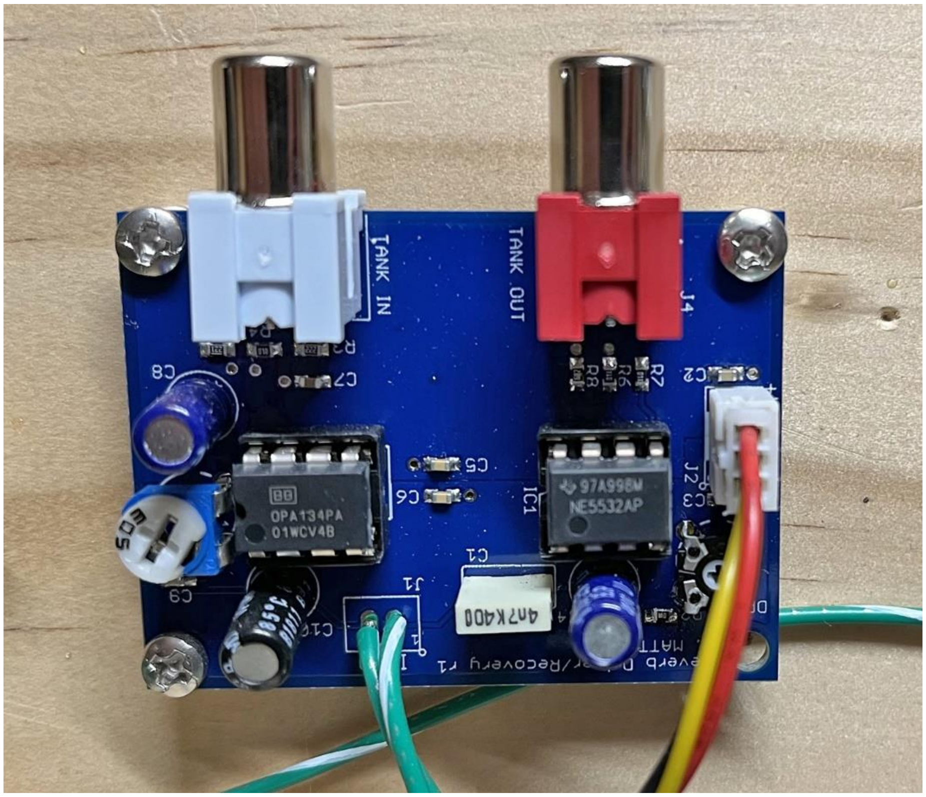
Reverb Send/Receive Board

Owner's Manual | Dec 2023



Contents

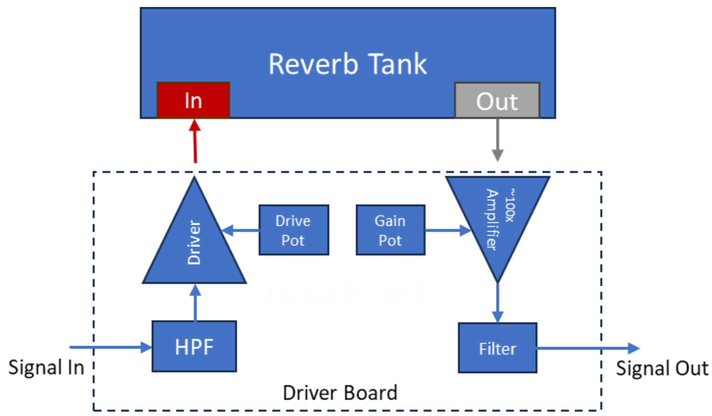
Notes and Warnings

- Verify the board output and input are connected to the correct tank output and input. Do not trust the color code shown on the board, some tanks have invers colors for input and output.

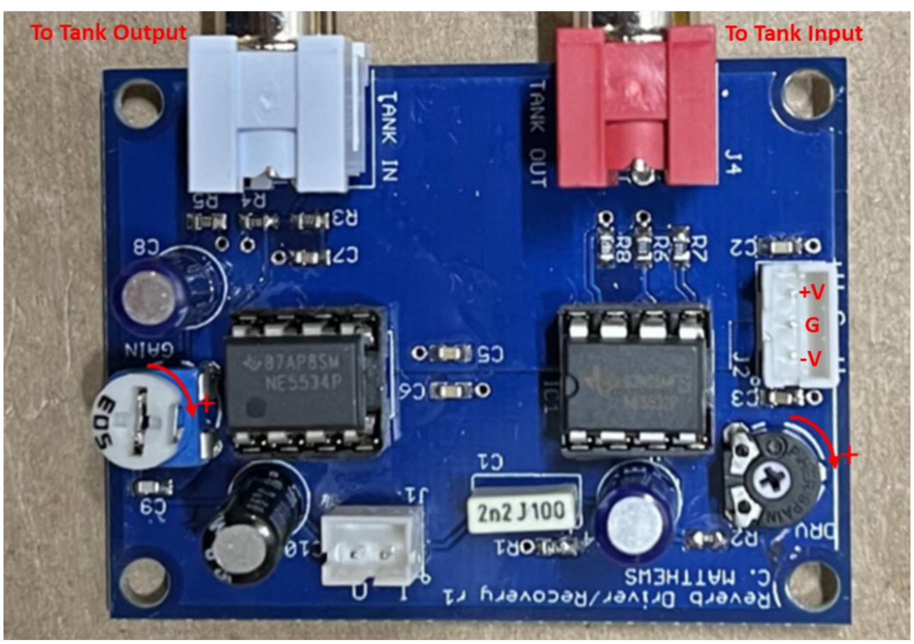
Overview

This board is designed to take a near line level signal and drive a spring reverb tank. The board then receives the return signal and amplifies it back up to near line level. There is an adjustable drive control and a return gain control pot onboard to handle different tanks and levels.

Below is a block diagram of the amplifier showing high level gain stages, filters and controls.



Below is the board, showing the rotation of the potentiometers to increase both receive gain and drive power. Note for a high impedance tank drive should be fully CCW and for low impedance it should be fully CW.



Specifications

Input Power:	±5-15VDC 15mA. Recommended ±12-15V [1]
Signal Input Impedance:	620kΩ
Output Drive:	0-10mW using current feedback with ~170Hz low pass filter.[2]
Output Impedance:	<10Ω
Reverb Tank Compatibility:	Recommend 200Ω - 400Ω tanks. 150Ω-800Ω is achievable with increased harmonic distortion. Isolated (ungrounded) input.

[1] – Higher impedance tanks require higher rail voltages to drive. You will experience clipping if tank impedance is high and rail voltages are low. Though minor clipping may not be auditable through tank, or can be minimized by lowering drive current via potentiometer.

[2] – Tank drive current is configured via drive potentiometer. $P_t = \frac{{V_t}^2}{R_t} = \left[V_{in(rms)} * \left(\frac{R_d + R_t}{R_d}\right)\right]^2 / R_t$

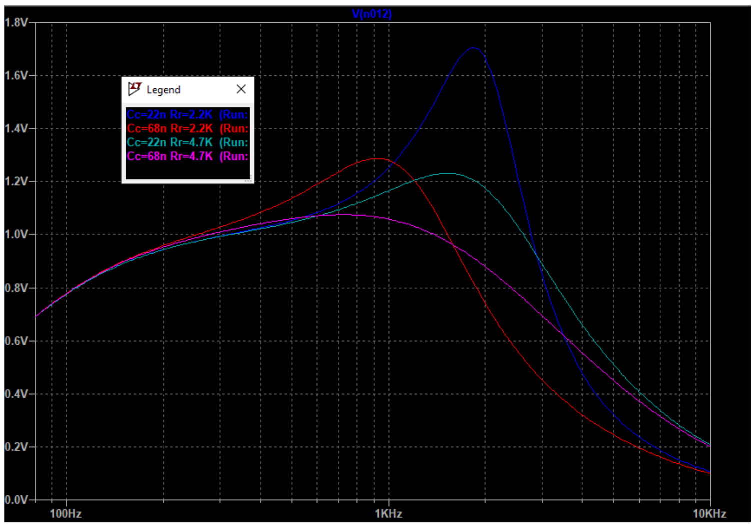
P_t = Tank drive power in mW. 5-10mW seems to be typical.
$V_{in(rms)}$ = Voltage into reverb board.
R_d = Drive resistance, this is 100Ω + The value of the potentiometer.
R_t = Tank impedance (can simplify to resistance for approximation).
V_t = Tank drive voltage (not an input, can be back calculated to determine how close to rail voltage you are.

Tone Hacking

This section assumes you are semi familiar with electronics, and some of the following points will require resoldering or reflowing components on the board.

- For less drive of the tank, increase the resistance of the DRV potentiometer. This may result in shortening the reverb a bit as well as altering the tone.

- Reverb tanks have a self-resonance on their output typically. This is roughly controlled via R3 and C7. See simulation below for examples. This will change the “shimmer” sound you get out of the tank. Stock values are C7=22n, R3=2.2k (Dark Blue line).



- The input to the drive circuit has a high pass filter, this removes some of the bass signal which tends to create a mushy and distorted sound. Adjusting C1 and R1 would effect this cutoff. Note R1 effects the input impedance of this circuit, and could cause a loading effect if you feed the board via a higher impedance source like the output of a 12AX7. If driven by an op-amp or low impedance, the value of R1 is negligible for loading. Stock values are C1=1.5n, R1=620k.