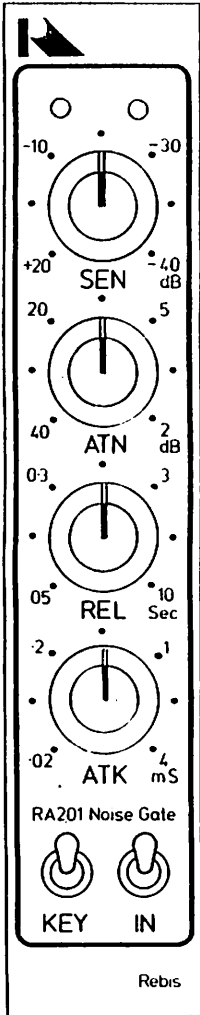


RA201 Noise Gate

OPERATORS MANUAL

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CONTROLS



LED'S: Indicate gating action.
Red - gate closed. Green -
gate open.
(See IN/OUT SWITCH)

SEN: [Sensitivity] Adjusts the
level at which the gate opens.

ATN: [Attenuation] Sets the amount
by which the signal is
reduced when the gate closes.

REL: [Release] Sets the time
between signal dropping below
sensitivity threshold and
gate closing.

ATK: [Attack] Sets the time taken
for the gate to open.

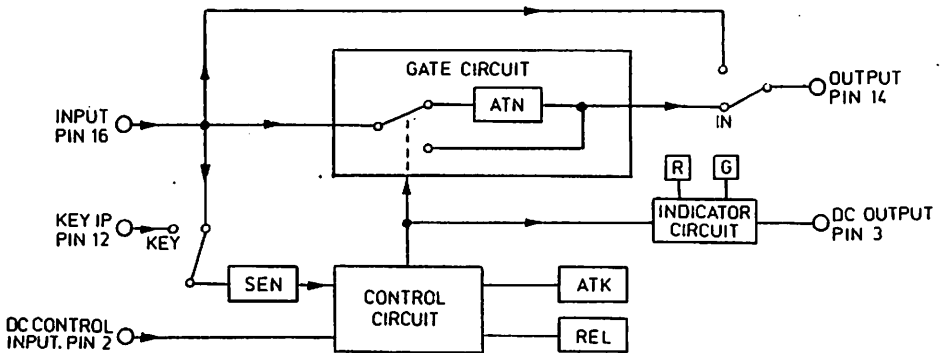
KEYSWITCH: Allows gating of normal
through signal by an
auxiliary audio source fed to
the Key input.

IN/OUT SWITCH: Bypasses gate.
[LEDS still indicate gate's
status].

INTRODUCTION

The RA201 Noise Gate is an electronic audio switch which can be controlled by the signal it is gating, an auxiliary audio source or an external DC input.

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



RA201 BLOCK DIAGRAM

INSTALLATION

Pin Connections

- 1) Keyway Slot
- 2) DC Control Input
(requires 15 to 40V to open gate)
- 3) DC Output
2V when gate open
10V when gate closed
- 9) Main 0 Volts
- 10) +24 to +40 Volts
- 11) Screen
- 12) Key input
- 13) Screen
- 14) Output
- 15) Screen
- 16) Input

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

For normal audio operation pins 2 and 3 need no connections.

Screened cables should be used for all signal connections, the screens being connected to 0 volts at the edge connector only for inputs and at the jackfield only for outputs.

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.

OPERATION

To obtain maximum noise reduction the RA201 Noise 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 anticlockwise, KEY switch up, IN/OUT switch down.
- 3 Set SEN control as low as possible [clockwise] without letting through unwanted background noises or cross mic pickup.
- 4 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*.
- 5 Set the REL control to suit the decay of the signal's envelope. [On drums this will probably remain quite fast]
- 6 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.

* 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 LED'S indicate the status of the gate circuit 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 down the gate is no longer controlled by the through signal but by a signal fed to the Key input.

APPLICATION NOTES

General

The RA201 Noise Gate would normally be used in the channel inserts of the mixing desk. If pre and post eq 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 RA201 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 practice to switch them out for the 'take' and back in for replay and mixdown. This is particularly important when you are using the RA201 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. An equaliser cannot solve this problem because any application of high frequency cut to reduce the hi-hat will immediately affect the snare drum sound. But an equaliser (an RA204 Parametric is ideal) can be used with the RA201 Noise Gate to remove the unwanted signal without altering the eq of the track. The equaliser is used to boost a frequency band in the track or cut a band in the unwanted signal to create a level difference which the gate can trigger on. The

equaliser is prevented from affecting the final track by using the RA201 in the key mode. So the procedure for frequency related gating is as follows:

- 1 Feed the track through the RA201's normal input and output.
- 2 Take a parallel feed from the input of the RA201 to the input of an RA204.
- 3 Feed the output of the RA204 to the key input of the RA201.
- 4 Switch RA201 into KEY mode.
- 5 It will probably be helpful to monitor the output of the RA204 while adjusting equalisation.
- 6 Adjust the RA204 to accentuate the difference in frequency content between the track and the unwanted signal.
(In the case of our example of the snare drum track - 'tune' the frequency control of the RA204 to the resonant frequency of the snare drum skin and apply maximum boost)
- 7 The RA201 can now be set up in the normal way bearing in mind that whenever the RA201 is in the KEY mode the controls all take their trigger instructions from the key input.

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 RA201.
- 2 Fix a contact mic to the same drum and feed it to the Key input.

The high degree of separation which you can achieve using RA201 Noise 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 RA201 to modify the envelope of percussive sounds can be very effective. Once you have set the sensitivity and attenuation a little experimentation with the attack and release controls will show you just what the RA201 can do.

Special Effects

Feeding a continuous synthesiser tone or noise through the gate and keying the gate with a drum track can produce a useful percussive track to add to the mix or replace a drum track.

The RA201 can be used to make a bass guitar track take on the exact rhythm of the bass drum. Feed the bass guitar track through the gate and the bass drum track to the key input. The attack and release controls can be used to adjust the envelope of the bass guitar.

Difficult funky brass section passages can be tidied up by feeding each brass track through its own gate, and driving all the key inputs from a single track - the lead player or even a special drum track.

Repeat Echo Control

The RA201 can be used to cut off echo after a pre-determined number of repeats by gating the echo signal and keying with the dry signal. The release control will determine the number of repeats.

Negative Attack Time

If you have a tape machine with separate sync and replay outputs you can achieve foolproof

gating for general noise reduction on mixdown. This is done by gating the replay output of each track using the sync output to key the gate. This will effectively give you a negative attack time and allow you to set the RA201 to open just before the signal appears.

DC Control

The RA201 can be remote controlled with DC by applying +15 to 40 Volts to the DC input on Pin 2 of the edge connector.

The DC output on Pin 3 of the edge connector rises from 2 Volts to 10 Volts when the gate closes. This can be used to trigger DC controlled equipment.

TEST BENCH NOTES

Should it become necessary to adjust the indicator circuit, allow at least an hour on power in the rack before unplugging the module and moving it to the test connector.

Equipment:

- 1.A Burst Generator with a sine-wave output.
- 2.A Double Beam Oscilloscope.

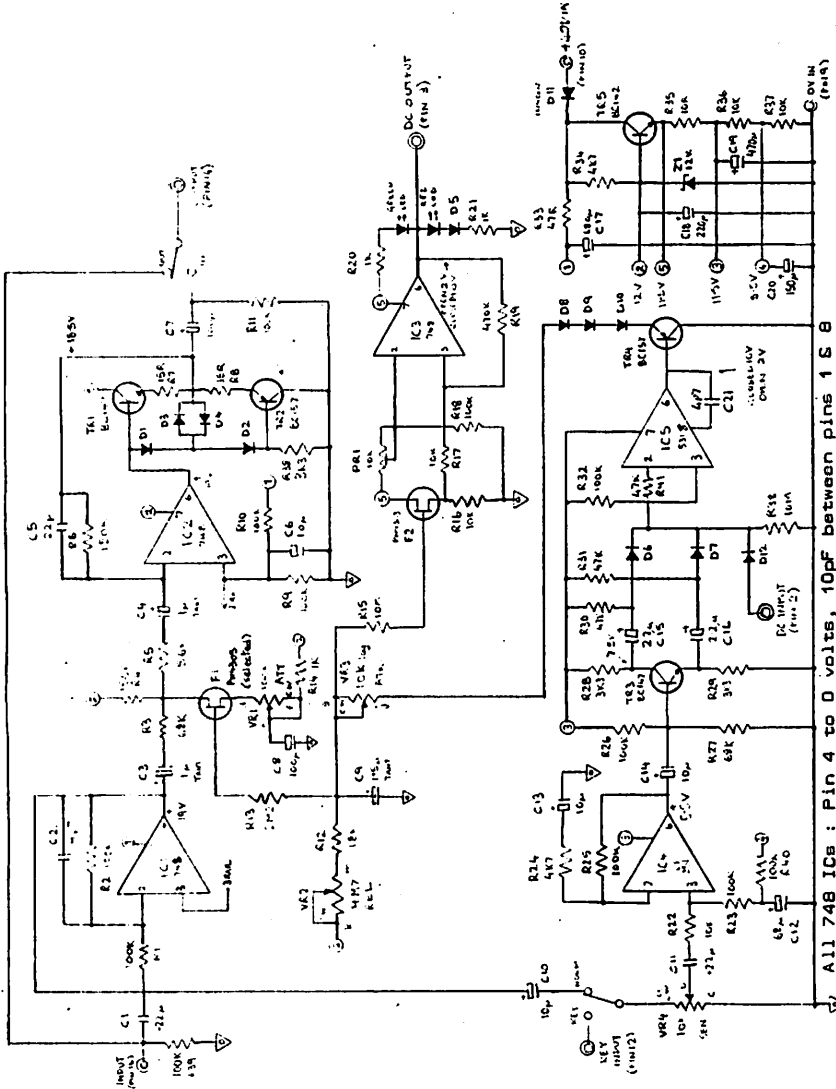
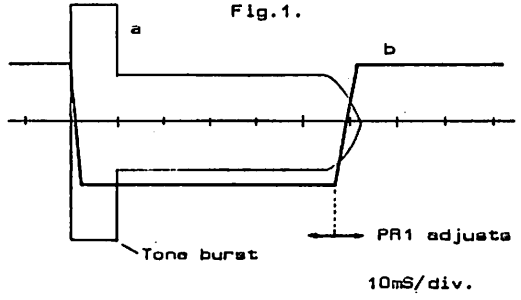
Preliminary:

PR1 centred. Switches;KEY up, IN down.
ATN,REL, ATK controls fully anticlockwise.

Procedure:

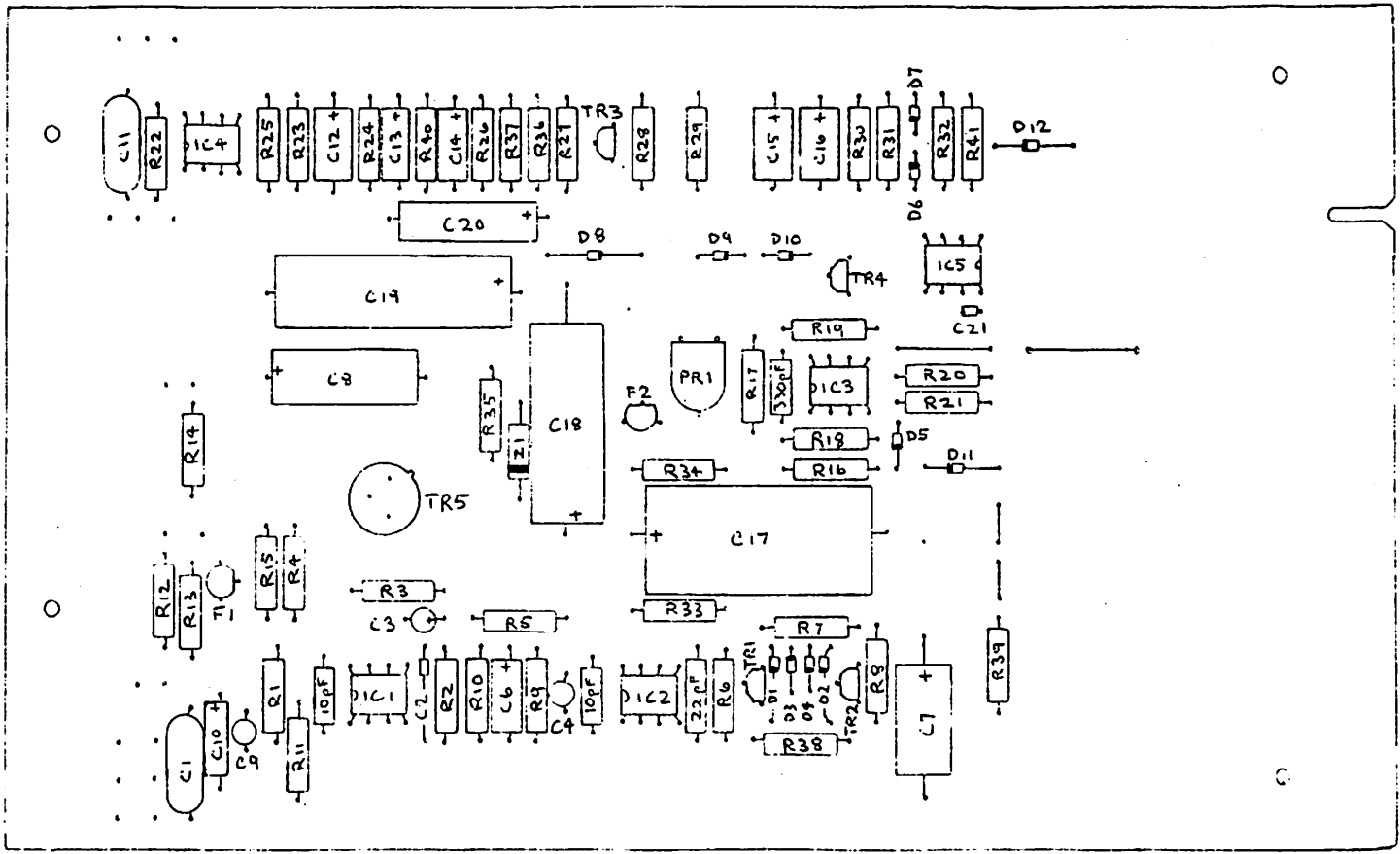
- 1.Adjust the Burst Generator to provide 10mS bursts of 1KHz @0dBm followed by 100mS 'spaces' of 1KHz @ -10dBm and inject this waveform into the input of the module.
- 2.Connect one beam of the Oscilloscope to the output of the module and the other to the output of 1C3(rear end of R19).
- 3.Set oscilloscope to 10mS/div and adjust SEN control so that the output signal looks like fig1 trace a.

4. Adjust PR1 until the output of IC3 appears as trace b of Fig.1, with LEDs changing over as the signal dies away.



All 748 ICs : Pin 4 to 0 volts, 10pF between pins 1 & 8
 All unmarked diodes type 1N4148
 F1 : Vp = 1.6 to 2 volts

RA201 CIRCUIT DIAGRAM



RA201 LAYOUT

RA201 NOISE GATE SPECIFICATION:

SENSITIVITY: -40 to +20dBm. Normal and Key inputs.

ATTENUATION: 2dB to 40dB.

RELEASE TIME: 50mS to 10 seconds.

ATTACK TIME: 20uS to 4mS.

LEDS: Red indicates closed. Green indicates open.

KEY SWITCH: Key input allows for control of gate operation with another audio signal.

IN/OUT SWITCH: Bypasses gate circuit.

INPUT IMPEDANCE: Normal input 100 kilohms. Key input 10 kilohms.

OUTPUT IMPEDANCE: Less than 1 ohm.

MAXIMUM INPUT LEVEL: +24dBm.

MAXIMUM OUTPUT LEVEL: +23dBm.

FREQUENCY RESPONSE. +0dB -1dB 20Hz to 20kHz.

NOISE: -92dBm, bandwidth 20Hz to 20kHz.

DISTORTION: 0.01% THD @ +20dBm @ 1kHz.

DC CONTROL INPUT: Requires 15 to 40V to open gate.

DC OUTPUT: 2V when gate open, 10V when gate closed.

POWER REQUIREMENTS: +24 to +40 volts DC @ 50mA.

DIMENSIONS: h 5.25", w 1", d 7.9" behind front panel.

N.B. All specifications quoted with 40V supply.