THE 'LIL WATTER'

BY NZCDOG

INTRO:

This is a cheap small practice amplifier designed to be a tubey sounding 1 Watt practice amp that will sound good with a variety of guitars/pedals/speaker combinations... and powered off 12VDC!

Small: because it fits in a 125-B enclosure...
Cheap: because it uses the minimum parts, has only one tube and needs no output transformer to connect with a speaker load.

It's basically a starved plate 12AU7A adaptation of a fender preamp stage, going into a simple LM386 power amplifier.

TUBE CHOICE:

I used an old RCA clear top 12AU7A and designed the filtering and gain around this tube, and I recommend using any 12AU7A you can find. Using a higher gain tube such as a 12AX7 is possible but will considerably change the performance of the circuit, (particularly on starved plate voltages), and also probably lead to earlier power-amp saturation from the LM386.

LM386:

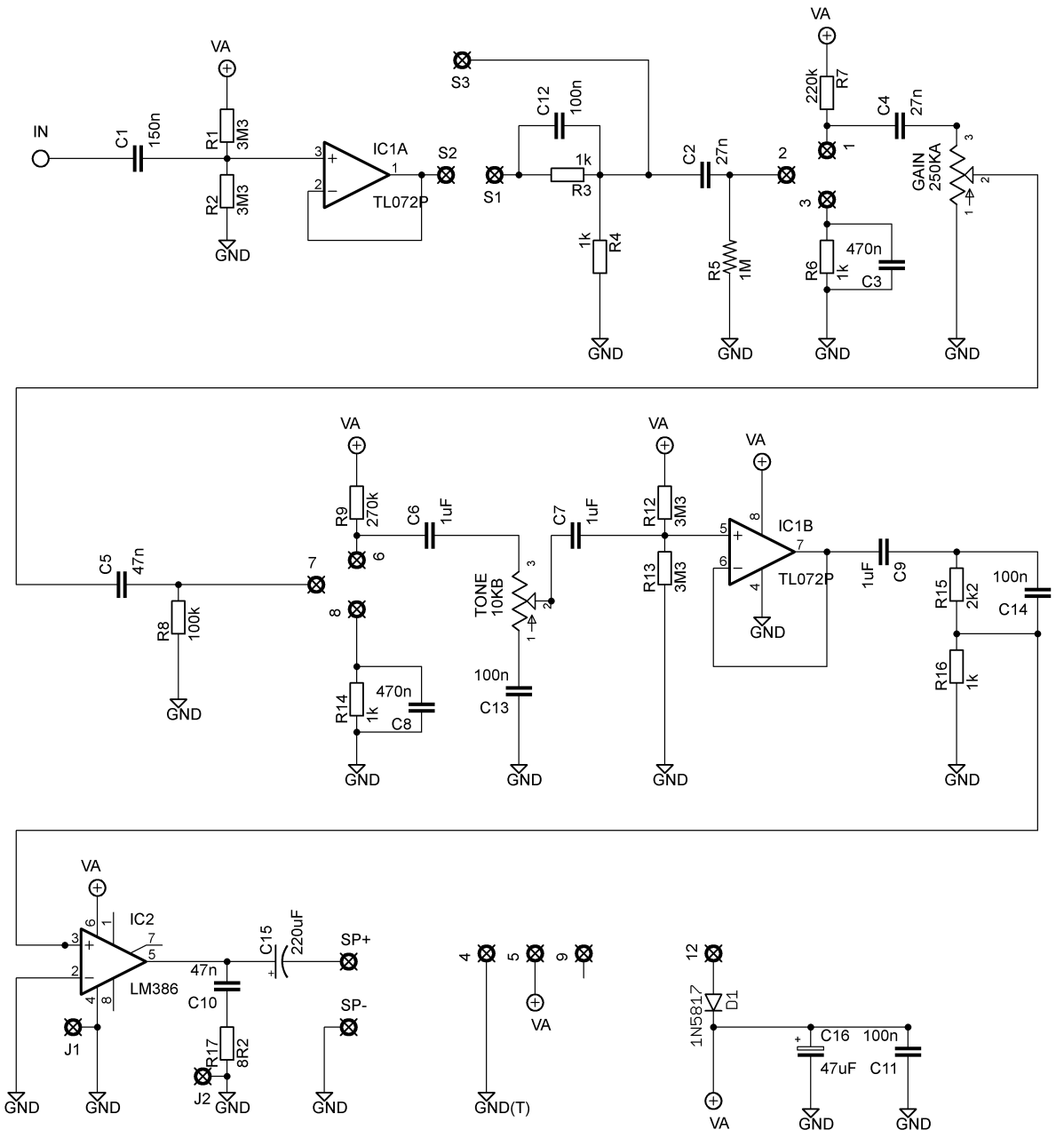
I recommend using the LM386N-3 or N-4 Amplifier. Note: There are the N-1 is also available, but has lower power output. These amps will allow you to match with various speaker loads of 4-16 ohms impedance no problem.

LOUD SPEAKER:

I recommend AT LEAST a 2.5 Watt speaker load from 4-16 ohms impedance. (Preferably 4 Watts or higher.) Why? Even though the amplifier only outputs about 1 Watt RMS, there are huge inconsistencies with the ratings of speakers, from company to company and model to model, performance and power handling can vary regardless of the 'stated' power handling. (Feel free to do your own reading on this topic.) I got lucky when I bought a bunch of old 3" drivers online for only a $1... they happen to sound superb! I have tried various hifi speakers with mixed results... ideally an 8-12" guitar speaker would be a good choice to match the amplifier. Bottom line is the speaker choice is a huge factor in getting a good sound from this circuit.

TONE TWEAKS:

Depending on your tube, guitar and speaker choice you may wish to tweak the tone a for a little more bass. The first place I would start is with C14, maybe reducing it to 82n... you could go lower to 68n but it will drive the power-amp harder the lower you go. If you are getting 'flubby' distortion in the preamp section you could try reducing C1 to 100n. I had this on the breadboard for a few weeks tweaking with my different guitars and speakers so hopefully it works for you with the original values, and remember there's always the 'Bright/Fat' switch to help tone tweak too.



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TITLE: 12AU7_386AMP Rev2	
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COMPONENT VALUES:

R1 1M
R2 1M
R3 1k
R4 1k
R5 1M
R6 1k
R7 220k
R8 100k
R9 270k
R12 1M
R13 1M
R14 1k
R15 2k2
R16 1k
R17 8R2 (1W)

GAIN 250KA
TONE 10KB

D1 1N5817

C1 150n
C2 27n
C3 470n
C4 27n
C5 47n
C6 1uF
C7 1uF
C8 470n
C9 1uF
C10 47n
C11 100n
C12 100n
C13 100n
C14 100n
C15 220uF (16V or higher)
C16 47uF (25V or higher)

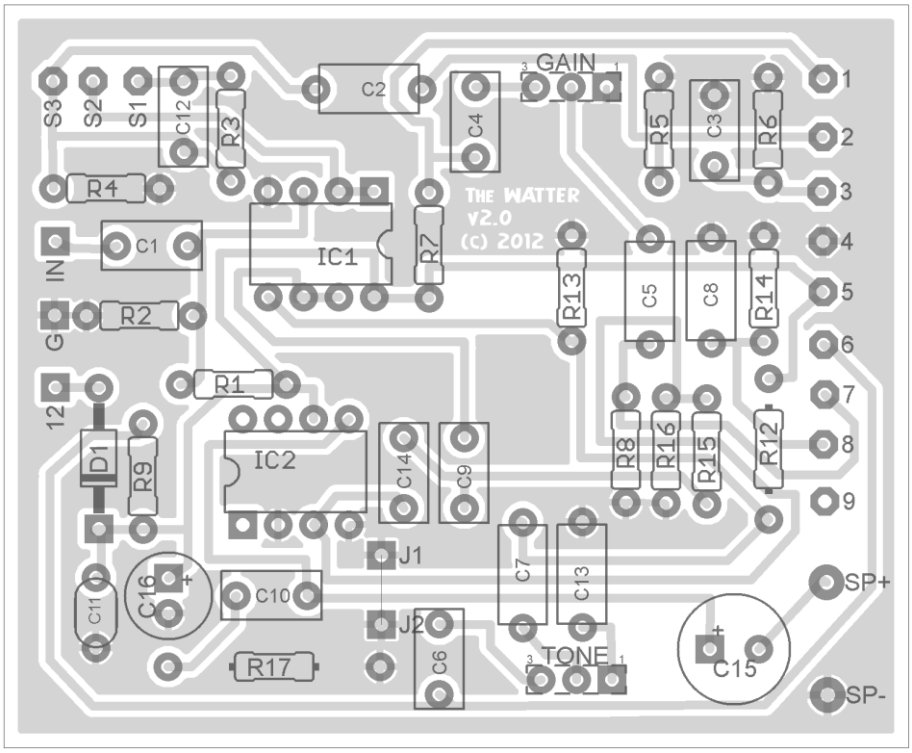
IC1 TL072
IC2 LM386
Bright/Fat Switch: SPDT On-On

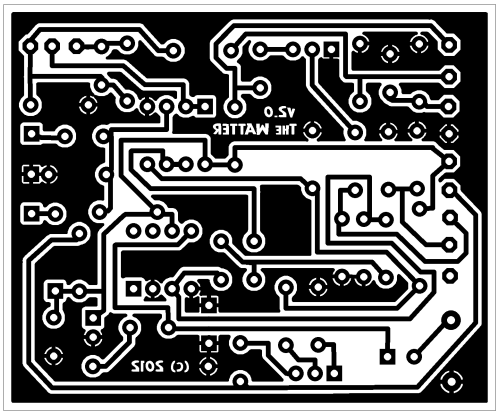
NOTES:

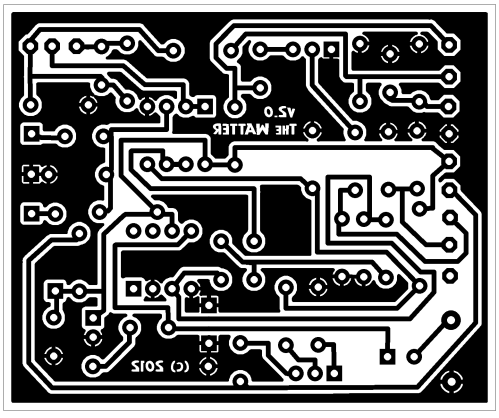
J1-J2 is a jumper wire
'SP+' is hot speaker connection' SP-' is ground speaker connection.
S1,S2,S3 is for SPDT switch wiring, S2 is the middle lug
Pads 1-9 are tube pins: I used ribbon cable to connect the pcb to the tube socket, **pin 9 isn't required so you can leave that disconnected if you wish**
For Capacitors you can use the box film type, or whatever you prefer as long as they have minimum 16V rating.
C16 should be 25V electrolytic (minimum), C15 can be 16V electrolytic (minimum).
All resistors 1/4 watt except R17 which is 1 Watt.
Run it from a regulated 12VDC supply. Mine draws a little over 200mA, YMMV

Video demo of my build here
Pics here

Enjoy and post build pics!!!! :D







Single sided for etching: 66x54mm (including borders)