Really Nice Levelling Amp
QuickStart Guide
V0.60

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ACKNOWLEDGEMENT

I'm sure that you're anxious to plug in your new Really Nice Levelling Amplifier (RNLA), so I'll get right to the point: I know that you can choose to spend your money on any of a myriad of other products out there. Whether by chance or coercion, you've chosen ours. As the song goes, I just wanna...

THANK YOU!

I appreciate you putting your trust and hard-earned cash into one of FMR Audio's products (or at least giving us a shot by demoing them)! Even though all of us here at FMR Audio are very proud of our products, the point of what we do is to give *you* the opportunity to *make music* without excessively draining your bank account or making you feel that you must make excuses for the sonic results! I hope that the RNLA7239 helps you realize, at least in some small way, your artistic vision...

Mark A. McQuilken
Designer & Co-owner
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INTRODUCTION

This is the Really Nice Levelling Amplifier (RNLA) Quick Start Guide. The purpose of this document is to:

- Describe the history and overall features of the FMR Audio RNLA
- Summarize the general features of the RNLA
- Describe the basic connection of the RNLA into your system
- Describe the front and rear panel controls/connections
- Present the RNLA's specifications

FUNCTIONAL DESCRIPTION

RNLA Overview

The Really Nice Levelling Amplifier (RNLA) is a compressor, of sorts, with a character that works well with vocals, bass guitar, acoustic guitars and two-mix sources. The sonic performance of the RNLA harkens back to the Really Nice Compressor's (RNC's) origins. The original RNC was, in fact, based upon an optical gain element (you can read the details as expressed in the 1984 US patent #04459557). This approach was ultimately *rejected* (and tucked away) due to its imparting of a sonic signature (i.e., "color"), not wanted in the final, sonically-neutral compressor. However, just like trying to throw away a ball of adhesive tape, this one has also stuck with (to?) us! What's the old saying? *What's old, is new again?* The implementation is a little different from the 1984 version (Oooooooo, VINTAGE! Yeah, right.), but the final sound is eerily similar (a friend describes it as "thick and gooey"). This one is also eminently more manufacturable *and* cost-effective...

What's a Levelling Amp?

Clearly, we've decided to distinguish our RNLA from our RNC by calling it a "levelling amplifier" instead of "Son of RNC" or "RNC II" or some such thing. Without being too geeky about it, we decided to call it "RNLA" for two reasons:

1) The RNLA has a sonic signature similar to many compressors that we've used over the years, many of which have been referred to as "levelling amps"(e.g., LA2A, LA3A, etc.). (DISCLAIMER: Please don't confuse this with us saying that *the RNLA sounds just like such-and-such*, 'cause it doesn't and that's *NOT* what we're saying!) There are some sonic similarities—a "classic" character, if you will—between the RNLA and some of the more preferred, sought-after levelling amps and opto compressors. Some well-outfitted RNLA users report that even with a full complement of expensive, vintage levelling amps/compressors, the RNLA *still* fills a niche that the others don't!

2) It allows us to call the RNC/RNLA by names that are as distinct as the sounds they produce. The RNC was designed to be somewhat neutral while the RNLA was designed to deliberately *color* the sound.

What's cool about the RNLA?

Before you run off to work on your next hit record, I want to point out to you some of the salient points about the Really Nice Levelling Amplifier that may not be overtly obvious and, yet, may be important for you to know:

- **Wide Dynamic Range —** Despite the unbalanced input/output connections, the RNLA has a dynamic range of 117dB, minimum, which is appropriate for today's digital systems and exceeds that which is attainable with many older, "vintage" levelling amplifiers. The RNLA offers a clip point (<3% THD) of 22.5dBu.

- **Fidelity —** Although the RNLA is designed to dynamically "color" the sound passing through it, the channel electronics are fairly neutral and designed so that the output signal (statically measured) closely resembles the input signal (*fidelity defined*...though slightly paraphrased). Each channel is hand-trimmed to typically less than 0.005% Total Harmonic Distortion plus Noise (THD+N). Even this low-level distortion is predominantly second-order...a much less heinous form of distortion and agreed by many to impart a slight "sweetness" to a signal.

- **Ugly and Cheesy Box —** Like its FMR brethren, the RNC and RNP, we use a third-rack cabinet (still a hearty combination of extruded aluminum and steel) to allow us to throw the money we save in cosmetics into the quality of the audio electronics. Although we did decide to splurge a little by putting *very red knobs* on it along with a brushed-aluminum Lexan™ overlay for that more impressively cheesy, "homegrown" look!

- **Easy-to-read Panel Graphics —** This may seem like an arbitrary and trivial point, but we think it's important: easily assessing the settings on a rack-mounted processor is important when you've got a lot of stuff going on during a recording session. In our experience, dark lettering on a light background works better than the other way around.

- **Inputs and Inserts —** As with the RNC, the RNLA has unbalanced inputs that also double as Tip-Ring-Sleeve (TRS) inserts to mate with popular mixer and equipment inserts. This allows you to connect an RNLA's channel (in & out) to a mixer or other compatible device (such as our own Really Nice Preamp, Great River Electronics MP-NV preamp, etc.) using only a single TRS-to-TRS cable per channel.

- **Balanced Outputs —** The RNLA has balanced, non-differential outputs. Although the "cold" part of the signal is not driven (that would be a "differential" signalling scheme), the impedance in both legs are the same, thereby giving your audio the benefit of reduced noise *if* the RNLA is connected to a balanced line input.

- **Precise Gain Reduction Metering —** A highly accurate gain reduction meter is provided to allow visual verification of what you're hearing. Although meters should never be a substitute for what you hear, a dynamically accurate meter is better than one that can "lag" or misread the actual dynamic performance of the compressor. Due to our digitally-controlled architecture, peak-detection errors are greatly reduced. This makes for a very accurate meter.

- **Full Parametric Control —** Some of the more common Levelling Amplifiers don't have full parametric control. Many LAs are missing the ability to control the ATTACK time. Some of them don't even provide a RATIO control, let alone a continuously-variable RATIO control! The RNLA provides both for maximum artistic flexibility. But, most importantly, *both the ATTACK and RELEASE controls go to 11!* In addition, all of the front panel controls are merely a "control surface" for the RNLA's internal digital engine. This means: (a) No main channel audio flows to/from the front panel controls that might increase its noise susceptibility (that's *bad*) or dreaded "scratchy pot syndrome" (that's *annoying*), and, (b) We can use a "ratiometric" measuring technique, along with robust digital filtering, to derive repeatable and precise compression parameters (that's *good,* if not a little *geeky*). Did I mention that *the ATTACK and RELEASE controls both go to 11*?

- **Alternative Release Contour —** Loosely based upon the "Log/Lin" control on the Valley People's (Person's?) Gain Brain II, this control ("Log Rel") can help restore some "punch" that can get lost without an acceleration of the release envelope. So, when **Log Rel** is on, we accelerate the release time as a function of gain reduction amount. We've found this to be particularly handy on drum sub-mixes where we still wanted the drums to "punch", but in a compressed and controlled way (you know, it's really true: talking about audio *is like dancing about architecture...*).

- **Hardwired Bypass —** We use a sealed relay (for long life) to switch the RNLA's output connectors between the output of the compression stage or the input jacks, thus providing a true bypass of the signal path. Worst case, without mains power, you'll still get a signal out of the RNLA!

- **Made In The U.S.A. —** We want you to know that we do our own manufacturing

here in beautiful Austin, Texas 'cause: (a) We live here. We're control freaks. We need things done to standards that are very specific and loftier than most. Manufacturing products here help control important costs and reduce waste (there's more to producing a product than just considering the costs of labor and parts). All this helps ensure that your RNLA will retain its value and continue compressing for many years to come, (b) Austin's resources and culture—from a very lively music scene to lots of high-tech companies/products—help inspire and maintain our commitment to music and technology, and, (c) In order to help others, here and abroad, we believe we've got to be vital and capable ourselves. Our first choice is to employ as many U.S.-based resources as possible in the design, manufacture and distribution of our products.

What sucks about the RNLA?

The first time I included this *What Sucks!* section was in the Really Nice Preamp (RNP) manual. It had the desired effect: our customers (i.e., those who "get us" and our products) really like—actually, based upon their responses, *downright appreciate*—having a first-pass assessment of our product's strengths and weaknesses even if it's from the product designer's view. So, here's to you, our dear customers! (drumroll please!) We continue this new-found tradition and present *What Sucks* about the RNLA...

- **The RNLA uses a wallwart —** As with our other products, the RNLA uses a wallwart. This is done to: (a) reduce internal noise induction, (b) make the national/international regulatory compliance less costly, and, (c) to permit easy adaptation of the RNLA to countries other than the U.S.A. As practical as these reasons for wallwart use are, it doesn't reduce the *annoyance factor* that the RNLA uses a less common, *AC* wallwart. You can reduce this annoyance, however, by: (a) labelling your wallwart on both ends (i.e., on the part that plugs into the wall and at its opposite end) that the wallwart is for use with the RNLA, and/or, (b) use AC mains power strips that can accommodate the extra space required by wallwarts, and/or, (c) hook-up your wallwarts with one of those short, power cord extenders. In either case, what a *pain* wallwarts are...

- **The RNLA "colors" the audio —** I don't consider myself a "purist", however, I *have* spent a fair amount of time/effort in the studio (and design lab) trying to reduce sonic coloration (i.e., distortion). Although I appreciate and applaud those who are skillful enough to record and mix with fidelity or coloration *at will*, I've always preferred fidelity over distortion...no matter how artsy it is! So, why are we now producing a device that *deliberately* distorts the audio? There are three reasons for this: (1) our customers have requested it and feel that they can't get specific combination of features elsewhere, (2) I believe that the RNLA *distorts* in a tasteful, useful and controllable way, and, (3) Maybe you can teach an old dog

new tricks: I'm actually learning to like and find uses for the sonics of the RNLA!

- **The RNLA has freakin' *Red Knobs* —** Proof, once again, that there's "no accounting for taste", I specified these knobs after a word-association game with my therapist. Here's an excerpt:

  Therapist: Dog?

  Me: Compressor(?)

  Therapist: Cat?

  Me: Compressor(?!)

  Therapist: Red knobs?

  Me: Levelling amp! (???)

  Okay, I made that up, but it *could have happened!* In any case, for those of you who are color-blind (or not) I apologize...

HOOKING-UP THE RNLA

Even for those of you who are very experienced, there are some different operational features that you need to be aware of when hooking up the RNLA. To use the RNLA right away, there are three things you must do:

- Connect the audio source and destinations to the RNLA
- Apply power to the RNLA
- Make groovy music

In more detail:

Connect The RNLA:

1) **Connect the Source(s) —**For best results, connect the inputs to the RNLA with standard, 1/4" plug when connecting to a source that has a dedicated SEND jack or OUTPUT jack. You can, alternatively, connect the RNLA input jack to a single 1/4" SEND/RECEIVE jack with a single TRS-to-TRS cable, provided that the SEND signal is on the TIP and the RECEIVE is on the RING (if you're not sure about the configuration of the source equipment's INSERT wiring, be sure to consult with the manufacturer...lest you *possibly* damage your equipment).

2) **Connect the Output(s) —** If you're connecting the RNLA to a balanced destina-

tion, use the appropriate connectors to mechanically make the connection. For example, if you're connecting to a destination device with a XLR input connector, then use a 1/4"TRS-to-XLRM cable that passes the TIP signal to XLR pin #2, the RING signal to XLR pin #3 and the SLEEVE to XLR pin #1. If you are connecting to an unbalanced destination, use a 1/4"TS-to-1/4"TS connector with TIP wired to TIP and SLEEVE wired to SLEEVE.

3) **Connect the power supply —** Using only the provided power supply, connect it to the RNLA power jack, then plug the power supply into a powered wall-outlet. Remember, the RNLA requires a special 9V *AC* output wallwart. Trying to use the more common 9V *DC* power supply will result in less-than-useful RNLA performance (i.e., no sound will pass through it).

You don't have to do things in the order given above for everything to work. The above order is only a suggestion.

OPERATING THE CONTROLS

Initial Settings

We can't specify exact settings for all the possible uses you might have for the RNLA. However, here's some general guidelines that worked well for us:

- Start with the RATIO, ATTACK and RELEASE controls in the 12 o'clock position.
- Adjust the THRESHOLD control, in the presence of the input signal, until you've achieved 4 to 6 dB of GAIN REDUCTION (GR) during "normal" passages or have attained the desired sound. Clockwise (CW) adjustment of THRESHOLD will decrease the amount of GR, while counterclockwise (CCW) movement will increase the amount of GR.

Adjustments

Once you've got the initial settings dialed-in, the following can help guide you in making adjustments:

- **Adjusting the RATIO control —** If you want a more "extreme" sound, increase the RATIO (i.e., turn it CW). If you want a "milder" sound, decrease the RATIO (i.e., turn it CCW).
- **Adjusting the ATTACK control —** If you want fewer transients (a "smoother" sound), use a faster ATTACK (i.e., turn it CCW). If you want more "pop" to a transient, use a slower ATTACK (i.e., turn it CW).

- **Adjusting the RELEASE control —** If you want less compressor action overall, use a slower RELEASE by turning it CW. If you want more coloration, use a faster RELEASE by turning it CCW.

- **Using the LOG REL control —** Engage this function (LOG REL light is illuminated) when you want more "pop" to a transient source (like a snare drum). Disengage this function (LOG REL light is extinguished) when you need more peak control.

- **Adjusting Output GAIN —** This is primarily used to make up the signal level loss that occurs as a result of compression. In general, adjust the GAIN to "make up" the average GR loss. Alternatively, you can use this control to merely help match signal levels between the RNLA and downstream devices.

There is an interdependence between all of these controls. These guidelines are given as broad-brush advice to aid your understanding and eventual creativity with the RNLA.

Learning More

When it comes to compression, there's no substitute for experience! Some helpful hints for learning more:

1) **Practice —** Playback a loop of an instrument you're interested in compressing and spend time adjusting the RNLA's controls until you attain some sounds that you find interesting or useful. Make notes of settings and how control changes affect the sound.

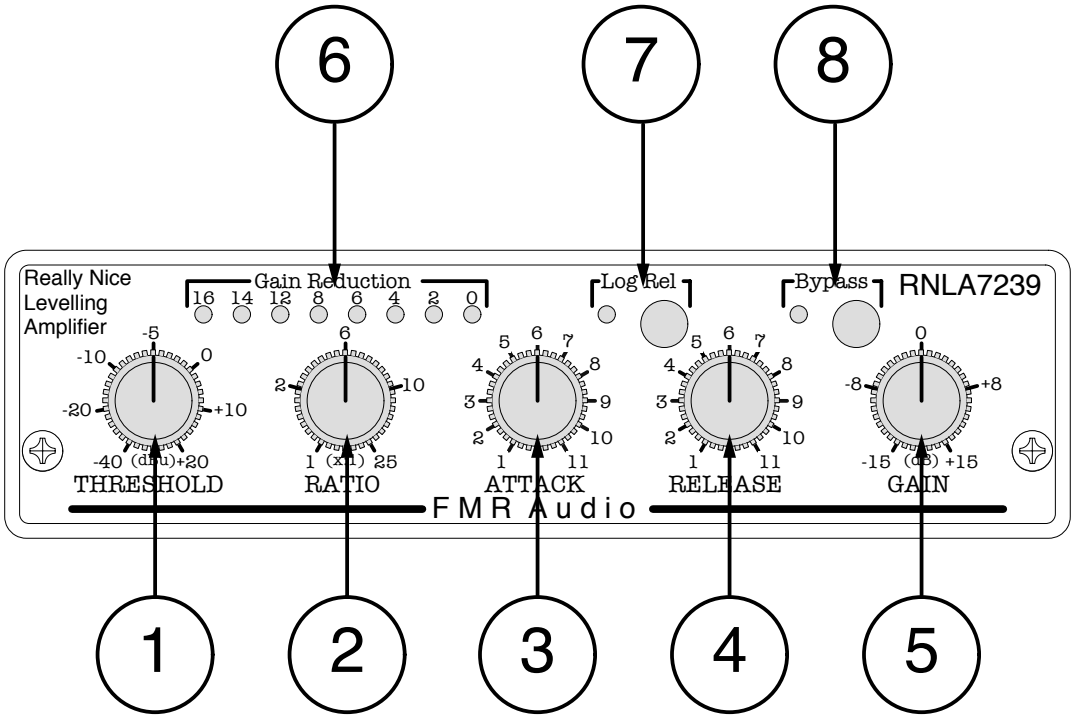
2) **Read —** Spend time reading about the general mechanisms involved in compression. Test your analytical understanding with step (1). Make sure that you're able verify your predicted results.

3) **Talk —** Observe and discuss compression and its applications with industry professionals. These folks are more likely to have exercised the other suggestions in this list for longer periods of time and higher frequency. Imagine if you could dedicate 8 hours a day for the next 4 weeks straight playing with compressors versus just doing it on weekends.

4) **Be Tenacious —** Don't get discouraged if you're not making as much progress as you might like! Dynamic processing is, arguably, one of the more difficult-to-master studio skills. Although it has taken many of us years to learn, the tools are more plentiful and more consistent than ever before. This should help you learn faster than previous generations.

5) **Use Different Compressors —** Use as many different types and brands of compressors, hardware and software, that you can. If your focus is to improve your recording chops, this will come in handy for meeting yours or your client's needs.

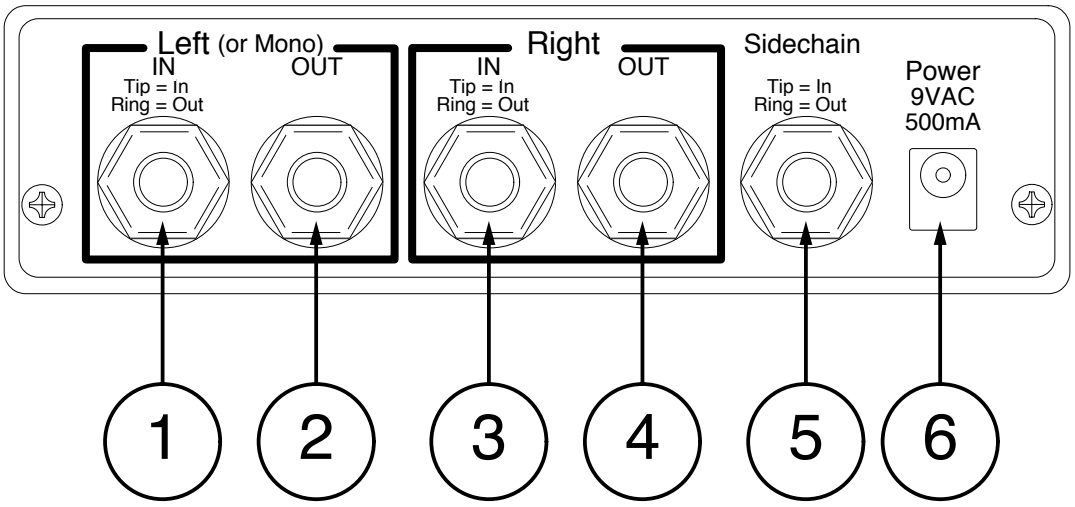
Figure 1: RNLA Front Panel Controls



#	Control Description
1	**Threshold —** This control sets the input signal amplitude at which the RNLA will start compressing. When turned counterclockwise (CCW), the RNLA will compress quieter signals. When turned clockwise (CW), the RNLA requires hotter signals before it will begin compression.
2	**Ratio —** This control determines how much the RNLA will change the output signal as the input signal changes over threshold. Turning this control CCW *decreases* the difference between the compressor's output and input signals. Turning this control CW *increases* the difference between the compressor's output and input signals.
3	**Attack Time —** This control sets "how fast" the RNLA will try to correct the input signal after it rises above the threshold level. CCW *decreases* the RNLA's response time, while turning this control clockwise means the RNLA will take *longer* to correct the signal.
4	**Release Time —** This control sets "how fast" the RNLA will return to the gain setting just before the input signal rose above the threshold level. CCW *decreases* the time it will take the RNLA to return to the original gain level, while turning this control CW means the RNLA will take *longer* to return to this original gain level.
5	**Gain —** This control was designed to "make up" average gain loss which occurs during normal compression. However, it can also be used to match gain levels to subsequent stages, etc.
6	**Gain Reduction Meter —** This meter shows the current amount of "gain reduction" being applied to the input signal. "Gain reduction" merely means "how much the signal is being turned-down". This meter is precisely calibrated in decibels.

#	Control Description
7	**Log Rel —** This push button invokes either the default, "normal" mode or a mode with an increased release curve acceleration. When compressing a fair amount (6dB or more), transient signals can get "swallowed", "ducked" or over-compressed. By changing the release characteristics under higher gain reduction amounts, the "punchy" character of some transient sources can be partially restored. That's what this control does. When the light to the left of this push button is *not* illuminated, the Log Rel function is *not* engaged. When the light is illuminated, additional processing is engaged to help restore program transients.
8	**Bypass —** This push button engages or disengages a relay that routes the input signal around to the output jacks, thereby bypassing the output of the compressor. This control *does not disrupt the operation of the compressor in any way*, but merely selects the source signal for the output jacks: either the output of the compressor or the original input signal. When the light to the left of the push button is illuminated, this function is engaged (i.e., the output is taken directly from the input jack without any compression). When the light is extinguished, the function is disabled and the output is taken from the output of the compressor.

Figure 2: RNLA Rear Panel Connections



#	Control Description
1	**Left Channel Input —** This 1/4" connector accepts unbalanced, single-ended output signals from other devices. There are two modes this jack may operated in: (1) "standard" input routing into the RNLA with a standard 1/4" Tip-Sleeve (TS) plug, or, (2) "insert" routing to/from the RNLA with a 1/4" TRS plug wired with TIP = Input signal to RNLA, RING = RNLA Left Channel output and SLEEVE = reference.
2	**Left Channel Output —** This 1/4" connector presents the left channel audio output from the RNLA in an *balanced, single-ended* format. When operating in "insert" mode, no plug should be inserted in this connector. This will disable the return signal on the INPUT/INSERT jack. In "normal" mode, however, this jack should be used to connect to downstream devices.
3	**Right Channel Input —** This connector functions analogously for the right channel as described above for the left channel.
4	**Right Channel Output —** This connector functions analogously for the right channel as described above for the left channel.
5	**Sidechain Insert —** The SIDECHAIN is where the control rules are determined for the RNLA. This jack allows this signal to be interrupted and further processed (e.g., using an equalizer in the SIDECHAIN signal can be used to make a frequency-sensitive compressor, like a "de-esser"). The SEND from the RNLA SIDECHAIN is on the TIP of this connector while the RETURN is on the RING. The SLEEVE is the reference. A plug should only be inserted into this jack if the circuit is completed elsewhere, otherwise the RNLA won't have the SIDECHAIN signal that is necessary to compress.
6	**2.1mm coaxial power connector —** This connector allows the 9VAC transformer to power the RNLA. The wallwart must be a 9V *AC* output variety or the RNLA will fail to pass audio.

Table 1: RNLA Specifications

Size	1/3 x 1 EIA rack unit
Connectors	Left/Right 1/4“ unbalanced inputs (TS, or TRS for console inserts) Left/Right 1/4“ balanced, single-ended outputs TRS sidechain
Controls & Displays	***Rotary:*** Threshold, Ratio, Attack Time, Release Time, Output Level ***Switches:*** Bypass, Mode Select ***Meter:*** 8-segment LED Gain Reduction, 0-16 dB
Modes	***Normal:*** Provides fast attack/release ***Log Rel:*** Provides release envelope acceleration to aid maintenance of transient “punch”
Operating Level	0.775 Vrms (0 dBu) nominal for +22 dB headroom 1.228 Vrms (+4 dBu) nominal for +18 dB headroom
Noise	Less than -90 dBu over 20-20k Hz Typically -95 dBu over 20-20k Hz
Frequency Response	10 - 100k Hz ±0.5 dB @ 0 dBu
Clip Point	+22.5 dBu @ ≤ 3% THD, 1 kHz, greater than 2k Ohm load
Distortion	Less than 0.1%, no gain reduction @ 1 kHz, 0 dBu; Less than 0.5%, 6 dB G.R. @ 1 kHz, 6:1, 6.0 msec attack, 0.5 sec. release, 0 dB gain, 0 dBu
Threshold Range	-40 dBu to +20 dBu
Ratio Range	1:1 to 25:1
Output Trim Range	±15 dB
Input Impedance	approx. 10kΩ
Output Impedance	approx. 100Ω unbalanced, 200Ω balanced
AC Power	Wall transformer, 9VAC @ 500mA, 2.1mm jack
Dimensions	5.5" x 5.5" x 1.6"
Weight	2 lbs