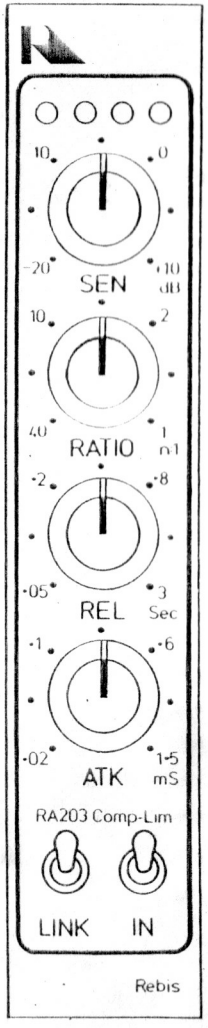
RA203
Compressor-Limiter
OPERATORS MANUAL

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RA203 COMPRESSOR-LIMITER

LED METER : Indicates 1dB,5dB,10dB & 15dB of compression at limit.

SENSITIVITY : Threshold variable from -20dBm to +10dBm.

RATIO : Variable from 40:1 (limit) to 1:1 (no compression).

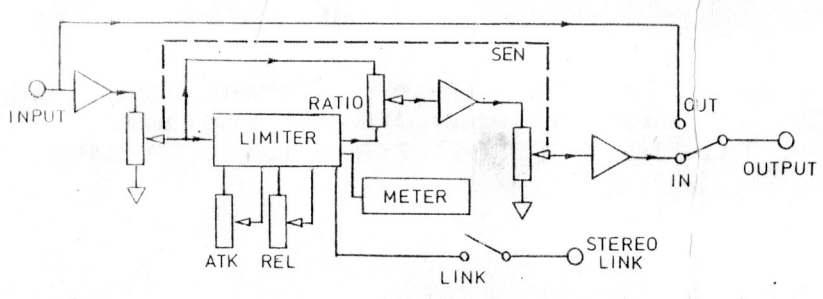
RELEASE : Release time variable from 50 millisecs. to 3 secs.

ATTACK : Attack time variable from 20 microsecs to 1.5 millisecs.

LINK SWITCH : Joins control points of two units for stereo use.

IN/OUT SWITCH : Bypasses unit.

lock Diagram



INSTALLATION

PIN CONNECTIONS

1) Keyway Slot.
2-6) Spare
7,11,13,15) Linked to 0 Volts on board.
8) Stereo Link,wire link to pin 8,2nd unit.
9) Main 0 Volts.
10) +24 to +40 Volts D.C.
14) Output.
16) Input.

Screened cables should be used for input and output connections,the screens being connected to 0 volts at the edge connector only.Run a separate wire from module 0 volts to your master system earth point (probably at the mixer).This arrangement should ensure no earth loops.

The unit should not be installed close to excessive heat sources like power amplifiers or power supplies.

Note: The threshold indicator LED may stay on for a few minutes when first switched on.It will go out when the compressor reaches normal working temperature.

EARTHING

When installing the unit in a Rebis rack 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

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,this is set by the SENSITIVITY control.

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 40:1 the output is "limited".This

means that the dynamic range is squashed such that a 40dB increase in input level only produces a 1dB change in output level.

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.

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 immeadiately and the increase in background noise is unnoticeable.If a long release were used background noise would be noticed rising in the gaps.

Long release times maintain the dynamic range of full programme material whilst controlling its 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 this technique is dependent on the type of music.

Compression ratios of 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.

When the stereo LINK of two RA203's are switched in the control points of the two units are joined so that a peak on either module will compress both channels equally.This means that the stereo image is maintained.When used in this way the controls of both modules should be set the same.

The LINK facility can also be used for the fading

of one signal by another.This technique is used for 'voice over' in broadcasting and special effects.The RATIO control of the background channel is set to 40:1 and the SENSITIVITY control turned until about 1dB of compression is shown by the LED display.The SENSITIVITY control of the voice channel is adjusted until the required amount of background compression is achieved,usually 6-10dB. ATTACK and RELEASE controls of both modules should be set the same,about 50 microseconds attack and 300 milliseconds release.Any compression required on the voice channel can be obtained,without affecting the background channel,by using the voice channel RATIO control.

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 40:1.Back off the SENSITIVITY control until the 10dB LED is flashing.Now 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.

As you will have seen from the block diagram the LED display is fed from the limiter section of the module.This means that the display always shows the compression that would be obtained at limit. However this effectively changes the range of the LED display in proportion to the RATIO selected. For example at 2:1 the meter range is halved,the LED's indicating 1dB,2.5dB,5dB and 7.5dB of compression.(If this were not the case at low ratios only one or two LED's would light.)

RA203 Set up Instructions

Please do not attempt any adjustment of the unit unless you are a competent electronics engineer and you have all the relevant equipment.

General.

Before proceeding with any set up instructions it is essential that the module has reached its normal operating temperature.Ideally allow an hour on power in the rack before moving to the test connector.

Equipment.

1. Sine wave oscillator.
2. Millivoltmeter calibrated in dB's.
3. Distortion Meter.
4. Digital voltmeter.

* N.B. If item 3 above is not available do not touch RP2 either in preliminary or set up instruction.

Preliminary.

SEN,RATIO controls fully clockwise.
REL,ATK controls fully anticlockwise.
RP3 fully clockwise.
RP5,RP8 fully anticlockwise.
RP1,RP2*,RP4,RP6,RP7 centred.
Switched IN.

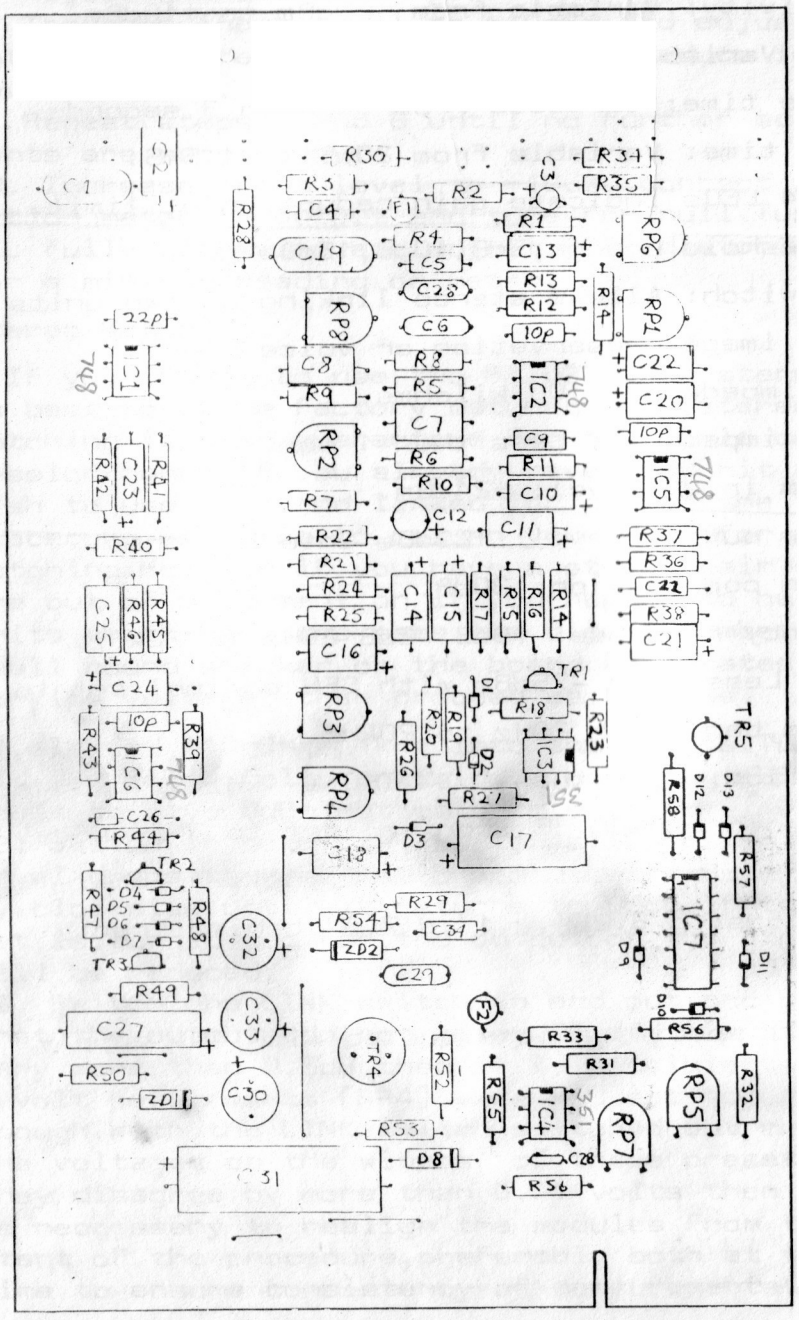
Procedure.

1. Inject 1kHz @ OdBm into input from oscillator. Meter module output and adjust RP1 (+10 trim) to obtain reading of OdBm.
2. Turn SEN fully anticlockwise and adjust RP6 (-20 trim) for reading of OdBm at output.
3. Measure voltage on wiper of RP4 (set 5 volts) with digital voltmeter and adjust RP4 until a reading of 5.00 volts is obtained.
4. Turn SEN fully clockwise and RATIO fully anticlockwise and adjust RP8 (bias) until output level is OdBm.
5. Turn SEN to centre of range,look at signal level at junction of C10 and C11 and adjust RP3 until a reading of +3dBm is obtained.
6. Turn SEN fully clockwise and then back anticlockwise until the output level falls to -0.5dBm.
7. Adjust RP5 until orange LED is just on.
8. Increase input level to +10dBm and adjust RP7 until middle red LED just comes on.Reduce input level to OdBm.
9. Repeat steps 7 and 8 until no further adjustments are neccessary.
10. Increase input level to +10dBm,connect distortion meter to output and tune for null.Turn REL fully clockwise and adjust RP2 (distortion*) for a minimum reading on meter.

Stereo Matching.

If you intend to use two RA203's for stereo it is best to buy a factory matched pair,stereo matching is then guaranteed for the whole compression range.If you already have one unit and wish to use a second linked for stereo the ideal procedure would be to return your unit for factory matching.However if you have a stereo pair which are out of alignment or if you happen to have two units which have the same two figure number on the small round sticker on the board (indicates FET working voltage) then proceed as follows.

11. Inject +10dBm @ 1kHz into the inputs.Turn REL, ATK and RATIO fully anticlockwise.Adjust SEN controls to give OdBm out of both outputs.
12. Switch in both LINK switches.If either output level drops then adjust RP8 on that module slightly clockwise until it returns to OdBm.IF this preset is turned too far the output of the other unit will be reduced.
13. Switch one LINK switch in and out and check that the outputs do not alter.If at this stage they vary more than 0.5dB then it is possible that the 5 volt set presets (RP4) were not set accurately enough.With the LINK switch switched out measure the voltages on the wipers of these presets.If they disagree by more than 0.01 volts then it may be neccessary to realign the modules from the start of the procedure,preferably both at the same time to ensure consistency of measurements.



REBIS AUDIO RA203 COMPRESSOR-LIMITER BOARD LAYOUT

<u>RA203 Compressor-Limiter</u> Specification:

Sensitivity: Variable from -20dBm to +10dBm.

Ratio: Variable from 40:1 to 1:1.

Release time: Variable from 50mS to 3 seconds.

Attack time: Variable from 20uS to 1.5mS.

LEDs: 4 LEDs indicate gain reduction at limit, threshold orange, 5dB, 10dB, 15dBs red.

Link switch: Allows stereo linking of two units for image preservation or voice over.

Input impedance: 100 kilohms.

Output impedance: Less than 1 ohm.

Maximum input level: +24dBm.

Maximum output level: +23dBm into 600 ohms.

Maximum compression: 30dB.

Frequency response: +0dB -2dB 20Hz to 20kHz.

Noise: Less than -75dBm with SEN control set to 0dBm, bandwidth 20Hz to 20kHz.

Distortion: Less than 0.3% THD @ 1kHz @ 15dBs of compression, REL control set to 3 seconds.

Power requirements: +24 to +40 volts @ 65mA.

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

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

Rebis Audio Ltd reserve the right to alter designs and specifications without prior notice.