Sushi Box FX – Echo Foxtrot

The Echo Foxtrot is a simple single-tube preamp with minimal controls. It uses an EF86 pentode tube for a rich, complex clean tone that can be used by itself as a clean preamp or always-on "tone sweetener", in front of an amp as a clean boost, or you can put another boost in front of it to push it into a nice tube overdrive.

IMPORTANT NOTE: Echo Foxtrot uses an EF86 tube and <u>WILL NOT</u> function with a 12AX7 or similar tube.

DISCLAIMER AND WARNING

This circuit contains high voltages exceeding 200V, and is EXTREMELY DANGEROUS. Sushi Box FX is not responsible for any damage or injury caused by improper use or assembly, and I encourage you to use the utmost care when building, testing, and using this pedal. If high voltages make you uncomfortable, DO NOT BUILD THIS. Just don't. This is not a beginner project and should not be treated as such. It was designed to be as easy as possible to assemble and make it work, but **<u>you have to be careful</u>**.

Normally I would recommend testing a circuit before putting it into the box, but in this case I recommend fully boxing the unit before testing for the sake of safety. If for any reason you need to probe voltages inside the box, do so with extreme caution, and only keep one hand near the box at a time, do not allow both hands to touch the box/circuit at the same time.

Recommended Build Instructions

This will go similar to most pedal builds; I recommend starting with smaller components and working your way up to the larger components. I recommend assembling in the following order:

1. resistors
2. diodes
3. IC socket
4. ceramic capacitors
5. LED under tube socket
6. film capacitors
7. electrolytic capacitors
8. inductor
9. BJT transistor
10. power MOSFET
11. tube socket
12. potentiometers
13. ribbon cable

The power jack and ¼" jacks need to be inserted into the box prior to the board being inserted, and I recommend soldering the wires to the all jacks prior to putting the board in, as there won't be much room to reach in to solder them afterward. After the wires have been soldered to the jacks insert the board, then

connect each wire to its corresponding pad on the board. Lastly connect the ribbon cable to the footswitch board, and you're good to go.

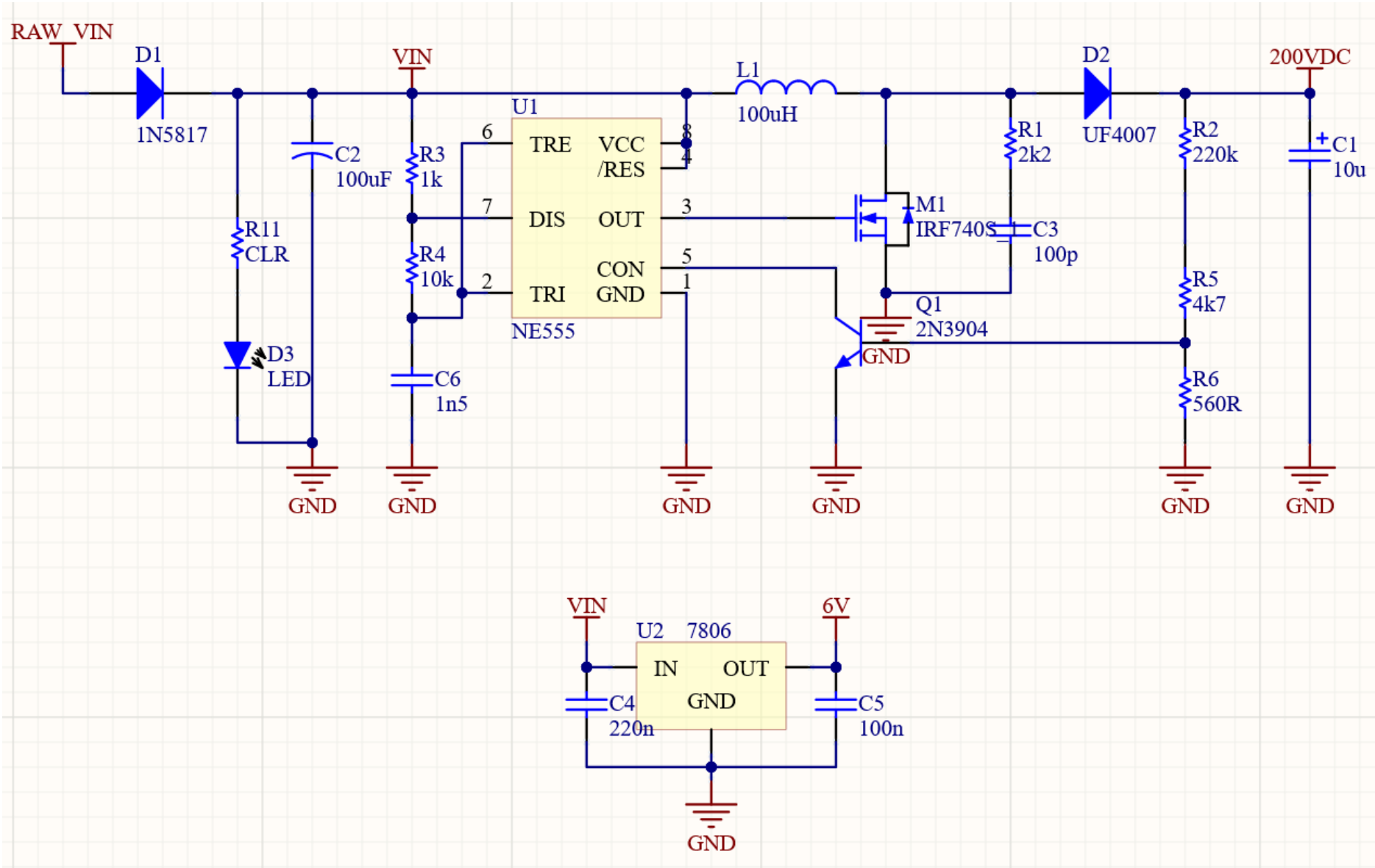
Bill of Materials

The links below are recommendations and suitable replacements can be used as needed. Voltage ratings of capacitors are minimum values, higher voltage rated caps may be used. The links below are non-affiliated links, I get no compensation of any kind if these links are used. Some of the parts have a "suitable replacement" that may be easier to find, and the effect on the overall tone will be minimal.

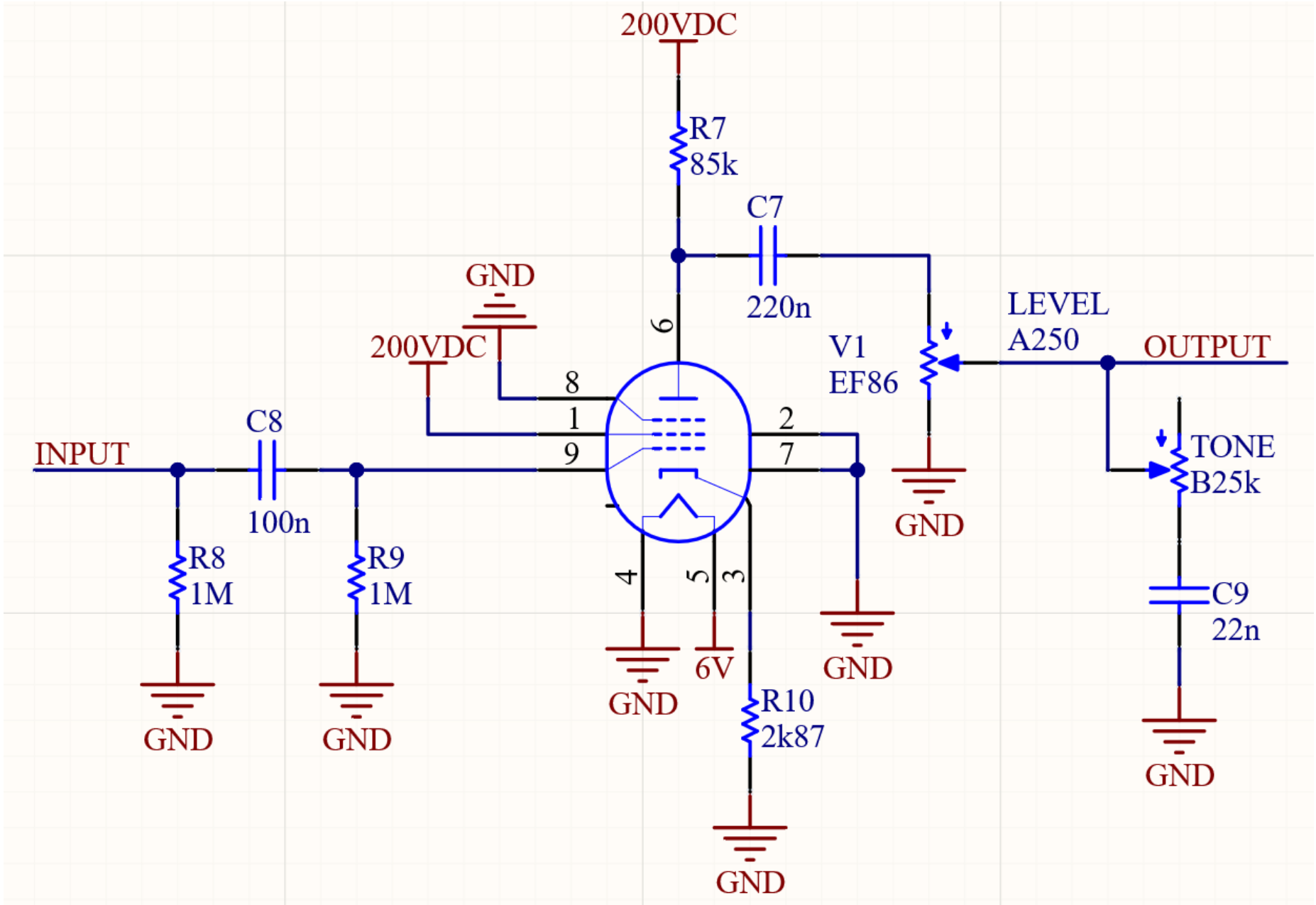
Comment	Designator	Quantity	Link	Suitable Replacement	Effect of replacement	Replacement Link
10uF 250V	C1	1	Tayda Link			
100uF 25V	C2	1	Tayda Link			
100pF 50V	C3	1	Tayda Link			
220nF 50V	C4	1	Tayda Link			
100nF 50V	C5, C8	2	Tayda Link			
1n5 50V	C6	1	Tayda Link			
220nF 250V	C7	1	Tayda Link	100nF 630V	Less low end on output	Tayda Link
22nF 50V	C9	1	Tayda Link			
1N5817	D1	1	Tayda Link			
UF4007	D2	1	Tayda Link			
3mm LED (mounts under tube socket)	D3	1	Tayda Link	Any color 3mm LED	none	
100uH inductor	L1	1	Tayda Link			
A250K 16mm pot	Level	1	Tayda Link			
B25K 16mm pot	Tone	1	Tayda Link			
IRF740	M1	1	Tayda Link			
2N3904	Q1	1	Tayda Link			
2.2k 1/4W	R1	1	Tayda Link			
220k 1/4W	R2	1	Tayda Link			
1k 1/4W	R3	1	Tayda Link			
10k 1/4W	R4	1	Tayda Link			
4.7k 1/4W	R5	1	Tayda Link			
560ohm 1/4W	R6	1	Tayda Link			
85k 1/4W	R7	1	Mouser Link	82k	Almost none	Tayda Link
1M 1/4W	R8, R9	2	Tayda Link			
2.87k 1/4W	R10	1	Mouser Link	2.7k	Almost none	Tayda Link
CLR (recommend 1k for LED under tube socket, 4.7k for LED on THWITCH PCB)	R11	2	Tayda Link	Adjust for LED brightness		
NE555	U1	1	Tayda Link			
8-pin DIP socket	U1	1	Tayda Link			

L7806 voltage regulator	U2	1	Tayda Link			
EF86 (or Soviet 6Ж32П/6J32P)	V1	1	eBay Link			AES Link
9-pin tube socket	V1	1	AES Link			
125B enclosure		1	Tayda Link			
1/4" jacks		2	BLMS Link			
2.1mm jack		1	BLMS Link			
3PDT footswitch		1	Tayda Link			
LED		1	Any LED			
Knobs		2	Any knobs			

Schematic – Power Supply



Schematic – Audio



Board Layout