Little Labs

LL2A

compressor limiter

PRELIMINARY

OPERATORS MANUAL

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READ THIS FIRST
BEFORE USING THE LL2A

There is a lot more in this manual, but please read this even if you don't read manuals.
To power the LL2A, you must use the supplied In Phase Engineering 16 volt 0.3 amp, dc regulated, bipolar, switch mode power supply. This supply, designed in house, is specifically for use with Little Labs high-end pro audio electronics. You can plug it in any AC outlet in the world 100-240 volts 50 or 60Hz.

The dc power connector jack used on the LL2A looks like a CB microphone connector. Although difficult to misalign because it has a key, take care to align the plug and jack properly when inserting.

If you open the LL2A, use the tools provided, one for the knob removal (1.5mm Allen hex L-key) and one for the panel (3/32" Allen hex L-key). If rack mounting using the LL2A rack kit, please remember to disconnect the power beforehand. There are internal high voltages on the PCB traces and wires next to the Nixie tube. Please contact Little Labs for any service issues.

The I/O of the LL2A is unique. It is balanced mono, but in a unique differential way, when fed a balanced signal, it remains balanced throughout the LL2A. It is two single-ended (unbalanced) audio paths, one for the positive, pin 2 of the XLR (tip of the TRS), and one for the negative, pin 3 of the XLR (ring on the TRS).
So with the right cabling, you can run the LL2A unbalanced stereo. See more about running in stereo further in the manual.

Happy compression sound soldiers!

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BACKGROUND ON THE LL2A DEVELOPMENT

Thank you for purchasing the Little Labs LL2A™ compressor limiter.

First of all, in case you are wondering, the LL2A has absolutely nothing to do with the classic Universal Audio Teletronix LA-2A Leveling Amplifier. The name is similar to grab your attention. The LL2A is a 100% original design. The name choice annoyed some, but please note I have nothing but respect for Universal Audio. After all they do the plugins for Little Labs IBP and VOG and are a fantastic company.

For the longest time, I had no interest in a Little Labs compressor. There are so many compressors available out there. Typically these compressors are reimagined variations of classics. Little Labs had no interest in using the same old tech out there to make a compressor. Then a new way of controlling audio levels was brought to my attention by one of my brilliant audio designer friends. Frankly, I had a hard time understanding how it worked. It uses in the audio path a single linear analog multiplier to control the attenuation (not the amplification) of an audio signal. The tricky part is how the analog multiplier reacts, and there is a bit of serious math involved in the side chain. What I liked about the whole concept is the ability to have that single device doing the level control work and only one other active device, the output driver, in the audio signal path. So often, "clean" sounding compressors are what I would call hard sounding. This compressor using this minimalist circuit topology is clean, but in no way hard, it is like nothing, it breathes and has a smooth openness that I can't compare with any other compressor out there.

A factor that went into the LL2A design was ergonomic simplicity. On so many of the newer compressors, you have so much control available to you on every parameter. Some engineers love this incredible amount of control, but many could care less and thus reach for one of their old classics. I chose to keep it simple. The threshold and makeup gain combined with bypass allows you to dial in the perfect compression very quickly. The attack and release times were chosen for vocals and full-range material, but one of the hidden tricks of the LL2A is if you select the link button and do not have a link cable in place, it slows way down, creating a slow attack more suitable for bass. The meter! So many compressors are using cheap Chinese made VU meters or boring LEDs; I hate both. I do love a nice big professional VU meter but didn't have the room for it. So, I love NIXIE tubes, and they are still available at least for now as new old stock out of Ukraine. They are reliable and have infinite range. Tricky to get the VU ballistic just right, but I think you'll be happy, and doesn't it look cool?

So cheers, thank you for your purchase, the LL2A could very well become a classic, because a pro like you will appreciate it. Be sure to take a look at the rest of the manual (especially the read this first part).

Oh, and thanks to all the people for the help, patience, and functional insights while developing this product, especially Jimmy Liu, Raymond, George, and Joyce Lui (G&J mfg), and my wonderfully supportive amazing girlfriend, Randi Kory.

Happy Limiting,
Jonathan Little

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BASIC INFO

Threshold knob, Output knob, and Bypass button
The threshold knob, output knob, and bypass button are self-explanatory. Set up your threshold for the amount of compression, and then go between bypass on and off while setting the output so the level sounds the same.

Link button and jack
When you have two LL2As, use a TS cable (tip sleeve, short guitar cable) and stick in each LL2A's link jack. The output will be controlled independently. The threshold will affect both, and whichever compressors threshold is set higher will be the dominant master.
As a standalone compressor, meaning nothing plugged into the link jack, pushing the link button in slows down the compressor. Too fast of an attack /release in any compressor on bass will make the bass sound distorted; this will alleviate that.

Meter button
Selects whether you want the NIXIE meter to indicate gain reduction or VU ballistic characteristic output level.

Sidechain insert jack
This TRS (tip-ring-sleeve) jack, when you insert a balanced line-level signal (it must be a balanced signal here, more about that later in the less basic info section), allows another audio source to trigger the compression. Commonly used by DJs in radio, so the music is automatically lowered in level (called duck-

ing) just when they speak. Also useful for things where you don't want the compressor to react to, for example, a kick drum, but you do on a loud snare. You can split the signal and use a high pass filter on the signal feeding the side chain insert so the compressor won't react to the kick, only the higher frequency snare.

Input and Output TRS jacks

The TRS jacks are wired in parallel with the XLR jacks for your convenience. As an example, to make it easy to tap off to feed a high pass filter, then to feed the sidechain insert.

Stereo unbalanced operation

For unbalanced stereo use, you will need a special cable wired TRS (tip-left, ring-right, sleeve earth), or XLR (pin 2-left pin 3-right pin 1-earth). There are pre-wired cables called "insert cables" that will work, they are TRS (tip-ring-sleeve) to two TS (tip-sleeve). Do an "insert cables" search, quite a few are available.
Here is a link to a decent quality one:
https://tinyurl.com/yxygjvrv

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LESS BASIC INFO

The Inputs, the Outputs, and the unique LL2A circuit topology

The I/O circuit topology of the LL2A is unique. Most audio devices have transformers or active circuits to convert a balanced signal to single-ended signals where they then are internally processed then converted back to balanced on the output using more transformers or an active circuit. The LL2A is fully differential, so what you feed it is what comes out, avoiding those input and output stages of audio degradation. To make it clear, what is fed to the + input is processed 100% separately from what is fed to the - output throughout the whole LL2A. Most Little Labs products use that topology (don't tell anyone but that's part of the reason they sound so good.

This circuit topology allows you to use the LL2A stereo unbalanced or mono balanced as you know, but in this configuration, keep in mind some rules for hooking up apply. You don't want to feed a mono balanced signal to the input and then feed a mono unbalanced input from the LL2A output, for example. Doing this would be driving the - audio signal into ground and cause overall weirdness. If you have no interest in running unbalanced stereo, keep all cabling balanced, and all will be well.

This cabling includes the sidechain insert in mono; there must be a balanced signal feeding it.

In unbalanced stereo mode to have the side chain work properly, you need to feed it either balanced mono or TRS wired mono, so the tip and sleeve are wired with the same signal on the tip and ring. Label this cable special, it's a weird one.

The LL2A output

For the output of the LL2A to have a title of its own, it must be unique, and it is.
What is used on the output is part of what inspired me to create the LL2A. The Monotor headphone amp has been an enormous success for Little Labs, utilizing top-notch passive components and a single very low output impedance simple current driver. The LL2A uses this same driver and passive components, and the only other active device in the audio signal path is the linear analog multiplier on the input. This allows the LL2A to have a 0.5-ohm output impedance. Why is that good? Well, if you happen to be feeding after the LL2A vintage transformer gear, transformers love a super low output impedance.
As an analogy, it's like the difference between driving a V6 car and a V8 supercharged. Sonically it is pure, effortless acceleration.
Also, get this; if you are using the LL2A stereo unbalanced, you can plug your headphone into the TRS output to monitor the purest of the pure post limiter audio, and it sounds killer!
Very handy when demoing!

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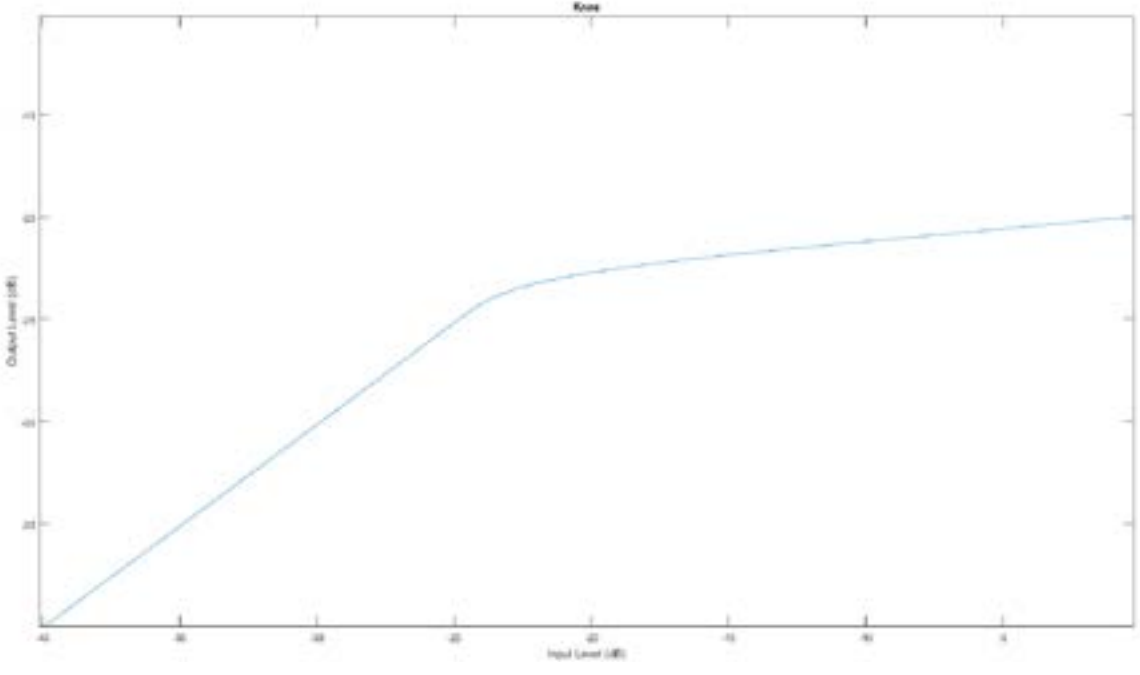
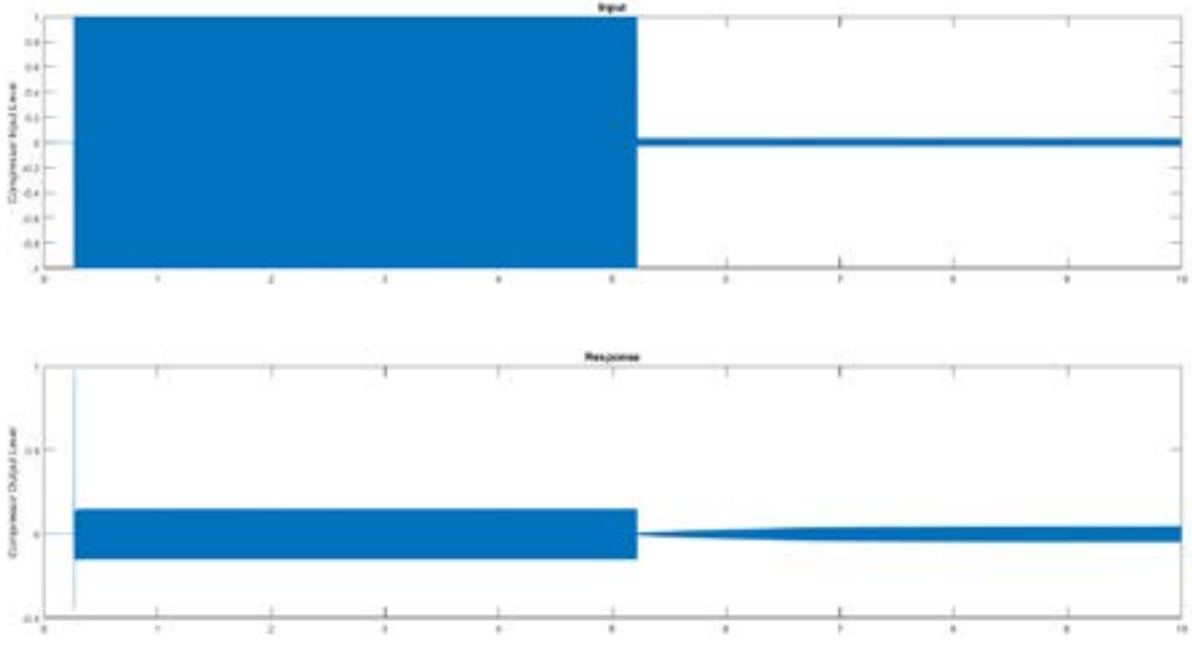
LL2A Compression ratio

The LL2A does not have a fixed ratio; it is a soft knee compressor limiter. Here is a graph of the input level vs. output level knee.



LL2A Attack and Release, and the secret to slowing it down

The LL2A has a fast 400-microsecond attack and a 0.9-second release. The attack is fast and similar to the attack setting on the very popular Fairchild 670 number two setting, but with a slower release. To obtain a much slower attack and release select the link button, without a link plug in the jack, this creates a 2400-microsecond attack, 4.9-second release. Below is a graph of the standard 400 ms attack and 0.9-second release.



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OTHER

Input impedance
Mono balanced input impedance: 20k Ω
Stereo unbalanced input impedance: 10k Ω

Output impedance
Mono balanced output impedance:< 0.5Ω
Stereo unbalanced output impedance: < 0.5 Ω

Maximum output level
In balanced mono +28dB
In unbalanced stereo +22dB

Dimensions
7.25" wide
1.5" height
7.5" depth (with knobs)


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-30
-24
-18
-12
-6
0
+8
LL2A
bypass
meter
gr
vu
link
threshold
compressor limiter
output


side chain insert trs
link ts
input
in trs
out trs
output
power in bipolar
16.5 volts dc only
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LL2A RACK MOUNT KIT (RAK1CL/RAK2CL) INSTALLATION PROCEDURE

1. Unplug power from the LL2A.

2. Remove the knobs using the supplied 1.5mm Allen key to loosen the set screw.

3. Remove the front panel socket head 4-40 screws with the supplied 3/32" Allen key.

4. Remove the front panel.

5. Remove the plastic frame and save it, you might want to return the LL2A to a stand alone unit at a later date.

6. The rack kit RAKA extrusion replaces the plastic frame piece.

7. Line the holes up with the chassis placed behind the rack kit RAKA extrusion and with the front panel placed on the front of the rack kit RAKA extrusion. Carefully screw back in the 4-40 socket head screws, using preferably the longer socket head 4-40 socket head screws that came with the rack kit (but not essential).

8. Replace knobs and tighten set screws. You're all done!

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