

10 BAND 3 MODE EQUALIZER

RACK EXTENSION FOR REASON
INSTRUCTION MANUAL



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THANK YOU

Thank you very much for expressing your confidence in our products by purchasing one of our equalizers, Red Queen. This 2-channel high-quality equalizer was designed with our experience of both filtering capabilities in the digital realm as well as the crafting of audio for all types of users; producers, engineers and artists alike.

We hope you continue to enjoy using Red Queen in your projects for now and for future.

Lab:One Recordings © 2013

ACKNOWLEDGEMENTS

Thanks to the Red Queen betatesters for helping with this product;

Timo "Shokstar" Schönbeck Dipl.Audio-Engineer" – head tester
 Nicola "Kaiserin" Alexandra Hajdu – tester & Combinator Skin designer
 Kim "Equinoxz" Bleus - tester
 William "White Noise Bleed" – tester
 Juan "synclab" Pablo - tester

Propellerhead Software (for Reason, the SDK and the concept of the Re)

User Presets designed by:

<u>Key</u>	<u>User</u>	<u>Preset type</u>
[LB1]	LAB:ONE Recordings	Red Queen presets Combinator presets
[djF]	djfresha c/o LAB:ONE Recordings	Red Queen presets
[SHOK]	Timo "Shokstar" Schönbeck	Red Queen presets Combinator presets
[WNB]	White Noise Bleed	Red Queen presets Combinator presets

Presets by users can be found within the Red Queen RE under 'User Presets' folder.

DEDICATIONS & ACCOLADES

To my wife Alicia who after waiting for me to code this up is now a happy bunny (again) :D

This Re is dedicated to all the Propellerhead Reason users & forum threaders, friends, & colleagues we have spoken to over the years.

Dj Fresha: Thanks goes out to my studio buddies; Dos aka Ocro, Puggy, Dj EQ, for the support & feedback, shouts go out to all who know me, including FLAVAUNIT crew, REBIRTH massive & SUBTRONIK crew, and not forgetting Simon @ Massive Sound Studios for the support

Now let's get into the Red Queen....

Introduction

The Red Queen 10 band multi-mode equalizer is a dedicated rack unit, built as a Rack Extension for the Propellerhead Reason environment. This device has a maximum of what would be 7U space in the real world. Being a Rack Extension (Re), this gives you various options of versatility within your projects.

The Red Queen features 10 frequency bands, plus a high-pass and low-pass filter, and includes an input trim control, dry/wet mix control, EQ scaling gain control, dB range control and a master gain control (see 'A brief guide of the Red Queen' section). All these controls are adjustable to suit your application, and these settings can be stored as your own presets, so you can recall them again and again at a later time (See 'How to save and recall presets' section).

The Red Queen features two audio inputs and six audio outputs (one pair of Left-Right stereo outputs, a pair of MID outputs, and a pair of SIDE outputs), which are processed in various ways depending on the EQ signal path mode you select. (See 'How to connect audio' section).

Red Queen also has some extra controls which have been developed with the audio engineer and the musician in mind. These extra functions & controls are;

- 6 signal path modes:
 - STEREO (linked Left & Right)
= GR.STEREO, PA.STEREO, ZPLANE-STEREO modes
 - Separate Left and Right (EQ each channel independently)
= GR.LEFT/RIGHT, PA.LEFT/RIGHT modes
 - MID Linked & SIDE Linked (to EQ MID L&R and SIDE L&R signals)
= GR.MID/SIDE, PA.MID/SIDE modes
 - MID Linked & SIDE Unlinked (to EQ MID L&R together, while you can EQ SIDE Left signal and SIDE Right signal independently)
= GR.MID/SIDEL/SIDER, PA.MID/SIDEL/SIDER modes
 - MID Unlinked & SIDE Linked (to EQ MID Left signal and MID Right signal independently, while EQing SIDE L&R together)
= GR.MIDL/MIDR/SIDE, PA.MIDL/MIDR/SIDE modes
 - MID + SIDE unlinked (to EQ all MID and SIDE components both left and right independently, resulting in a MID / SIDE / LEFT / RIGHT EQ matrix)
= GR.M/S/L/R, PA.M/S.L.R modes

- 18dB Gain control for each band, which can be increased or inverted while using SCALE control in conjunction with the gain controls

- Band On/Off controls

- DRY/WET mix knob, which now gives even more control between original signal and processed signal.

- 3 Equalization modes:
 - GRAPHIC (traditional fixed band, ideal for broad tonal control)
 - PARAMETRIC (for surgical work and signal sculpting)
 - Z-PLANE (for creative filtering control)

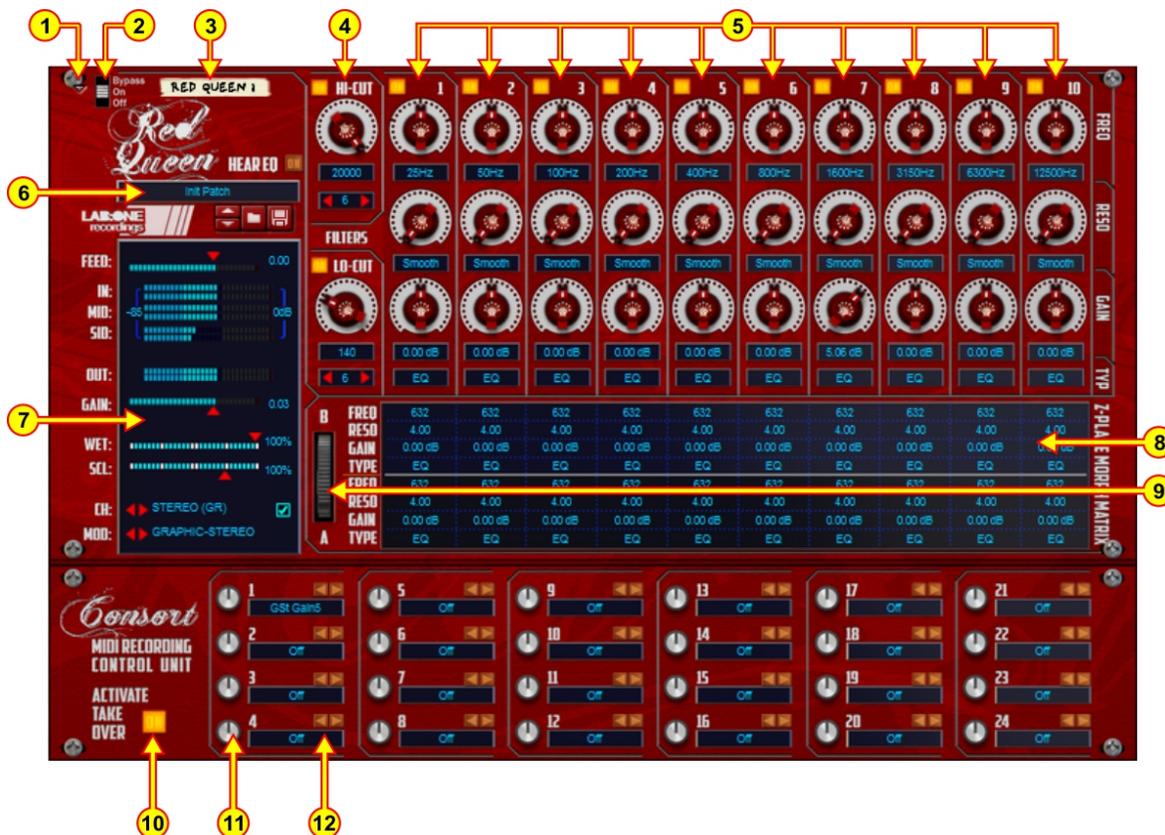
For more information see 'The different modes: Graphic, Parametric and Z-plane' chapter

- A Z-plane Mod-matrix panel (for use in Z-plane mode), plus a Modulation Wheel to be used in conjunction with the mod-matrix panel, to fully exploit z-plane filtering. For more information see 'The different modes: Graphic, Parametric and Z-plane' chapter
- 24 Assignable MIDI controls via the additional Consort MIDI Recording Control Unit (a part of Red Queen)

The Red Queen is designed to be a transparent effect, meaning that if no adjustments are made on the device, the audio passing through the effect is 'clean' and has not been affected by the equalisation filters or the low pass or high pass filters. This is the ideal, so that no coloration is applied to the sound.

A tour of Red Queen

Red Queen is based on most hardware 10 Band equalizer units.



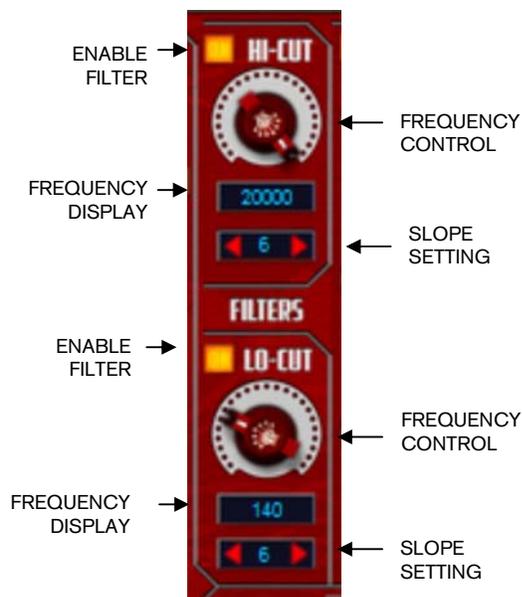
The Front Panel

- FOLD-UNFOLD [1] – To allow the RE to be maximized or minimized
- BYPASS SWITCH [2] – To determine signal flow (BYPASS effect, effect ON, or effect OFF)
- TAPE STRIP [3] – Used to identify the RE. Double click to edit
- FILTER SECTION [4] – To be used to cut away hi-end or low-end audio information
- 10 BAND SECTION [5] – Frequency, Resonance, Gain and EQ Type controls for each band
- PATCH NAME AND BROWSER [6] – for loading and saving presets
- MASTER CONTROLS & METERS [7] – to control feed input, gain output, mid/side meters (post filters and post EQ), wet/dry mix, dB range scaling, equalizer mode and equalizer channel selections
- Z-PLANE MORPH MATRIX [8] and Z-PLANE MOD WHEEL [9] – used when Red Queen is in Z-Plane mode, a full display of band frequencies, resonances, gains and types of equalization

Additionally there is an accompanying device called CONSORT, which allows linking of MIDI recording to selected controls. The available controls are:

- ACTIVATE TAKE OVER button [10], to allow the MIDI controls to take ownership of the specified control
- MIDI CONTROL KNOBS [11], relating to the selected control
- MIDI CONTROL DESTINATION [12], listing the control that Consort will take over from Red Queen.

The next pages will describe more in detail each section in turn of Red Queen, page 23 shows more details on how to setup Red Queen with Consort



The FILTER SECTION is used on audio globally, and prior to any of the bands in Red Queen. These filters are 6dB/Octave in design, and are cascaded in series when you increase the dB/Octave setting (also known as SLOPE SETTING). To change the slope settings, either click the left arrow to decrease in 6dB steps, or the right arrow to increase in 6dB steps, up to a maximum of 36dB/Octave. You can click right past 36dB to wrap back to 6dB, or click left past 6dB to wrap to 36dB.

The FILTERS are activated with the ENABLE FILTER buttons (indicated by a glowing button). The

The FREQUENCY CONTROL can be used to set the centre frequency of the filter, which is visible in the FREQUENCY DISPLAY. The filters can run from 20Hz to 20kHz (most humans hearing range).

The FILTER FREQUENCY CONTROLS can be automated and recorded in Reason's sequencer.

Furthermore, if you need a specific frequency to be set, you can use the Reason sequencer to create / edit an automation clip, and set any of your nodes to the specific value you require (whole number frequencies).

A note on Hi-cut / Low-cut filter characteristics: The 6dB/Octave filter design uses the centre frequency as the key point of where you want the cut to occur. However, please be aware that at the centre frequency, the signal level is reduced by half the slope setting. For example:

Hi-Cut filter set to 2000Hz, at a 6dB/Octave slope. When we analyse this, we see that at 2000Hz the audio level is -3dB, while at 4000Hz the audio level is at the required -6dB level, at 8000Hz, the audio level continues the flat curve shape to -12dB, at 16000Hz the audio level is -18dB, as expected.

Looking the other way: 1000Hz level is -1.5dB, 500Hz is -0.75dB, 250Hz is -0.375dB... and so on.

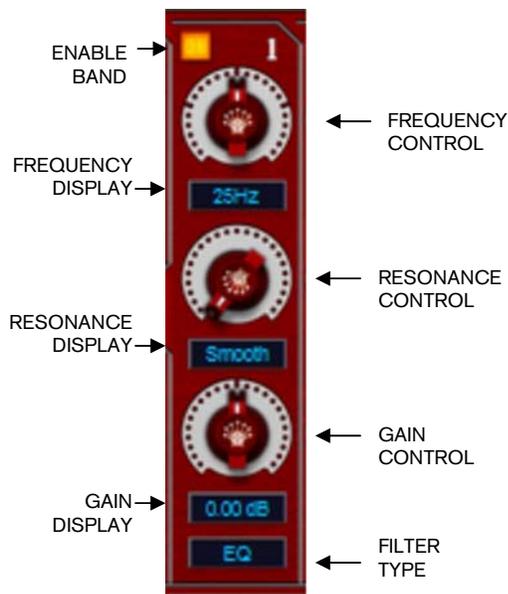
This 'natural' curve is common on single pole filters (we won't go too far into what a pole is), and single poles are very smooth in character. This is by design. This is something to be aware of when using filters of this type.

Taking our example further, we go for 12dB/Octave, so at centre frequency we expect our level to be -6dB (half the slope setting), then as we double the frequency for Hi-cut filtering the dB goes in multiples of slope setting; in this case -12dB, double frequency again we get -24dB... and so on.

- 18dB slope setting = -9dB at centre frequency
- 24dB slope setting = -12dB at centre frequency
- 30dB slope setting = -15dB at centre frequency
- 36dB slope setting = -18dB at centre frequency

These slope settings and centre frequency audio levels apply to both Hi-cut and Lo-cut filters.

The filter frequency control, slope and filter ENABLE controls are MIDI recordable directly.



The FREQUENCY BAND CONTROLS all share specific controls, and all work in series (from BAND1 through to BAND 10).

The available controls are:

ENABLE BAND, BAND FREQUENCY, BAND RESONANCE BAND GAIN and FILTER TYPE

To active any of the bands, click the ENABLE BAND button on the specific band. This is open the band controls for all respective channels (ie if using Left/Right mode and turn on band 1, you activate band 1 for both Left and Right signals, if using Mid/Side mode and turn on band 1, you activate band 1 for both Mid and Side signals).

The BAND FREQUENCY control sets the band centre frequency of your choice, and determines where in the audio signal spectrum to apply the equalization.

The BAND RESONANCE control sets the width of the equalization curve, from a wide setting through to a sharp point. This control can also be associated with a 'ringing' sound when set to a tight (high) value and using a high gain level.

The BAND GAIN control sets the level of the equalization. A positive value increases the signal at the centre frequency, while a negative value reduces the signal level. See NOTE 1 below.

The BAND FILTER TYPE control is a special control, which allows a choice of 8 different filter types. These types are:

LP – Low Pass (Hi Cut) filter – used to remove high frequency signals.

LS – Low Shelf filter – associated with what a BASS control could do on a typical audio device, such as a home stereo, your TV, car radio etc. The signal below the centre frequency can be increased or reduced evenly, and signals above the centre frequency are left unaffected.

EQ – Equalizer filter – this filter can be used to attenuate at the centre frequency, and can be used as a colouration tool or as a surgical corrective tool

HS – High Shelf filter – alike the Low Shelf filter, this can be associated with the TREBLE control on a typical audio device. The signal above the centre frequency can be increased or reduced evenly, and signals below the centre frequency are left unaffected.

HP – High Pass (Low Cut) filter – used to remove low frequency signals.

AP1 – All Pass 1st Order filter – see special note below

AP2 – All Pass 2nd Order filter – see special note below

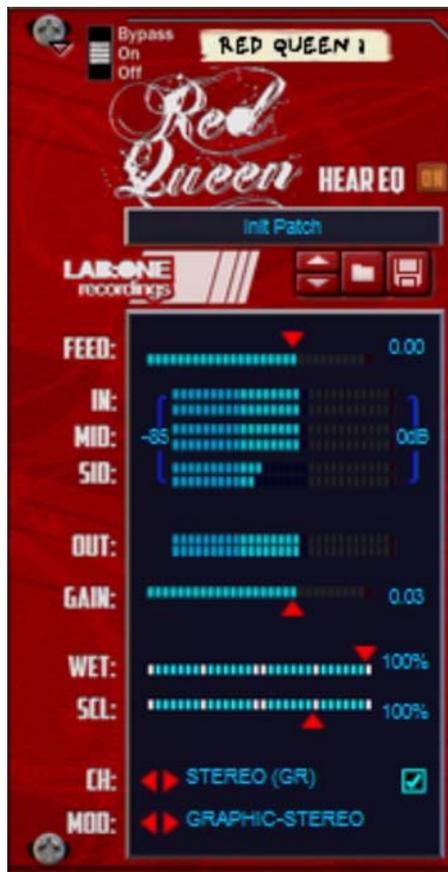
BP – Band Pass filter – this filter passes frequencies within a certain range and rejects (attenuates) frequencies outside that range.

NOTE 1: Traditional LP / HP / BP filters are not affected by gain. Red Queen however breaks this tradition by allowing you to gain the output of the signal after the filter, due to possible level loss whilst removing audio signal information.

NOTE 2: The only controls which are MIDI recordable directly are the 'BAND ON/OFF' control. All other valid controls can be MIDI assigned via Consort (see page 11 for more)

SPECIAL NOTE: All Pass Filters are special filters which do not adjust the frequency amplitude by apply phase rotation of the frequencies instead. All Pass 1 filters adjust the frequency phase rotation by 90 degrees, while All Pass 2 rotates the phase rotation 180 degrees. These can be used as corrective filters, or constructed to create phaser and comb filter style effect sounds. The GAIN controls have no effect on the filter while in AP1 or AP2 states.

The Master Controls and Meters



Within the main display on Red Queen is a collection of controls and displays which are explained below:

The controls:

FEED IN control allows you to increase or decrease the input into Red Queen – the range of this control is +30dB / -60dB. This is a pre-filter and pre-eq control. This control is also MIDI recordable. Each LED corresponds to 3dB steps.

GAIN control also works in a similar fashion to FEED IN control, allowing you to increase or decrease the final output, as a releveling control – the range of this control is +30dB/-60dB. This is a post-filter/ post-eq / post WET/DRY control. This control is also MIDI recordable. Each LED corresponds to 3dB steps.

WET/DRY control allows us to mix the original signal with the equalized signal. This takes into consideration the GAIN control. The range of this control is 0% (dry, original signal) and 100% (wet, fully affected signal). This control is also MIDI recordable.

CHANNEL control: This allows us to gain access to the specific controls to use in conjunction with the MODE of Red Queen. An indicator is also a part of the CHANNEL control, and this indicates

whether the controls will have any effect on the signal chain, based on the MODE of the equalizer. A valid channel selected is indicated by a cyan 'tick', while an invalid channel selected is indicated by a red 'X'.

MODE control: This sets Red Queen to equalize the signals based on a signal path. These are either stereo-linked paths (Graphic / Parametric / Z-Plane modes), left-right independent (Graphic / Parametric only), mid-side independent (Graphic / Parametric only) or a mixture of mid-left/mid-right/side-left/side-right configurations (Graphic / Parametric only). For more on this see the section 'Working with Red Queen'

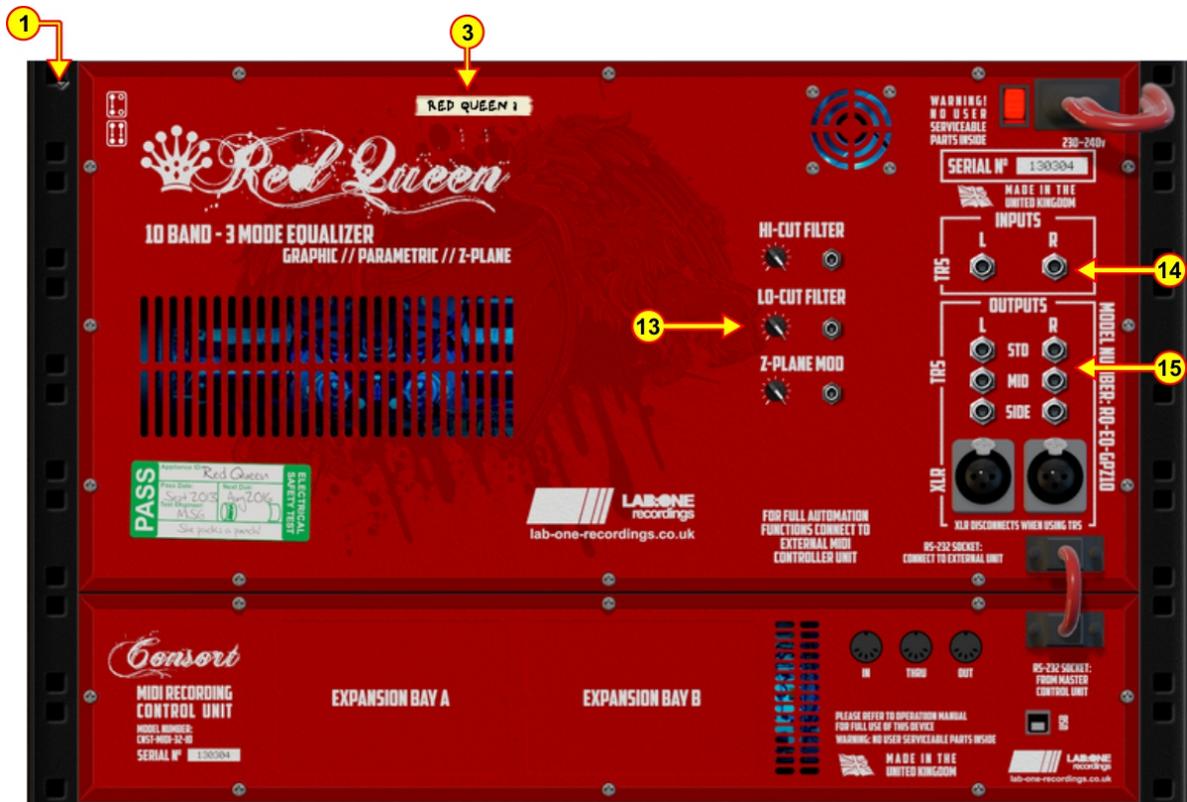
The meters:

There are 4 sets of peak meters available, which are:

- INPUT meters (reading the signals of Red Queen audio inputs pre-filters and pre-EQ)
- MID meters (reading the mid signals present in the audio, post-filters and post-EQ)
- SIDE meters (reading the side signals present in the audio, post-filters and post-EQ)
- OUTPUT meters (reading the final output signal, post-filters and post-EQ)

These meters can be used to assess and balance your audio while using the equalization. The ranges for the peaks are set by LED colour.

- BLUE LEDS correspond to 5dB per LED, and range from -85dB up to -45dB
- CYAN LEDS correspond to 3dB per LED, and range from -42 to -12dB
- WHITE LEDS correspond to 1dB per LED, and range from -11dB to -1dB
- RED LEDs correspond to 0dB, and are a warning that clipping of your audio may occur if left at this point or driven past this level.



The Back Panel

- FOLD-UNFOLD [1] – To allow the RE to be maximized or minimized
- TAPE STRIP [3] – Used to identify the RE. Double click to edit
- CV INPUT SOCKETS AND TRIMS [13] – Used to accept control voltage signals from other devices
- AUDIO INPUT SOCKETS[14] – Standard Left/Right audio input sockets
- AUDIO OUTPUT SOCKETS[15] – Standard Left/Right audio output sockets, plus additional Mid signal audio output sockets, and Side signal output sockets

CONSORT: The MIDI companion to Red Queen

CONSORT is an extension to Red Queen, and allows you to map certain controls to your own Remote device, via 24 MIDI assignable knobs. This is so that any 'live' control you wish to perform on your audio can be recorded and will not adjust the base equalization setup you might have spend the past 30minutes or so doing.

Consort has 24 MIDI knobs, and 24 assignable slots, so you can pick out of a listing of what we would consider recordable controls within the sequencer, or alternatively can be used as an A/B equalization 'scratchpad', for even more control.

To assign a knob control, simply click-hold with the mouse on the display and drag up or down to scroll through the listing. Shift-click-hold-dragging allows you to scroll through the list slower, and additional previous and next buttons for each slot are available for final setting controls.

There is a list of 421 possible options (including 'off'); of course these would be best set to a valid control based on the MODE of Red Queen.

Graphic controls for Consort are only GAIN controls – since we feel that a user would not commonly 'snap' the frequency controls or the resonance controls in graphic mode, we decided that this would not commonly be recordable via the sequencer and MID edits.

Parametric and Z-Plane controls for Consort include FREQUENCY, RESONANCE and GAINS only. Again we feel that a user would not 'snap' through filter types during playback or recording, so this again is the reason for the available controls.

NOTE: If any of the filter types are set to AP1 or AP2 and a MIDI knob is linked to the respective band GAIN controls these will have no effect on the audio signal (gain controls for all pass filters are not used, as All Pass filters do not use amplitude to effect the signals)

See page 23 for more on how to specifically set up your controls within Consort, and how to record the MIDI information to Reason sequencer

How to connect audio

To connect the Red Queen you can use Reason's own auto-connection system, and the Red Queen will decide the best way to auto-wire; if you have a mono-output device (Subtractor, for example), and you wish to add a Red Queen to it, the Red Queen will auto-connect the Subtractor output to the Left input, and then continue to route the Left output of the Red Queen to the Left input of the mix-channel (or next device in your processing chain).

You can do any of the following to create the Red Queen;

a) right-click (Win) / CTRL-click (Mac) on the device, select 'Create Device', choose sub-menu 'Studio Effects', and select 'Red Queen 10 Band 3 Mode EQ' from the listing.

b) with the device selected, use the 'Create', select 'Create Device', choose sub-menu 'Studio Effects' and select 'Red Queen 10 Band 3 Mode EQ' from the listing

c) using the Tool Palette in Reason (F8), select 'Studio Effects' when in the 'Devices' tab, and locate the 'Red Queen 10 Band 3 Mode EQ' device, click on the icon and drag it to the device you wish to add it to.

Working with Red Queen

So now you know the controls, how to connect Red Queen into your signal chain and the available options for your equalizing tasks; now you would want to put your new RE into action. Depending on the task you want to do will determine the approach of what you need to do to set up Red Queen. The following walkthroughs will show you how Red Queen can be used.

First thing is to decide how you want to use Red Queen – are you wanting to colour the final mixdown, or correct an audio signal, or use Red Queen as a creative tool?

For colouration ('character' sound control), we advise using the Graphic equalizer mode, as this would use specific frequency settings and resonance settings, with freedom to adjust the gain freely.

For corrective & surgical tasks, we advise using the Parametric equalizer mode, as this allows you to freely set the frequency and resonance controls as well as the gain control.

For creative tasks, you may find both Parametric and Z-Plane equalizer modes of interest; the Z-Plane mode can be modulated via the modwheel (and MIDI controlled via Consort, page 11), while the parametric controls may be MIDI recorded via Consort (see page 11) for creative effect. Z-Plane has the advantage of more creative use as the filter shapes can be morphed between two types as well as the frequency, resonance and gains can also be

How to use the master controls – an objective approach:

Ideally you can use the master controls to aid with setting the initial input, checking the signals pre- and post- filters and EQ, and setting the final make-up level. The way we would advise to do this is as follows:

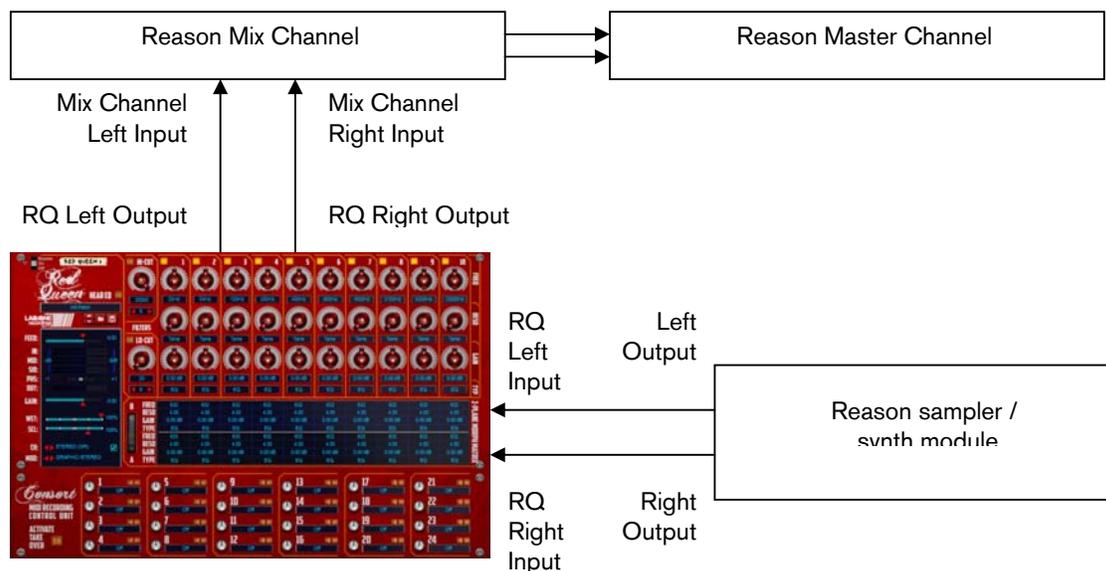
- 1) Set your level using the FEED control, so the left most WHITE LED on the INPUT meters is active, or thereabouts
- 2) Assess your mid/side signals (if relevant)
- 3) Equalize / filter your audio
- 4) Use the WET/DRY % control to assess the original signal (0%) vs. the new output (100%)
- 5) Use the GAIN output control to raise / lower the final equalized signal so the OUTPUT meters match relatively closely with the INPUT meters.
- 6) Once relevelled, use the WET/DRY control to final assess your equalization subjectively, and so that a louder equalized signal is not causing your decisions to be biased towards it.

The note with regards to biased equalization settings comes from an old yet well known observation that louder signals seem coherently 'better', but the listener is not 100% sure why. Red Queen aids with your decisions objectively, so you get the best possible sound you can without compromising of your productions.

Possible scenarios integrating Red Queen

Red Queen is designed to be a flexible device, allowing it to be used however you see best fit. Only typical applications will be listed in this manual. You are however free to choose your own setup.

A) Using the Red Queen as an insert (mix channel setup).

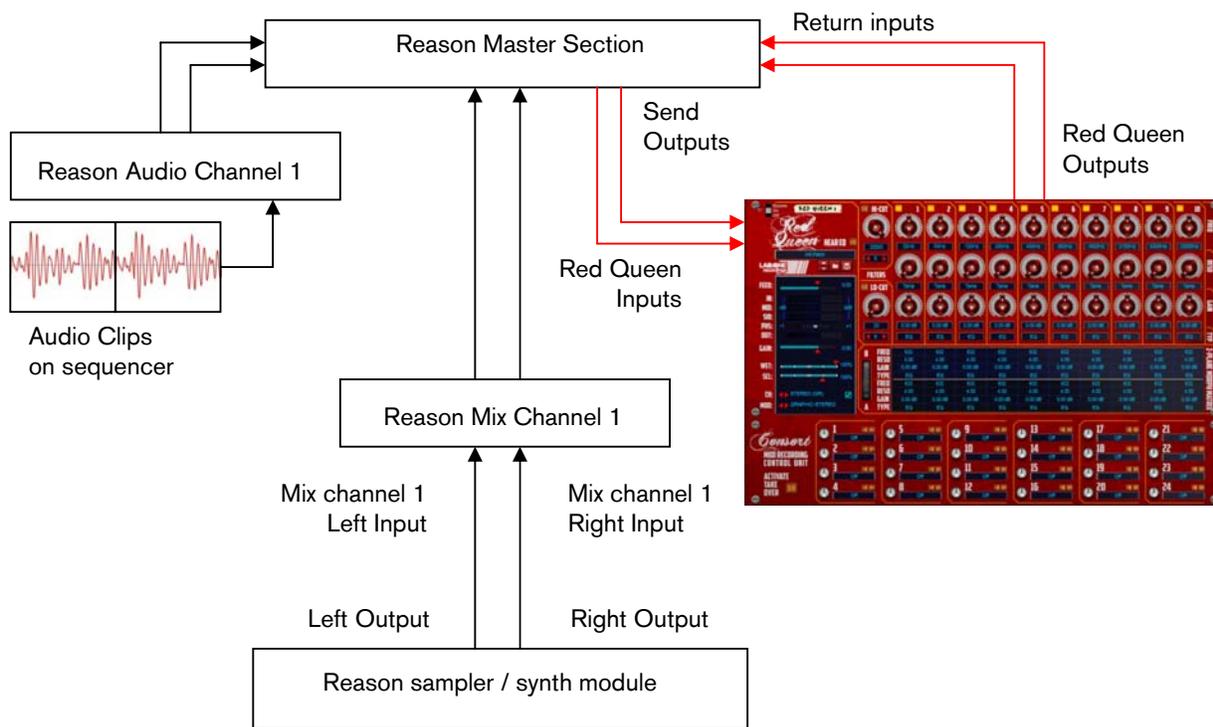


In setup (A), this would use the Red Queen as an insert effect (works within the signal chain directly, and only this signal chain). This means that whatever control you adjust on the Red Queen, it will affect the total sound coming out of the sampler / synth module.

NOTE: if Red Queen was inserted, and the WET control was set to 0%, the signal would pass through unaffected). If the Red Queen is in bypass mode or has the 'INIT PATCH' preset loaded, the audio playing would still sound 'clean' and unaffected.

To affect the sound, begin with adjusting the FEED slider if you have a low signal (or alternatively, raise the signal on the sampler / synth module). Adjust and activate the Low Pass and High Pass filter knobs to taste (not compulsory). Low passing will 'dull' the sound by suppressing the higher frequencies, while High passing would remove some 'body' from the lower end of the frequency spectrum. Adjust the controls on the equalizer to compliment the sounds you wish to 'bring out'. To help you, refer to Appendix 1: Frequency Band 'character' descriptions. To finalise the adjustments, use the gain dial to return the audio back to the same level pre-equalization. What this allows you to do is to be more subjective with your EQ'ing decisions, to see if improvements have occurred. If you leave the level higher after equalization, the natural 'boost' in level gives a false pretence to the ear, making you believe it is better sounding (purely because of being at a slightly higher level). Remember to equalize carefully, so not to make wrong decisions too quickly (the 'louder is not always better' principle)

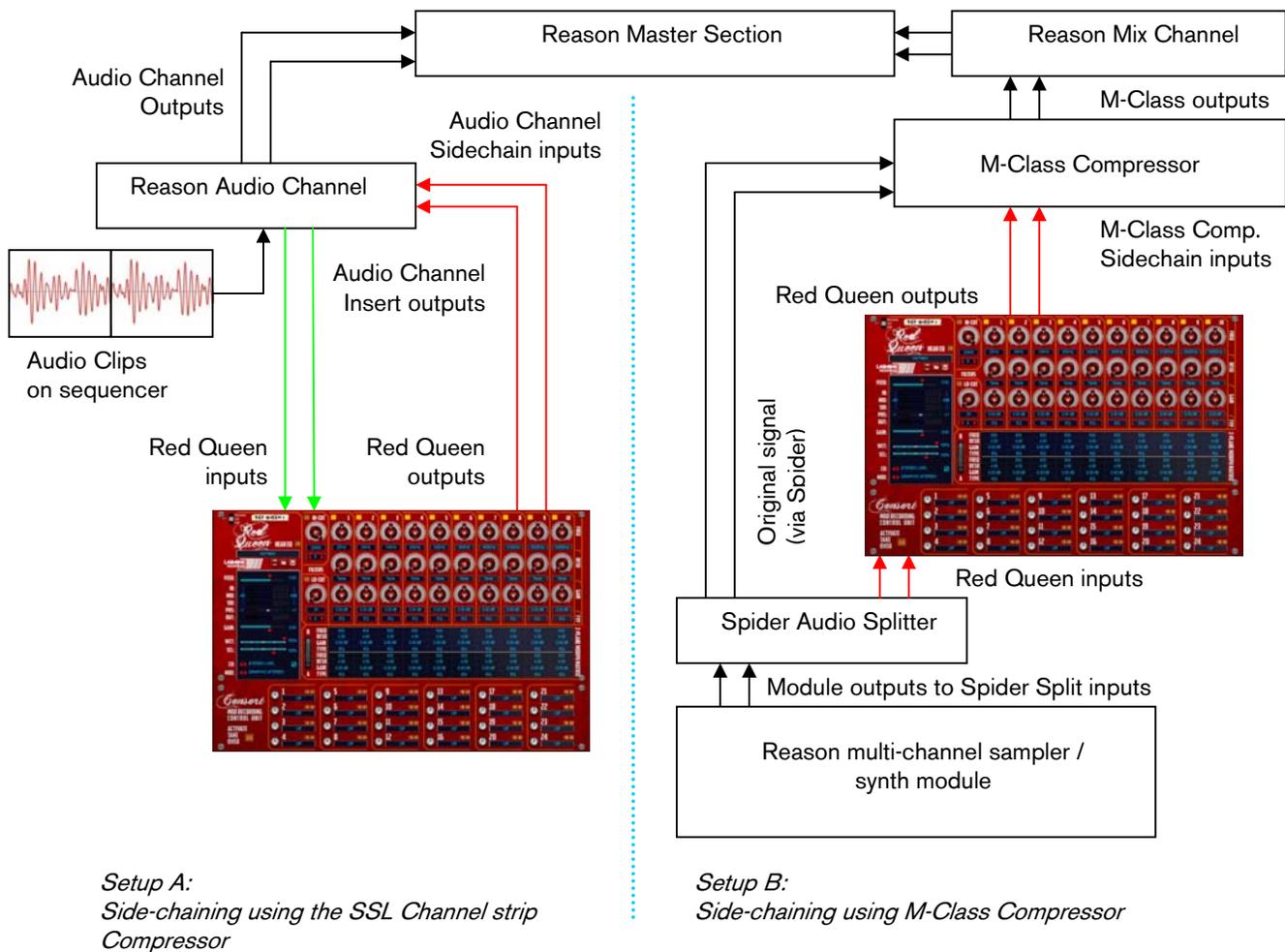
B) Using the Red Queen as a send effect (mix / audio channel setup).



In setup (B), this would use Red Queen as a send effect (works in parallel, and as a global device). This means that whatever control you adjust on Red Queen, it will affect the sound coming from the Master Section at a set amount, determined by the Send Effect dial on that specific Mix / Audio channel. This means you can have a clean sound mixed with an altered equalized sound. This is known as Parallel Processing, and may be desired in some cases.

Again you can adjust Red Queen as mentioned in setup (A) above, with the addition of the SEND dial located on the Main Mixer in Reason. Full left setting of the SEND dial has no effect on the sound, while full right setting of the SEND dial will send a maximum level possible to Red Queen. This means you can have one Red Queen as a send device for all your audio channels. However, latency may have a side effect of cancellation of audio (aka phasing), due to the processing time needed to perform the filtering of the Red Queen, when used as a Send effect. Red Queen has been designed so that latency is as close to zero latency as possible.

C) Using Red Queen as an insert to a side-chain (mix / audio channel setup)



Above you will see two alternative setups using Red Queen as part of a side-chain effect signal path. The method on the left utilises the Audio Channel insert sockets, to send signal from the Audio clips on the sequencer through the SSL desk channel strip. The insert sockets send the original signal to Red Queen, which then can alter the signal by using the band controls and master controls to ‘exaggerate’ the signal more. Reason for doing this may be to use Red Queen to help with sibilance and plosive sounds which can be found in vocal recordings. From Red Queen the outputs are then fed into the channel strips own side-chain sockets, and the ‘KEY’ button will become active on the SSL desk, indicating that the side-chain functionality of the compressor found on the SSL desk is in operation.

Method 2 on the right shows a similar setup, but using a Spider Audio Splitter unit to divide the original signal / sound source into two parallel pairs of signals, one set is sent to the M-Class Compressor unit audio inputs, while the second pair from the Spider is sent to the audio inputs of Red Queen, and the outputs of Red Queen are connected to the side-chain input of the M-Class Compressor. This frees the side-chain of the SSL compressor, so another sound source could be used to control the main SSL dynamics for that channel strip.

Experiment with setups to your own way of working, use these as a guide, but not necessarily as the be-all-and-end-all approach.

Alternative setups

For devices which have multiple outputs (ie NN-XT, Redrum, Thor, Spider Audio), then if required additional Red Queen's could be added as either mono-devices (only connecting left audio input & output sockets), or as stereo devices. This in turn allows you to edit specific sounds within a preset if you so wish (ie split zone instrument patches may have a bass guitar for one half of the keymap, while a synth lead is using the other half, and you wish to effect the sounds independently). See the next page for more examples of setups.

Another possible option would be to use one instance of Red Queen, and have 2 mono devices linked into it, and process both inputs in parallel, and output the two signals to two separate mixer channels. This may be desired to help use the same eqing settings on two mono devices at the same time.

Going further into things regarding using 1 Red Queen for two mono signals, you can split Red Queen in two within the same device. Simply set the MODE to Graphic Left/Right or Parametric Left/Right gives you two 10 band equalizers in parallel, which means you can use 1 device for two instruments. This will aid in reducing CPU load.

Using Red Queen as a 20 band EQ.

Expanding on the split-10band method above, you can also treat 1 instance in the same way, but instead of routing two separate signals into each channel, you can do the following:

- 1) Mono signal in to Red Queen Left In
- 2) Red Queen Left Out into Red Queen Right In
- 3) Red Queen Right Out back to mix channel / mixer / next device
- 4) Switch MODE to Graphic Left/Right or Parametric Left/Right

As mentioned in the tour of Red Queen earlier, be aware that when you activate a band using the BAND ENABLE buttons, you turn on the bands for both channels at the same time.

HEAR EQ and how it works

Red Queen has the option to listen to the affect of the EQ itself, via the HEAR EQ button, without the original content. This can be beneficial to help identify if certain instruments or sounds should be brought forward or sent to the back of the mix, in any of the signal path modes, making the sounds clearer out of context

- When you turn HEAR EQ on with all faders set to zero, you should hear no signal at all. This is because the EQ is having no effect on the final audio
- If you raise any of the gains above the zero line, you will hear portions of audio based on that specific frequency centre; this will indicate what you are **ADDING** to the final signal.
- If you lower any gains below the zero line, you will hear portions of audio based again on that specific frequency centre, with the difference that this will be the audio **REMOVED** from the final signal. **NOTE:** this will invert audio frequencies whilst in HEAR EQ mode, so even though it sounds alike the original, the phase relationship with the original is an inversion. Also be aware that lowering the gain also sounds quieter than raising the gain, even though the signals sound similar when HEAR EQ is on. This is purely down to the decibel rating. To get an even balance between these two, a 'boosting' gain half the value of a 'cutting' gain will sound more even ie:

6dB Gain while HEAR EQ is active = -12dB Gain while HEAR EQ is active.

This function can be very convenient to tell what you are adding or removing, giving you more insight to what the equalisation is doing to your final signal – raising the gain informs you of what signals are being added to the final signal, while lowering the gain informs you of what you will be taking away from the final signal. Depending on which mode you select also depends on what you may hear. For example with stereo modes, you will here both left and right channels in sync, in left/right modes you have independent controls so left may be louder than right etc, in mid/side modes the signal you hear depends on what amount of mid information and what amount of side information exists in the original content (if no side signal then you won't hear anything when you raise / lower the controls, and if one channel is phase inverted you may not hear any mid information due to signal cancellations)

HEAR EQ can also be used creatively if you so desire, especially useful for sound design

The different modes: Graphic, Parametric and Z-plane

Red Queen has been designed to cover 3 bases of equalization. These are known as GRAPHIC, PARAMETRIC and Z-PLANE equalization, and are explained below.

GRAPHIC EQUALIZATION

In Graphic modes, Red Queen frequency and resonance controls are step-selectable, giving you some freedom to choose your required setting, and is primarily used more as a final 'colourising' of your audio, be it on an individual sound or your final mix.

Each of the band frequency controls have 5 selectable frequencies, and are based on the ISO band settings found on most hardware units. Also each of the band resonance controls has 3 selectable resonance ranges, from wide to medium to tight settings. This again gives some freedom to use as you see fit.

The frequencies are:

BAND 1:	16Hz / 20Hz / 25Hz / 31.5Hz / 40Hz
BAND 2:	31.5Hz / 40Hz / 50Hz / 63Hz / 80Hz
BAND 3:	63Hz / 80Hz / 100Hz / 125Hz / 160Hz
BAND 4:	125Hz / 160Hz / 200Hz / 250Hz / 315Hz
BAND 5:	250Hz / 315Hz / 400Hz / 500Hz / 630Hz
BAND 6:	500Hz / 630Hz / 800Hz / 1kHz / 1.25kHz
BAND 7:	1kHz / 1.25kHz / 1.6kHz / 2kHz / 2.5kHz
BAND 8:	2kHz / 2.5kHz / 3.15kHz / 4kHz / 5kHz
BAND 9:	4kHz / 5kHz / 6.3kHz / 8kHz / 10kHz
BAND 10:	8kHz / 10kHz / 12.5kHz / 18kHz / 20kHz

As you can see each of these frequencies are set 1 octave above each other, covering 10 octaves in all. Also you do have overlapping frequencies, for even more flexibility for a graphic equalizer

The resonances are:

Smooth (broad, $2/3^{\text{rd}}$ octave range)

Sweet ($1/3^{\text{rd}}$ octave range)

Sharp ($1/6^{\text{th}}$ octave range)

These 3 resonance controls can help with colouring your audio by giving it 'character' with the Smooth and Sweet settings, while also allowing some corrective control with the Sharp setting.

The gain controls allow you to raise or lower the effect of the filter on the signals.

The graphic controls can also affect the signal in conjunction with the chosen filter types

PARAMETRIC EQUALIZATION

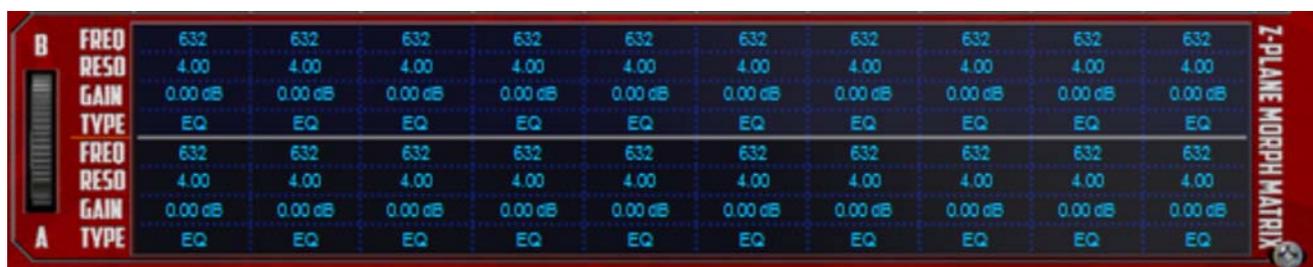
In Parametric modes, Red Queen frequency and resonance controls are free from any step restriction and work within a set range for each, giving you opportunity to use Red Queen as a corrective tool.

Each of the band frequency cover the audible hearing range between 20Hz to 20kHz, found on most parametric hardware units and software plugins & DAWs. The band resonance controls have a range from 0.5 (2½ octave range) to 32 (1/22nd octave range) from very wide to needle-tight settings. This gives you total control over the recognised range of audio signals for human-hearing (20Hz – 20kHz)

The gain controls allow you to raise or lower the effect of the filter on the signals.

Z-PLANE EQUALIZATION

Following on from Parametric Equalization, there is Z-Plane Equalization. This is a special type of equalization which can be used to create major filter changes over time, from filter state A to filter state B. Red Queen allows you to set the two filter states and interpolate between them using the Mod Wheel.



The ZPlane Morph Matrix

Similar controls can be achieved using MIDI automation on frequency, resonance and gain controls, but Red Queen excels further due to being able to interpolate between filter types, for example a true-calculated morphing of filters from Low Pass to High Pass, or Peaking EQ to All Pass 2. We'll dive into this now.

Setting up the two Z-Plane states:

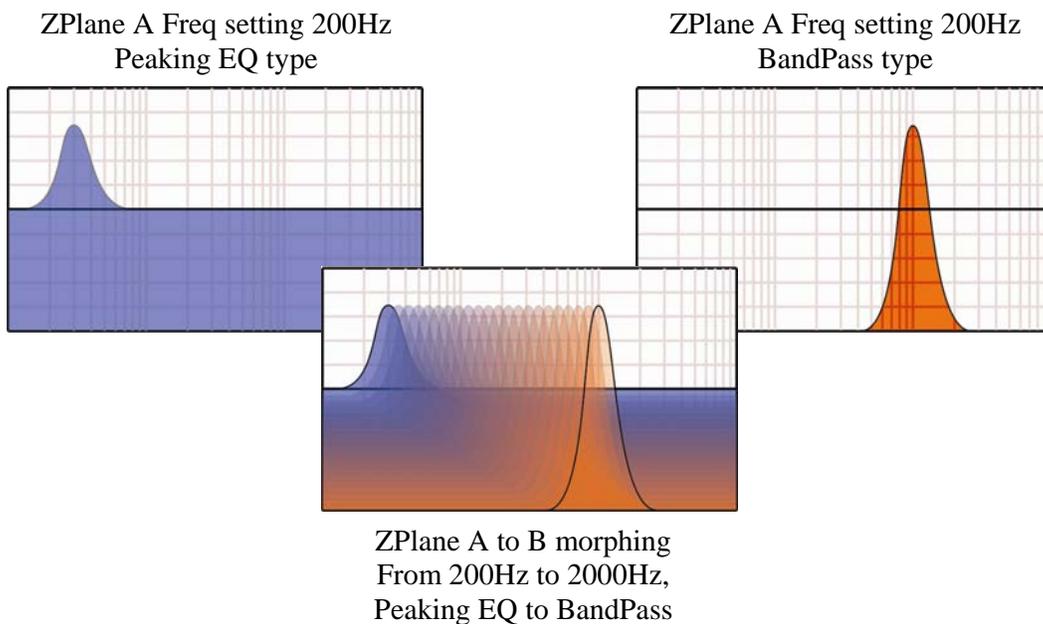
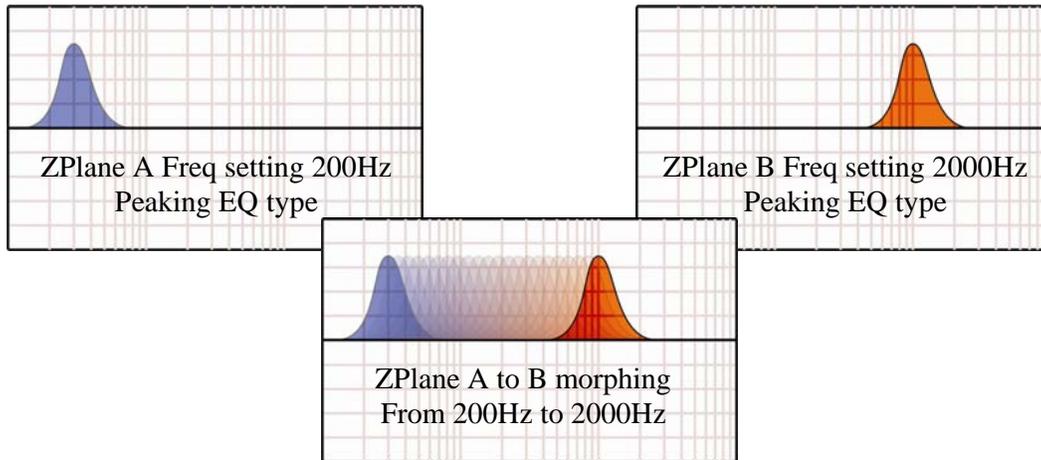
Set Red Queen to Z-PLANE STEREO mode, and you can either select the CHANNEL to ZPLANE(A) or ZPLANE(B) or use the Z-Plane Morph Matrix grid and click-hold-drag the readouts for each setting. Start with a simple filter setting using 1 band, until you start to become more accustomed to how this function works.

- 1) Turn on BAND 1 (activates Band 1 for both ZPLANE(A) and ZPLANE(B))
- 2) Set the frequency of ZPLANE(A) Band 1 frequency to around 200Hz
- 3) Set the frequency of ZPLANE(B) Band 1 frequency to around 2000Hz
- 4) Turn both ZPLANE(A) and ZPLANE(B) gains to about 10dB.
- 5) Now use the MOD WHEEL to morph between ZPLANE(A) and ZPLANE(B)

Ok nothing too fancy going on here, simple filter sweep sound can be heard. Let's go a little further.

- 6) Set the filter type on ZPLANE(B) to BP (Band Pass), by click-hold-dragging and moving the mouse up to change the filter type.
- 7) Now use the MOD WHEEL to morph between ZPLANE(A) and ZPLANE(B)

Now this sounds a bit different... so what is happening? See below for visual example of what we've just done



As you can see, the top 3 graphs show steps 1 to 5 on previous page and the morphing positions, and the bottom 3 graphs show the steps 1 to 7. With this in mind, you can create complex filter shapes and morph between each state, or alternatively you can treat ZPlane A as you're a EQ settings and use ZPlane B as your B settings and use as an A/B comparison or morph between each of the two.

So what is ZPlane good for besides morphing? Well, if you get the right frequencies, resonance and gain settings, you can emulate formant sounds (vowels, such as A,E,I,O,U, plus additional vowel like tones like 'oo' as in *boot*, 'aa' as in *car*, 'eh' as in *red*, 'ii' as in *it*, and so on. This information can be used to create such filter shapes that emulate phonemes (the sounds of vowels) to create what appears to be recognisable sounds to the ear. A lot of electronic music uses these types of effects to create the 'woy' bass sounds we hear in Dubstep, plus also devastating basslines with a hint of vocal to them in Drum&Bass, but in both cases sound like vocal effects or speaking bass when in fact they are simply modulated.

So, in answer to the question, ZPlane is great for creative filtering, and using as an A to B morph check if using in a standard equalization fashion.

Advancing the controls in all modes further

As Red Queen has a very large array of controls, Reason cannot fully cater for automation of everything within Red Queen. So Consort (Google search result: *companion, in particular the spouse of a reigning monarch*, in case you were wondering of the name) is the tool to use to handshake between your MIDI controller, the Reason sequencer and Red Queen controls.



Consort: MIDI Recording Control Unit

As mentioned earlier, Consort can take ownership of 24 of 420 available controls which are classed as MIDI recordable. These include the Graphic mode gains, the Parametric mode frequencies / resonances / gains, and the ZPlane mode frequencies / resonances / gains. Master controls are directly MIDI recordable, so Consort does not need to map any of these controls.

To set the control on Consort that you want to MIDI map, simply click-hold-drag on the available slot and push up or pull down on your mouse to scroll through the listing. To be more precise use Shift-click-hold-drag for slower scrolling, and also you can use the PREV and NEXT buttons to skip through the controls. The controls are categorised by mode and signal path, so you would see Graphic Stereo Gains 1-10, then Graphic Left Gains 1-10, then Graphic Right Gains 1-10... and so on. Parametric controls are also grouped by mode, so you would see Parametric-Stereo-Freqs 1-10, then Parametric-Stereo-Resonances 1-10, then Parametric-Stereo-Gains 1-10, then Parametric-Left-Frequencies 1-10, and so on.

Once you have set the slots to the control, you can activate ownership by turning on the 'ACTIVATE TAKE OVER' button on Consort. This will arm the corresponding control to the specified MIDI knob, so you can record in a non-destructive way, leaving your equalizer settings how they are, and use the MIDI knobs to adjust instead. This also can be another form of A/B comparison. The 'ACTIVATE TAKE OVER' button is also MIDI recordable, so you can freely use MIDI data on the specified controls, or simply use the equalizer controls as they are (in a sort of 'bypass MIDI' mode). You can also link to different controls within the list using the same data, so for example if Graphic Stereo Band 1 Gain was assigned to MIDI knob 1, and you decide that Gain 1 is not an option but Gain 4 is, you can simply 'swap' the control for Gain 1 to Gain 4 and the control will swap over to the newly set control.

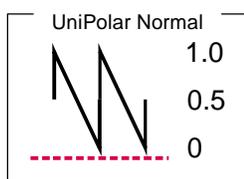
If Red Queen is within a Combinator, then you can point one of the rotaries of the Combinator to 10 MIDI knobs of Consort, for even more control. This is if you want to 'group' effect using one MIDI control instead of 10 MIDI lanes.

All Consort settings are saved within the Red Queen presets.

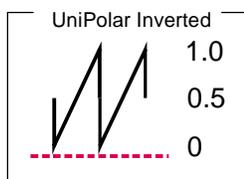
CV inputs and controls

Red Queen has 3 CV inputs & trim knobs (to scale CV input signals). Each of the CV sockets connect to its relevant counterpart on the front of Red Queen, giving more creative use of the equalizer where the user sees best fit (labelled above each control)

To use the CV inputs, simply connect a CV output from another device. Default settings for CV trim knobs are at maximum, so be aware of possible loud signals (especially if using Zplane mod CV control and have the SCALE setting at +/-200%, and gains set to +/-18dB)



From the example on the left, we can see two CV versions, Unipolar normal and Unipolar Inverted. HiCut CV uses UniPolar normal signal type, while LoCut CV and ZPlane CV uses Unipolar Inverted signal type.



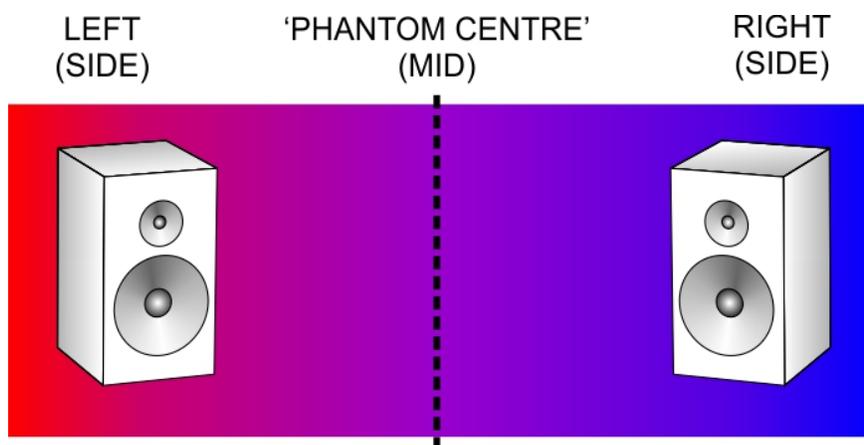
NOTE. CV signal patching will remain only within Mixer / Audio Channel effect chains, or within a Combinator, and of course your template rack setups. Red Queen will not save CV input chains, but will keep CV trim scale settings within the presets.

The MID / SIDE matrix

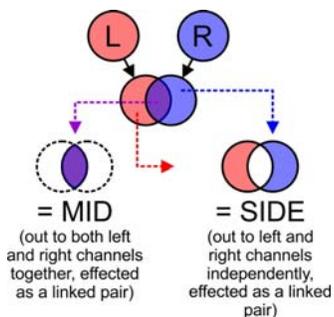
Red Queen allows you to not only equalize your audio in stereo or left and right configurations, but also in mid and side configurations too.... So what is mid and side?

Simply put, the MID signal is the audio content that appears in both left and right audio channels at the same time, like two mono signals with exactly the same information. To the listener, this would give the impression that the sound is in between both speakers. This is also known as 'phantom centre'. Mid is another term for saying 'central' or 'audio in the MIDdle' of the audio panorama. So what about Side? Well, side is the opposite of what Mid is, it's the differences between both left and right channels, that gives us the perception of audio that is not central in the audio panorama.

From this illustration below this hopefully will make things more clear.

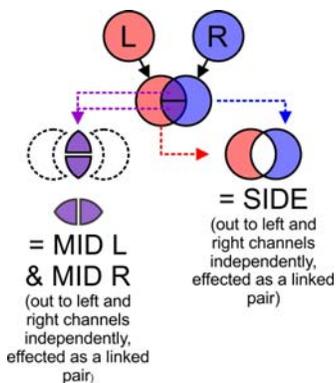


As you can see in the image above, the stereo panorama can be treated as the area between the two speakers, far left sounds (red) will only be heard in the left speaker, while far right sounds (blue) will only be heard in the right speaker. As we pan from left to right and vice versa, the audio levels discretely reduce in level, giving the impression the sound is 'moving' from each speaker to the other. Dead centre (the purple zone) means both left and right speakers are at the same level, and are outputting the same information. Now with this in mind we can look at the mid/side matrixes that Red Queen can setup



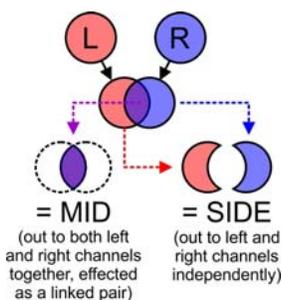
This setup is common for most Mid/Side processing units / plugins / effects. This uses the general principle of adding left to right to obtain the mid, and the different of left to right to obtain the sides.

The modes GR.MID/SIDE and PA.MID/SIDE are configured this way



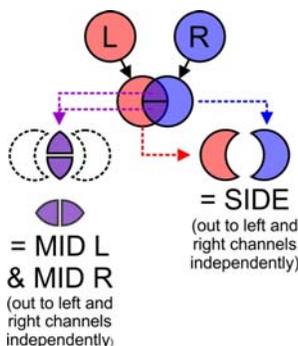
This setup is one of the three special setups for mid / side processing. This splits the Mid signal into two independent channels, allowing the user to adjust the Mid left and Mid right channels independently, while adjusting the side information as a linked pair. This means we can create more stereo width from mono information, if so desired.

The modes GR.MIDL/MIDR/SIDE and PA.MIDL/MIDR/SIDE are configured this way



This setup is the second of the three special setups for mid / side processing. This splits the Side signals into independent channels, so we can manipulate the Side Left and Side Right separately, whilst we can adjust the Mid signal as a linked pair (remember Mid signals even though are in the centre, they will be heard out of both left and right channels at the same time).

The modes GR.MID/SIDEL/SIDER and PA.MID/SIDEL/SIDER are configured this way



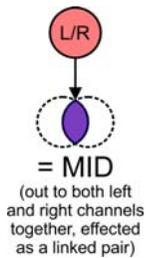
This setup is the third of three special setups for mid / side processing. This splits both the Mid signals into an unlinked-pair and the Side signals also as an unlinked-pair. This gives us even more flexibility when we adjust Mid Left, Mid Right, Side Left and Side Right information.

The modes GR.M/S/L/R and PA.M/S/L/R are configured this way.

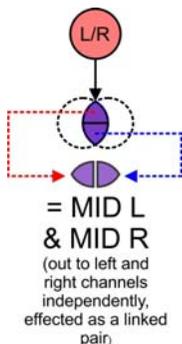
So with these extra configurations, what advantages are there? Well, say if you are supplied a stereo mixdown or an audio CD with no access to the original audio stems or edit files, and we want to correct something that needs looking at, in a mastering sense or a creative sense. We can use these special setups to emphasise stereo information where there is none, using the MID split setups; or if things are 'too' stereo we can control the signals to bring them more 'central'. This is purely one general example.

Another possible scenario is that you have your stereo mix down again no access to original stems, and the lead guitar on the left is not as loud as you like. You can use the split SIDE setups to manipulate the guitar frequencies without affecting the signal on the right. Of course you would need to take care doing such things, because you might have over instrumentation in the same SIDE channel that overlaps, and may be emphasised which may not be what you desire.

Wait... we're nearly done with the Mid/Side stuff, we've got one more example you can use to your advantage.



You can have a mono signal in to either Left In or Right In of Red Queen and obtain a stereo signal. The image on the left shows a standard MID setup; mono in = mid out as default (because a Mono sound is simply the same signal coming out of two speakers, same level, same phase etc). If you use the standard MID setups (ie GR.MID/SIDE), then you would simple raise or lower the signals together, which would still give the impression of a mono signal.



Using one of the MID split setups as mentioned above, you can link a mono audio signal into one of the channels only, and instead of using the corresponding output, you can use the two MID outputs, and feed them to a Mixer channel in Reason (this only works as a chain, and not within a Combinator / Audio / Mixer channel if Mono signals are initially present). When you use one of the MID split modes, you can adjust the Mono signal as if it was a dual mono-pair, and you can create width on your mono synths / samples. The image on the left shows this setup.

What you will need to be careful of when using some of these setups is that phase cancellations (were positive audio signals meet negative audio signals and by nature's way cancel each other out) can cause more harm than good. Stereo bass is commonly seen as something that is not desired, plus the human ear cannot determine where exactly a low sub-sonic sound source is coming from; try listening to a sub speaker only in your own setup, put it in the corner of the room and now run some audio through it, and listen around the room. You'll still hear bass and sub, you're just not sure where it would be coming from in a subconscious fashion, apart from of course your brain will tell you "it's coming from the corner where you put it"... so don't let your brain take the biased approach. The human ear can detect higher frequencies and can majority of the time detect where in the audio spectrum the sound is emanating from, even if the sound is behind you.

Another thing to be careful of is using lots of Side information, as when translating to a mono device (ie mobile phone loud speakers, personal MP3 players with mono speakers, even on hold music if you think about it), your crazy but amazing sounds can be lost due to phase cancellations. With headphones on the effect can also make the listener feel uncomfortable as their ears will hear the sound but their brain won't be able to place where in the audio panorama the sound is. This also may cause the listener to not like the sound because of this, but they are not sure why (purely because they are out of their 'comfort zone'). So be aware of these points, they can be stellar effects, but if they don't translate properly, then they may not get your message across. But that's another subject all together....

One last note: The Mid / Side outputs always depend on what is fed into Red Queen initially – if you send in a Mono signal, you won't get any side information out (because a mono signal is technically, but not officially, a left signal and a right signal at the same level, remember)

... right, let's get back on track...

How to save and load presets

Red Queen comes with a collection of basic presets as a 'starting' point. Depending on your application may depend on how you wish to use the Red Queen. Listed within the presets are some general application setups which may help guide you to the type of sound you want, and you may adjust them to suit accordingly.

As default, every time you create a Red Queen, either the default preset or the 'INIT PATCH' preset will load, initializing all the settings ready for you to use from scratch, 'fresh-out-of-the-box'. To browse the bundled presets, simply use the browser up & down buttons to activate the next preset in the listing, or alternatively you can click and hold on to the preset name to show a popup windows, for faster browsing and preset selection.

To save your own presets, simply click the 'save' button located next to the preset name display, and select where to save the preset (ideally create a new folder and keep it as a favourite in the Reason browser window, for easier finding and retrieval at a later date). The presets are saved as a .repatch name, and can only be used with that specific Rack Extension.

To load alternative presets, click the 'browse patch' button to locate presets (which are not part of the bundled pack within Red Queen). To preview the patch, simply play the sequencer with Red Queen setup so it is in use, and select the 'load patch' button, and select within the browser the specific preset. Red Queen will update whilst you are previewing, so you can hear the effect before finally committing to the chosen patch. If you cancel browsing Red Queen will reset back to its prior state before patch browsing.

Preset listings:

All available presets which have Consort configurations use [MCRU] acronym in the filenames. This means that your MIDI controller when linked to Red Queen can access the controls, while some of the main controls will be available (dependent on preset)

How to 'latch' your own MIDI via Remote Overriding

Reason allows the user to re-define certain controls via MIDI devices by using the Remote Override configuration. This means that a control on Red Queen can be mapped by any MIDI controller you have connected to your DAW. Red Queen has a comprehensive list of available controls for Remote Control already, but not all controls have this 'out of the box' functionality (due to the heavy load of controls already within).

You can only map one specific control to any of the available Remote 'receiving' controls on the Rack Extension – if you use a specific control and want to re-map it afterwards, you will lose the original Override. Also, custom-set Remote Override controls are only saved within each independent Reason song file. Ideally, if you use a dedicated piece of MIDI equipment for Red Queen, a template start-up file would be a better option, so that the Remote Override template is pre-defined on each new song/project.

All of the controls on Red Queen are Remote Override-able. To access the override editor, select from the 'Options' Menu 'Edit Remote Overrides'. The Rack will now display the specific device selected, with either pre-defined Remote control indicators (the Remote symbol), yellow Lightning bolts (overridden Remote controls pre-defined) or blue arrows (unassigned Remote controls)

Red Queen, displaying all available Remote overrides, currently not set (images to go here)

You can right-click one of the controls and select 'Edit Remote override'. This will open a new popup window, with some available options, and to show you which MIDI controller is currently set to that specific Remote Override. This may be a better option to edit, and utilise the CHANNEL setting so you can define your own controls if you so desire.

By moving one of the controls on your MIDI device (already pre-defined in Reason), you should then see MIDI activity indicator display that a MIDI message was received. Note also the control surface and the control itself on the MIDI device that was adjusted relays to the new Remote Override.

Once you are happy with the control being set, you can click 'OK' to continue with the new setting, or 'CANCEL' to abort the mapping. Also note that if you accept this mapping, the control (if already linked to another) will be fixed to the new mapping. Any previously set mappings will be 'moved' to the new mapped control. This should be used with care if you already have pre-defined Remote Override mappings.

Red Queen, with a Remote Override mapping defined on the HICUT control, indicated by a yellow Lightning bolt (image to go here)

This Remote Overriding method can be handy if you don't know how to set up your own MIDI controller to the dedicated MIDI controls mentioned in the previous chapter. For speed, you can simply double click a blue arrow, and the arrow will turn into a spinning yellow Lightning bolt, indicating that Reason is awaiting a MIDI signal to that control. You can then adjust a MIDI control on your MIDI device, and the control will map automatically without the need to use the popup previously mentioned. Double-click each specific control you want to map to save time and to use the mapping in a faster method.

All Remote Overrides can then be used to record automation within Reason, which can be fine tuned using the Sequencer and the clips (see the Reason Operating Manual for more information on how to edit & record automation)

Remote templates (which are currently in use by supported manufacturers) are currently not available for Red Queen, but may be implemented and available in the near future

MIDI Implementation table

Below is a listing of all MIDI Control Change (CC) numbers, which can be applied to your choice of device.

(list to be added)

Appendix 1:

Instrument Frequency ranges

To understand EQ and its intricacies you need hands-on experience, but through practice and use of the Red Queen you will start to become accustomed to certain 'ranges' of the frequency spectrum.

Also, every sound that you use may sound different to someone else, even if you use the same sound – different variables come into play (amplitude, pitch, envelope, bit rate,.. etc.), so you need to keep in mind that the below listed frequency settings can be used with 'a pinch of salt'; EQing is like seasoning of your sound, it adds flavour (and can also take it away too).

The Kick Drum

Any apparent muddiness can be rolled off around 300Hz. Try a small boost around 5-7kHz to add some high end.

50-100Hz ~ Adds bottom to the sound
100-250Hz ~ Adds roundness
250-800Hz ~ Muddiness Area
5-8kHz ~ Adds high end presence
8-12kHz ~ Adds Hiss

The Snare

Try a small boost around 60-120Hz if the sound is a little too wimpy. Try boosting around 6kHz for that 'snappy' sound.

100-250Hz ~ Fills out the sound
6-8kHz ~ Adds presence

The Hi hats, The Cymbals, The Rides & The Other High-end Percussive sounds

Any apparent muddiness can be rolled off around 300Hz. To add some brightness try a small boost around 3kHz.

250-800Hz ~ Muddiness area
1-6kHz ~ Adds presence
6-8kHz ~ Adds clarity
8-12kHz ~ Adds brightness

The Bass

Try boosting around 60Hz to add more body. Any apparent muddiness can be rolled off around 300Hz. If more presence is needed, boost around 6kHz.

50-100Hz ~ Adds bottom end
100-250Hz ~ Adds roundness
250-800Hz ~ Muddiness Area
800-1kHz ~ Adds beef to small speakers
1-6kHz ~ Adds presence
6-8kHz ~ Adds high-end presence
8-12kHz ~ Adds hiss

The Vocal

This is a difficult one, as it depends on the microphone that was used to record the vocal. Apply either cut or boost around 300hz. Apply a very small boost around 6kHz to add some clarity.

100-250Hz ~ Adds 'up-frontness'
250-800Hz ~ Muddiness area
1-6kHz ~ Adds presence
6-8kHz ~ Adds sibilance and clarity
8-12kHz ~ Adds brightness

The Piano

Any apparent muddiness can be rolled off around 300Hz. Apply a very small boost around 6kHz to add some clarity.

50-100Hz ~ Adds bottom
100-250Hz ~ Adds roundness
250-1kHz ~ Muddiness area
1-6kHz ~ Adds presence
6-8kHz ~ Adds clarity
8-12kHz ~ Adds hiss

The Electric Guitar

Again this depends on the mix and the recording. Apply either cut or boost around 300hz, depending on the song and sound. Try boosting around 3kHz to add some edge to the sound, or cut to add some transparency. Try boosting around 6kHz to add presence. Try boosting around 10kHz to add brightness.

100-250Hz ~ Adds body
250-800Hz ~ Muddiness area
1-6 kHz ~ Cuts through the mix
6-8 kHz ~ Adds clarity
8-12 kHz ~ Adds hiss

The Acoustic Guitar

Any apparent muddiness can be rolled off between 100-300Hz. Apply small amounts of cut around 1-3 kHz, to push the image higher. Apply small amounts of boost around 5 kHz to add some presence.

100-250Hz ~ Adds body
6-8kHz ~ Adds clarity
8-12kHz ~ Adds brightness

The Strings

These depend entirely on the mix and the sound used.

50-100Hz ~ Adds bottom end
100-250Hz ~ Adds body
250-800Hz ~ Muddiness area
1-6kHz ~ Sounds crunchy
6-8kHz ~ Adds clarity
8-12kHz ~ Adds brightness

Appendix 2: EQ Tables

Below is a general guide to what specific frequencies may do to your sounds / mix.

50 Hz

1. Increase to add more fullness to lowest frequency instruments like foot, toms, and the bass.
2. Reduce to decrease the "boom" of the bass and will increase overtones and the recognition of bass line in the mix. This is most often used on bass lines in Rap and R&B.

100 Hz

- Increase to add a harder bass sound to lowest frequency instruments.
Increase to add fullness to guitars, snare.
Increase to add warmth to piano and horns.
Reduce to remove boom on guitars & increase clarity.

200 Hz

1. Increase to add fullness to vocals.
2. Increase to add fullness to snare and guitar (harder sound).
3. Reduce to decrease muddiness of vocals or mid-range instruments.
4. Reduce to decrease gong sound of cymbals.

400 Hz

1. Increase to add clarity to bass lines especially when speakers are at low volume.
2. Reduce to decrease "cardboard" sound of lower drums (foot and toms).
3. Reduce to decrease ambiance on cymbals.

800 Hz

1. Increase for clarity and "punch" of bass.
2. Reduce to remove "cheap" sound of guitars

1.5 KHz

1. Increase for "clarity" and "pluck" of bass.
2. Reduce to remove dullness of guitars.

3 KHz

1. Increase for more "pluck" of bass.
2. Increase for more attack of electric / acoustic guitar.
3. Increase for more attack on low piano parts.
4. Increase for more clarity / hardness on voice.
5. Reduce to increase breathy, soft sound on background vocals.
6. Reduce to disguise out-of-tune vocals / guitars

5 KHz

1. Increase for vocal presence.
2. Increase low frequency drum attack (foot/toms).
3. Increase for more "finger sound" on bass.
4. Increase attack of piano, acoustic guitar and brightness on guitars.
5. Reduce to make background parts more distant.
6. Reduce to soften "thin" guitar.

7 KHz

1. Increase to add attack on low frequency drums (more metallic sound).
2. Increase to add attack to percussion instruments.
3. Increase on dull singer.
4. Increase for more "finger sound" on acoustic bass.
5. Reduce to decrease "s" sound on singers.
6. Increase to add sharpness to synthesizers, rock guitars, acoustic guitar and piano.

10KHz

1. Increase to brighten vocals.
2. Increase for "light brightness" in acoustic guitar and piano.
3. Increase for hardness on cymbals.
4. Reduce to decrease "s" sound on singers.

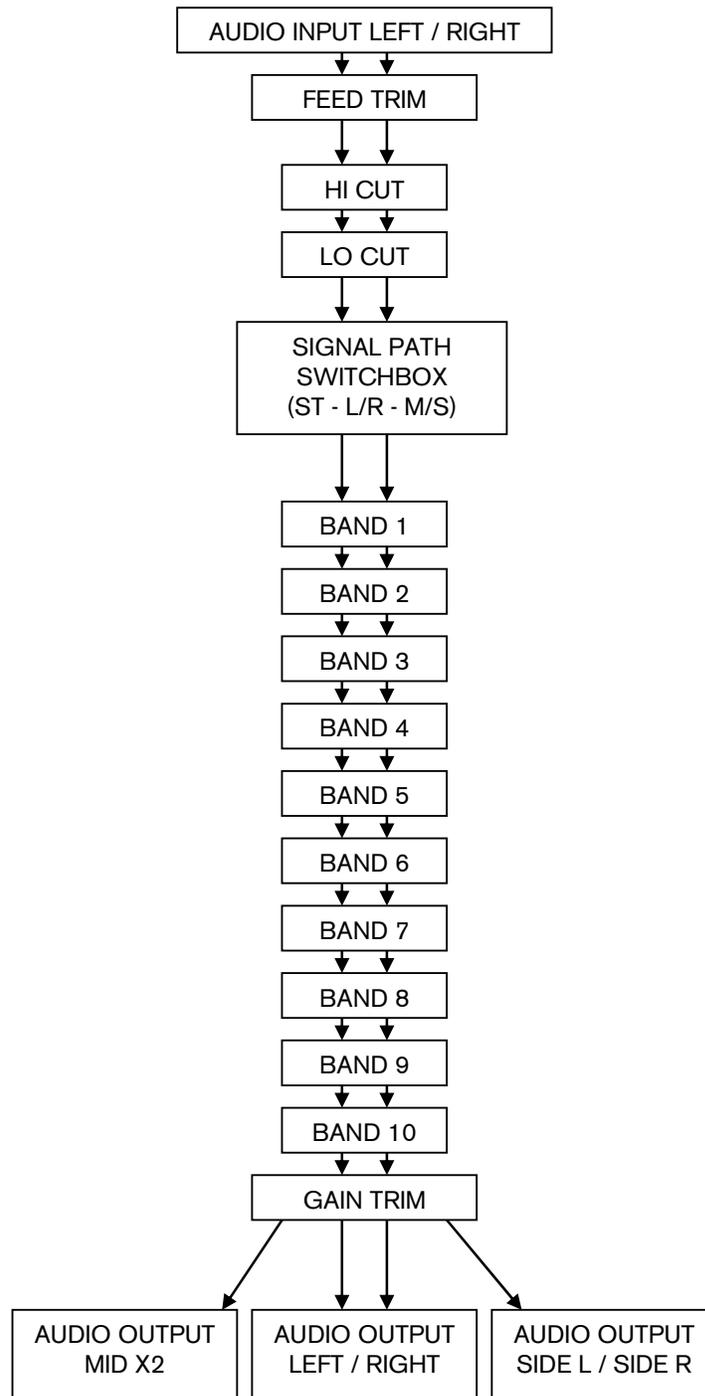
15KHz

1. Increase to brighten vocals (breath sound).
2. Increase to brighten cymbals, string instruments and flutes.
3. Increase to make sampled synthesizer sound more real.

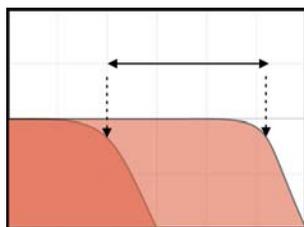
Formant filters:

Formants are a very particular sound which the human vocal tract can make, and commonly in synthesizers, vocoders and equalizers you can emulate this by using two or three formant frequencies, to give the listener the impression of a 'speaking' sound. Red Queen comes bundled with a collection of formant filter setups, ready for you to use.

Appendix 3: Signal Routing diagram

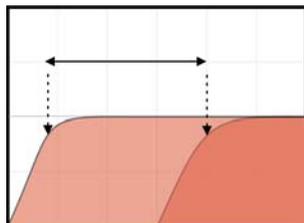


Appendix 4: Filter type diagrams

**LOW PASS FILTER (aka Hi-Cut filter)**

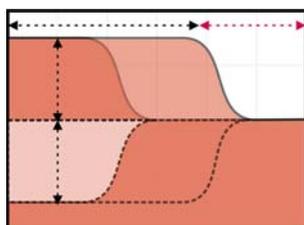
Characteristics: Removes high end information above the frequency setting. 6dB/Octave filters attenuate amplitude of frequency centre by -3dB, as used for the Hi-Cut filter on Red Queen.

12dB/Octave filters (filter bands on Red Queen) also have resonance controls, which can produce 'ringing' at the frequency centre.

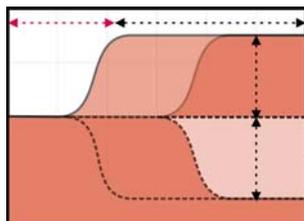
**HIGH PASS FILTER (aka Lo-Cut filter)**

Characteristics: Removes high end information above the frequency setting. 6dB/Octave filters attenuate amplitude of frequency centre by -3dB, as used for the Lo-Cut filter on Red Queen.

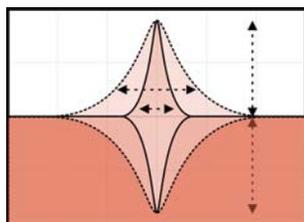
12dB/Octave filters (filter bands on Red Queen) also have resonance controls, which can produce 'ringing' at the frequency centre.

**LOW SHELF FILTER**

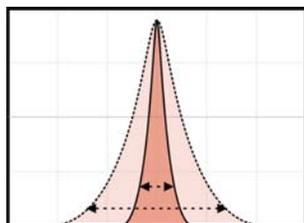
Characteristics: Attenuates signal below frequency centre evenly, commonly used for bass controls on standard audio playback equipment. Frequencies above the centre frequency are left unaltered. Resonance can cause sharper low shelf filtering, and may introduce ringing at high resonance settings

**HIGH SHELF FILTER**

Characteristics: Attenuates signal above frequency centre evenly, commonly used for treble controls on standard audio playback equipment. Frequencies above the centre frequency are left unaltered. Resonance can cause sharper low shelf filtering, and may introduce ringing at high resonance settings

**PEAK / NOTCH FILTER (aka EQ)**

Characteristics: Attenuates at frequency centre, and uses a resonance setting to control the width of the peak / notch. Gain controls set the filter to peak if positive gain, or notch if negative gain. Used for creative and surgical tasks, and commonly found on parametric and fixed graphic devices

**BAND PASS FILTER**

Characteristics: Attenuates at frequency centre, and uses a resonance setting to control the width of the pass band. All frequencies outside of the pass band are removed from the signal, allowing only a specific range of frequencies through.

All Pass Filters are a special case filter where the frequencies are not affected, but the phase of the signal is affected. This can only be shown by use of oscillator displays and samples, and can be heard quite easily.

(screenshots of samples to go here, original signal, probably sawtooth, then AP1 90° phase and AP2 180° phase)

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