



JAAL

Look Ahead Analog Limiter with Dynamic Transient™



Unhindered Maker's MASTERING SERIES

The missing link in analog mastering chain.
www.hum-audio.com

WE BUILD THE SOUND

User Manual

Be a true Unhindered Maker...

JAAL

Look Ahead Analog Limiter
with Dynamic Transient™

OWNER'S MANUAL

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Dear Customer,

Thank you for the confidence you have shown towards HUM Audio Devices by purchasing the LAAL Look Ahead Analog Limiter. You have chosen absolutely unique high end tool which will help you to get excellent masters. LAAL is a result of over two years of meticulous development, careful audiophile quality component selection, and extensive studio testing during real sessions to get the final sound. Because we are also sound engineers with over 22 years of practice, we did our best to provide LAAL with sound and features that make it very practical, creative and extraordinary tool.

We believe you will have as much fun using LAAL as we did designing and building it for you. Be the true Unhindered Maker!

Create your next masterpiece without compromise, with vital and full-of-life sound. Your hard mastering work deserves that. We wish you every success with your new LAAL mastering limiter!

Your HUM Audio Devices - Team



Krzysztof Tonn



Krzysztof Rudnicki

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HUM Audio Devices LAAL limiter was designed, developed and precisely handcrafted in Poland.

Introduction

Our LAAL mastering limiter is absolutely exceptional in many ways. An innovative idea of detection and limiting process allowed us to achieve a new standard in analog mastering.

One of the strongest advantages of our design is a fully analog (0.2 ms) delay line to obtain the "Look Ahead" ability.

Thanks to it the detection circuit can react to even the fastest peaks. LAAL is extremely effective in this task, allowing you to reach great RMS levels when required, but with minimal side effects and without compromising sound quality. Your track will also preserve low-end energy and punch in a wide gain attenuation range. LAAL does its best on each limiting task you will potentially have in your everyday work. No matter if it's audiophile acoustic music where you need just a subtle touch or if you need to do heavier brick-wall limiting in modern music genres. You can always use your LAAL limiter with confidence.

Operation Safety

Power the LAAL limiter exclusively with the voltage rating specified for the country of purchase. LAAL is always factory prepared for use with that voltage. In case of doubt, or when it's necessary to change PSU voltage contact your local dealer. LAAL can be internally switched to other voltages if necessary.

Disconnect the LAAL from the electric power grid if you are not going to use it for a long period of time. Unplug the power cord from the mains to cut power supply to the unit.



Do not use LAAL anywhere near water (for example in a bath room, a damp cellar, near swimming pools, or similar environments). Otherwise you are dealing with an extremely high risk of electrical shocks! LAAL should also not be installed near equipment which produce strong magnetic fields or extreme heat.

Never allow any fluids to be spilled or sprayed on the LAAL's enclosure. Such actions can lead to dangerous electrical shocks or fire!

If, during operation the sound is interrupted or indicators no longer illuminate, or if abnormal odor or smoke is detected, or if liquids are spilled on the unit, immediately disconnect the power cord plug and contact your dealer.

Service and Repairs

Unplug the LAAL limiter from power and signal connections and contact your local dealer when you think repair is needed - or when moisture may accidentally have reached inside the LAAL box housing, or in cases when the LAAL limiter may have fallen and shows any signs of damage. This also applies to any situation in which the unit has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered. In cases of damage to the power supply and cord, first turn off the main circuit breaker before unplugging the power cord.

All repairs are done at HUM audio Devices lab or in some cases at authorized dealer's site.



**Do not open the LAAL limiter ourselves -
- there are no user serviceable parts inside !**



Replacement parts

Be sure that any authorized service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock or other dangers, including further equipment damage. HUM Audio Devices can only guarantee quality of performance if correct replacement parts are used.

Always be sure to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired device is in all respects up to factory standards.

Cleaning

Do not use any solvents, as these can damage the chassis, switches, panel or enclosure finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning liquid). Great for cleaning LAAL's anodised front panel and housing is dry micro fibre cloth. Disconnect the device from power source before cleaning.



Declaration of CE Conformity

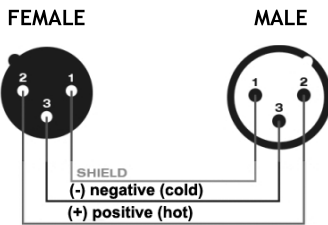
The construction of these units is in compliance with the standards and regulations of the European Union.

Installation and connections

LAAL is a two-channel device that can work as a stereo limiter or as two independent mono limiters. On the rear panel you will find a power socket and two pair of balanced XLR sockets – for left and right inputs and outputs. For connection use high quality balanced and shielded audio cables.



XLR wiring scheme:



NOTES

1. View from front (mates to other connector)
2. Pins 1 and 2 are reversed when looking at the other end (with solder points)

Power Supply

Sound quality of all audio equipment strongly depends on good power supply. That's why we designed very high quality PSU circuits for LAAL limiter.

PSU is built into the LAAL. It is based on custom toroidal double shielded transformer with individual voltages for audio and control parts of LAAL, and best Linear Technology voltage regulators. You have also soft start and protection during power cycle, so no thumps and other sound artefacts are present on your monitors. Although it is safe to turn on/off LAAL on working monitors, it is good to get into the habit of muting the monitors output before making any substantial changes in any of your audio connections.

We strongly recommend using good quality, custom shielded AC cable included in LAAL set to power the unit.



The unit is prepared to use with voltage adequate to a country of purchase. Always connect LAAL to the AC outlet with that voltage, otherwise you may damage the device!



Be sure also to use correct fuse adequate to operating voltage !

It is possible to change the voltage - please contact your local dealer if you need to do this.

Using the LAAL Limiter

The idea behind the LAAL design was to allow the mastering engineer to remain in the analog domain throughout the whole mastering process. Up to now, there was no analog limiter of this quality and versatility, so mastering engineers were often forced to make some compromises, using digital or plug-in limiters, especially when higher RMS levels were required. Fortunately, with your LAAL limiter, this is no longer the case. LAAL takes maximum care about the quality of your master.

LAAL does not use any soft clipping or similar process to artificially increase RMS levels. All magic happens in our unique and sophisticated detection and gain stage circuits. When you look at the waveform after LAAL processing - you will find your master still "lives" and has an "air" above!

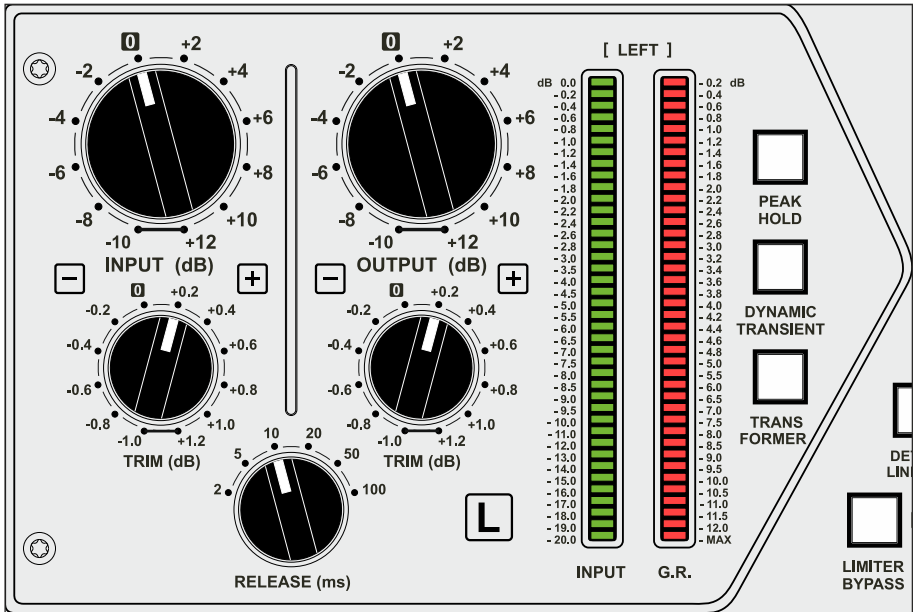
Please note that the front panel of the LAAL is a mirror image. Although it may take a little getting used to it does become second-nature after a short while. It is done this way to ensure the high channel accuracy of the limiter. The Inputs are the outer knobs and the Outputs are the inner ones.

This design choice is very important from the point of view of the precision of the limiter, because thanks to this, the internal audio paths are also perfectly symmetrical.

LAAL is very precisely calibrated with better than 0.1dB accuracy in L/R channels, and it keeps the output level exactly.

The detection circuit is thermally compensated which ensures the stability and repeatability of processing results in all studio conditions.

The controls of the LAAL are minimalist and simple. There is no need for Ratio or Threshold controls as the Ratio is effectively "infinity:1" and the Threshold is fixed at +13dBu. Attack time is virtually instantaneous due to the unique Look Ahead function.



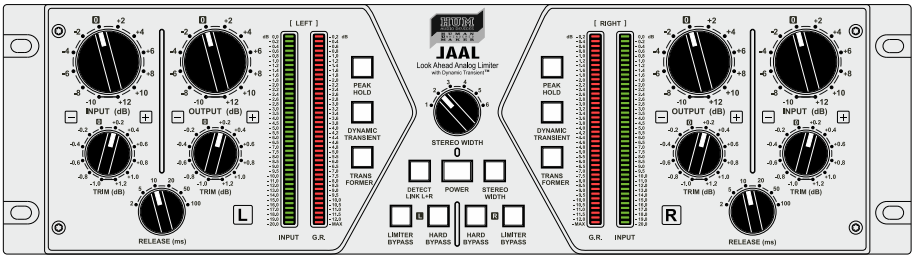
To start, it's best to first set a Release time of your choice (based on the material with which you are working) and set the Input and Output controls to "0". Set like this the LAAL automatically limits the signal when it exceeds +13dBu (0dB on the Input meter - green display). Any increase in level will exceed the threshold and the limiting circuits will then come into play. The G.R. meter (red display) will illuminate to show the level of limiting. The G.R. display (descending from the top) will illuminate to show the level of limiting. The 40-segment G.R. meter is scaled in 0.2dB steps down to -5.0dB and, from there, in 0.5dB steps.

To set the limiting threshold to a level different from +13dBu, just increase the Input level accordingly - EG: to limit from +10dBu, increase the Input level by 3dB by setting +2dB on the Input control and +1.0dB on the Trim (or +4dB on the input and -1.0dB on the Trim).

The Input level, using both Input and Trim controls, can be set in 0.2dB steps from -11dB to +13.2dB. So, the highest limiting level is then +24dBu and the lowest is -0.2dBu.

Finally, set the desired Output level, depending on the input of your A/D converter. This is the effective headroom you will achieve in your DAW after recording your master.

Please be aware that, due to the LAALs unique "Dynamic Transient" function (see page 9), the LAAL may not "sound" like it's limiting when it actually is; as the transients are being regenerated in proportion to the limiting level to retain the magic of the original recording.



POWER

When this switch is lit - it means the LAAL is on and ready to work. Soft start ensures no "thump" in your monitors during the power cycle.

INPUT & TRIM

Rotary switches for input level. INPUT switches have steps of +/-2dB. TRIM switches allows you to set the levels with an accuracy of up to +/-0.2dB. When the input level signal exceeds 0dB, you will observe the increasing Gain Reduction level on the G.R. (gain reduction) meters. INPUT and G.R. 40-element led meters are very precisely calibrated and have a resolution of up to 0.2dB.

OUTPUT & TRIM

Rotary switches for output level. OUTPUT switches have steps of +/-2dB. TRIM switches allows you to set the levels with an accuracy of up to +/-0.2dB. This output level is effectively the headroom you set for the recorded track after LAAL processing. Look at the DAW input meters when setting levels with these switches.

RELEASE [ms]

Six release times to choose from: 2ms, 5ms, 10ms, 20ms, 50ms, 100ms.

STEREO WIDTH

Six rotary switch positions for six different levels of stereo image widening. This function is activated with the STEREO WIDTH button. The circuit works differently and in a more musical way compared to similar processors. You will perceive a nice increase in the spaciousness of your tracks, but you won't lose low-end energy in the center of the stereo image, and it's also fully mono compatible.

PEAK HOLD

Activates PEAK HOLD function for Gain Reduction meters.

DYNAMIC TRANSIENT

An extraordinary and absolutely unique feature of our limiter. This function is responsible for regenerating transients proportionally to the limiting level. It plays a major role in preserving space and details in your sound as you intend.

TRANSFORMER

Activates inter-stage high-end audio transformers. Adds subtle warmth & body.

DETECT LINK L+R

Activates stereo linking for limiter detection circuits.

HARD BYPASS

Bypasses the whole limiter by physically connecting LAAL's inputs and outputs (by relay switches).

LIMITER BYPASS

Bypasses limiting circuits, but you can still use STEREO WIDTH and audio TRANSFORMERS.

Feature summary

- All discrete audio signal path
- Very high headroom (+/-24V int. powering)
- Highest quality audio transformers
- Ultra stable linear power supply
- Thermal compensation for the ultra-precise detection circuit
- Analog LOOK AHEAD circuit (0.2 ms analog delay line)
- Variable STEREO WIDTH function
- DYNAMIC TRANSIENT function
- Variable Release Time (stepped, from 2ms to 100ms)
- Precise led metering (0.2 dB steps)
- Precise input/output setting (0.2dB steps)
- Peak Hold function for gain reduction meters
- Rotary step switches for all knobs
- Stereo link for detection
- Limiter Bypass
- Hard Bypass
- Custom made shielded AC cord

Specifications

Self Noise A-weighted:	-102 dB (at 0dB IN/OUT setting)
THD+N absolute:	0.026% (1V RMS, 1 kHz at max gain reduction)
Frequency Response:	20Hz - 30kHz (+/- 0.3dB)
Max Input Level:	+22dBV
Max Output Level:	+28dBV
Input XLR	balanced, impedance 10 kOhm
Output XLR	balanced, impedance 75 Ohm
AC Powering	(internally switchable 240V/120V) 50/60Hz
Power Consumption:	max. 70 Watt
Weight:	9.4kg (11.6kg shipping)
Dimensions:	LAAL (3U) Width: 484mm Height: 133mm Depth: 314mm (including knobs & sockets)
	Shipping Width: 620mm box Height: 250mm Depth: 420mm
Package contains:	- LAAL limiter - Custom shielded AC cord

Warranty

- 1) We provide full two (2) year Warranty for HUM Audio Devices LAAL limiter against defects in material and workmanship. This Warranty relates to each original Customer of HUM Audio Devices product and is not transferable to other persons.
- 2) The period of this Warranty commences at the official receipt date of product purchase from authorized HUM Audio Devices Distributor or Dealer in given country, or directly from HUM Audio Devices for other countries. Within a period of Warranty, HUM Audio Devices will remove defects in materials and manufacturing faults adversely affecting warranted product performance, by repairing or replacing parts or replacing the product as we deem appropriate, free of charge.
- 3) This Warranty does not apply to any defect, failure, or damage due to any cause other than defects in materials or workmanship of the product. Slight variations in finish and anodized coating are normal in the manufacturing process and are not a defect.
- 4) HUM Audio Devices will not be responsible for damage to, or failure of, or need for repair or correction of any product, which occurs as a result of user abuse or misuse, including but not limited to the operation with wrong power supply or excessive voltage, or other wrong application or storage including unreasonable exposure to heat, cold, wind, water, or other elements, negligence or accident, and to material fatigue or degradation through very intensive normal usage.
- 5) Serial number removing or altering, actual or attempted correction, repair, service, modification or alteration of any HUM Audio Devices product by persons not authorized to do it automatically expires this Warranty.
- 6) Customer must contact his local HUM Audio Devices Distributor or Dealer, or in countries without Distribution - directly with HUM Audio Devices, to receive Product Return Authorization Number that will be used to track and identify the returned product.
- 7) After receiving Product Return Authorisation Number please deliver the complete product in the original packing or in such packing that is adequate to prevent damage to the product during the normal course of transport to your local HUM Audio Devices Dealer, or in case of direct purchase - to HUM Audio Devices. Transportation and insurance is the Customer's responsibility and is not covered by this Warranty.
- 8) In the interests of product development, the specifications, construction and appearance of all above products are subject to change without prior notice and without obligation to install these improvements in any product previously manufactured.

- 9) All remedies and the measure of damages are limited to the above services. It is possible that economic loss or injury to person or property may result from the failure of the product; however, even if HUM Audio Devices has been advised of this possibility, this limited warranty does not cover any such consequential or incidental damages. Some states or countries do not allow the limitations or exclusion of incidental or consequential damages, so the above limitation may not apply to you.

Limitations of Liability

In no event will HUM Audio Devices be liable for any damage, including loss of data, lost profits, cost of cover or other special, incidental, consequential or indirect damages arising from the use of the unit, however caused and on any theory of liability. This limitation will apply even if HUM Audio Devices or an authorised dealer has been advised of the possibility of such damage.

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and look for further High End products from us:**

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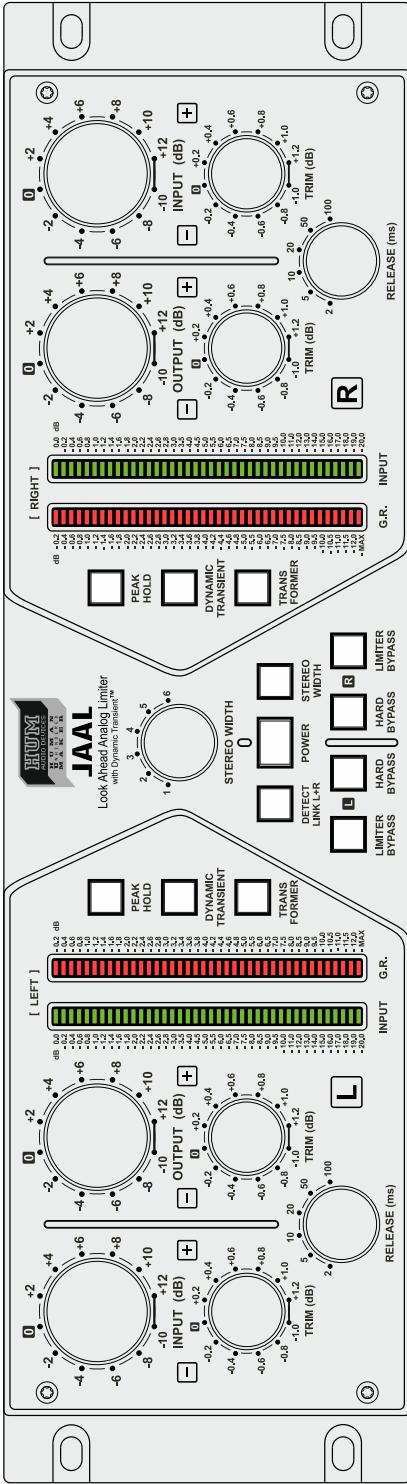
VIMEO: vimeo.com/788220594 - see here the LAAL Sound Test video

YOUTUBE: www.youtube.com/channel/UCil8uxb9q9wnNyM0AyFqPtw

Twitter: www.twitter.com/HumAudioDevices

Instagram: www.instagram.com/hum_audio_devices

Session Recall Sheet



SESSION:	
ARTIST:	
TRACK:	
ENGINEER:	
DATE:	
STUDIO:	
NOTES:	