

# THOR V1.2

# Runoffgroove's Thor with added modifications

### **OVERVIEW**

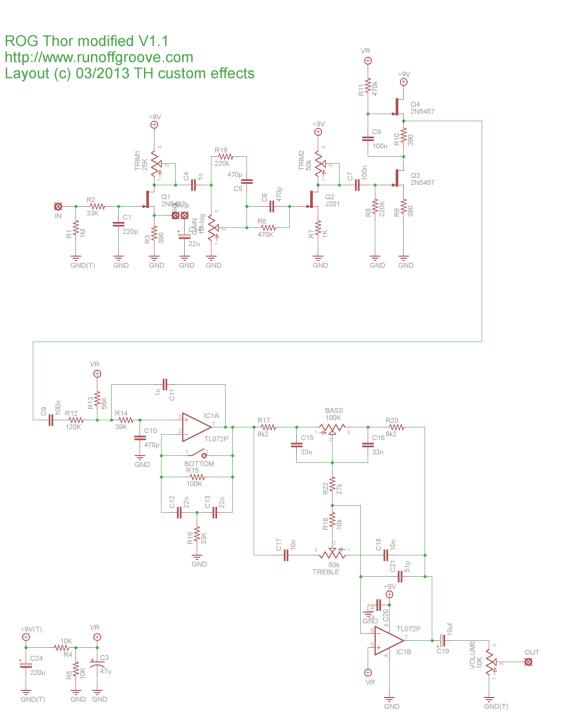
All credit for the main circuit goes to <a href="http://runoffgroove.com">http://runoffgroove.com</a>. You will also find a lot <a href="https://runoffgroove.com">of sound samples</a> and <a href="https://runoffgroove.com">documentation</a> on their website.

### GENERAL

This is my attempt on an easy-to-use PCB for this great circuit. This is intended to work as a Marshall 100W super lead amp.

I have adjusted this to my taste by adding a Bandaxall tonestack as well s some modifications like a lead-channel-switch and a modification to implement a better bright-switch (by removing it ©).

### SCHEM/ATIC





# BILL OF MATERIALS

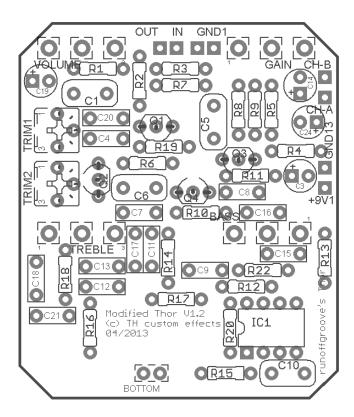
Resistors         R1         1         IMM           R2,R16         2         33k           R3,R9,R10         3         390R           R4,R5,R18         3         10k           R6,R11         2         470k           R7         1         1k           R8,R19         2         200k           R12         1         120k           R13         1         56k           R14         3         39k           R15         1         100k           R17,R20         2         8k2           R22         1         27k           C3         1         47u         polarized electro           C4,C11         2         1         100n         film           C5,C6,C10         3         470p         ceram           C12,C13         2         22n         film           C12,C13         2         22n         film           C12,C13         2         22n         film           C19         1         10u         polarized electro           C17,C18         2         10n         polarized electro           C17,C18         2 </th <th></th> <th>Device#</th> <th>Qty</th> <th>Value</th> <th>Comment</th>		Device#	Qty	Value	Comment
R3,R9,R10   3   390R	Resistors	R1	1	1M	
R4,R5,R18		R2,R16	2	33k	
R6,R11		R3,R9,R10	3	390R	
R7		R4,R5,R18	3	10k	
R8,R19		R6,R11	2	470k	
R12		R7	1	1k	
R13		R8,R19	2	220k	
R14		R12	1	120k	
R15		R13	1	56k	
R17,R20       2       8k2         R22       1       27k         Capacitors       C1       1       220p       ceram         C3       1       47u       polarized electro         C4,C11       2       1n       film         C5,C6,C10       3       470p       ceram         C7,C8,C9,C20       4       100n       film         C12,C13       2       22n       film         C14       1       22u       polarized electro         C15,C16       2       33n       film         C17,C18       2       10n       film         C19       1       10u       polarized electro         C21       1       51p       ceram (can also be 47p)         C24       1       220u       polarized electro         Transistors       Q1,Q3,Q4       3       2N5457       2         Q2       1       1201       1         Trimmer       TRIM1       1       25k       6mm         Pots       GAIN       1       1M-log       16mm right-angle print         BASS       1       100k-lin       16mm right-angle print         ICS       <		R14	1	39k	
Capacitors         R22         1         27k           Capacitors         C1         1         220p         ceram           C3         1         47u         polarized electro           C4,C11         2         1n         film           C5,C6,C10         3         470p         ceram           C7,C8,C9,C20         4         100n         film           C12,C13         2         22n         film           C14         1         22u         polarized electro           C15,C16         2         33n         film           C17,C18         2         10n         film           C19         1         10u         polarized electro           C21         1         51p         ceram (can also be 47p)           C24         1         220u         polarized electro           Transistors         Q1,Q3,Q4         3         2N5457           Q2         1         J201           Trimmer         TRIM1         1         25k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle pri		R15	1	100k	
Capacitors         C1         1         220p         ceram           C3         1         47u         polarized electro           C4,C11         2         1n         film           C5,C6,C10         3         470p         ceram           C7,C8,C9,C20         4         100n         film           C12,C13         2         22n         film           C14         1         22u         polarized electro           C15,C16         2         33n         film           C19         1         10u         polarized electro           C21         1         51p         ceram (can also be 47p)           C24         1         220u         polarized electro           Transistors         Q1,Q3,Q4         3         2N5457           Q2         1         J201         Trimmer         TRIM1         1         25k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           ICS         IC1         1         10k-log		R17,R20	2	8k2	
C3		R22	1	27k	
C4,C11       2       1n       film         C5,C6,C10       3       470p       ceram         C7,C8,C9,C20       4       100n       film         C12,C13       2       22n       film         C14       1       22u       polarized electro         C15,C16       2       33n       film         C17,C18       2       10n       film         C19       1       10u       polarized electro         C21       1       51p       ceram (can also be 47p)         C24       1       220u       polarized electro         Transistors       Q1,Q3,Q4       3       2N5457         Q2       1       J201       J201         Trimmer       TRIM1       1       25k       6mm         Pots       GAIN       1       1M-log       16mm right-angle print         BASS       1       100k-lin       16mm right-angle print         TREBLE       1       50k-lin       16mm right-angle print         ICS       IC1       1       TL072       Always use the -IP version for lower noise!	Capacitors	C1	1	220p	ceram
C5,C6,C10       3       470p       ceram         C7,C8,C9,C20       4       100n       film         C12,C13       2       22n       film         C14       1       22u       polarized electro         C15,C16       2       33n       film         C17,C18       2       10n       film         C19       1       10u       polarized electro         C21       1       51p       ceram (can also be 47p)         C24       1       220u       polarized electro         Transistors       Q1,Q3,Q4       3       2N5457         Q2       1       J201       T         Trimmer       TRIM1       1       25k       6mm         TRIM2       1       50k       6mm         Pots       GAIN       1       1M-log       16mm right-angle print         BASS       1       100k-lin       16mm right-angle print         TREBLE       1       50k-lin       16mm right-angle print         ICS       IC1       1       TL072       Always use the ¬IP version for lower noise!		C3	1	47u	polarized electro
C7,C8,C9,C20		C4,C11	2	1n	film
C12,C13   2   22n   film     C14		C5,C6,C10	3	470p	ceram
C14		C7,C8,C9,C20	4	100n	film
C15,C16   2   33n   film     C17,C18   2   10n   film     C19   1   10u   polarized electro     C21   1   51p   ceram (can also be 47p)     C24   1   220u   polarized electro     C24   1   220u   polarized electro     Transistors   Q1,Q3,Q4   3   2N5457     Q2   1   J201     Trimmer   TRIM1   1   25k   6mm     TRIM2   1   50k   6mm     Pots   GAIN   1   1M-log   16mm right-angle print     BASS   1   100k-lin   16mm right-angle print     TREBLE   1   50k-lin   16mm right-angle print     VOLUME   1   10k-log   16mm right-angle print     VOLUME   1   10k-log   16mm right-angle print     ICs   IC1   1   TL072   Always use the -IP version for lower noise!		C12,C13	2	22n	film
C17,C18		C14	1	22u	polarized electro
C19		C15,C16	2	33n	film
C21       1       51p       ceram (can also be 47p)         C24       1       220u       polarized electro         Transistors       Q1,Q3,Q4       3       2N5457         Q2       1       J201		C17,C18	2	10n	film
Transistors         C24         1         220u         polarized electro           Transistors         Q1,Q3,Q4         3         2N5457           Q2         1         J201           Trimmer         TRIM1         1         25k         6mm           TRIM2         1         50k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           VOLUME         1         10k-log         16mm right-angle print           ICs         IC1         1         TL072         Always use the -IP version for lower noise!		C19	1	10u	polarized electro
Transistors         Q1,Q3,Q4         3         2N5457           Q2         1         J201           Trimmer         TRIM1         1         25k         6mm           TRIM2         1         50k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           VOLUME         1         10k-log         16mm right-angle print           ICs         IC1         1         TL072         Always use the -IP version for lower noise!		C21	1	51p	ceram (can also be 47p)
Trimmer         TRIM1         1         25k         6mm           TRIM2         1         50k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           VOLUME         1         10k-log         16mm right-angle print           ICs         IC1         1         TL072         Always use the -IP version for lower noise!		C24	1	220u	polarized electro
Trimmer         TRIM1         1         25k         6mm           Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           VOLUME         1         10k-log         16mm right-angle print           ICs         IC1         1         TL072         Always use the -IP version for lower noise!	Transistors	Q1,Q3,Q4	3	2N5457	
Pots         GAIN         1         1M-log         16mm right-angle print           BASS         1         100k-lin         16mm right-angle print           TREBLE         1         50k-lin         16mm right-angle print           VOLUME         1         10k-log         16mm right-angle print           ICs         IC1         1         TL072         Always use the -IP version for lower noise!		Q2	1	J201	
PotsGAIN11M-log16mm right-angle printBASS1100k-lin16mm right-angle printTREBLE150k-lin16mm right-angle printVOLUME110k-log16mm right-angle printICsIC11TL072Always use the -IP version for lower noise!	Trimmer	TRIM1	1	25k	6mm
BASS 1 100k-lin 16mm right-angle print TREBLE 1 50k-lin 16mm right-angle print VOLUME 1 10k-log 16mm right-angle print ICs IC1 1 TL072 Always use the –IP version for lower noise!		TRIM2	1	50k	6mm
TREBLE 1 50k-lin 16mm right-angle print VOLUME 1 10k-log 16mm right-angle print  ICs IC1 1 TL072 Always use the –IP version for lower noise!	Pots	GAIN	1	1M-log	16mm right-angle print
VOLUME 1 10k-log 16mm right-angle print  ICs IC1 1 TL072 Always use the –IP version for lower noise!		BASS	1	100k-lin	16mm right-angle print
ICs IC1 1 TL072 Always use the –IP version for lower noise!		TREBLE	1	50k-lin	16mm right-angle print
		VOLUME	1	10k-log	16mm right-angle print
Other SW1,2 2 SPST	ICs	IC1	1	TL072	Always use the –IP version for lower noise!
	Other	SW1,2	2	SPST	

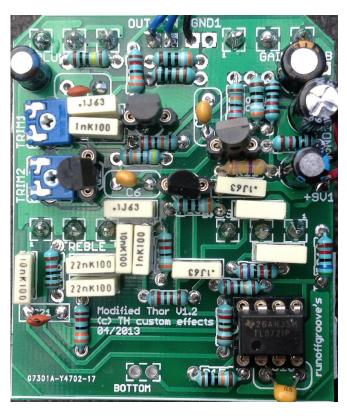
The total number of capacitors is 21 despite the different numbering in the schematic. There are also only 21 resistors.



#### BUILDING

Start populating the resistors first. You want to socket the transistors. Put the sockets in next. Then go the trimmpots. Last are ceramic and box film 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 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.

#### BIASING:

As there are only two transistors you will be able to adjust this by ear. If you have never done it before please use a multimeter and check that the transistor drain voltage is close to 6V for the 2N5457 (Q1) and 5V for the J201 (Q2). At least this should put them into their working area. You can fine-tune the transistors once you have powered the circuit up by ear.



### FINALLY

This is a real Marshall-sounding circuit. I think the mods done are giving this a much wider range of tones than before.

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