

ALL-IN-ONE V1.3

Homerecording and LiveGig solution

OVERVIEW

The All-In-One box is a combination of useful circuits and can make up your universal tool for recording, home-practicing and stage.

GENERAL

What does it do?

- tube input preamp (external, optional)
- Input gain control
- FX Loop
- Wet/Dry Mixer (it's a panner actually, so you can have 100% wet and 0% dry)
- aux in and aux volume control (connect your favourite mp3 player)
- buffered amp-out with volume control (selectable Mix or FX-loop only)
- wide range single knob tone control.
- Frequency correction with speaker saturation control (can be bypassed)
- recording out volume control
- Mic-a Mic-b and line-level output for the recording Signal
- symmetric line out for XLR connection (DI-Out)
- headphone amp (external, optional)
- power amp 10W (external, optional)

The prototype which was built consists of the main board and optional external components. It is up to you which ones you want and which not depending on what YOU need!

Despite the high parts count it is an easy build. Due to the board mounted pots and switches you almost cannot make wiring mistakes.

Please note that there is a design flaw in the project: Using the "pure" setting on the filter will cause bass loss. So 4kHz/5kHz are the only options available. If you don't get enough heights at 5kHz you might want to change some values:

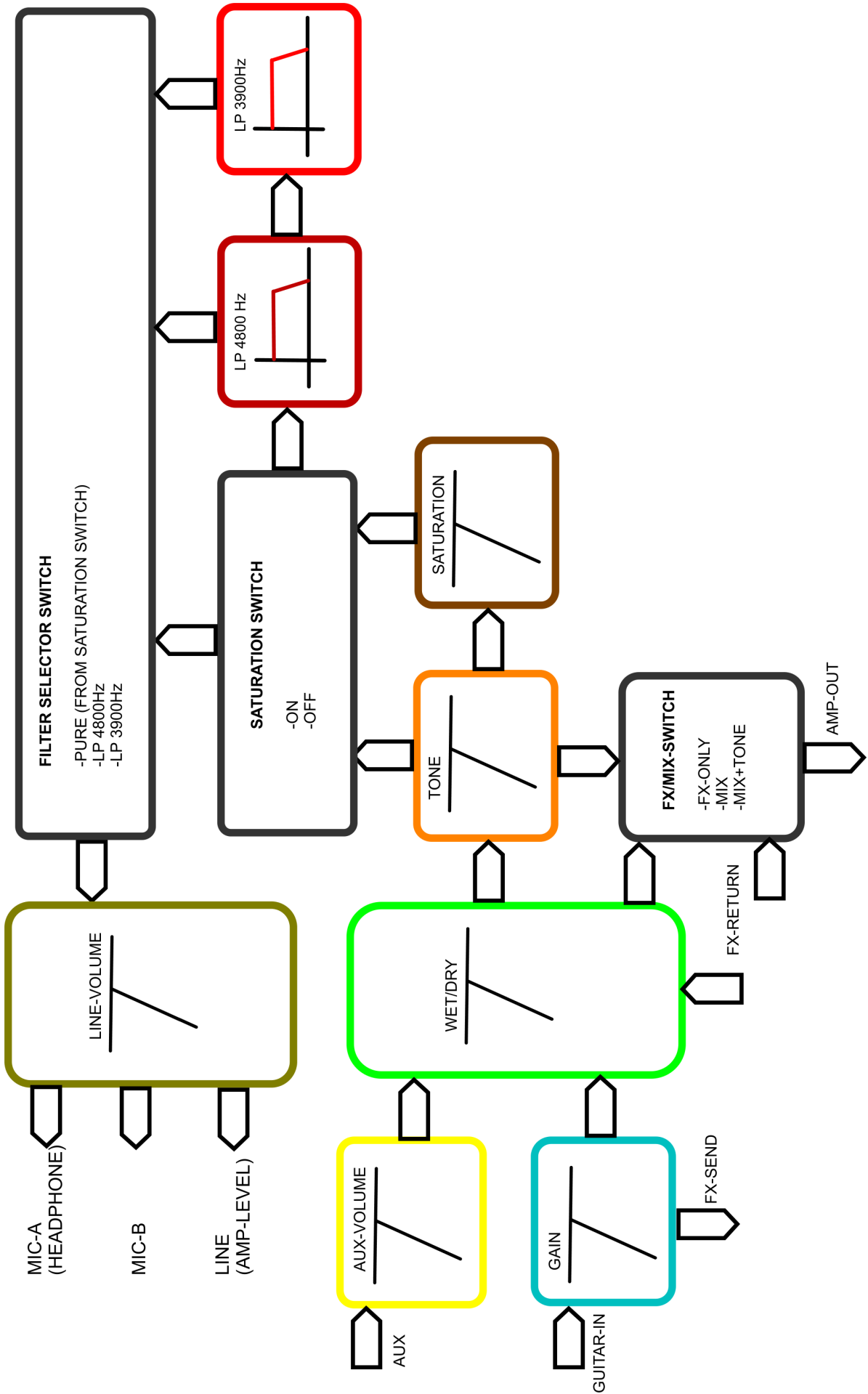
Changing C9 from 2.2n to 1n will raise the corner frequency to 7.5kHz.
Lowering C6 to 560pF additionally will further raise it to 10kHz.

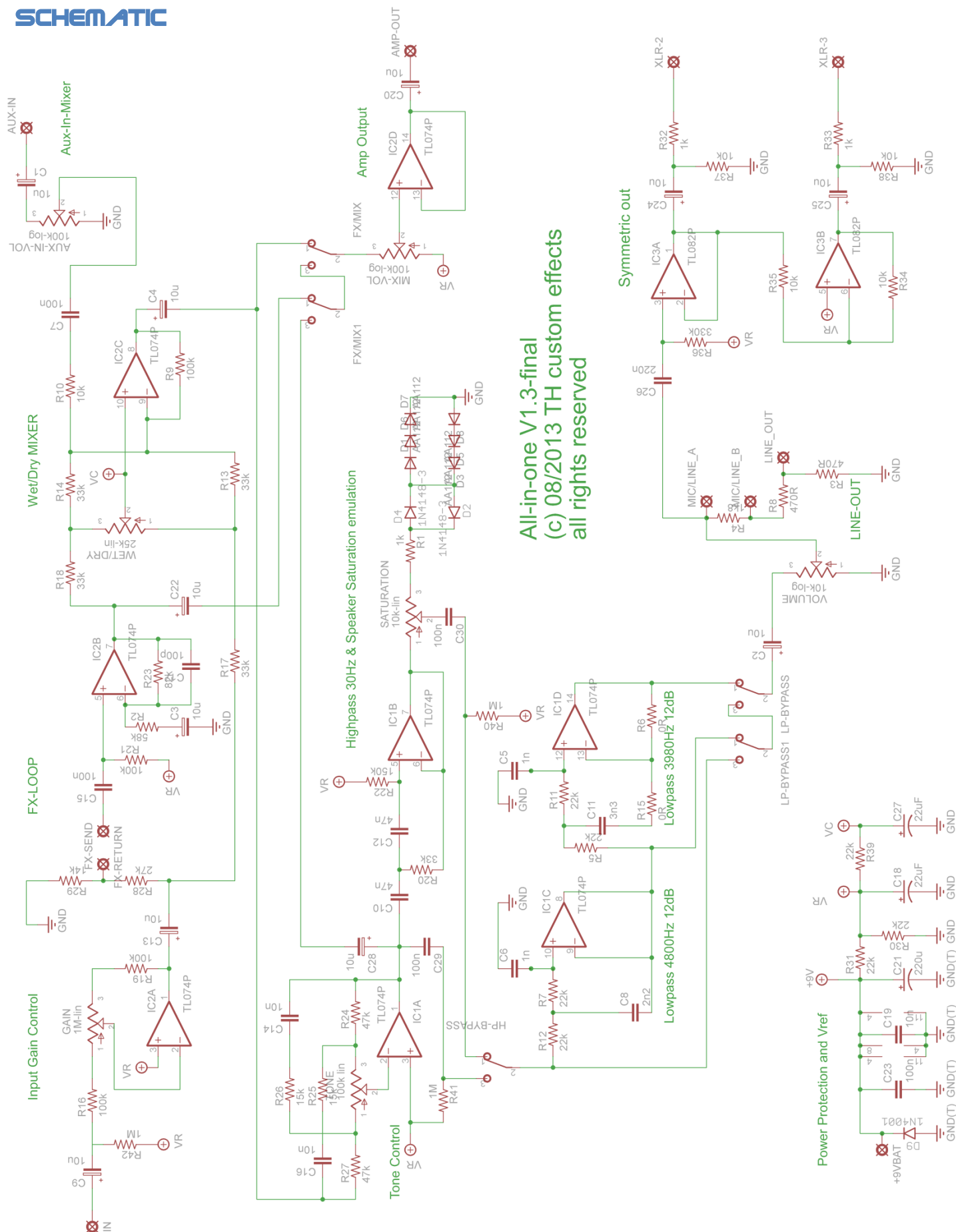
To better understand the functionality there is a block diagram showing the circuit blocks and signal paths.

FIXED settings:

- If you always need a 5kHz lowpass filter in front of the line-out you can hardwire the LP-BYPASS and even leave out the components around IC1D.
- If you don't want the Speaker saturation simulation you can hardwire the HP-BYPASS switch and leave out all components around IC1B including pot and diodes.
- If you always want to have the mixed signal without the tone-control involved at your amp-out you can hardwire the FX/MIX-SWITCH.
- If you need other Filter parameters for the LP-filters which limit the high frequencies you can use the free "Filter Pro" software from Texas Instruments to calc your own 4th grade Sallen-Key lowpass!

BLOCK DIAGRAM AND SIGNAL PATHS





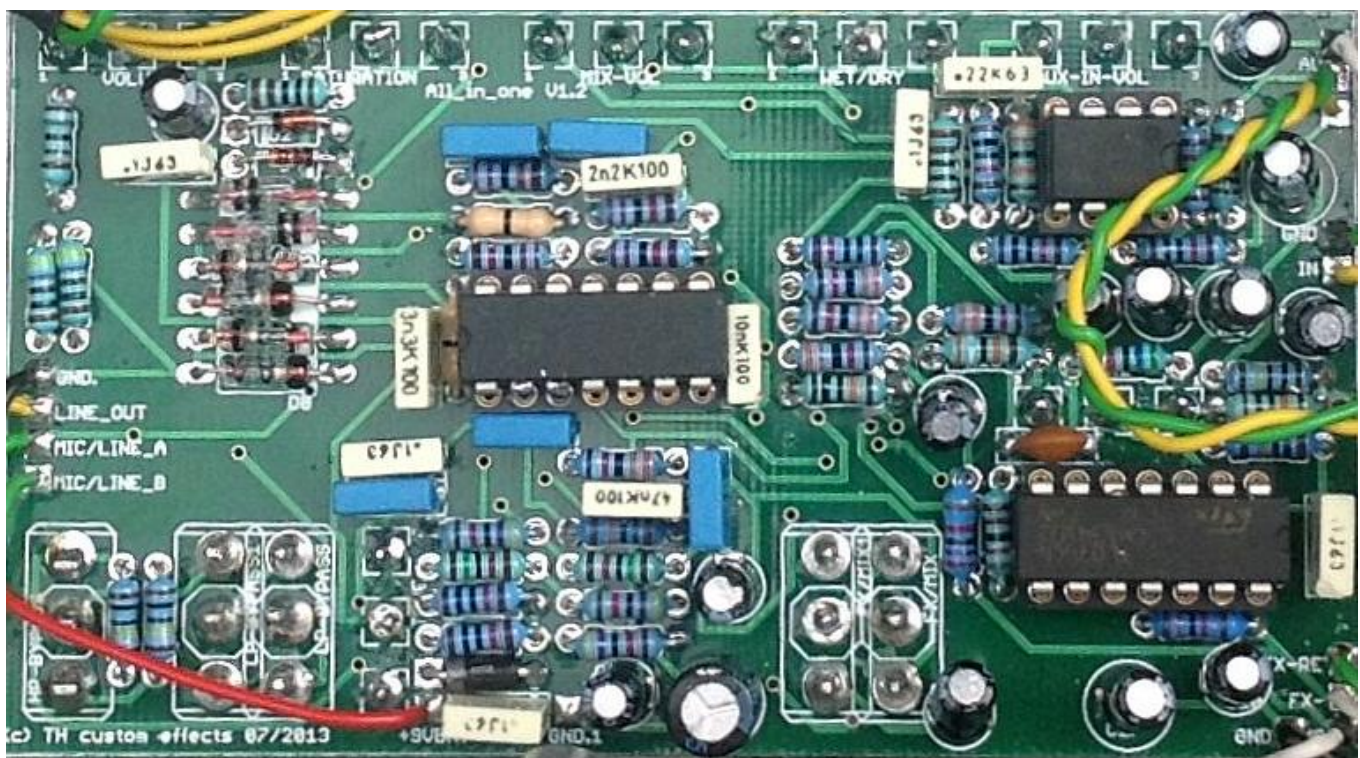
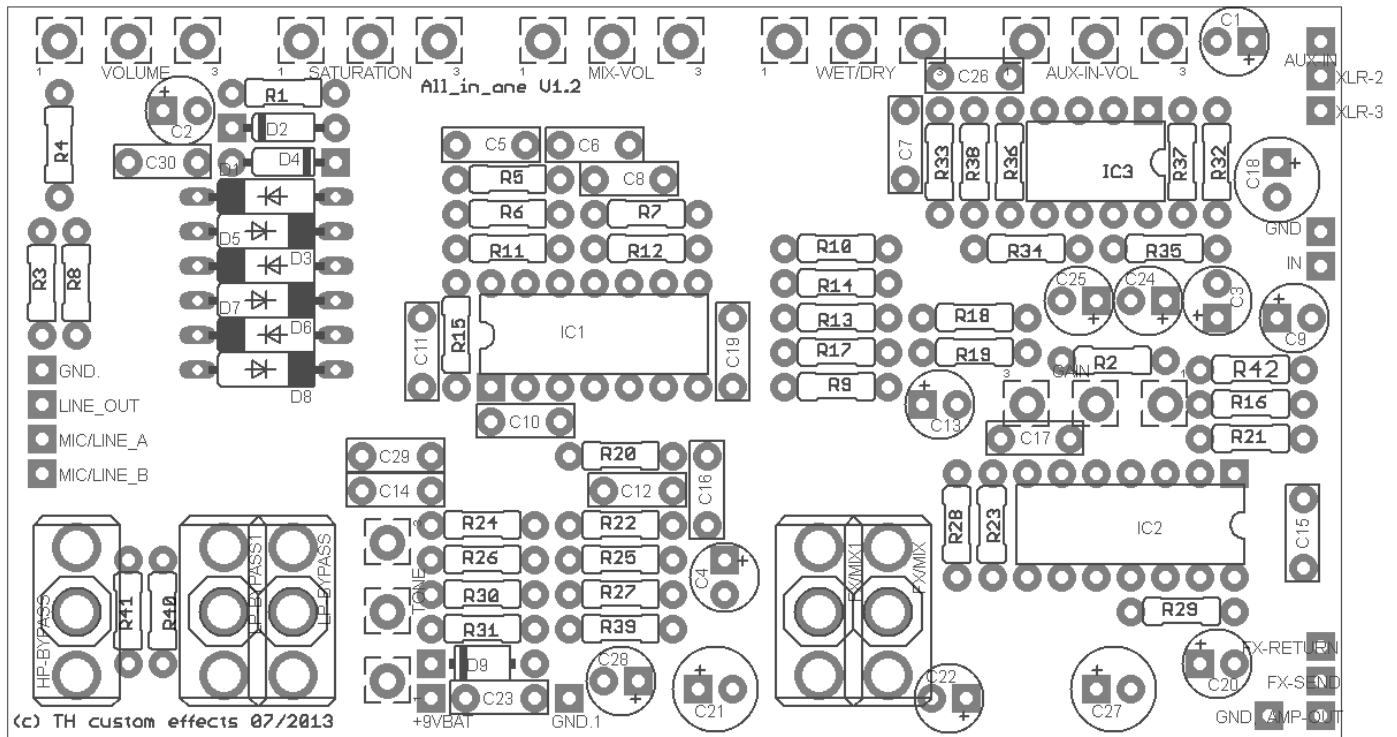
All-in-one V1.3-final
(c) 08/2013 TH custom effects
all rights reserved

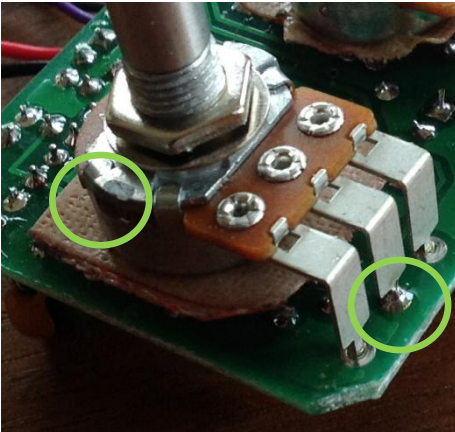
BILL OF MATERIALS

	<i>Device#</i>	<i>Qty</i>	<i>Value</i>	<i>Comment</i>
Resistors	R1, R32, R33	3	1k	
	R2	1	56k	
	R3,R8	2	470R	
	R4	1	1k8	
	R5, R7, R11, R12, R30, R31,R39	7	22k	
	R6,R15	2	0R	or jumper
	R24, R27	2	47k	
	R13, R14, R17, R18, R20	5	33k	
	R9, R16, R19, R21	1	100k	
	R22	1	150k	
	R23	1	82k	
	R25, R26	2	15k	
	R28	1	27k	
	R29	1	14k	
	R10, R34, R35, R37, R38	4	10k	
	R36	1	330k	
	R40, R41,R42	3	1M	
Capacitors	C1, C2, C3, C4, C9, C13, C20, C22, C24, C25,C28	11	10u	polarized electro
	C5,C6	2	1n	box film
	C7, C15, C23,C29,C30	5	100n	box film
	C8	1	2n2	box film
	C10, C12	2	47n	box film
	C11	1	3n3	
	C17	1	100p	ceram
	C18,C27	2	22u	polarized electro
	C14, C16, C19	2	10n	box film
	C21	1	220u	polarized electro
	C26	1	220n	box film
Diodes	D1,D3,D5,D6,D7,D8	6	AA112	any GE with Vfwd ~0.4V
	D2,D4	2	1N4148	
	D9	1	1N4001	
Pots	GAIN	1	1M-lin	16mm right-angle print
	SATURATION	1	10k-lin	16mm right-angle print
	MIX-VOL (to_AMP), AUX-VOL	2	100k-log	16mm right-angle print
	TONE	1	100k-lin	16mm right-angle print
	WET/DRY	1	25k-lin	16mm right-angle print
	LINE-VOL	1	10k-log	16mm right-angle print
ICs	IC1,IC2	2	TL 074	
	IC3	1	TL 082	
Other	LP-BYPASS, FX-MIX	2	DPDT On-On-On	Mouser Part# 633-M202403 LINK
	HP-BYPASS	1	SPDT On-On	
	XLR	1	XLR Connector	DO NOT CONNECT GROUND to 1!!!

BUILDING

Start populating the diodes and resistors first. Take care when bending the legs of the GE-diodes as their glass housing breaks easily. Put the IC sockets in next. Last are ceramic and film box capacitors, then the electrolytic.



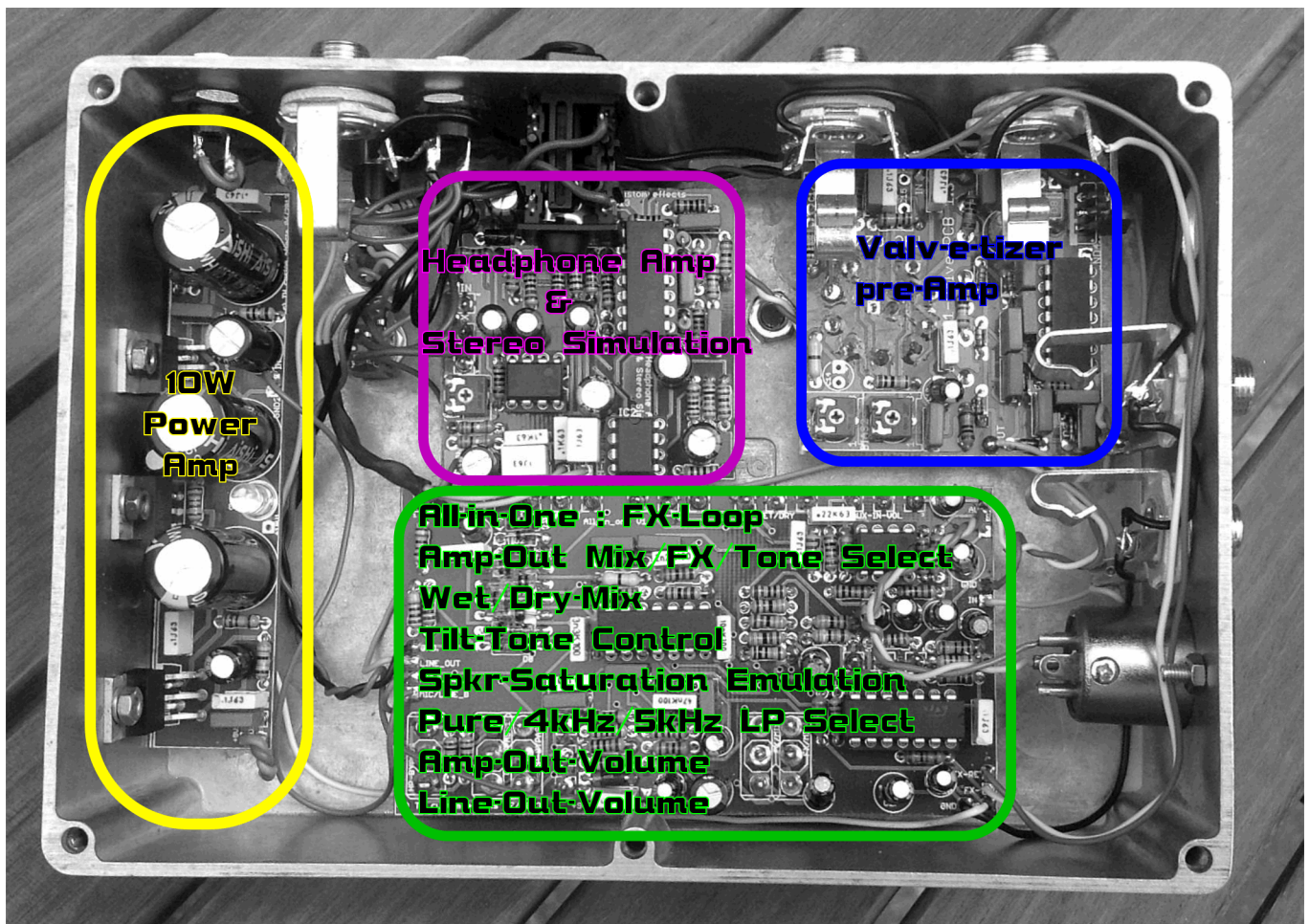


The board mounted pots need to go onto the other side of the board. Use some (double-sided) tape to make sure the pot cases do not shorten any pins that come through the board. As you solder them it is good practice to apply some solder to the middle pin first, then pull it back or approx. 1mm and let it harden. Then solder the other pins. This will align the pot horizontally in a better way and avoid shortcuts of the wide pot pins and the board.

Don't forget to clip of the small bracket before you mount the circuit.

ENCLOSURE

Depending on what needs to go into the box here is an idea: Hammond 1590E



If you wire the Valv-e-tizer to fixed values and have no pots you need a good idea how to mount the board with the tube. I used a panel mounted socket for the tube and somehow managed to fix it. Try it before you ruin your enclosure. (The acrylic cover you see is not there for aesthetics only ... ☺)

FINALLY

You have created a very useful tool for your (daily) business or entertainment. This is how it could look like:



Please note that for some reason I managed to make a few mistakes in the labeling. The tone control is not labeled at all and the two switches at the right should be labeled the other way round (4kHz/5kHz/Pure) and (On/Off) from top down.

DISCLAIMER & LICENSE

PCBs purchased from TH custom effects are intended for DIY / non-commercial use only. It is not allowed to redistribute the PCBs and artwork from this document. However, you can use these instructions and PCBs to build and sell your own product based on PCBs ordered from TH custom effects.