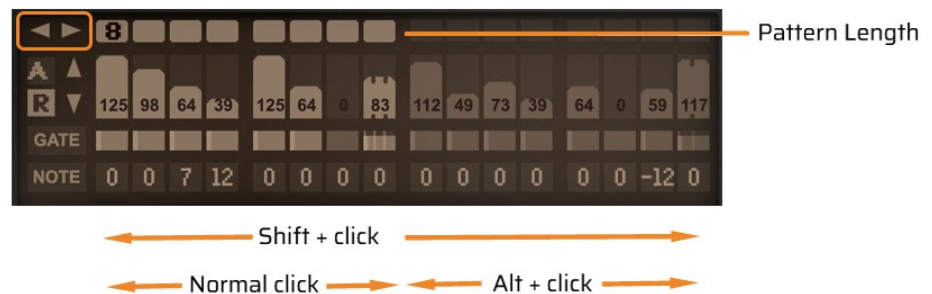
Change Velocity: you can increase or decrease the velocity of the steps in the pattern length range.
Normal click changes the values of velocities by five. For smooth changes press the [Shift] button.
[Alt]-click will change only those values that are not 0 (at increasing), or not 127 (at decreasing), it may help to keep the original sequence's structure.

Change Length: this button (**GATE**) has two positions: you can increase (right side) or decrease (left side) the steps's length in the pattern length range. Control/Command-click resets all values.

Change Note: same as the previous one, but it changes the notes in the -24 - +24 semitone range.
Control/Command-click resets all values.

5.3 Sampler editor

Load a sample using drag and drop, or by clicking the Browse sample button, or by using the Up/Down buttons to scroll and load a sample from the currently selected folder. You can also drag and drop samples to specific wave slots.

Alternatively, sample straight into RAMA by clicking the Start sampling button. See the "Sampling" chapter in the Reason/Reason Intro/Reason Lite Operation Manual for more information about setting up for sampling.

Click the Edit Sample button to open up the existing sample in the Sample Edit window. See "Editing samples" in the Sampling chapter in the Reason/Reason Intro/Reason Lite Operation Manual for more information about editing samples.

Important: like with the other sampler devices in Reason, the RAMA patch does not include the actual samples - only references to them. Therefore, the samples have to be stored separately (self-contained with the song, or already on disk or in a ReFill on your computer).

The ROOT NOTE will be set automatically **if** the sample contains the root note information. Note: all **PinkNoise ReFills** contain these informations.

6. Main filter panel

The filter panel contains the most important parameters of the multimode filter of RAMA.
Regarding the use of the G, X, Y, Z buttons, read the relevant section of the EG Panels.

Filter type: Click on to get a drop-down menu to select one of the available filter types, or step through the filter types by clicking the Up/Down arrow buttons. The following filter types are available: Lowpass 24 dB/octave, Lowpass 18 dB/octave, Lowpass 12 dB/octave, Lowpass 6 dB/octave, Bandpass 12 dB/octave, Highpass 12 dB//octave.

FREQ = Filter frequency: sets the cutoff/center frequency. The cutoff parameter sets where in the frequency range you want the resonance and attenuation to appear.

RES = Resonance: sets the resonance amount. The resonance parameter amplifies the frequencies at, and around the cutoff/center frequency.

ENV Mod Env Amount: sets how much you want the Modulation Envelope to affect the CUTOFF frequency. Range: -100% via 0% (no modulation) to 100%.

KEY = Keyboard tracking: sets how much the cutoff/center frequency should track incoming MIDI Notes. Range: 0% (no tracking /constant frequency) to 200% (2 semitones per key).

VEL = Velocity sensitivity: sets how much the cutoff/center frequency should be modulated by Keyboard Velocity. Range: -100% to 100%.

Filter utility menu
If you click on the small triangle in the upper left corner, a drop-down menu will appear: you can copy the filter settings back and forth among the oscillators or you can reset the current filter.

7. LFO panels

An LFO (Low Frequency Oscillator) is used for generating cyclic modulation. RAMA has three low frequency oscillators to use as modulator source in the synth and fx mod matrix.

Waveform: click and drag up and down on the waveform display to scroll through the available shapes.
There are 8 waveforms available: Sine, Triangle, Square, Saw, Random (random steps), Drift (smooth random), Saw Up and Saw Exp (exponential decay).

RATE: controls the LFO frequency (Hz) in absolute mode. In tempo synced mode the Rate parameter controls the time divisions.

DELAY: turn the DELAY knob to introduce a delay before the LFO modulation kicks in after a note is played.

Sync (Beat sync): The LFOs have two modes: the frequency rates can be set in Hz (cycles per seconds) or in beats (quarternotes per cycle). Selectable values: 16/4, 12/4, 8/4, 7/4, 6/4, 5/4, 4/4, 3/4, 2/4, 3/8, 1/4, 3/16, 1/8, 1/8T, 1/16, 1/32.

Key sync (RETRIG): when enabled, the LFO restarts each time you press a new note, otherwise it runs free.
Please note that when RETRIG is enabled, the LFO runs in polyphonic mode, each note has its own LFO modulation. It's recommended for tempo synced modulations. When RETRIG is OFF, the LFO runs in monophonic mode. This latter can be useful for slow filter sweeps, panning effects, vibrato, etc.

Unipolar: LFOs are bipolar modulators by default. You can set them to unipolar as well.

8. Performance panel

The performance panel contains all parameters related to play mode and performance style.

PITCH: The Pitch bend wheel can be used for bending note pitches up and down in 0-12 semitones range. RAMA also responds to Pitch Bend MIDI data from a connected MIDI master keyboard. You can set the desired pitch bend range using the "PB" range control.

MOD: The Mod wheel can be used as a modulation source in the Modulation Bus. The synth also responds to MIDI CC#1 data from a connected MIDI master keyboard.

Performance Control: you can select which one you want to edit / see from a drop-down menu.
Available options: Aftertouch (default), Breath Control (CC# 2), Expression (CC# 11), Macro 1, Macro 2, Macro 3.

TRANSP: transposes the synth in a range of -24 / +24 semitones.

GLIDE: (or portamento) allows the synth to regularly slide in pitch with each new note.
Glide modes: off (no glide), on (always glide), auto (only glide if a key is already held).
Glide time: specifies in how much time the sound slides to the next key.

HOLD: if the Hold is active (lit button), the sounds (notes, sequences, arpeggios) will continue to run even if you release all keys. It will continue to hold the last notes played until a new note-on is received. In Arp mode, if you continue to hold down at least one key when Hold is on, any new notes will be added to the existing arpeggio as opposed to starting a new arpeggio.

The effect of the Hold is different from the sustain pedal: the sustain pedal suspends all releases. In the case of the Hold, if you release all the keys and press a new one, the notes held until then will be released and only the new ones will sound.

PLAY MODES

POLY: this is the default polyphonic mode. You can set the oscillator's polyphony using the VOICES parameter.

Mod EG modes:

    Poly: this is the normal polyphonic mode: each voice has its own Mod Envelope.

    Single: it's a paraphonic mode, in this case the Mod EG is triggered by the first note played and no new envelope is generated until all keys are released and a new "first key" is played.

    Multi: is another paraphonic mode. The Mod EG is restarted with each key played, so you get the same new envelope for each note.

MONO: switches RAMA to a classic monophonic mode.

Legato: if enabled, and you play a new note without having released the previous one, the envelopes won't start over. If disabled, RAMA will always re-trigger the envelopes as soon as a new note is played.

CHRD: Chord mode similar to mono mode, but you can define up to 3 additional notes to play chords.

STRUM: adds a strumming effect to the first played key. Use the Xfade knob to set the delay between the notes of the chord.

Xfade knob: adjusts the strum delay and the legato crossfade time up to 100 ms.

Legato: same as in mono mode.

ARP: the Arpeggiator generates rhythmic note patterns (arpeggios) from notes or chords. See the Seq Editor for the advanced options.

SEQ: Step sequencer. The Sequencer is polyphonic, which means each sequence runs independently from each other, and you can play and trig entire chords or polyrhythmic runs. See the Seq Editor for the advanced options.

9. FX section

RAMA has three identical FX slots, each containing 12 types of effects:
Chorus, Phaser, Flanger, Filter, Parametric EQ, Isolator EQ, Compressor, Saturation, Distortion, Bitcrush, Delay and Reverb.

The order of the effects can be freely changed. To rearrange them, click on the effect ID (FX1, FX2, FX3), drag the mouse to the other effect's box, and release: done.

Please note that due to the large number of fx parameters, the settings of the effects cannot be automated. However, you can assign automatable mod sources (performance and macro controllers) to them in the FX mod panel, and in this way they become automatable.

10. Master Out
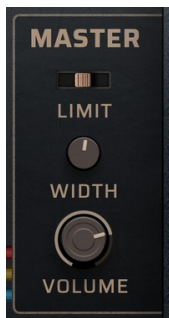
LIMITER: this is a safety limiter to keep levels in check, with a fixed 0 dBFS threshold. The limiter has two modes, it can be soft or hard limiter.

WIDTH: controls the stereo width of the instument. At 0%, the output will be completely mono-aural. At 100%, the stereo field will be intact, and at 140%, it will be wide stereo.

Volume sets the main instrument's volume.

11. Back Panel

Important: please keep in mind that CV connections are not stored in the patches! If you want to store CV connections between devices, put them in a Combinator device and save the Combi patch.

The back panel contains three sections: CV inputs, CV outputs and Audio out.
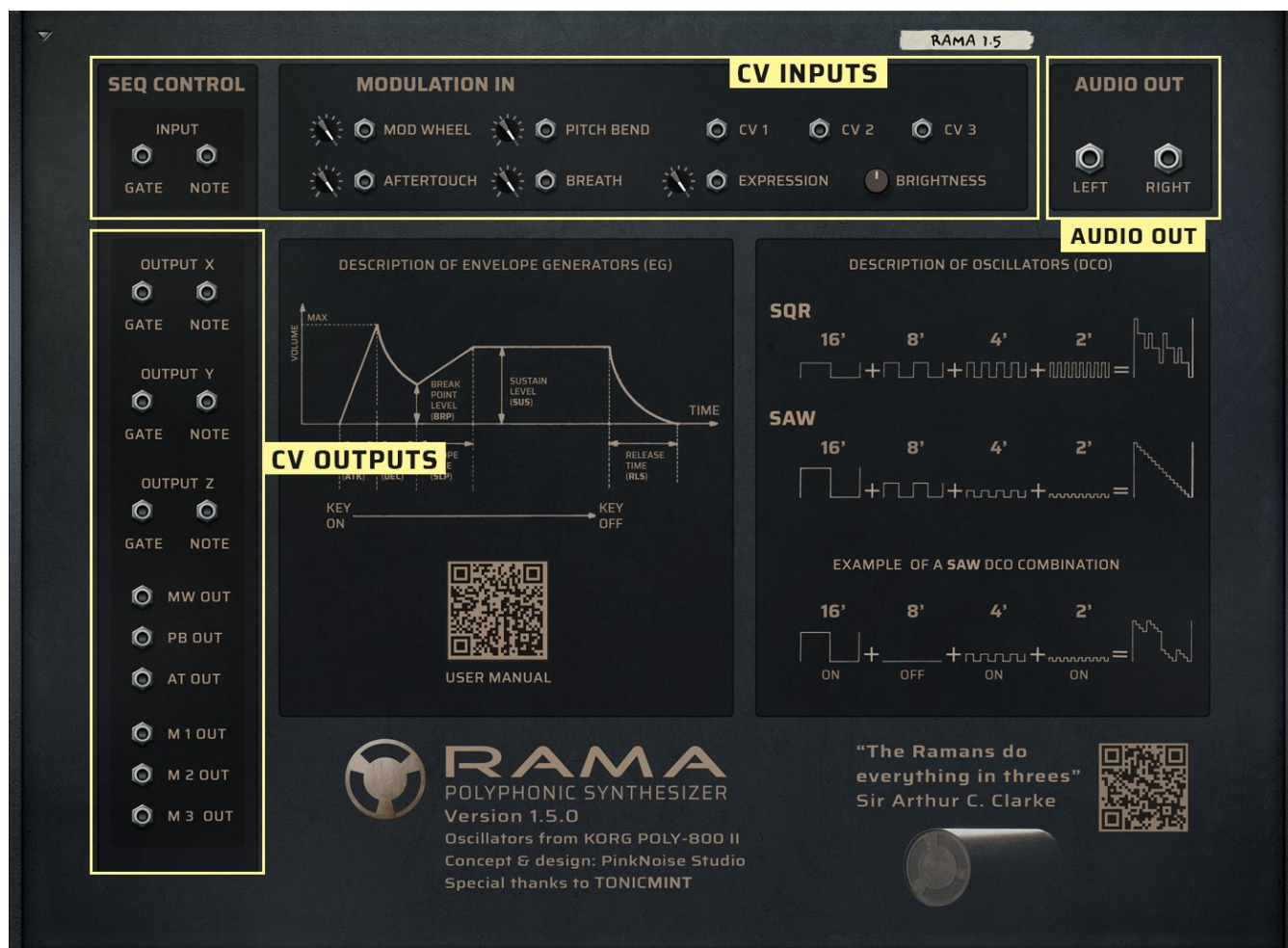

11.1 CV inputs

Seq Control Input: the Sequencer Control CV and Gate inputs allow you to play RAMA from an another CV/Gate device (eg. Maia, another RAMA, Matrix or RPG-8). The signal to the CV input controls the note pitch, while the signal to the Gate input delivers note on/off along with velocity (O velocity = note off).

Modulation in: these inputs can receive external CV messages from other Reason devices. The values of these CVs are merged with the incoming MIDI CC values that the synth receives. CV 1 - 3 and the external midi controllers can be used in the Modulation Bus as a modulation source.

Brightness: sets the opacity of the CC value bars in the mod source panel.
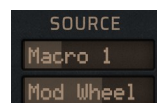
11.2 CV outputs

Output X / Y / Z: Each oscillator has its own separate CV output. Please note that if you disable an oscillator on the OSC panel, the corresponding CV output will also be disabled.
Gate transmits a gate/velocity value that corresponds to the Velocity parameter.
**NOTE** transmits the note CVs generated by the sequencer or the notes you input to the synth.

These outputs send processed values, not simply copied from the midi input: if you set the play mode to mono, the sounds will be played in mono behavior. When you play a note in chord mode, the same chords will be sent as you hear from the synth.

Controller outputs: Mod Wheel, Pitch Bend, Aftertouch values, combined/merged with the corresponding control input values. Macro outputs 1,2,3 are also available here if you want to use the Control Pad with other devices.
If you want to connect these outputs to more than one instrument, use the "Spider CV Merger & Splitter" utility.

11.3 Audio out

Stereo output of the synth. When you create a new RAMA device, these outputs are auto-routed to the first available Mix Channel in the Reason main mixer. If there is no Mix Channel available, a new one will be automatically created.

RAMA Synthesizer v.1.5.0
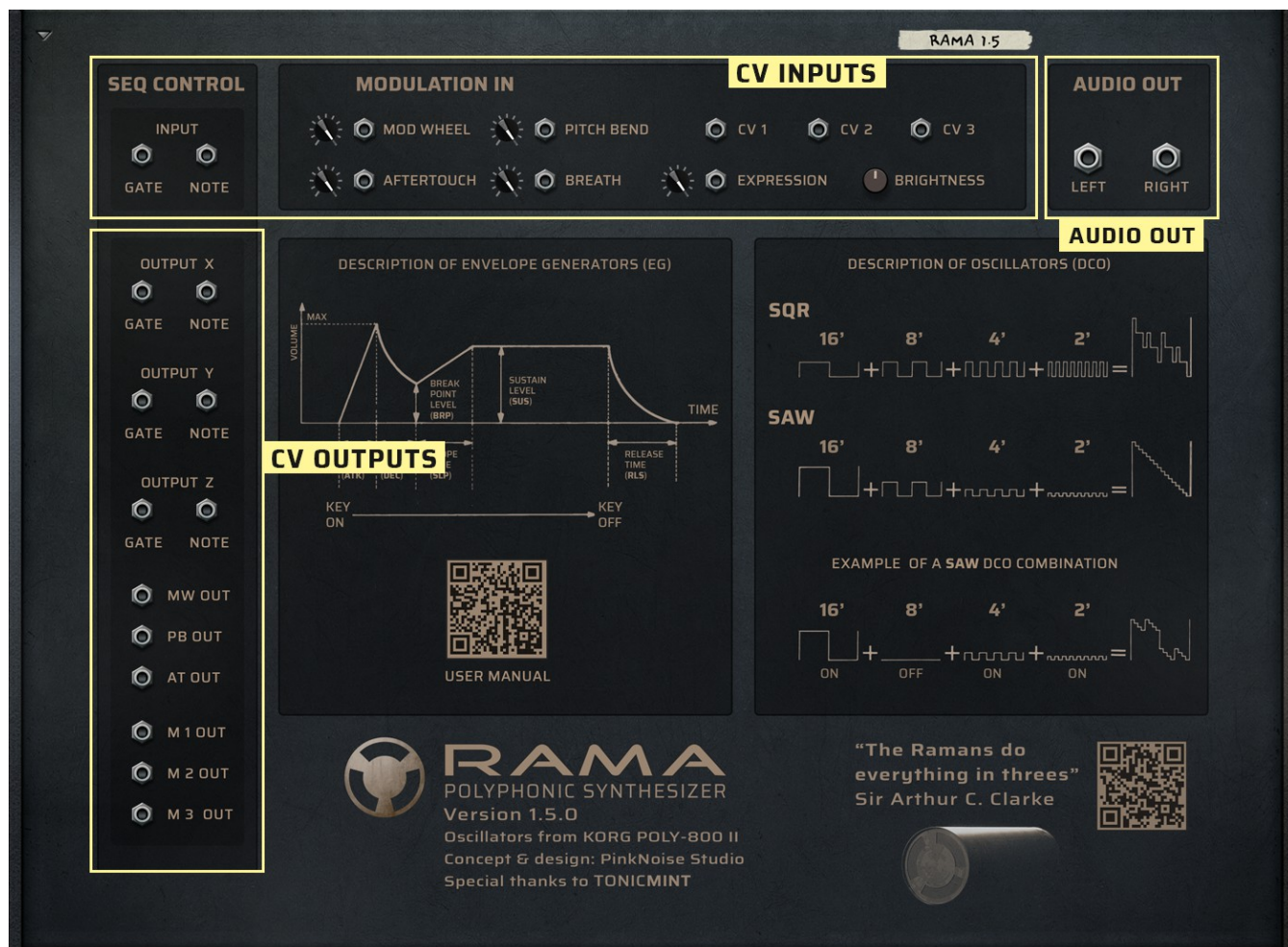
Credits

Andras Haasz: concept and UX design, programming, sound recording & editing, sound & patch design

PinkNoise Studio: GUI design

Additional patch design:

- Loque (LQ)
- Tonicmint (TM)

Special thanks to:

- Loque
- Mihaly Botyanszki
- Samuel Haasz
- MrFigg
- Patrick Maerker

RAMA webpage:

https://www.reasonbanks.com/re_rama.html

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