

**LNDVerb**

## **LNDVerb**

**High voltage module for analog reverb tanks**  
**PCB version 1.5 – date 30.08.2024**



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## Introduction

The LNDVerb kit is based on a classic Fender reverb circuit, but uses LND 150 Mosfets instead of tubes. These can be operated at voltages as high as 500 V, to get as close as possible to the characteristics of real tubes.

The kit can be integrated into an existing amplifier or can be build as standalone unit like the Fender tube reverb. The module works with the typically high supply voltage in a tube amplifier (DANGER TO LIFE).

The unit needs less than 10 mA current, so a VPump for example can be used as power supply in a standalone build. If it gets integrated into an existing amplifier the already present power supply of the amp can be used to supply the needed voltage for the unit without the need to upgrade the power transformer.

A reverb transformer of the type 125A20B or similar and a reverb tank are necessary to operate the LNDVerb. These are both not included in the kit. The needed RCA phone sockets and potentiometers are included in the kit.

The module is neutral and universally designed, as good as possible, so it can be installed and operated in a variety of amplifiers. On the following pages a few examples are outlined how and where in the circuit an integration can be realized. Due to the large number of amplifiers, it is not possible to provide guides or installation instructions for all models.

## Hints

Manufacturers and distributors are not liable or responsible for the consequences of inappropriate use, installation errors or operation errors of this product due to disregard of the manual. The installation should only be completed by qualified personnel.

The contents of this manual are subject to change without notice.

## Warning

This module works with voltages which are potentially fatal. This kit is NOT a beginner's project!

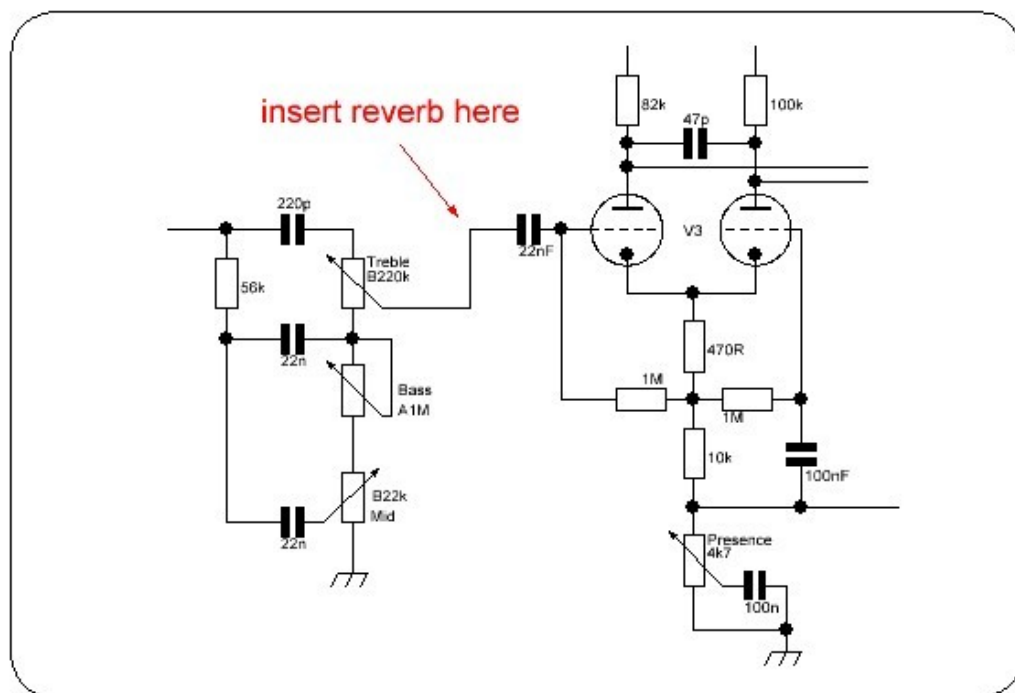
A successful build requires you can read (and understand) a schematic diagram, you know how to use various measuring devices, and you have some experience working with voltages higher than 60V.



## Examples of Use

### Example 1: Integration

Example of an integration into a JTM-45. Extract of the JTM45 schematic as reference:

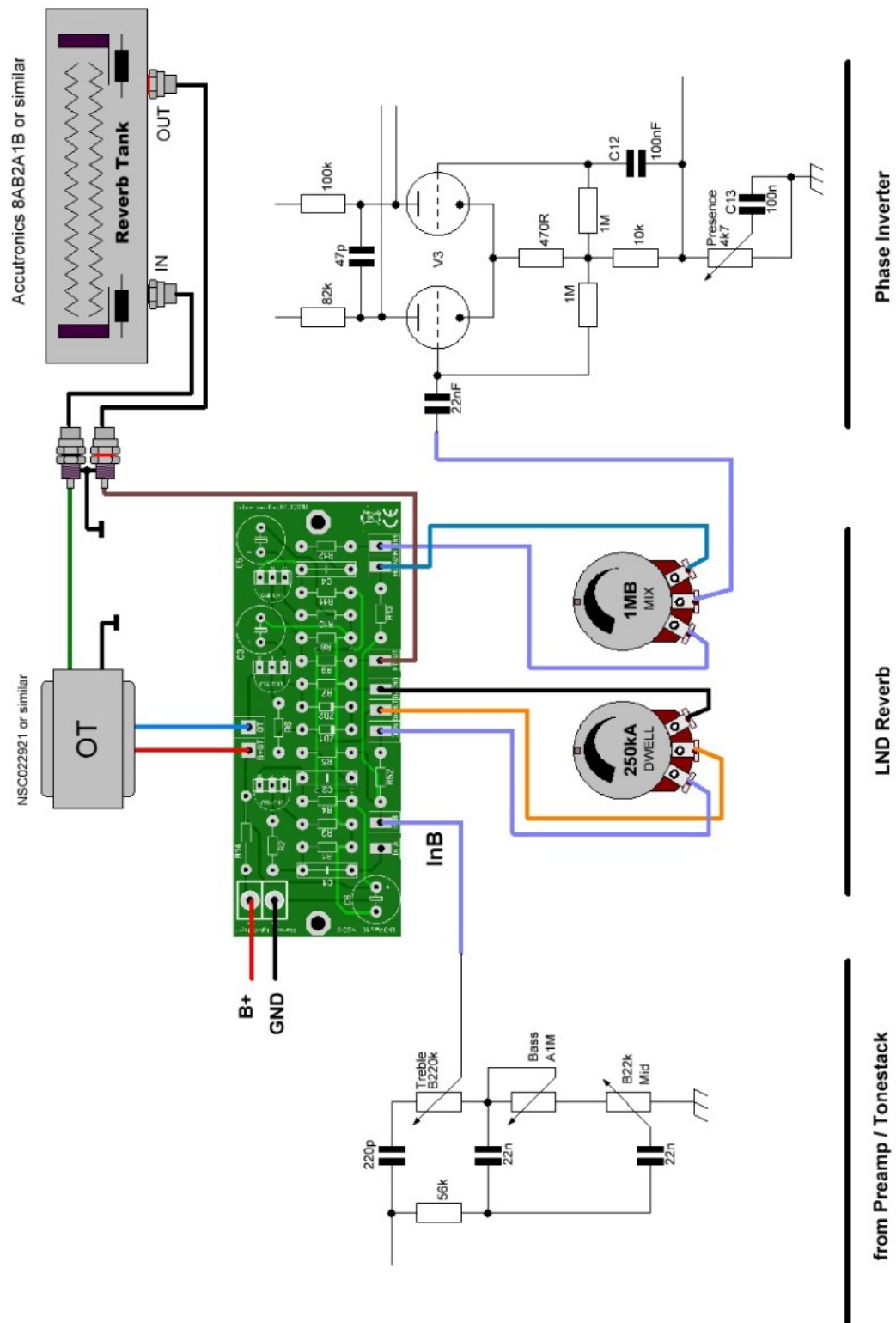


### Recommendations

- input for signals at high levels: InB
- supply voltage B+: 250-320 VDC
- reverb tank: 8AB2A1B or similar
- reverb transformer: NSC022921 or similar
- Attention:
  - R52: 1 MOhm
  - R13: 1 MOhm



# LNDVerb Module





**BOM (Integration)**

Component	Value
R1	1 MOhm
R2	10 kOhm
R3	330 Ohm
R4	100 kOhm
R5	470 kOhm
R52	1 MOhm
R6	10 kOhm
R7	330 Ohm
R8	470 kOhm
R9	10 kOhm
R10	330 Ohm
R11	100 kOhm
R12	220 kOhm
R13	1 MOhm
R14	10 kOhm / 2W
C1	100 nF / 400V
C2	22 nF / 400V
C3	220 µF / 35V
C4	22 nF / 400V
C5	220 µF / 35V
C6	4,7 µF / 450V
ZD1	Zener 18V
ZD2	Zener 18V
DWELL	250 kOhm log
MIX	1 MOhm lin

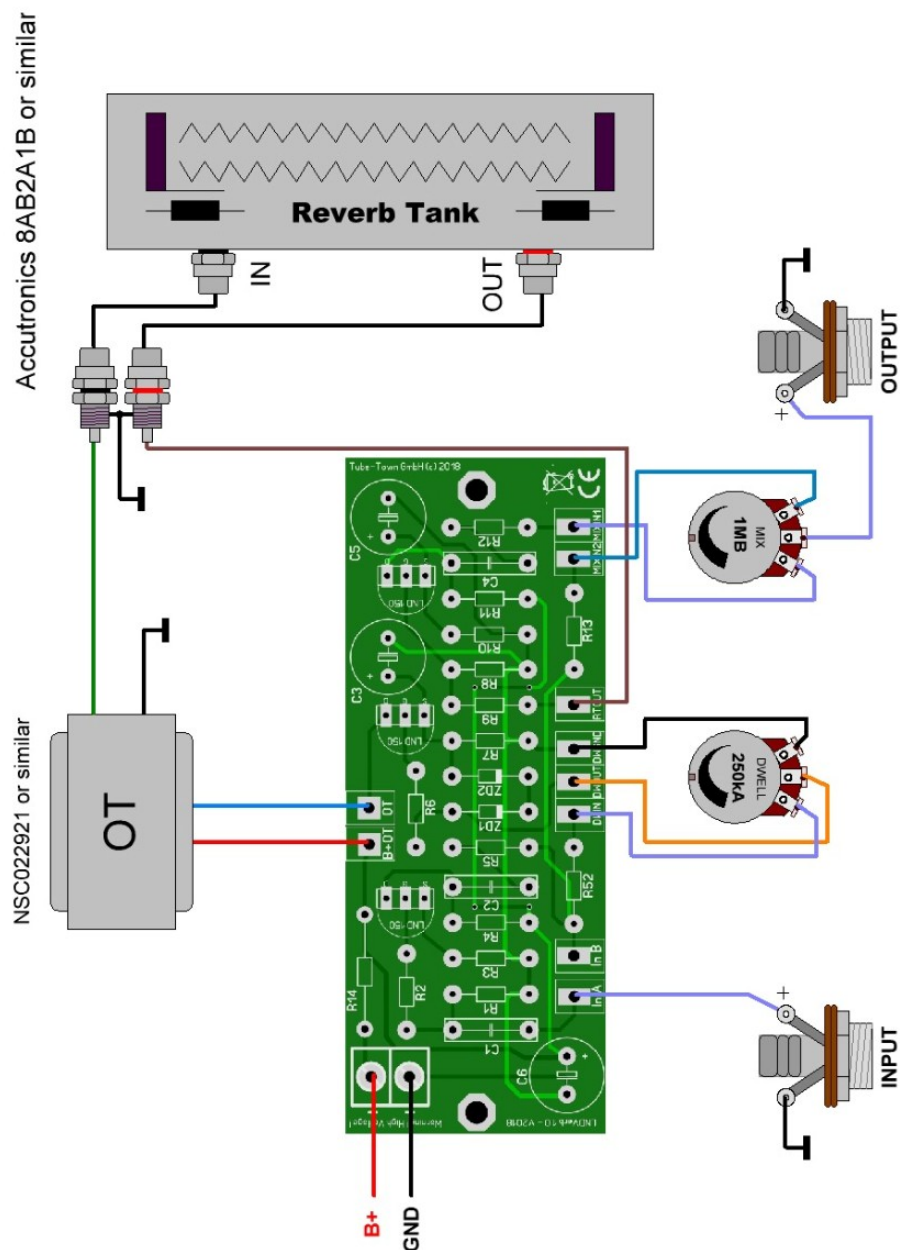
**Notes**

It may be necessary to adjust the signal level of the input (R52) and the bypass (R13) depending on the amp the unit is used in. As a starting point an example of an integration into a JTM45 is attached.



## Example 2: Standalone Unit

The following example shows a build as stand-alone reverb unit. The power supply needs to deliver a DC voltage in the area of 180 – 300 V.





## Recommendations

- Input for signals at guitar level: InA
- Supply voltage: 180 – 300 VDC
- Reverb Tank: 8AB2A1B or similar
- Reverb Transformer: NSC022921 or similar
- Attention:
  - R52 = 470 kOhm
  - R13 = 1,5 MOhm

## BOM (Standalone Unit)

Bauteil	Wert
R1	1 MOhm
R2	10 kOhm
R3	330 Ohm
R4	100 kOhm
R5	470 kOhm
R52	470 kOhm
R6	10 kOhm
R7	330 Ohm
R8	470 kOhm
R9	10 kOhm
R10	330 Ohm
R11	100 kOhm
R12	220 kOhm
R13	1,5 MOhm
R14	10 kOhm / 2W
C1	100 nF / 400V
C2	22 nF / 400V
C3	220 µF / 35V
C4	22 nF / 400V
C5	220 µF / 35V
C6	4,7 µF / 450V
ZD1	Zener 18V
ZD2	Zener 18V
DWELL	250 kOhm log
MIX	1 MOhm lin



## Build examples: Standalone Reverb-Unit with Vpump

The following layouts show a build of a stand-alone unit in a separate housing. The VPump is used as power supply (kit-vpump).

The first example shows a standalone reverb unit with the Vpump as power supply. The case used here is a 19" rack-mount enclosure, just as example.

Example 2 shows an extended build proposal with the added possibility of switching between two different reverb tanks (for example one with a medium and one with a long reverb time).

### Additional hints for builds in separate housings:

- As power supply the vpump is used, we recommend the use of the in-plug power supply with article no. stn-dc12-2000
- additional to the kit-lndverb, kit-vpump and housing the following components are needed for the illustrated builds (no guarantee for completeness):

Bauteil	Artikelnummer
input/output jacks	e.g. neu-nmj4hc-s
DC-jack	e.g. bu40
On/Off switch (2-pole)	e.g. xsw63
fuse holder	e.g. siha-5-20
fuse	e.g. f-T100
optional indicator	e.g. led11-r plus dropping resistor
wire	
reverb tank/s, RCA cable	

- To build example no. 2 e.g. the pcb tbez-021 and corresponding components are needed for the additional switching. The designated rectification can be omitted, since the needed 12 VDC are already available. Relays must be of the 12 V type (e.g. article no. fin-30.22.9-12 )
- Hints for 19" housings: the needed height is 1,5 or 2 HE, since the build is too high for a 1 HE unit.



## Recommendations

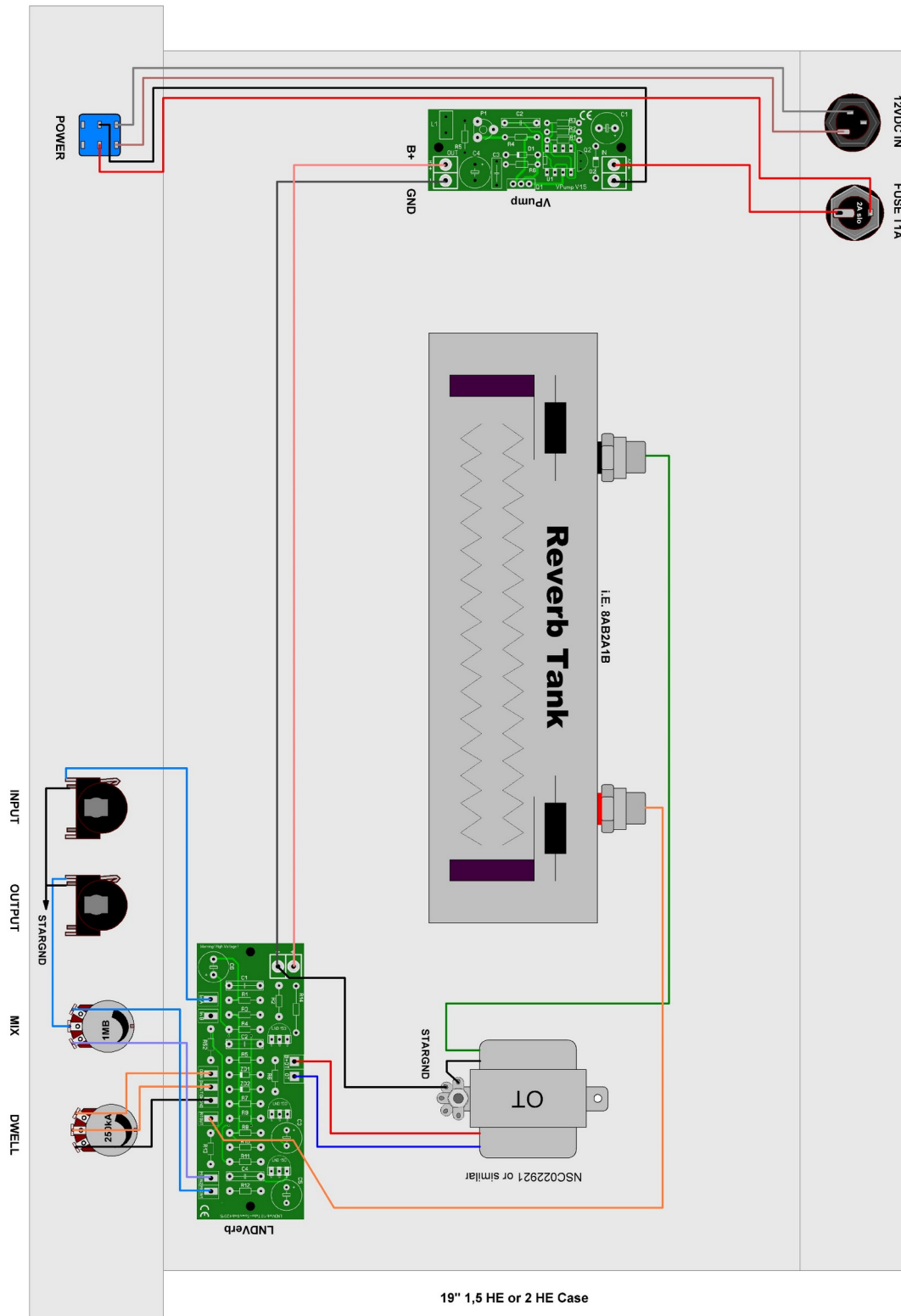
- Input for signals at guitar level: InA
- Supply voltage: 200 VDC
- Reverb tank: 8AB2A1B or similar
- Reverb transformer: NSC022921 or similar
- Attention:
  - R52 = 470 kOhm
  - R13 = 1,5 MOhm
- BOM according to "Example 2: Standalone Unit"

Bauteil	Wert
R1	1 MOhm
R2	10 kOhm
R3	330 Ohm
R4	100 kOhm
R5	470 kOhm
R52	470 kOhm
R6	10 kOhm
R7	330 Ohm
R8	470 kOhm
R9	10 kOhm
R10	330 Ohm
R11	100 kOhm
R12	220 kOhm
R13	1,5 MOhm
R14	10 kOhm / 2W
C1	100 nF / 400V
C2	22 nF / 400V
C3	220 µF / 35V
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ZD1	Zener 18V
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## LNDVerb Module

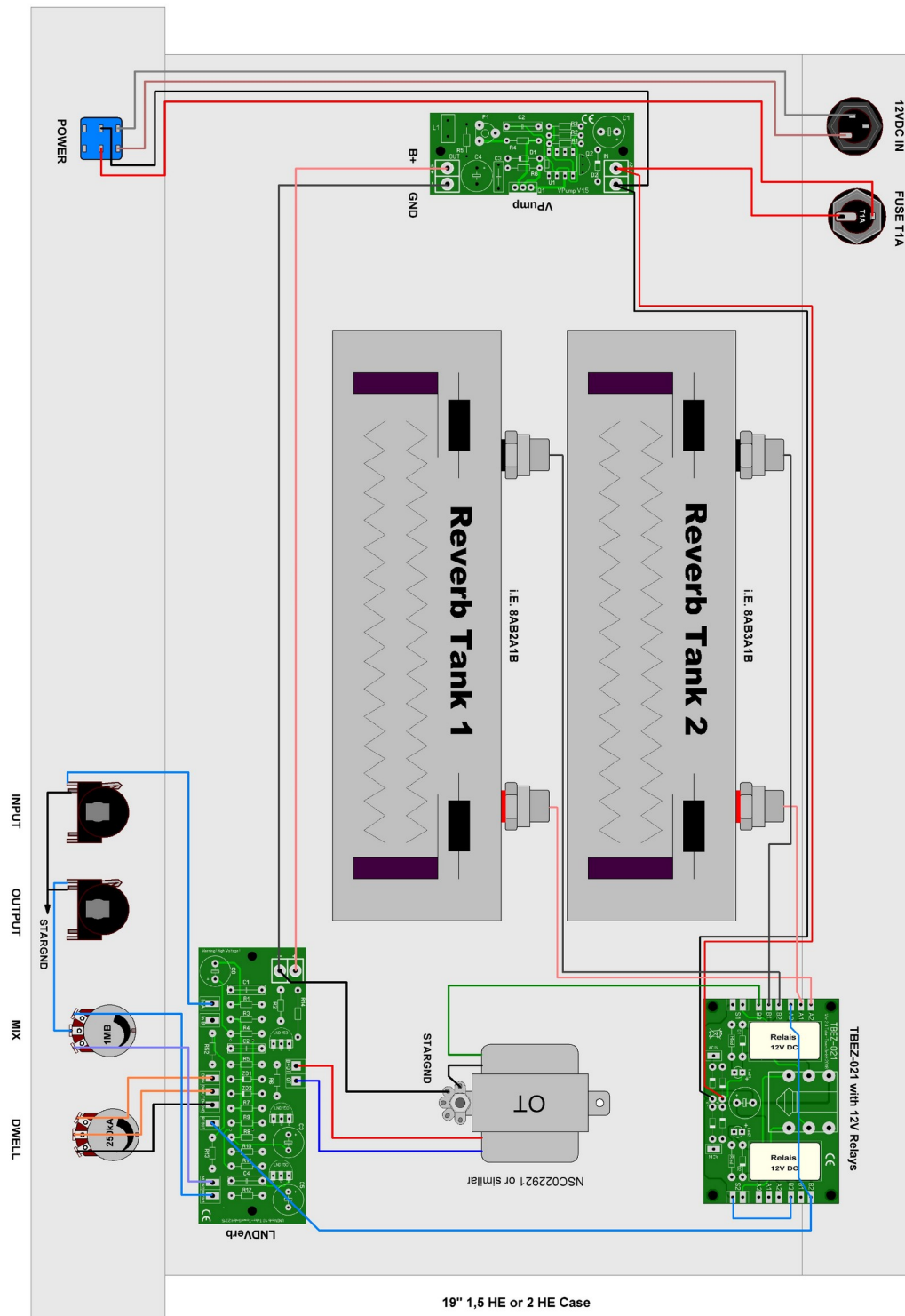
### Example 1: Standalone Unit with VPump





## LNDVerb Module

### Example 2: Standalone Unit with VPump and two switchable reverb tanks





## General notes for installation and assembly

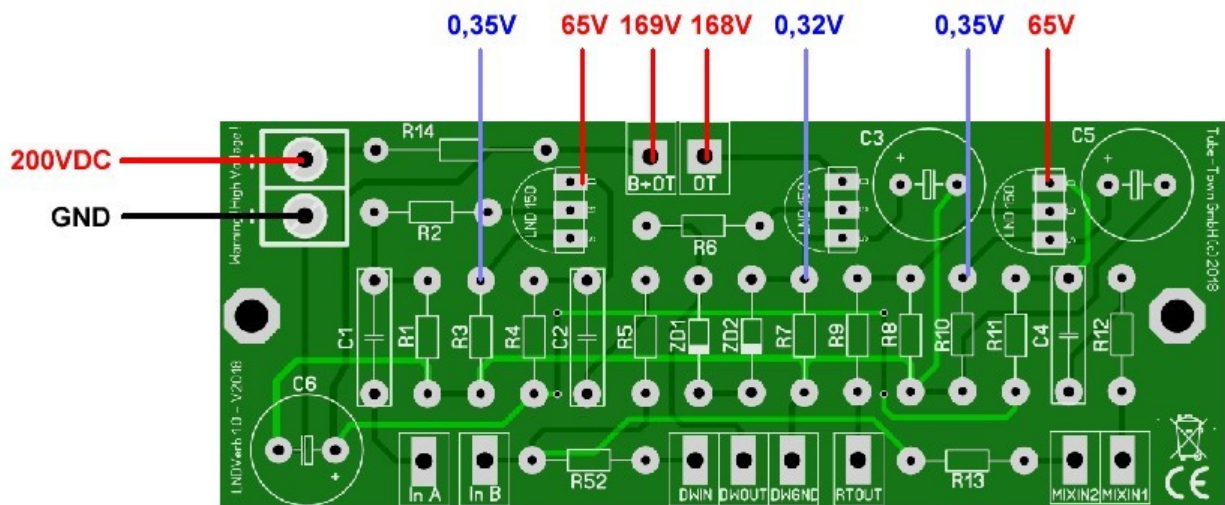
- The operating voltage must not exceed 300 VDC, otherwise the module can get damaged.
- When using reverbtanks other than the recommended models, a different output-transformer may need to be used. Also, check the output jack wiring and adjust as necessary to meet the requirements of the reverbtank.
- When integrating the LNDVerb into an existing amplifier, it must be checked on a case-by-case basis at which point in the signal path it can best be installed. Due to the complexity, a general and universally valid recommendation cannot be made. For amplifiers with classic Marshall topology, the installation position directly after the tone control is recommended.
- To ensure a trouble-free operation, a very good grounding is necessary. Neglecting the grounding is one of the most frequent reasons for interference and "hum" during operation. Avoid ground loops ! A star ground has proven to be a good choice for the standalone unit.
- In some cases it is necessary to use another filter element / RC element for the operating voltage, behind the last filter element in the rectification, for example. Which component values should be used for this depends on the type of rectification and the voltages. For example, the last existing filter element of the rectification, which is usually used to supply the preamplifier voltage, can serve as an orientation point.
- If the input level is too high, then overloads can occur in the first amplifier stage of the LNDVerb module. For such cases there is the input InB, which feeds the signal into the signal path after the first amplifier stage. But before using this input it should be checked if the input level can be reduced by a voltage divider or if a reduction of the gain of the first stage of the LNDVerb solves the problem.
- To reduce the gain it is often sufficient to replace resistor R4 (default: 100k) by a resistor with a lower value. Possible values are 82k, 68k or 47k.
- It may also be necessary to combine different measures.
- Hum due to interference in the reverbtank is a common problem. To reduce or avoid such interference, the reverbtank should be mounted as far away as possible from the rest of the circuit.
- If the module is not working properly, it is often due to a improper position in the signal path. To make sure that the LNDVerb module itself works without errors, it should first be operated before the input of the first stage (quasi like in the standalone example). Only when the function is satisfactory there, it can be moved further in the signal path towards the output stage. Usually the position of the module behind the first amplifier stage is optimal.



## Test Points

Overview of test points. The voltages should be in the indicated range with 200VDC applied to B+. If the reverb tanks gets connected the wrong way the a LND150 can be damaged.

All voltages measured with respect to ground and may vary +/- 20%.



## Dimensions

