

REBIS AUDIO RA302 VCA COMPRESSOR LIMITER OPERATORS MANUAL

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INTRODUCTION

The RA302 provides two compressor-limiters in a standard 19"x 3.5" (482.6mm x 88.9mm) rack mounting unit which can be used independently or linked with the stereo link switch.

Each channel has a meter, switchable to read input, output and gain reduction, and rotary controls for input threshold, compression ratio, output gain, attack and release. In addition there is an independent in/out switch for each channel.

The input threshold is variable down to -30dBm with the Threshold control, and the Gain control has a reserve gain of 30dB. The Ratio control provides continuously variable compression ratios from 50:1 (limit) to 1:1 (no compression). The Attack time can be varied from 50uS to 25mS and the Release control has a range of 50mS to 3Secs. The meter switching enables the compressor to be quickly matched to prevailing operating levels. Gain reduction is shown as a negative reading from 0 VU.

INSTALLATION

Immediately the RA302 is unpacked it should be inspected for transit damage. The unit left the factory in perfect order and any damage should be reported to the carriers immediately.

CHECK THAT THE MAINS VOLTAGE SELECTOR ON THE REAR PANEL IS SET TO THE CORRECT SUPPLY VOLTAGE. Units leave the factory set for 240 volt operation.

Signal connections are made via the XLR type connectors on the rear panel. Both inputs and outputs are electronically balanced and should be wired as shown in diagrammatic form on the rear panel.

Signal ground and chassis ground are separate, they can be linked inside one of the cable XLRs if required.

EARTHING

Some experimentation may be required to ascertain the best arrangement for earthing but the following is the system most commonly used. The rack in which the unit is mounted is connected to the system master earth point. Check that the unit's chassis makes good electrical contact with the rack. The screens of the input and output cables are discontinuous, the input screen connecting at the RA302, the output screen connecting at the system end. A separate wire is run from the signal earth of the unit to the system master earth point. Using this arrangement the mains earth at the end of the IEC lead should be left disconnected, the chassis of the unit being earthed via the rack. Whatever earthing system is used **IT IS ESSENTIAL THAT THE CHASSIS OF THE RA302 IS ULTIMATELY CONNECTED TO MAINS EARTH.**

POSITION

The unit should not be installed in close proximity to equipment such as power amplifiers or power supplies which produce heat or high levels of magnetic interference.

OVERVIEW

A compressor is a device which reduces the dynamic range of programme put through it. The compressor only acts on signals that are above its threshold level which is set on the front panel.

RATIO

The Ratio control sets the relative dynamic range of the output to the input. set to 1:1 the output is the same as the input, whilst at the other extreme, 50:1, the output is "limited". This means that the dynamic range is squashed such that a 50dB increase in input level only produces a 1dB change in output level. The Gain control is simply used to set the required output level.

ATTACK

The Attack control sets the time between the signal wavefront exceeding the threshold level and the compressor acting. Therefore drums, vibes and other instruments when played percussively would need a fast attack to capture the input transients.

However very fast attack with a bass guitar will produce a click due to clipping of the low frequency waveform. Longer attack times will obviously let through varying amounts of the input envelope.

RELEASE

The Release control sets the time between the signal dropping below threshold and the compressor ceasing to act. Release time settings depend on the amount of compression and the type of programme.

Percussive instruments usually require short release times so that the compressor recovers almost immediately and the increase in background noise is unnoticeable. If a long release were used background noise would be heard rising in the gaps.

Long Release times maintain the dynamic range of full programme material whilst controlling it's overall level. the compressor is driven by the peaks in the music and does not release in between them, therefore everything is compressed by the same amount and the dynamic range is preserved. Note that the success of this technique is dependent on the type of programme.

Compression ratios around 2:1 will reduce the dynamic range of vocals and similar programme material without making them sound compressed. High compression ratios are useful for tightening up instruments such as bass, drums and rhythm guitar.

OPERATION

To help familiarise yourself with the effects produced by the various controls we suggest the following procedure. Put programme through the compressor and set the Ratio control to 50:1. Turn up the Threshold control until the meter indicates peaks of about 10dB of compression (meter switched to gain reduction, scale reading -10VU). Now adjust the output control until the input and output levels are similar. By turning the Attack, Release and Ratio controls and listening to the effects produced the best settings for different types of programme material can be found.

STEREO LINK

When the stereo link is switched in the control points of the compressors are joined so that a peak on either channel will compress both equally. This means that the stereo image is maintained. When used in this way the controls of both channels should be set the same.

The stereo link can also be used for the fading of one signal by another. This technique is used for 'voice over' in broadcasting and for special effects. The Ratio controls are set to 50:1 and the Threshold control of the background channel is turned until about 1dB of compression is shown on the meter.

The Threshold control of the voice channel is adjusted until the required amount of background compression is achieved, usually 6-10dBs. Attack and Release controls of both channels should be set the same, usually 150uS attack and 300mS release.

If compression on the voice channel itself is not required it can be switched out with the in/out switch, the other channel will still be affected.

GUARANTEE

The RA302 compressor-limiter is guaranteed against defects in workmanship or components for a period of one year from the date of purchase, this guarantee applying only to the original purchaser. Should a fault develop within this period the unit will be repaired with no charge for parts or labour, shipping costs being met by the owner.

Any claim under the guarantee must be accompanied by a copy of the original customer invoice showing the date of purchase and the serial number. Any misuse of or modifications to the unit will render the guarantee void.

SHIPPING

NEVER RETURN A UNIT WITHOUT FIRST PHONING OR WRITING.

Should it prove necessary to return a unit it should be re-packed in the original packing material.

If this is not available it should be packed first in a plastic bag and then in a stout carton surrounded by at least 1.5" of shock absorbing material, Pelsapan polystyrene chips, bubble pack blanket or foam chips are suitable. Make sure the packing is firm enough to prevent the unit from shifting in transit. Seal the carton with wide reinforced tape.

The carton should be marked **FRAGILE. DELICATE INSTRUMENTS.**

SPECIFICATIONS:

Threshold control: Continuously variable from +24dBm to -30dBm.

Ratio control: Continuously variable compression ratio from 1:1 to 50:1.

Gain control: Provides continuously variable reserve gain from -10dB to +30dB.

Attack control: Continuously variable attack times from 50uS to 25mS for 90% capture.

Release control: Continuously variable release times from 50mS to 3Secs for 90% recovery.

Metering: A three way push button bank selects between input level, output level and gain reduction for monitoring on the VU meter. Gain reduction is indicated negatively from zero VU.

Bypass: Each channel has an IN/OUT switch.

Stereo Link: A switch links both channels for preservation of stereo image or voice over. Stereo tracking within 1 dB.

Maximum compression: 40dB.

Maximum input level: +26dBm.

Maximum output level: +23dBm into 600 ohms.

Input impedance: Balanced, 100 Kiloohms per leg.

Output impedance: Balanced, less than 50 ohms per leg.

Noise: Better than -90dB referred to an operating level of 4dBm.

Distortion: Less than 0.1% THD with 20dBs of compression, Release set to 3 Secs.

Frequency response: + 1dB from 20Hz to 20KHz.

Power requirements: 110-240 volts at 50-60Hz.

Dimensions: Width 19" (482.6mm). Height 3.5" (88.9mm). Depth 9.75" (247.6mm).

Weight: 8 lbs (3.6Kgs) approx.

CIRCUIT DESCRIPTION:

The RA302 is a VCA based feed forward compressor built around the dbx 2150A VCA IC. What follows is a detailed description of the circuit to aid in any repair work that may become necessary.

The signal enters the unit via a balanced unity gain buffer IC1 providing an input impedance of 10 kilohms per leg. The signal then feeds off to three different circuits, the meter select switching, the VCA itself and the Threshold control. The output of the VCA IC8 is fed to IC9 which is a dual op-amp wired as two inverting stages to provide a balanced output from the unit.

The control chain for the VCA starts at the Threshold control the output of which is fed firstly into a 20dB gain stage (IC2a) and then into a precision full wave rectifier and precision diode (IC2b, IC3 and IC4).

From the diode the signal passes via the smoothing circuit of C16, R17 and R18 into a logging circuit consisting of IC5 and IC10. The next stage in the signal path is a variable gain inverting amplifier which has its gain set by the Ratio control (IC6a). The logged full wave rectified input signal is then fed via another precision diode (IC6b) into the Attack/Release controls and associated storage capacitor (C20). The voltage on the storage capacitor is buffered by IC7a and fed to the meter select switches and via a 32dB attenuating mixer stage (IC7b) to the VCA control port.

The in/out switch is wired across IC7b and when switched out shorts out the feedback disabling the VCA control. The Gain control is fed via a mix resistor into IC7b thereby directly controlling the VCA gain as long as the unit is switched in.