REBIS AUDIO RA701
MIDI GATE
OPERATORS MANUAL

INSTALLATION

Important: Refer all installation and servicing to qualified personnel.
Note: The RA701 should not be installed in close proximity to such equipment as power amplifiers or power supplies which may produce excessive heat or magnetic interference.

Earthing

It is normal practice when installing rackmount equipment to disconnect the earth from the mains lead, and earth the unit mechanically via the rack cabinet.

Whatever earthing system is used **IT IS ESSENTIAL THAT THE CHASSIS OF THE RA701 IS ULTIMATELY CONNECTED TO MAINS EARTH.**

Audio Connections

Audio connections to the RA701 are made via 0.25 inch 'A' type mono jacks.

To avoid earth loops it is normal practice in professional studios to run a single 0V connection to the patchbay, and make signal screens discontinuous. Input screens should be connected at the RA701 and output screens at the patchbay.

DC Connections

DC connections to the RA701 are made via 0.25 inch 'A' type stereo jacks.

The DC trigger output appears on the tip, DC input on the ring, and 0V on the sleeve.

MIDI Connections

The MIDI out can be connected to the MIDI in on any suitable equipment, with a standard MIDI lead.

If more than one RA701 is being used and a common MIDI out is required, units can be cascaded by connecting the MIDI out on one unit to the Merge in on the next. (Note: Merge connections must be made using a true five way DIN to DIN lead. Your standard MIDI leads may only have three connections).

AUDIO OPERATION

The overall effect of the RA701 is controlled by the GATE section.

The **IN**/out switch is used to bypass the Gate or make A/B comparisons.

The maximum attenuation is determined by the **RANGE** control. Material with a high ambient level often sounds better with a reduced Range setting to make the gating action less abrupt.

The FILTER section can be used for programme equalisation or frequency conscious gating.

For programme eq switch the filter to the **GATE** position, the input signal will then pass through the filter into the gate. Tailoring the bandwidth to match the frequency content of the material can result in a significant reduction in system noise, with no loss of fidelity.

For frequency conscious gating switch the filter to the **TRIG**ger position. The input signal (internal or external) will then be fed through the filter to the trigger section. In this mode the filter can be used to adjust the frequency sensitivity of the trigger without affecting the gated signal.

Use the **HF** and **LF** controls to roll off any frequencies which may cause erratic gating. (e.g. snare drum channel - use HF to remove cymbals and LF to remove bass drum, leaving a 'window' for the snare). Use the **MONITOR** button (trigger section) to listen to the trigger signal while adjusting the filter.

The TRIGGER section takes audio signal and turns it into control information for the Envelope section.

The Trigger source, normally the input signal, can be changed to the Ext/Key input with the **EXTERNAL** button. External triggering allows one track to modify the dynamics of another track or tracks. (e.g. use the bass drum to Key a gated bass line).Using the **MONITOR** button to listen to the trigger source will now allow you to hear the external input.

The **THRESHOLD** control determines the level at which the trigger operates. It is usually best to set the Threshold as low as possible without letting through unwanted background noises or cross mic pick-up. The **THD** LED is illuminated while the trigger signal is above the set threshold.

When **MASK** is switched in, the trigger section will not re-fire for a period set by the **MASK** time control. The **MSK** LED shows when the trigger mask is active. Trigger Mask can be used to remove offbeats or, by reducing the attenuation range, creating accents.

**The dynamic parameters of the RA701 are
controlled by the ENVELOPE section.**

The **DELAY** control introduces a time lag between the trigger and the
Envelope Attack. It can produce flam effects on drums or repeat   ef-
fects on keyboards. Envelope Delay also opens new possibilities in re-
verb processing (e.g. when gating snare reverb use Delay to produce a
burst of reverb say one beat after the snare).
The **DEL** LED gives a visual indication of the delay length.

The **ATTACK** control sets the time taken for the gate to open. Very fast
Attack times are usually needed for percussive sounds, whilst vocals or
low frequency sounds normally require a slower attack.
The **ATK** LED fades up as the gate attacks and remains on full while
the gate is open.
When the trigger source falls below threshold the gate will remain fully
open for a period set by the **HOLD** control and indicated by the **HLD**
LED. Use Hold when you want to preserve the natural decay of the sig-
nal.
After the Hold period the gate starts to close. The time taken to reach
full attenuation is set by the **RELEASE** control.

The **DUCK** switch inverts the envelope, so when the trigger source is
above threshold the gate attenuates. Most Ducking applications will use
an external trigger source, and require a reduced Range setting. (e.g.
Duck a music track a few dBs using a vocal or voice over channel as
trigger source.)

When the **FIXED** mode is selected the whole envelope is triggered
when the signal rises above threshold. i.e. Hold will follow Attack with-
out waiting for the signal to fall below threshold. This mode is useful
for processing tom-toms if they have a particularly loud ring, or reshap-
ing sampled sounds.
When operating the RA701 in **STEREO** the right channel Envelope and
Trigger controls are disabled and left channel acts as master controller.

MIDI OPERATION

The primary application of MIDI on the RA701 is to trigger drum machine voices with a live or recorded drum track.

There are two important things to remember when using the RA701 with MIDI.
1. Good drum separation is vital. Every care must be taken to ensure that the gate can not be fired by the wrong drum. See DRUM SEPERATION P8.
2. The Hold time must be short enough for the gate to re-fire on the fastest successive beats.

Note on data is sent immediately the gate starts to attack.
The **ATK** LED therefore also serves to indicate note on sent.

The velocity value sent is normally 64 (50%). Switching in MIDI **VEL**ocity allows the value to be determined by the level of the trigger signal at the moment the gate starts to attack.

Note on transmission can be delayed up to 2 seconds with the DELAY control. If the signal is no longer at a suitable level at that point it may be necessary to switch out the **MIDI VEL**ocity. If the signal is no longer present at all, use the **FIXED** envelope mode to ensure that MIDI is still transmitted.

Note off data is sent when the gate starts to release, indicated by the **REL** LED.

Most drum machines do not require note off, but if you are using the RA701 to trigger a keyboard remember that the **HOLD** time will add to the note length. (In the **FIXED** mode the note length will be the sum of the **ATTACK** and **HOLD** times).

Trigger **MASK** can be used to great effect to send MIDI selectively, say on the first beat every two bars, by setting the **MASK** time to the equivalent of just less than two bars.

Use **DUCK** in conjunction with Mask to replace occasional beats with a MIDI voice. (e.g. a snare occurring every two beats can be alternately replaced by a MIDI handclap by selecting DUCK and setting the MASK time to the equivalent of three beats).

Occasionally, when complex gating and MIDI triggering are being carried out simultaneously, there may be a conflict between the control settings for audio and MIDI. The **STEREO** mode can be used to cope with this situation.

Whilst the **STEREO** mode locks the audio dynamics of the two channels and disables the right channel Trigger and Envelope controls, they remain operative for MIDI control. Using the left channel for audio and the right channel for MIDI allows full independent control of Mask, Delay, Duck etc.

MIDI KEY NUMBER

On most drum machines it is a simple operation to allocate a particular voice to a given MIDI key number, but if necessary the key numbers (along with the channel and velocity data) transmitted by the RA701 can be adjusted to suit the receiving MIDI equipment.
Refer to MIDI Data Switch Setting Table (back page) for rear panel switch positions.

GENERAL USE

The RA701 MIDI Gate is normally 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 RA701 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 RA701 to make modifications to the envelope of a sound. Remember a noise gate works by 'taking bits away' and once they've gone you won't be able to put them back.

DRUM SEPARATION

When using the RA701 with MIDI, achieving good drum separation is of great importance.
Careful use of the Filter to remove unwanted frequencies from the Trigger signal is usually all that is required. Using a contact mic to key the gate, however, will make false triggering virtually impossible. Mic the drum in the normal way, fit a contact mic to the drum (preferably inside) and use it to drive the Ext Key input.

LED INDICATORS

You will notice that the Threshold and Envelope LEDs remain operative when the Gate is switched out. This can be particularly useful in live situations.

DC TRIGGERS

The RA701 is fitted with DC Trigger outputs and inputs for each channel.

The outputs can be used to trigger drum machines of the pre-MIDI generation, or CV/Gate type synthesisers and samplers.
The inputs can be used for remote triggering of the gate or trigger/MIDI interface.
Switch the Trigger to External when using the DC Trigger input.

MIDI DATA

The RA701 leaves the factory adjusted to the following MIDI data settings.

Velocity Range: -10dB to +10dB. An input of -10dB will produce a velocity value of 1. Higher input levels will increase the velocity value through to 127 at +10dB.

Channel Number: 1. Set receiving MIDI equipment to channel 1 or OMNI mode.

Key Numbers: Left channel 36, right channel 38. Corresponding respectively to C1 and D1 on a MIDI Keyboard and bass drum and snare voices in most drum machines in default (initialized) mode.

SPECIFICATION

Model: RA701 MIDI Gate
Channels: 2
Inputs: Maxlevel+21dBm.Impedance 100 kilohms
Outputs: Max level +21dBm into 600 ohms.
    Impedance less than 50 ohms
Balancing: Optional electronic
Distortion: Less than 0.05% 20Hz to 20kHz
Noise: -104dBm. 20Hz to 20kHz. Max attenuation
    -95dBm. 20Hz to 20kHz. Zero attenuation
Frequency Response: +0.5dB. 20Hz to 20kHz

DC Trigger Inputs: +5 volts to open gate
DC Trigger Outputs: +5 volts when gate opens
MIDI Output: After Envelope Delay sends -
    Channel number (adjustable 1 to 16)
    Note on
    Key number (adjustable 0 to 127)
    Velocity (0 to 127/fixed 64)
    After Hold period sends -
    Matching channel number
    Note off
    Matching Key number

Power Requirement: 220-240V AC. 30 watts max
    (110-120V by internal connections)
Fuse: 500mA
Dimensions: 19" rackmount x 1U(44mm) x 245mm
Weight: 3.6 kg nett

CONTROLS

Gate
Bypass: In/Out
Range: 0dB to 90dB attenuation

Filter
Bypass: In/Out
Position: Gate (thru signal, pre side chain
        send)/Trigger (side chain)
LF: 25Hz to 5kHz. 12dB/octave
HF: 75Hz to 18kHz. 12dB/octave

Trigger
Mask: On/Off
Mask Time: 0 to 4 seconds
Monitor: Trigger (post filter)/Main output
Source: External (key input)/Main input
Threshold: +20dB to -40dB
Mask LED: Mask active (trigger disabled)
Threshold LED: Trigger source above threshold

Envelope
Delay LED: Delay period
Attack LED: Attack period (MIDI note on sent)
Hold LED: Hold period
Release LED: Release period (MIDI note off sent)
Delay: 0 to 2 seconds
Attack: 10uS to 250mS
Hold: 10mS to 3 seconds
Release: 5mS to 2 seconds
Duck: Inverts envelope
Fixed: Envelope length fixed/Programme related
Velocity: MIDI velocity fixed (value 64)/ Programme related (0 to 127)
Stereo Link: Dual mono/Stereo (master/slave)

REAR PANEL

Per Channel
Audio input
Audio output
Audio external trigger (Key input)
DC trigger input (ring)
DC trigger output (tip)
(Audio and DC connections on 1/4" 'A' type jacks)
MIDI key number selector (0 to 127)
MIDI velocity range switch (1 to 3)

Per Unit
MIDI channel number selector (1 to 16)
MIDI output
Merge input (Accepts an RA701 MIDI output for serial connection)
Fuse holder
IEC mains inlet

MIDI DATA SWITCH SETTING TABLE

Switch positions 'ON' for each range/number

Velocity Range	
-20dB to 0dB	OFF
-10dB to +10dB	1 3
0dB to +20dB	2 4

Channel Number

1 OFF		**9**	8
2 5		**10** 5 8	
3 6		**11** 6 8	
4 56		**12** 56 8	
5 7		**13** 78	
6 5 7		**14** 5 78	
7 67		**15** 678	
8 567		**16** 5678	

Note/Key Number

1 1	**24** 45	
2 2	**25** 1 45	
3 12	**26** 2 45	
4 3	**27** 12 45	
5 1 3	**28** 345	
6 23	**29** 1 345	
7 123	**30** 2345	
8 4	**31** 12345	
9 1 4	**32** 6	
10 2 4	**33** 1 6	
11 12 4	**34** 2 6	
12 34	**35** 12 6	
13 1 34	**36** 3 6	
14 234	**37** 1 3 6	
15 1234	**38** 23 6	
16 5	**39** 123 6	
17 1 5	**40** 4 6	
18 2 5	**41** 1 4 6	
19 12 5	**42** 2 4 6	
20 3 5	**43** 12 4 6	
21 1 3 5	**44** 34 6	
22 23 5	**45** 1 34 6	
23 123 5	**46** 234 6	

Note/Key Number

47 1234 6	**87** 123 5 7
48 56	**88** 45 7
49 1 56	**89** 1 45 7
50 2 56	**90** 2 45 7
51 12 56	**91** 12 45 7
52 3 56	**92** 345 7
53 1 3 56	**93** 1 345 7
54 23 56	**94** 2345 7
55 123 56	**95** 12345 7
56 456	**96** 67
57 1 456	**97** 1 67
58 2 456	**98** 2 67
59 12 456	**99** 12 67
60 3456	**100** 3 67
61 1 3456	**101** 1 3 67
62 23456	**102** 23 67
63 123456	**103** 123 67
64 7	**104** 4 67
65 1 7	**105** 1 4 67
66 2 7	**106** 2 4 67
67 12 7	**107** 12 4 67
68 3 7	**108** 34 67
69 1 3 7	**109** 1 34 67
70 23 7	**110** 234 67
71 123 7	**111** 1234 67
72 4 7	**112** 567
73 1 4 7	**113** 1 567
74 2 4 7	**114** 2 567
75 12 4 7	**115** 12 567
76 34 7	**116** 3 567
77 1 34 7	**117** 1 3 567
78 234 7	**118** 23 567
79 1234 7	**119** 123 567
80 5 7	**120** 4567
81 1 5 7	**121** 1 4567
82 2 5 7	**122** 2 4567
83 12 5 7	**123** 12 4567
84 3 5 7	**124** 34567
85 1 3 5 7	**125** 1 34567
86 23 5 7	**126** 234567