RA224 Filter Gate

OPERATORS MANUAL

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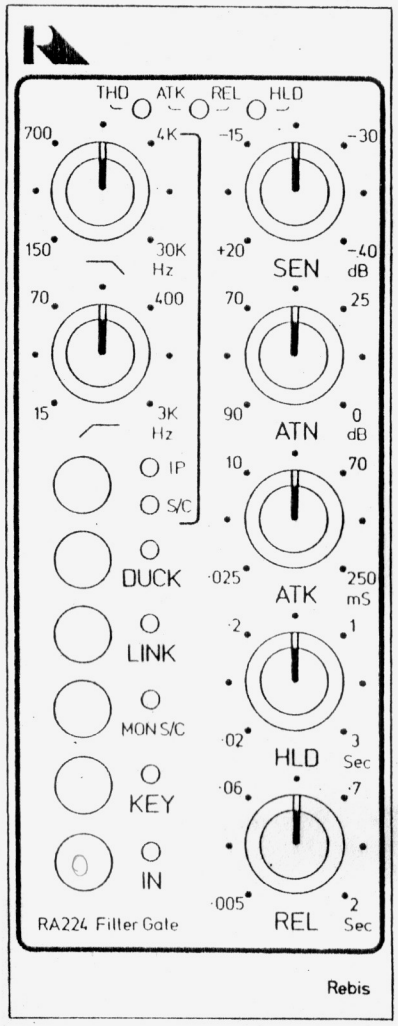
CONTROLS

LEDS: Indicate gating action. Green signal above threshold, Red fades up for attack, down for release, Orange hold.



SEN: Adjusts the level at which the gate opens. (-40 to +20dBm)

ATN: Sets the attenuation when the gate closes. (0 to 90dB)

ATK: Sets the time taken for the gate to open. (25uS to 250mS)

HOLD: Sets the time between the signal dropping below threshold and the gate starting to close. (20mS to 3 Secs)

REL: Sets how long the gate takes to close after the hold time. (40mS to 2 Secs)

HF FILTER: High frequency roll off filter. (12dB/8ve @ 150Hz to 30kHz)

LF FILTER: Low frequency roll off filter. (12dB/8ve @ 15Hz to 3kHz)

FILTER SWITCH: Selects whether Input or Side Chain signal is filtered.

DUCK: Reverses action of gate. ie: Attenuates over threshold level.

LINK: Links two RA224s for stereo operation.

MON S/C: Connects Side Chain signal to output of module.

KEY: Allows gating of main signal by an audio source fed to the Key input.

IN: In/out switch, bypasses unit entirely. (LEDs still indicate gate's status.)

INTRODUCTION

The RA224 Filter Gate uses the latest VCA technology to provide low distortion, low noise gating action with independent control of dynamic parameters. Separate Hold and Release controls allow this unit to be used on a wider variety of signals than previous generation gates.

This unit also includes variable frequency high and low pass filters in the control chain which virtually eliminate the problem of false triggering by unwanted signals and allow frequency related gating without a separate equaliser. These filters can if required be switched into the main signal path to act as scratch and rumble filters or to provide special effects.

Other facilities on this gate are an attenuation control, a Duck switch, the ability to Link two RA224s together for stereo operation, and a Mon S/C switch which allows the controlling signal to be easily monitored.

Its applications include elimination of unwanted low level signals and cross mic pickup and modification of drum sounds.

The RA224 gate can be controlled by the signal it is gating or by an auxiliary audio source. This allows it to be used for synchronising instruments, separating drum tracks and various special effects.

INSTALLATION

Pin Connections

1) Keyway slot
8) Stereo Link
9) Main 0 volts
10) +40 volts D.C.
12) Key Input
14) Output
16) Input

Pins 11, 13 and 15 are connected to 0 Volts on the module.

Screened cables should be used for all signal connections, the screens being connected to 0 Volts at the edge connector only for the inputs and at the jackfield only for the output.
A separate wire should join the Rack 0 Volts to the main Jackfield 0 volts.

Earthing

When installing the module in a Rebis Rack Frame ensure that it is firmly screwed in and that the rack is earthed, as it is essential both for safety and screening that the front panel is ultimately connected to mains earth.

Stereo Linking

These units can be linked in pairs for stereo operation by simply linking Pin 8 on their edge connectors and pressing both Link switches.
N.B. When linked for stereo operation all front panel controls should be set to the same positions on both modules.

OPERATION

To obtain maximum noise reduction the RA224 Filter Gate should be the final element in the signal processing chain.
To familiarise yourself with the controls try the following procedure.

1. Feed a single track, say snare drum, to the input and monitor the output.

2. Set all the controls except the HF Filter anticlockwise and that control clockwise. Push in the IN switch and make sure that all the other switches are out.

3. Set SEN control as low as possible (clockwise) without letting through unwanted background noises or cross mic pickup.

4. If difficulty is found in removing say the hi-hat from the snare track push the MON S/C switch and back off the HF Filter anticlockwise until the hi-hat is inaudible and then release the MON S/C button again. Repeating step 3 should now produce better results.

5. Turn the ATK control clockwise until the desired attack sound is achieved. Attack should be as slow as possible except where special percussive effects are required. *

6. Set the HLD and REL controls to suit the decay of the signals envelope. (On drums these will probably remain quite fast)

7. The ATN control can be used to reduce attenuation on material with a high noise level where full attenuation makes the gating action sound too abrupt. (This effect is not as noticable when the track in question is added to a complete mix.)

* Note: An unnecessarily fast attack time may cause a wave front so sharp that it will be heard as a click when the gate opens. This can be avoided by one or a combination of the following: Increase attack time (cw), increase sensitivity (cw), reduce attenuation (cw).

LED Indicators
You will notice that the LEDs indicate the status of the gate whether or not it is bypassed with the IN/OUT switch. This can be particularly useful in live situations.

KEY Input
When the KEY switch is in the gate is no longer controlled by the through signal but by a signal fed to the Key input.

APPLICATION NOTES

General
The RA224 Filter Gate would normally be used in the channel inserts of a mixing desk. If pre and post inserts are available the post eq inserts should be used, and if other signal processors are being used in series with the gate then it should be the last element in the chain.

In the studio, wherever possible, the RA224 should be used at the mixdown stage rather than on the initial recording. If noise gates are used to achieve the sound for the initial recording it is good practise to switch them out for the 'take' and back in for replay and mixdown. This is particularly important when you are using the RA224 to make modifications to the envelope of a sound (see envelope shaping). Remember a noise gate works by 'taking bits away' and once they've gone you won't be able to put them back.

Frequency Related Gating
In some situations where there is very little difference between the levels of the track and the unwanted signal gating is still possible, provided there is a consistent difference in the frequency content of the two components.
A notorious example of this is hi-hat cross mic pickup on the snare drum track. A filter in the main signal path cannot solve this problem because any application of high frequency cut to reduce the hi-hat will imediately affect the snare drum sound. However a filter can be used to remove the unwanted signal without affecting the eq of the track by using it on the side chain controlling signal to create a level difference that the RA224 can trigger on.
This is described in more detail in the Operation section earlier in this manual.

Drum Separation
Frequency related gating, as described in the previous section, is invaluable for dealing with drum track separation. There is however an even more foolproof method:

1. Mic the drum in the normal way and feed this channel of the mix through the RA224.
2. Fix a contact mic to the same drum and feed it to the Key input of the RA224. Push the KEY switch in on the front panel.

The high degree of separation which you can achieve using RA224 Filter Gates on a drum kit is invaluable in gaining full control of the final mix, and even makes it possible to re-take individual drum tracks should the need arise.

Envelope Shaping
Using the RA224 to modify the envelope of percussive sounds can be very effective. Once you have set the SEN and ATN controls a little experimentation with the ATK, HLD and REL controls will show just what the RA224 can do.

SPECIFICATIONS

Threshold: Continuously variable from -40dBm to +20dBm.

Attenuation: Continuously variable from 0dB to -90dB.

Attack: Continuously variable from 25uS/20dB to 250mS/20dB.

Hold: Continuously variable from 20mS to 3 Secs.

Release: Continuously variable from 40mS/20dB to 2 Secs/20dB.

Filters: High and low pass filters with 12dB/8ve slope with continuously variable turnover frequencies of: HF 150Hz to 30kHz
LF 15Hz to 3kHz

Filter Switch: Connects the filters into either the Side Chain or the Main signal path.

Duck Switch: Reverses the action of the gate.

Link Switch: Allows two RA224s to be linked together for stereo operation.

Mon S/C Switch: Allows monitoring of the Side Chain signal.

Key Switch: Audio input to allow control of side chain with an auxilliary source.

In/Out Switch: Bypasses unit entirely.

LEDs: Green indicates signal above threshold, Orange indicates Hold time, Red fades up and down to indicate Attack and Release times.

Frequency Response: ± 0.5dB 20Hz to 20kHz.

Distortion: Below 0.05% THD at +12dBm at 1kHz.

Input Impedance: 100 kilohms.

Output Impedance: Less than 50 ohms.

Maximum Input: +21dBm.

Maximum Output: +20dBm into 600 ohms.

Noise: Bandwidth 20Hz to 20kHz, gate closed better than -104dBm, gate open better than -95dBm.

Ratio: 20:1

Power Requirements: +40 Volts at 66mA.

Dimensions: 5.25" x 1" x 7.9" behind front panel.