

THE SENATOR

User Guide

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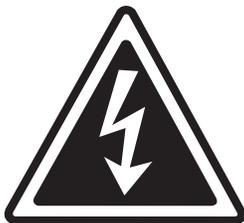
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Printed In USA

IMPORTANT SAFETY INSTRUCTIONS

- **Read these instructions.**
- **Keep these instructions.**
- **Heed all warnings.**
- **Follow all instructions.**
- **Do not use this apparatus near water.**
- **Clean only with dry cloth.**
- **Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus which produce heat.**
- **Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has 2 blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.**
- **Protect the power cord from being walked on or pinched.**
- **Unplug this apparatus during lightning storms or when unused for long periods of time.**
- **Refer all servicing to qualified service personnel.**



Introduction

Presenting The Senator, a unique non-linear compressor that combines original analog attitude with today's most advanced analog components. Inspired and guided by Grammy-winning recording engineer Jimmy "The Senator" Douglass, Joel Scheuneman, a technical engineer with twenty years of music industry experience, designed The Senator to capture that coveted vintage sound while providing the versatility and control lacking in vintage equipment.

To achieve this, The Senator introduces **variable curved compression**, a new approach to dynamics processing. Being non-linear, curved compression smoothly and naturally adapts its response to the input signal. In addition, a special **Dynamic Ratio** control gives the user complete power to fine-tune this compression curve, varying the effect as desired. Refined through more than two years of listening tests and real world trials, The Senator delivers musical results while being easy to use, flexible, and built to last.

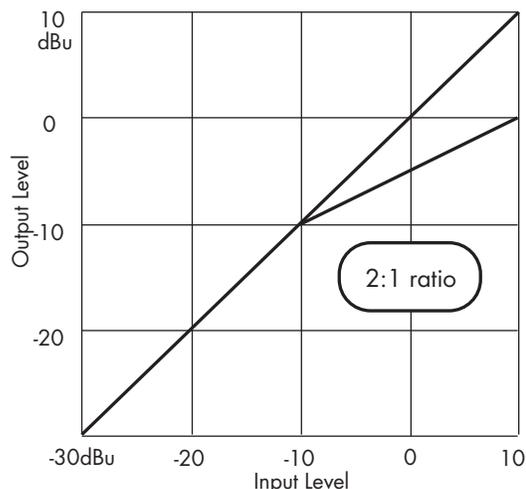


Figure 1. Linear Compression

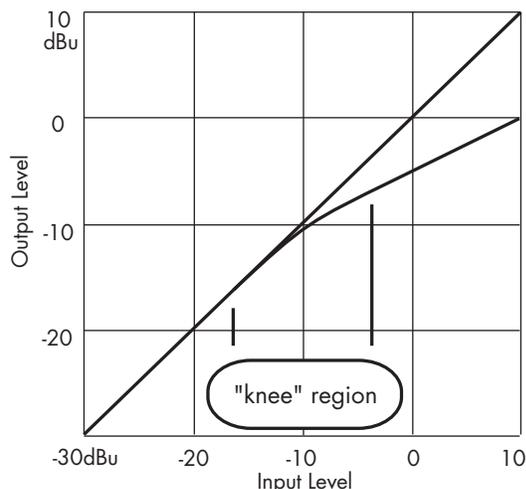


Figure 2. Non-Linear Compression

Linear vs. Non-Linear Compression

Most compressors operate by automatically turning down the volume when the input signal rises above the threshold set by the user. The reduction in volume (gain reduction) is usually determined by the ratio setting. For example, a 2:1 compression ratio means that when the input rises 2 dB over the threshold, the output only goes up 1 dB over the threshold; the gain is thus reduced by 1 dB. When the input is 4 dB over the threshold, the gain is reduced 2 dB. For every 2 dB above threshold, the gain is reduced by 1 dB, regardless of how far the signal rises over threshold. Since the relationship between input and output levels plotted on a graph is a straight line, this is called linear compression.

The Senator is a non-linear compressor, so the relationship between the input and output levels cannot be expressed as a simple ratio. The input vs. output graph is therefore a curve, not a straight line. This is because the compression ratio is proportional to the input level: Higher input levels are compressed at a higher ratio than lower levels.

Engineers have long recognized that a non-linear response results in a smoother, more desirable sound. Indeed, "Soft-knee" and "Mu-type" compressors have been staples in recording studios for decades. But The Senator does things a little differently. Not only is the graph curved, the shape of the curve is continuously variable. This gives the user complete control to dial in exactly the right treatment for any situation.

Compression Ratio

To vary the "curvature", The Senator provides a **Dynamic Ratio** control that derives its actual compression ratio from the loudness of the input signal. This is instead of a typical ratio control which maintains a static value. For example:

- * A low **Dynamic Ratio** setting could produce a compression ratio of 1.1:1 for quiet passages but 3:1 for louder parts.
- * A higher **Dynamic Ratio** might vary from 4:1 at low input levels to 20:1 for higher levels.
- * As the level increases, the compression ratio increases in a smooth continuous fashion.

Input Gain

Like other feed-forward type compressors, the Senator's input signal is routed to both audio and side chain circuits. The audio path has a Voltage Controlled Amplifier (VCA), and the side chain level is determined by the **Detector Gain** knob which sends the signal to an RMS detector. This level, in conjunction with the **Dynamic Ratio** control (described above), determines the compression to apply to the audio path. Adjusting gain on the side chain instead of the input has a distinct advantage: The Senator's compression behavior can change significantly by changing the **Detector Gain**, without changing the audio path. This helps maintain compatible levels with devices downstream from the Senator.

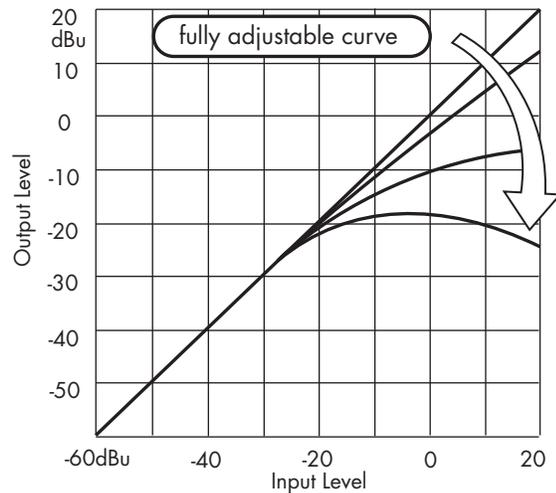


Figure 3. Variable Curved Compression

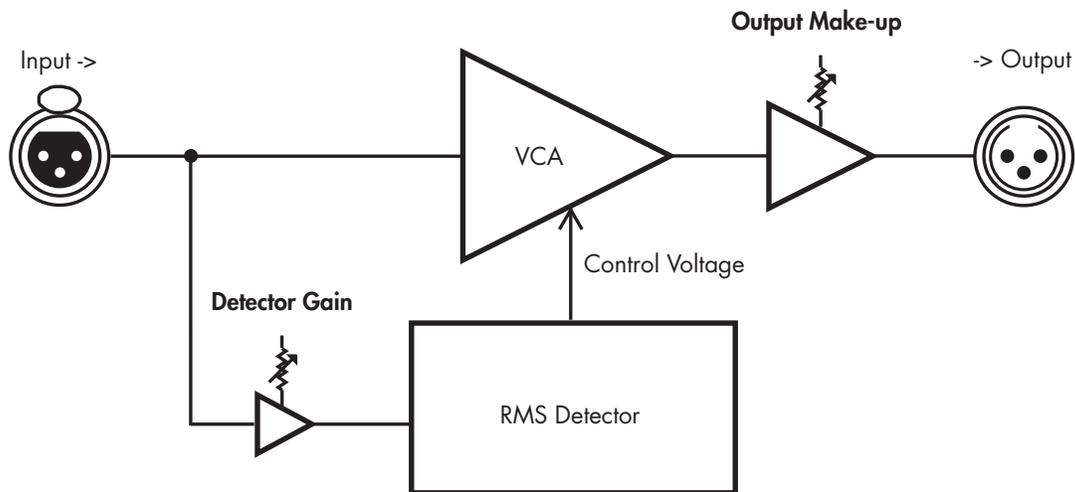
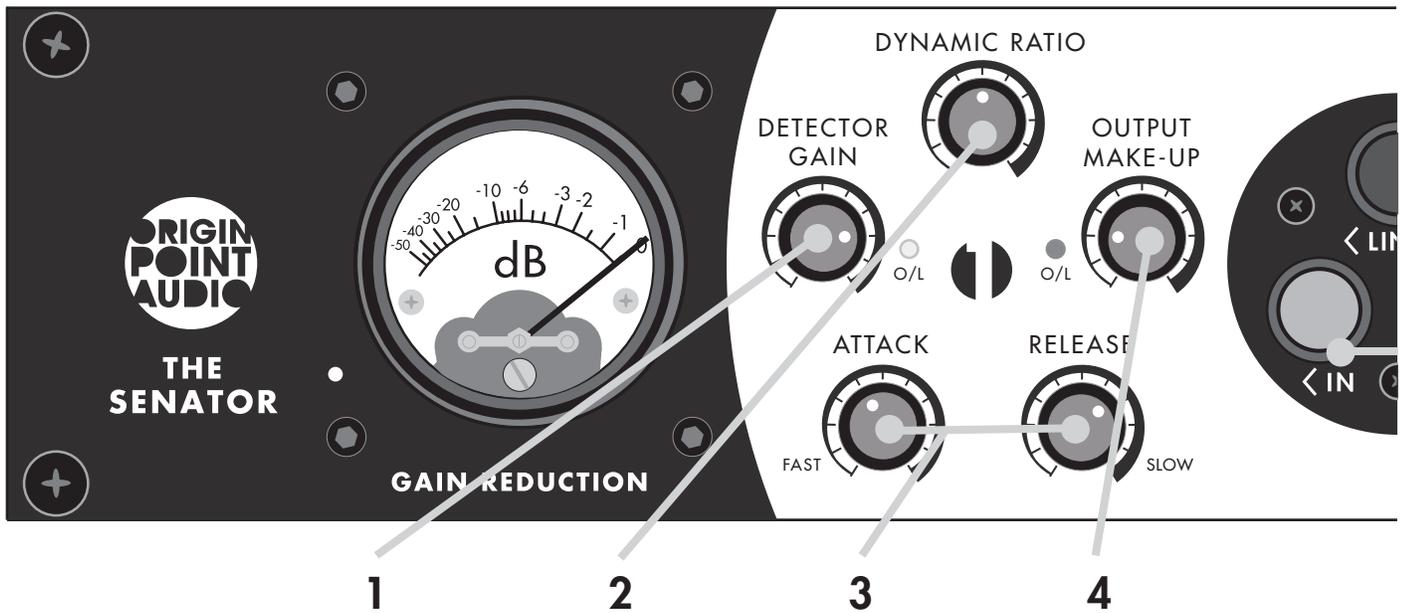


Figure 4. Feed-Forward Topology



1. **Detector Gain**

This knob controls the input level of the side chain detector. Position the knob at 3:00 for unity gain to the detector path (i.e., same level to each path).

2. **Dynamic Ratio**

This knob controls the rate of change of the compression ratio. For every dB that the input level goes up, the ratio gets a little higher. How much higher is determined by the **Dynamic Ratio** setting. This innovative feature changes the compression ratio in response to the side chain signal level set by the **Detector Gain** knob. Low level signals elicit a low compression ratio while higher signal levels produce a higher compression ratio. Even at high **Dynamic Ratio** settings, the compression will be quite gentle if the input level is low. At high input levels, the maximum gain reduction is around 50 dB.

This is The Senator's most unique feature, so experiment with different **Detector Gain** and **Dynamic Ratio** levels to understand how they interact.

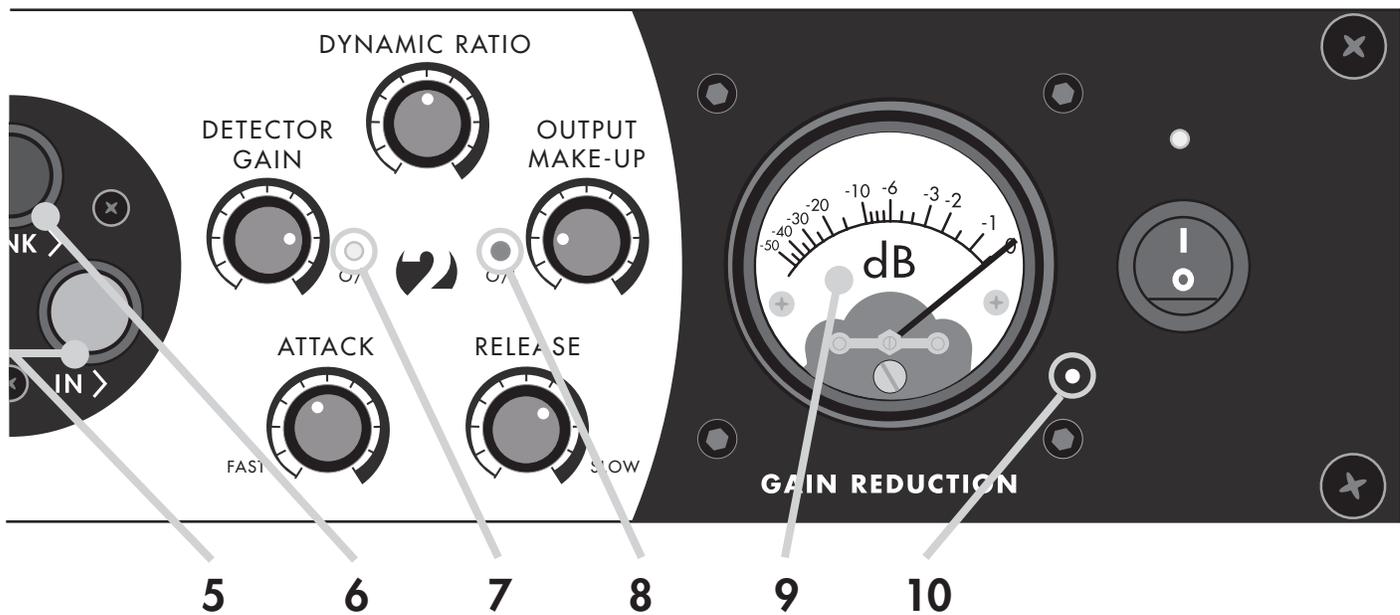
3. **Attack and Release**

Attack time and **Release** time refer to how long it takes for the circuit to react to changes of input level. **Attack** adjusts the time to reduce the gain as the input increases, and **Release** adjusts the time to increase the gain as the input decreases. A slower attack time tends to allow attack transients through, while a faster attack time prevents unwanted peaks. A faster release time retains more of the signal's natural decay properties, while a slower release time creates a longer, more even sustain.

Like all the knobs on The Senator, these controls are not detented, allowing the user to obtain the most musically appropriate response.

4. **Output Make-up Gain**

This knob, standard for all compressors, boosts the output to compensate for the gain lost to compression. Make-up gain can only boost, not reduce, the output level.



5. In

These two buttons toggle the left and right compressors in or out of circuit. A lit **In** button indicates an active compressor channel. When the channels are linked for stereo operation, pressing either **In** button toggles both channels in/out.

6. Link

Press the **Link** button to process a stereo program. To maintain a stable stereo image for a compressed program, both channels should respond to the same signal. To accomplish this, the greater of the left and right **Detector Gain** signals is used for both channels.



Even when **Link** is active, each channel's controls still operate independently. It is good practice to begin by setting each channel's controls to the same position. However, with different and dynamic instrumentation widely panned in stereo, each channel can benefit from different settings. For example:

If percussion in the left channel causes gain pumping, reduce the left channel's **Detector Gain** level. Set the right channel's **Detector Gain** to a higher level than the left so it better suits both channel's signal characteristics. The left channel may then benefit from faster **Attack** and **Release** settings than the right channel to control the percussive peaks.

7. Detector Over

This LED lights yellow when the side chain path is overloaded. This can occur when the input signal is large, and the **Detector Gain** knob is set past the 3:00 unity gain position. When this light is on, the compressor cannot react to further level increases and holds a fixed amount of gain reduction.

8. Audio Over

This LED lights red when the audio path is overloaded. Usually, the overload is due to the **Output Make-up** being set too high. However it could also indicate that the input signal is too loud.

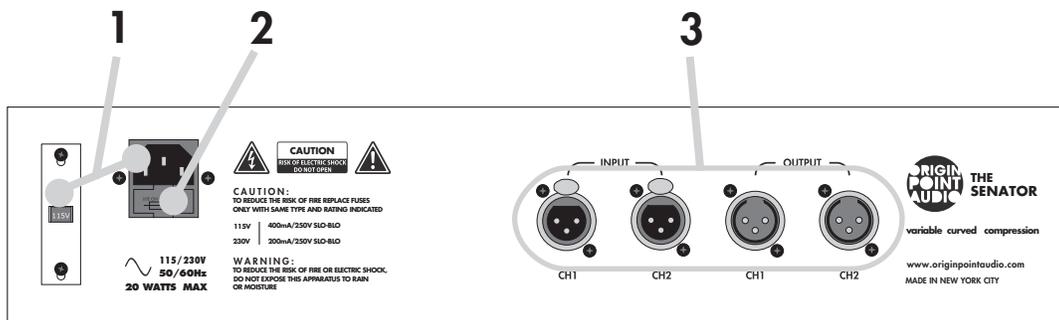
9. Gain Reduction Meter

This standard compressor feature indicates the current amount of gain reduction. The meter is logarithmic in scale. Although the meter begins to react at about 0.4 dB, the compression is continuous from 0 dB.

10. Meter Calibration

The front panel contains a meter calibration set screw. The meter is calibrated at the factory to be accurate when used in a typical controlled temperature environment. If The Senator is used in excessive heat or cold, the user may wish to adjust the meter response. To do this, use a 1 kHz test tone, and adjust the controls to achieve 6 dB gain reduction as measured by an external meter. Then adjust the front panel set screw until the meter shows 6dB gain reduction.

NOTE: This is unlikely to be necessary during normal use.



1. AC Input

Connect the AC cable supplied with the Senator (or an equivalent) to an AC power source and to the AC inlet on the device's rear panel. The compressor will not work without power, unless you wish to operate in bypass mode.

Make sure the Voltage Selector to the right of the AC inlet is set to the right voltage for your region. The currently selected voltage is displayed. The cover prevents accidental switching. To change settings, just loosen the screws; they need not be taken all the way out. Toggle to the new setting and retighten the screws.



The energy supplied to your mains outlet by your utility company is inherently hazardous. Please read and understand the safety instructions on page 3.

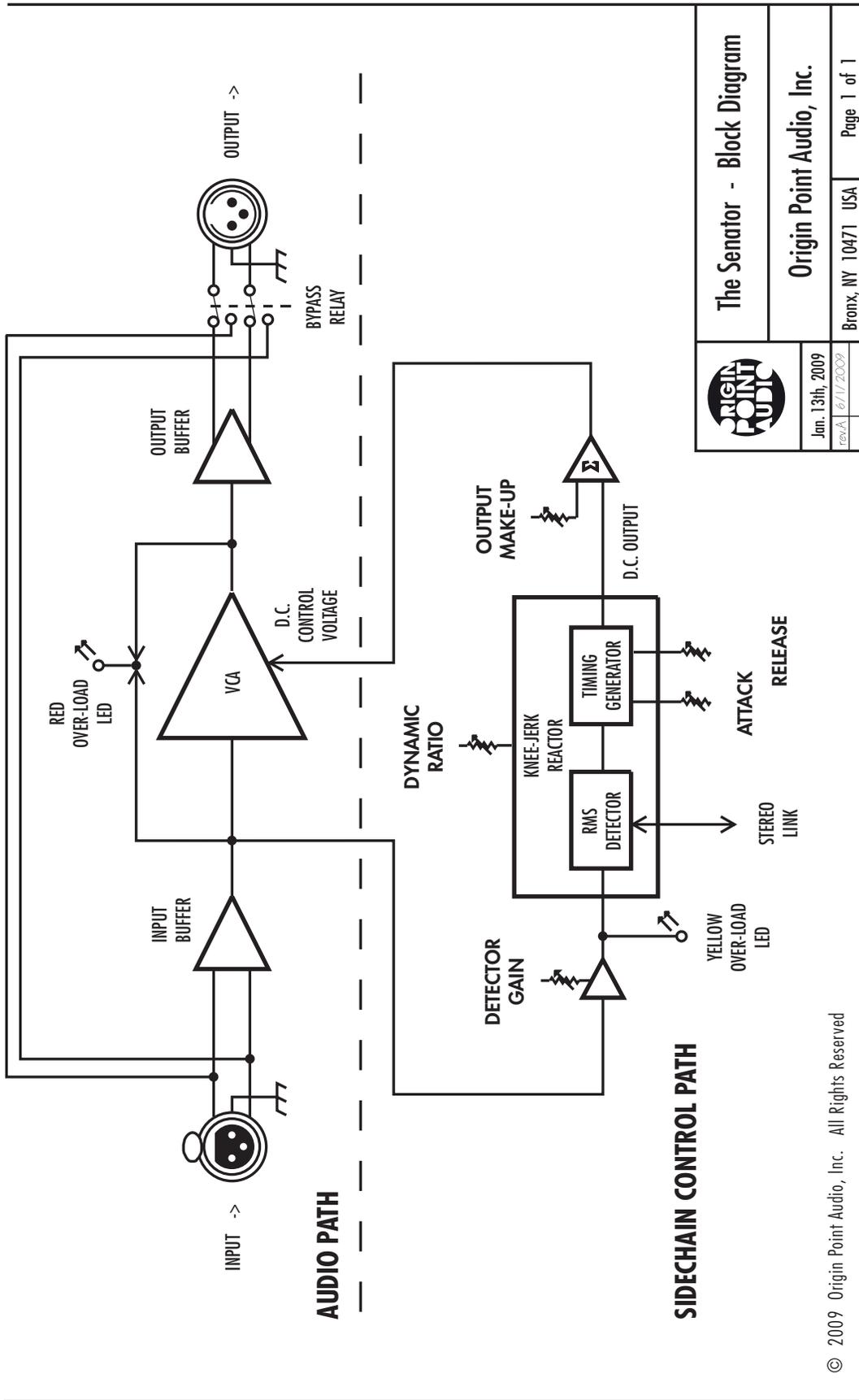
2. Fuse

A 5x20 time-lag fuse fits in the Fuse Holder. Use the current rating that corresponds to the mains voltage for your region. This is clearly stated on the rear panel:

115 V line: 400 mA/250 V slo-blo
OR
230 V line: 200 mA/250 V slo-blo

3. Input/Output Connectors

The Input and Output XLR connectors are electronically balanced. To use an unbalanced source or load, connect hot to pin 2 and ground to pin 3. Note that the maximum input/output level is reduced by 6 dB when using unbalanced connectors.



Jan. 13th, 2009
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The Senator - Block Diagram

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Bronx, NY 10471 USA

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SPECIFICATIONS

Nominal Level	+4 dBu
Maximum Input Level ¹	+27 dBu
Input Impedance	> 40K Ω
Maximum Output Level ^{1,2}	+27 dBu
Output Impedance	50 Ω
Recommended Load Impedance	600 Ω or higher
Frequency Response	10hz- 40000hz +0.0/-0.1 dB
CMRR	85 dB
Crosstalk	-90 dB
Distortion ³	<0.005% T.H.D.+N (no compression) 0.01% T.H.D.+N (10dB gain reduction)
Voltage Requirement	115/230V 50/60hz
Power Requirement	20 Watts Max.
Fuse Requirement	Use only 250V 5x20mm time lag fuses 400mA for 115V line 200mA for 230V line
Dimensions	19"W x 3.5"H x 8"D (2U rackmount)
Weight	6.75 lbs. (3.1 Kg.)
<p>1. When unbalanced connections are used, the maximum level is reduced by 6dB. 2. Less than 1% T.H.D. at maximum output level into 600Ω load. 3. T.H.D.+N. measured at +4dBu, 10-40000Hz bandwidth.</p>	

Limited Warranty

Origin Point Audio, Inc. warrants this product against defects in material or workmanship for a period of one (1) year from the date of original purchase, and agrees to repair or, at our option, replace any defective unit without charge for either parts or labor.

Any implied warranties as to the merchantability or fitness for any purpose shall be effective only for one (1) year from the date of original purchase.

This warranty excludes damage resulting from accident, misuse or abuse, neglect, lack of reasonable care, or unauthorized service.

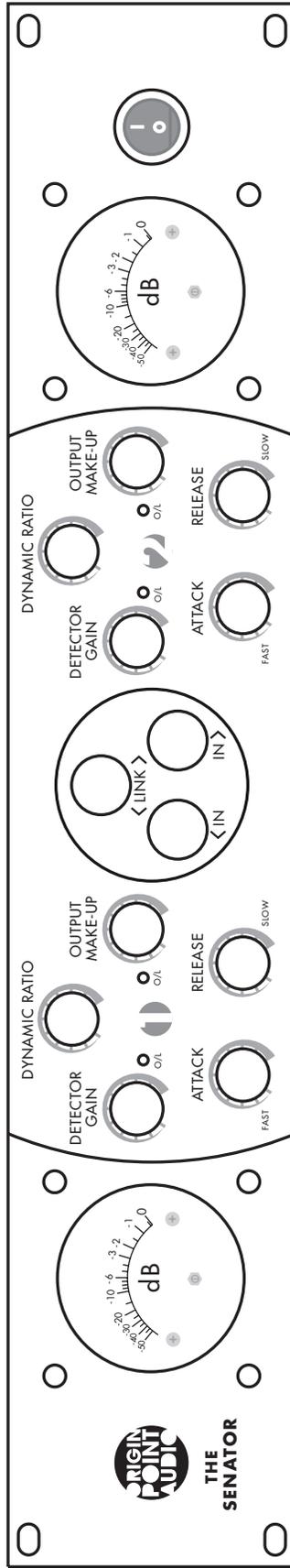
Origin Point Audio, Inc. shall be liable only to correct defects in the product itself, and not for any damage or injury which may result from or be incidental to or a consequence of such defect.

To obtain warranty service, contact Origin Point Audio, Inc. at www.originpointaudio.com to request authorization to return the defective product.

Photocopy the recall sheet provided on page 11, or download additional copies from www.originpointaudio.com

RECALL SHEET

www.originpointaudio.com



Artist: _____ Song: _____ Date: _____ Studio: _____

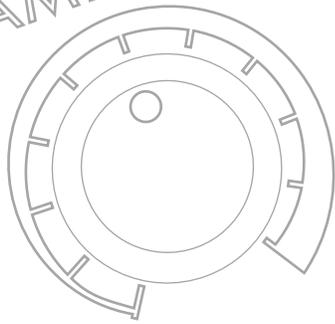
Credits

Joel Scheuneman
Jimmy "The Senator" Douglass
James "Bonzai" Caruso
Gregory G. Davis
Rob Wenig
David Weiss
Rahul Odedra

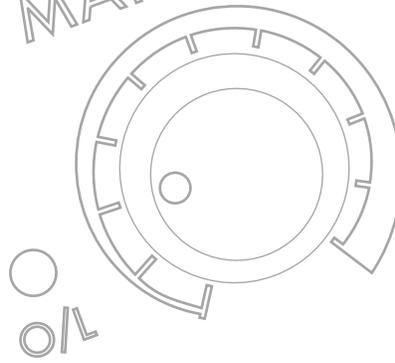
Composer, Producer
Lead Guitar, Vocals
Bass Guitar
Drums
Lyrics
Lyrics
Arrangements

Special thanks to Tal Zorer, Manhattan Center, THAT Corp.,
Richie Clarke, Darren Moore, George Kazakos, and Hardgroove.

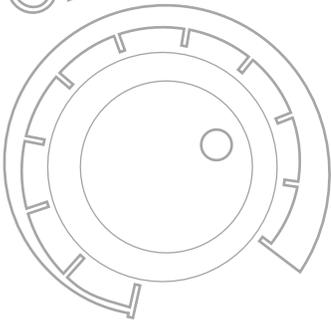
DYNAMIC RATIO



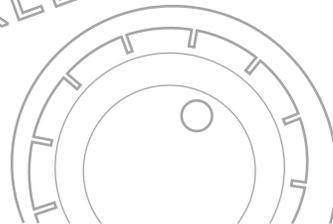
OUTPUT
MAKE-UP



DETECTOR
GAIN



RELEASE



SLOW

Origin Point Audio, Inc. Bronx, NY

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