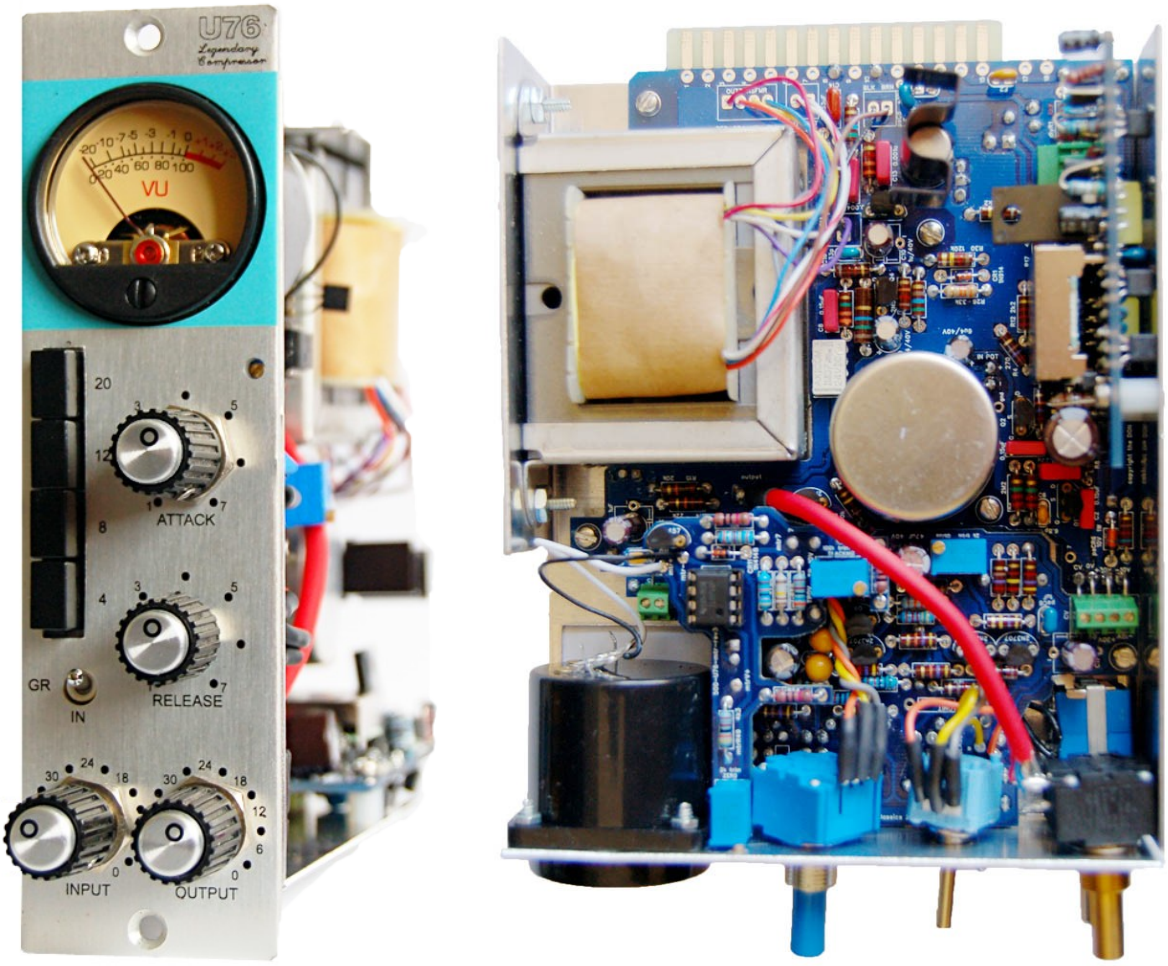
the DON classics

www.thedonclassics.com

U76

(blue face - rev A)
ASSEMBLY GUIDE
REV: 1:04



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QUICK ASSEMBLY GUIDE

9 STEPS TO COMPRESSOR HEAVEN!

1. **Solder parts on PCB**
2. **Wire pots**
3. **Solder transformers and meter**
4. **Place PCBs in metal work**
5. **Insert transistors & op-amp**
6. **Initial test**
7. **Match and insert FETs**
8. **Test and calibrate**
9. **Attach face plate & knobs**

Compress!

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Frequently Asked Questions (FAQ)

Q. ***What is included in the kit?***

A. Everything included on this page is included in the kit from us.

Q. ***What other orders do I need to make?***

A. You need to make 2 other orders as detailed on this page.

Q. ***Is there a schematic that would be useful?***

A. For reference you can download the U76 schematic from the DON classics website. U76 Schematic
PCB designations reference this.

Q. ***Which Lunchbox can I use this with? API? GDIY?***

A. Both!
If you wish to use this with a GDIY lunchbox then you do not need to cut the extra gold pins off.

If you wish to use a normal API standard lunchbox, you must cut the extra gold pins off.

Q. ***Who can build this?***

A. You!
As long as you have patience and are thorough in your work, anyone can build this classic compressor. There's lots of support and information and it is tried and tested.

Q. ***How close to the original does it sound?***

A. Spot on. We have chosen not to do any “new and improved” updates on a circuit that sounds so good. We have chosen the same parts that was used originally and recommend this. The only change we've made is to use the meter circuit off the rev F version as it's not in the signal path and is more stable so won't drift as much over time. It's also on PCB pins so you can remove it to check if you don't believe me ;)

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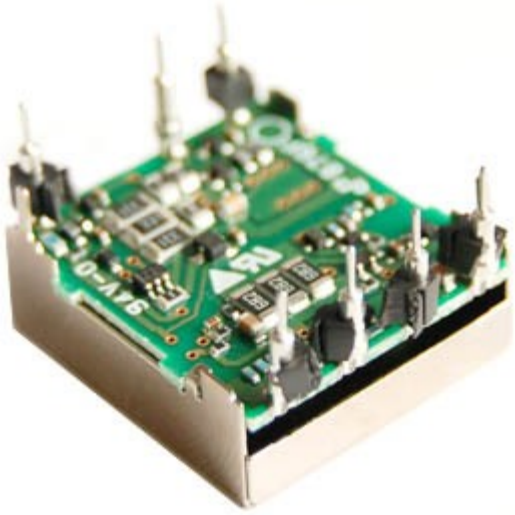
1. Solder parts on PCB

Insert all parts on to the PCB as marked on the silkscreen.
Silkscreens can be downloaded here: silkscreens.zip

TIPS:

- Start with smaller parts (resistors etc.) and work up to the larger parts (caps etc.)
- Solder sockets for transistors on all boards apart from the ***PS16Vto30V*** PCB.
- Fit bottom parts first as they'll be less room to solder up top.
- dlyR1 is 62k (as stated inside the box, not outside the box!)
- R64 – solder before the switches for more room
- 2k trim pot with screw on the end needs to be on the ***Meter*** board
- 2k trim pot with screw on top needs to be on the ***Control Amp*** board
- Where there is a choice of metal film or carbon comp.. always fit the carbon comp on the ***Control Amp*** PCB and ***Main*** PCB. Leave the metal film for ***Meter*** PCB or part designations beginning with "dly"
- Solder U1e, Q3e and U2f to the bottom of the board for more room
- Make sure no parts on the bottom of the ***PS16Vto30V*** or ***Main*** PCBs extend over the 6.35mm standoffs.
- Make sure no metal legs protrude over the edge of the ***PS16Vto30V*** PCB
- Place green molexs on the ***CA*** board and ***PS16Vto30V*** PCBs. Not ***Main*** PCB.
- Place transistor sockets on all DC/DC converter legs before soldering to PCB... (as shown below)



PCBs should end up looking like this...

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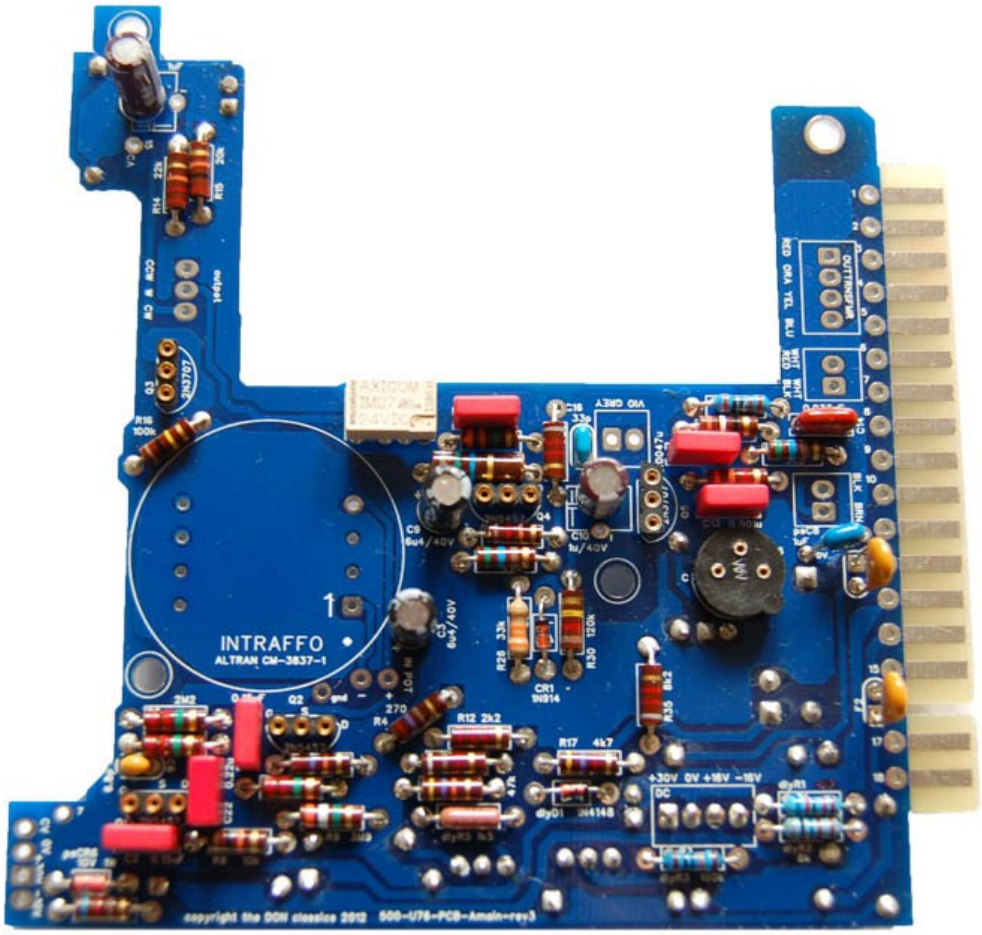
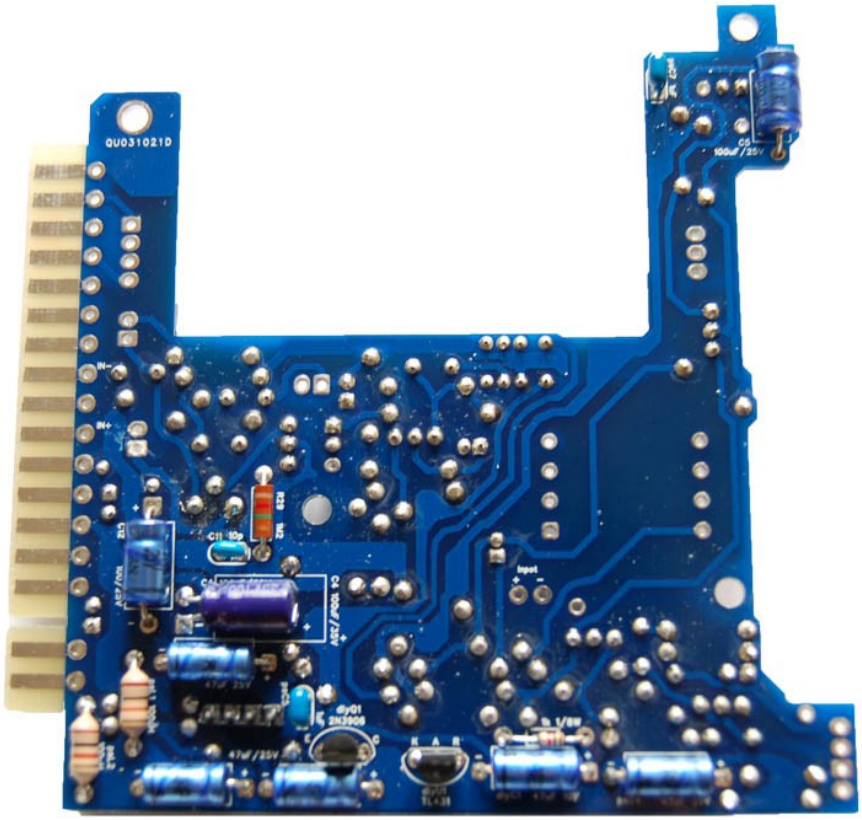
Main PCB





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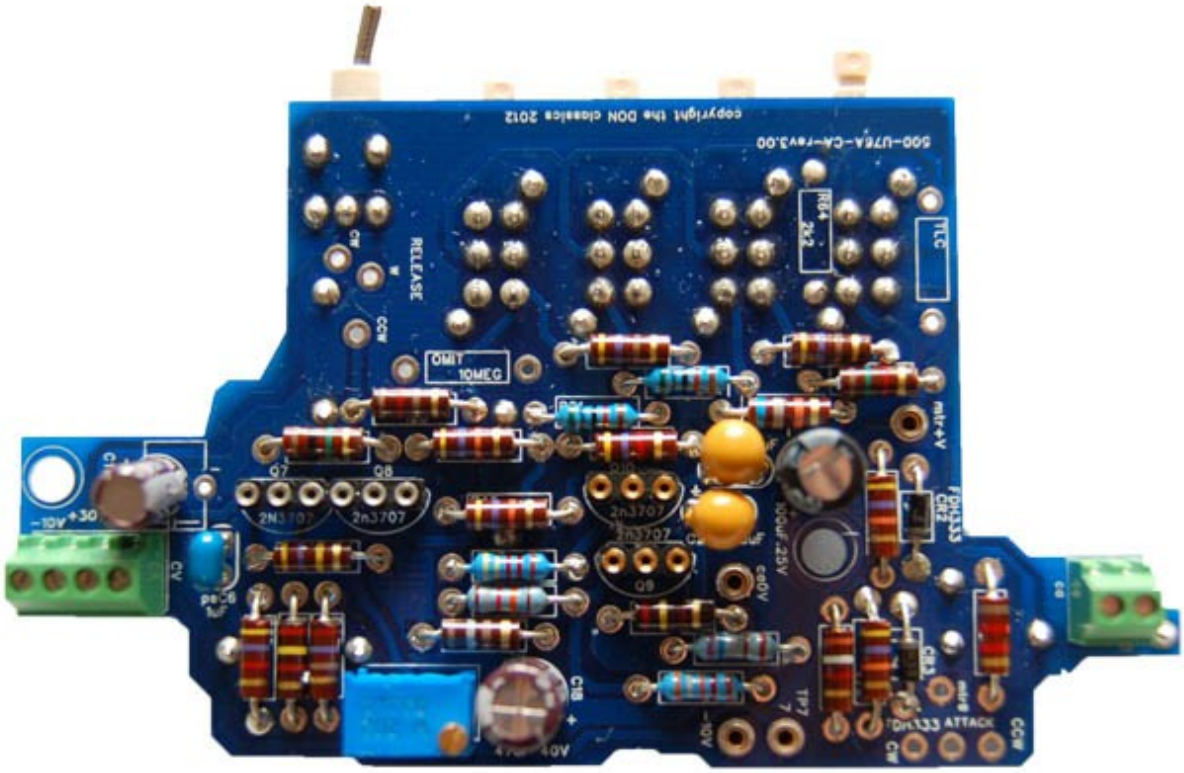
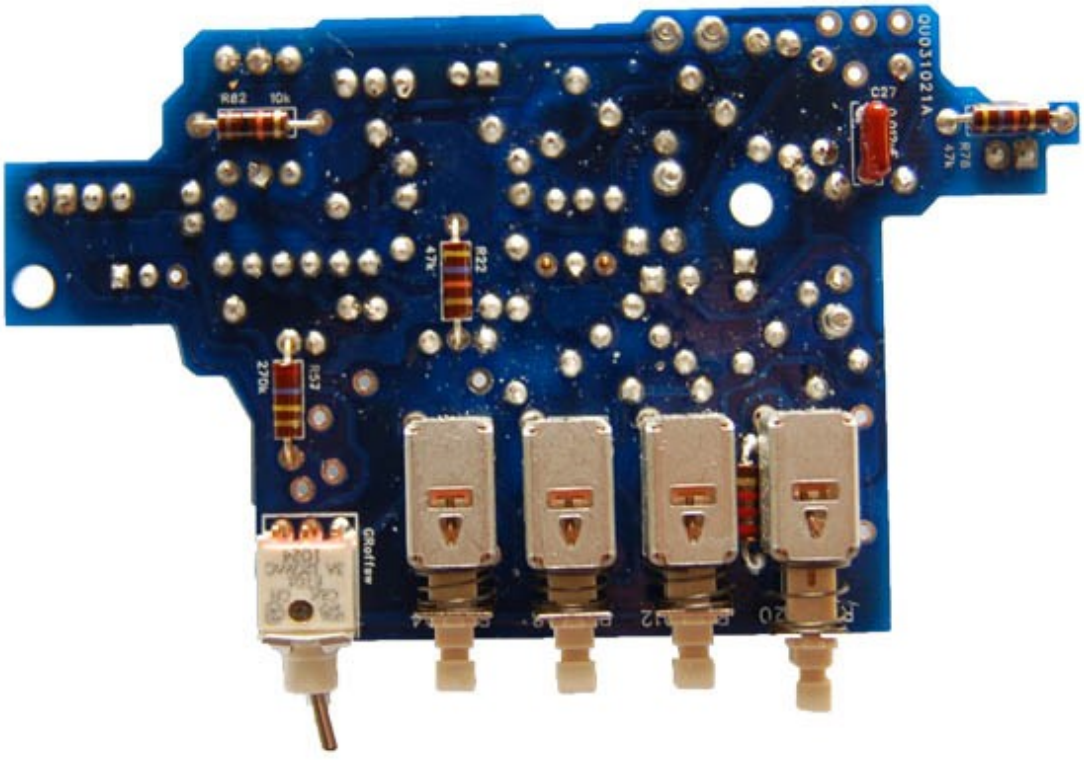
Control Amp PCB (CA PCB)





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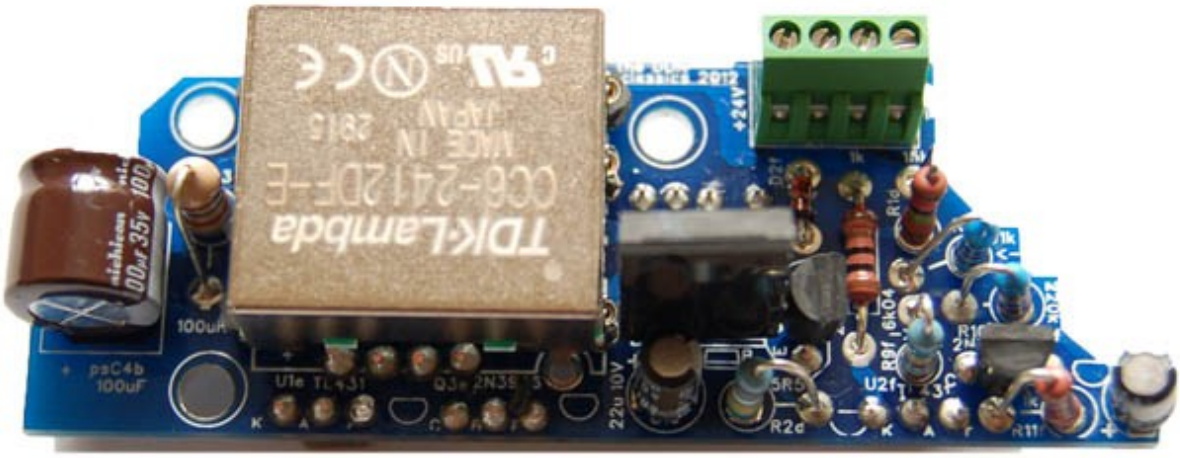
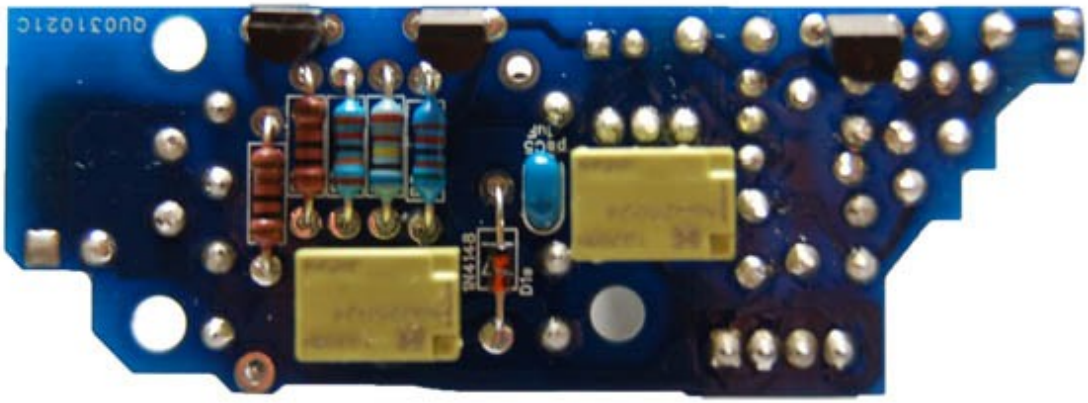
PS16Vto30V PCB





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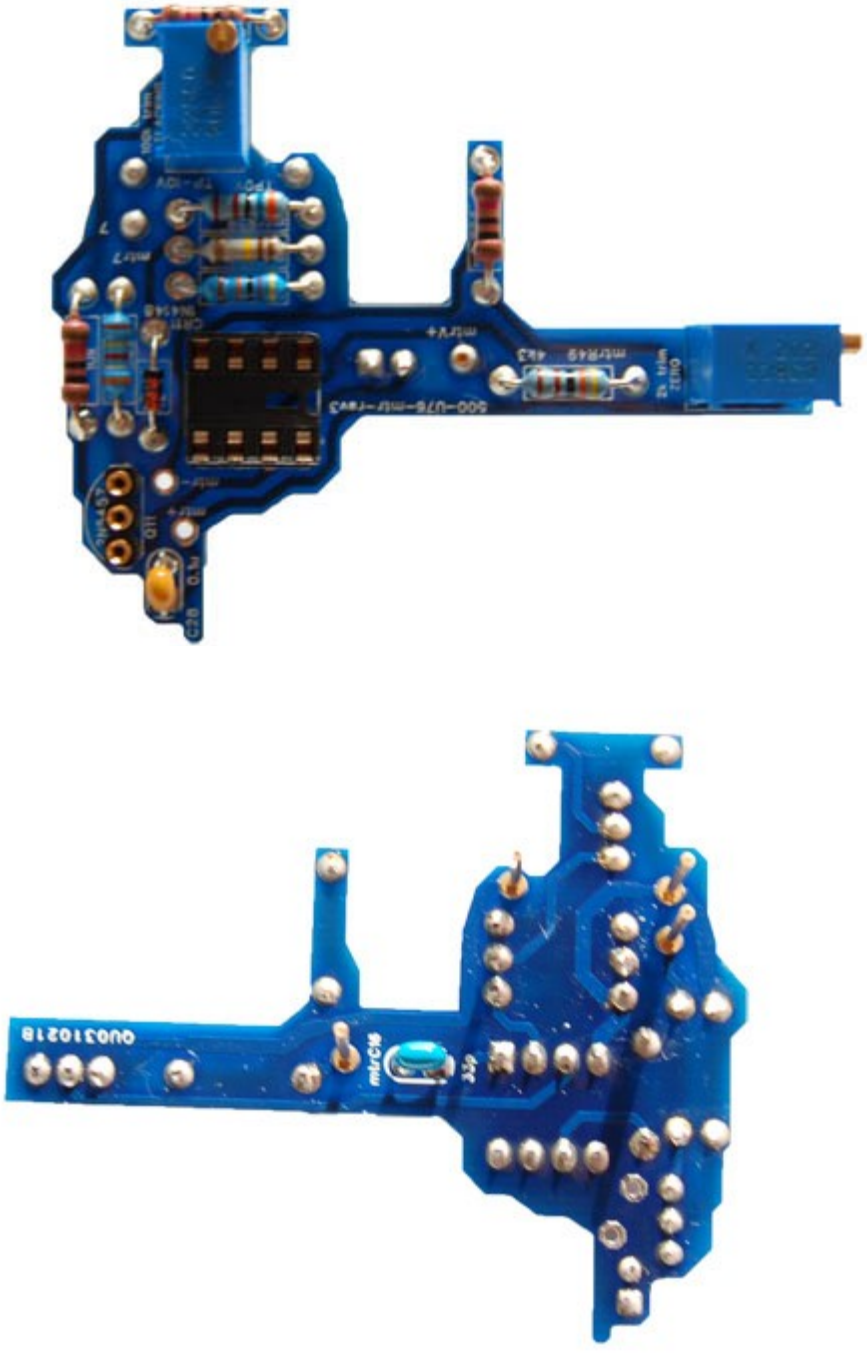
Meter PCB



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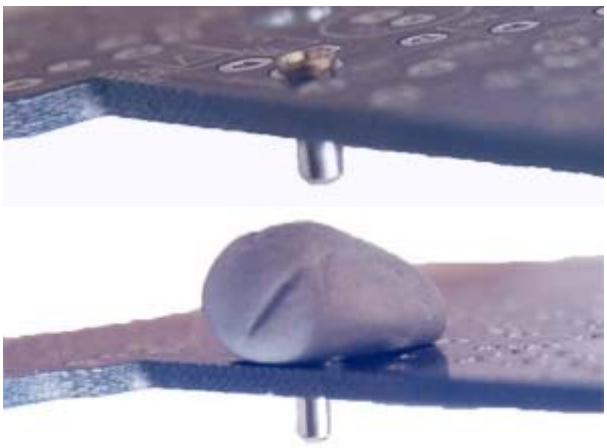
PCB pins and sockets assembly:

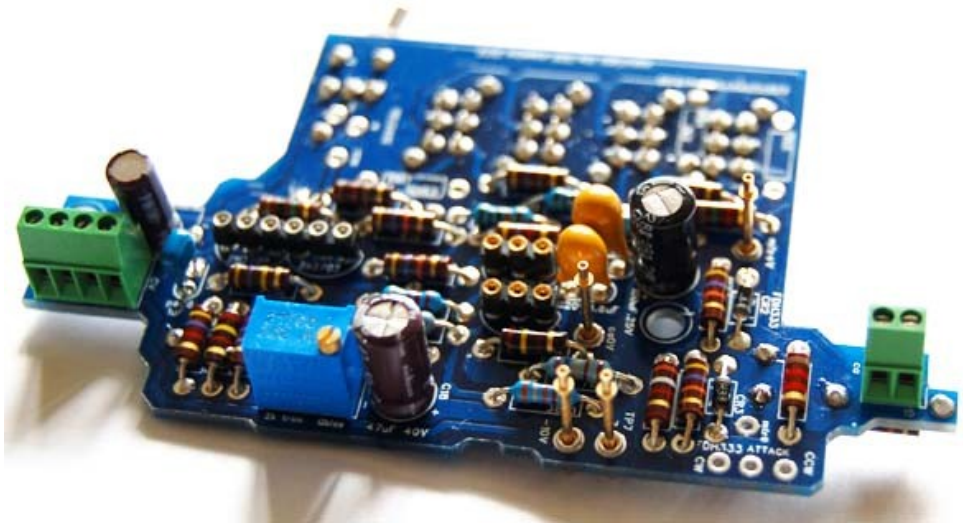


To solder the *CA PCB* sockets:
Insert the 4 PCB sockets as shown.

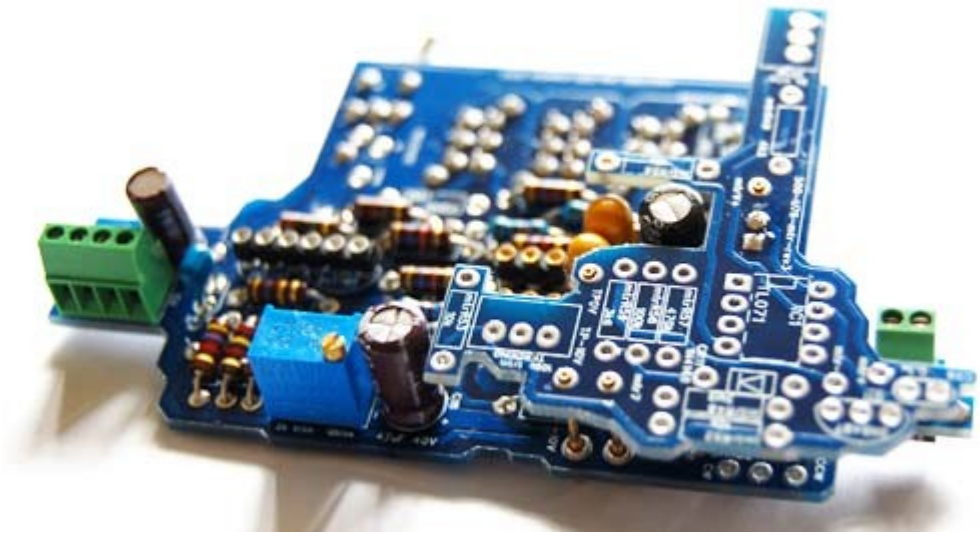
Hold the sockets in place from the top of the PCB (blue-tack or tape is good for this)

Then solder from the bottom of the PCB.

To solder the *meter PCB* pins: Insert the 4 PCB pins into the already soldered *CA PCB* sockets as shown.



Place the *meter PCB* on the pins as shown and solder from the top.



Remove and continue stuffing the rest of the components.

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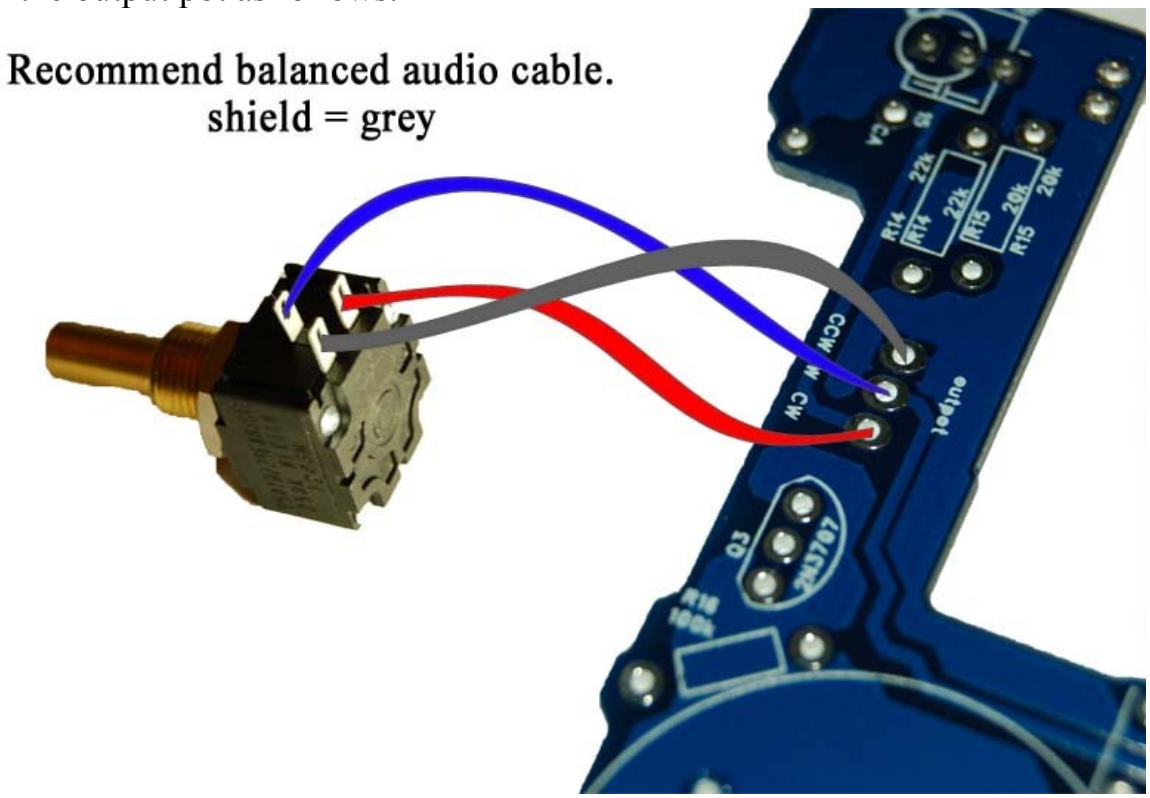
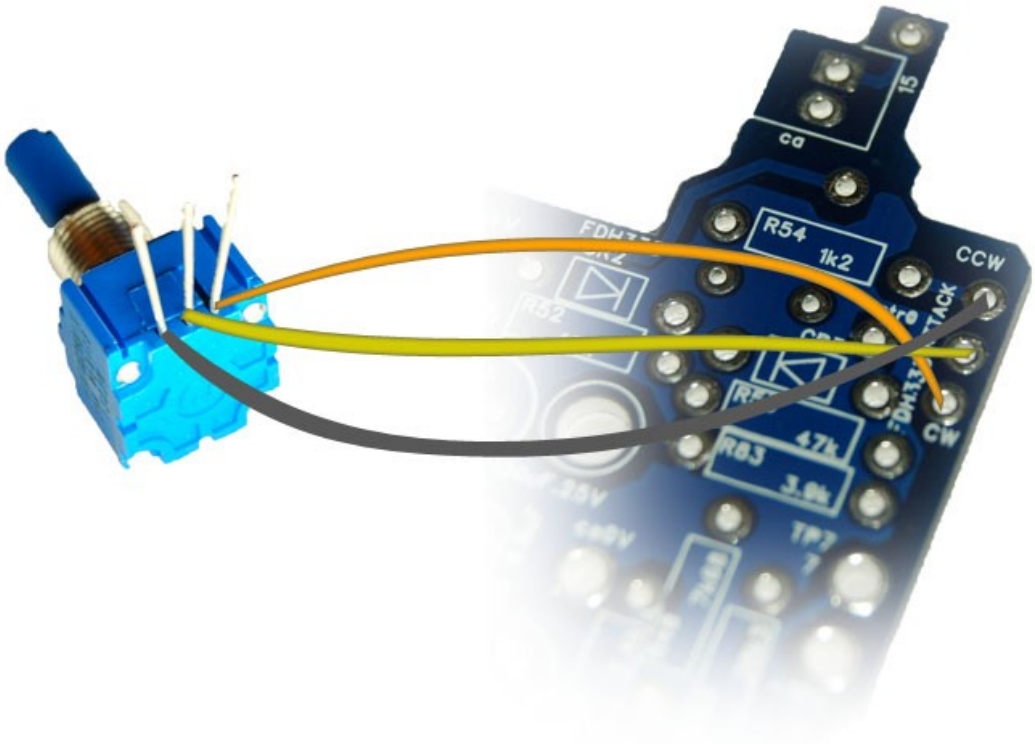
2. Wire pots

Solder the output pot as follows:



Solder the attack pot as follows:



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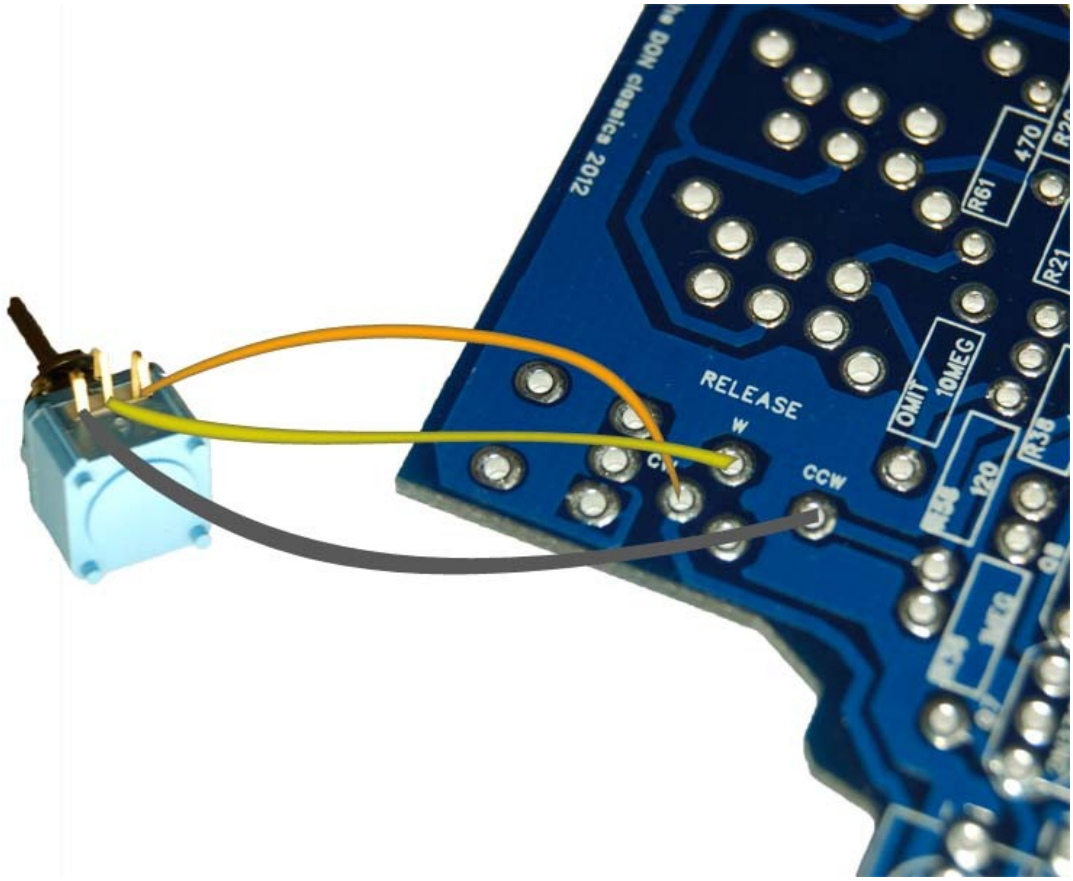
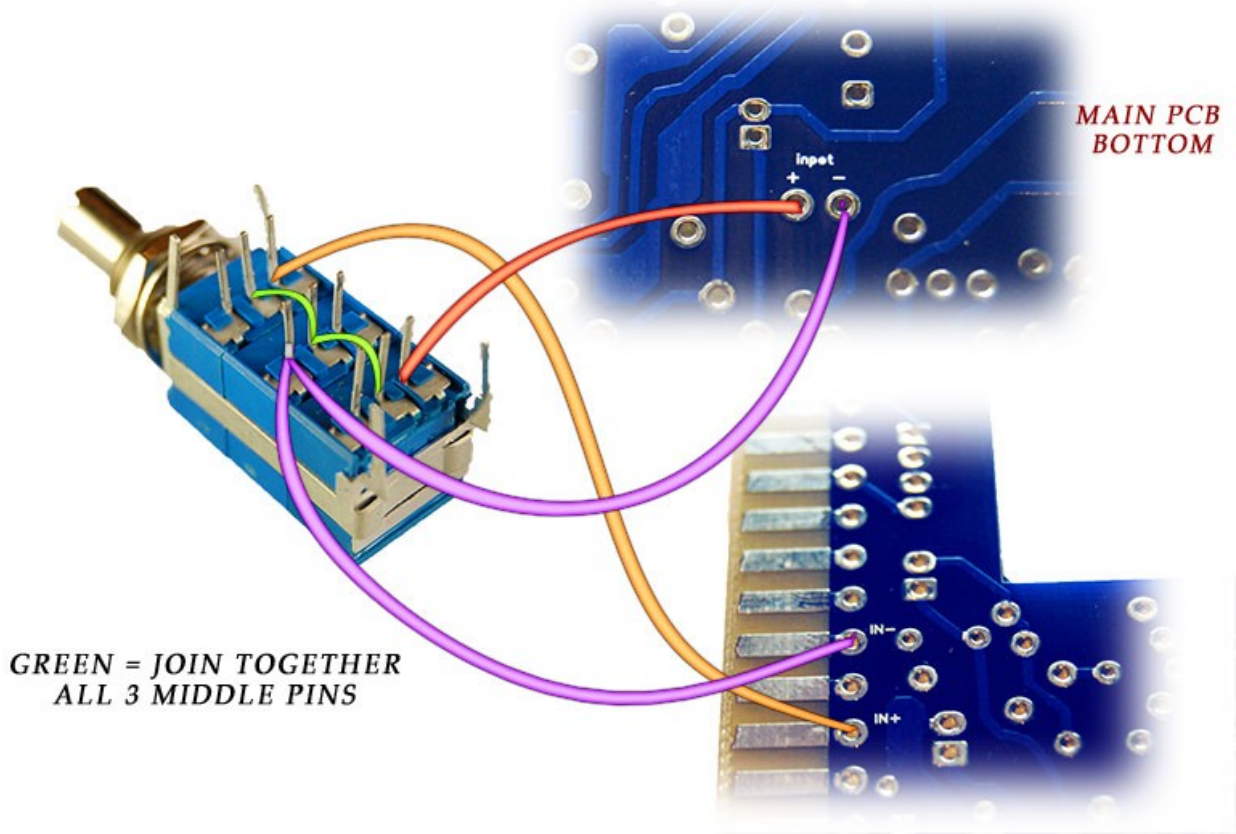
Solder the release pot as follows:



Solder the input pot as follows:



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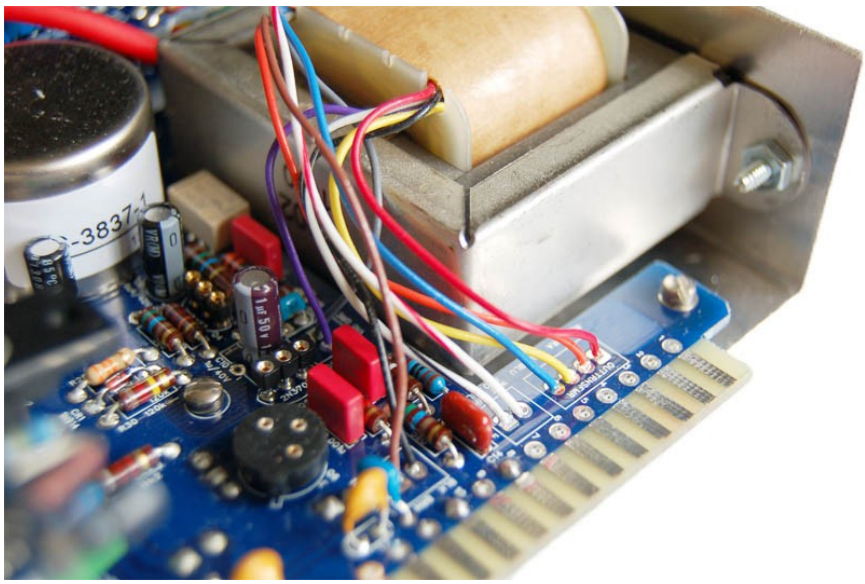
3. Solder transformers and meter

Solder the C-3837-1 lining up the dot.

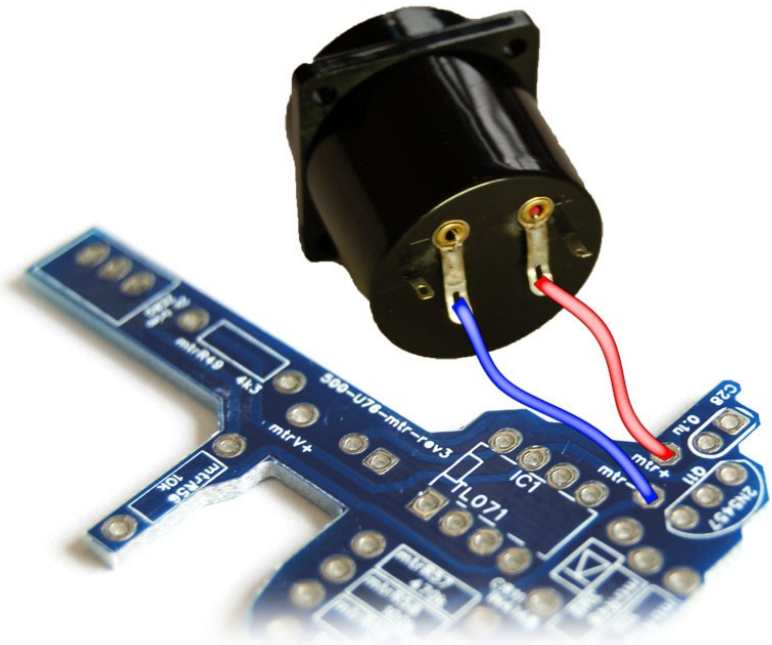
Solder the 5002 wires straight to the board. Keep wires fairly tight so they won't hang outside the metalwork. Follow colour coding.

NOTE: Due to an incorrect updated PCB silkscreen, if using *rev3 main PCB* then swap the red and blue wires on the PCB **OR** your unit will flip polarity. *(It doesn't affect sound and will only be a problem if using parallel compression etc. You can rectify by flipping polarity in the DAW or by using a polarity reverse cable – apologies for any inconvenience. Luckily as they're close to the edge of the PCB, you can desolder and rectify without removing PCB)* All other PCB revisions are correct.



Revision4 main PCB shown above. If using *revision 3*.. Swap the red and blue wires.

Solder the meter in.



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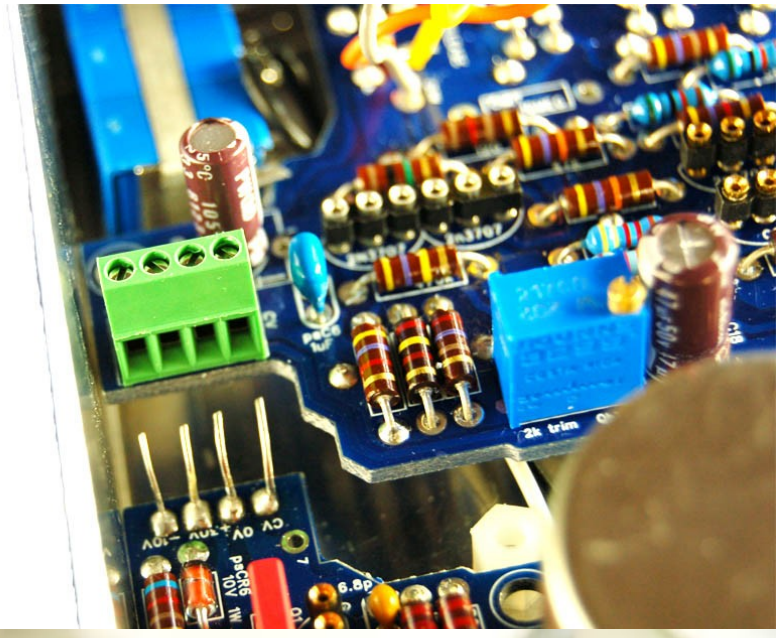
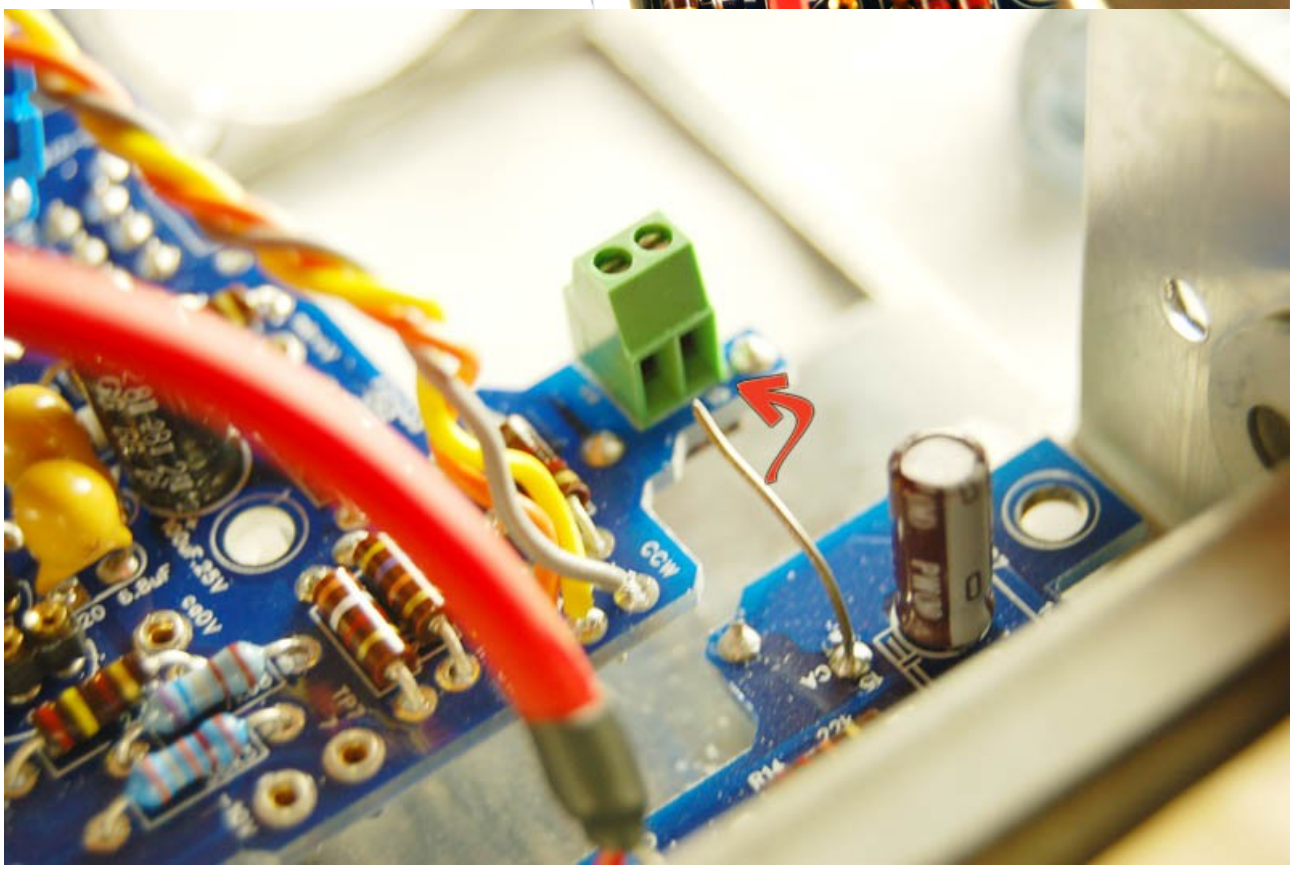
4. Place PCBs in metalwork

Cut off the 2 extra gold fingers on main PCB if not using 51X GDIY lunchbox.
Leave main PCB as it is if using 51X GDIY lunchbox.

Insert PCBs into the metal work. You can use resistor legs to join the main PCB to the two molexs on the CA PCB.





CA is connected to the right hole as shown. (marked 15 on PCB shown above)

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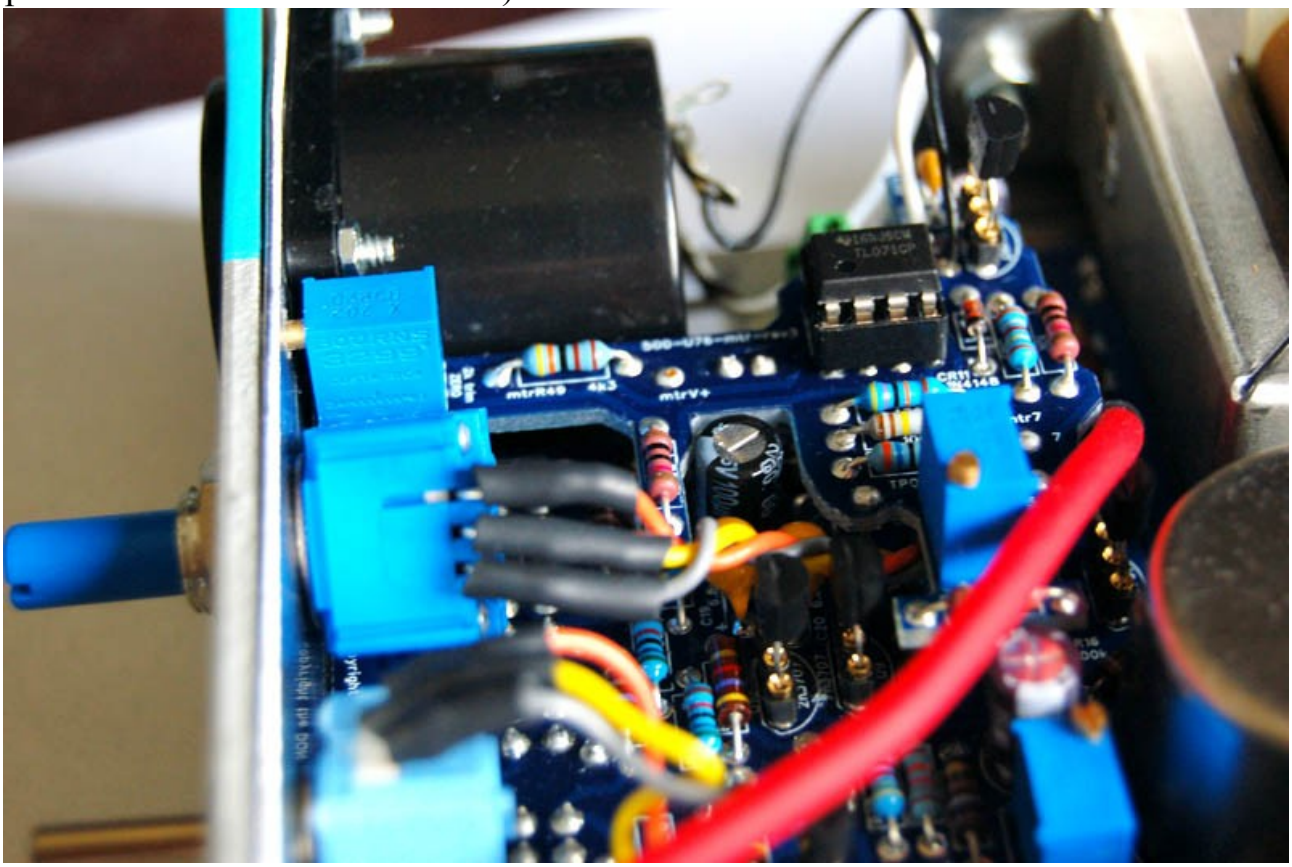
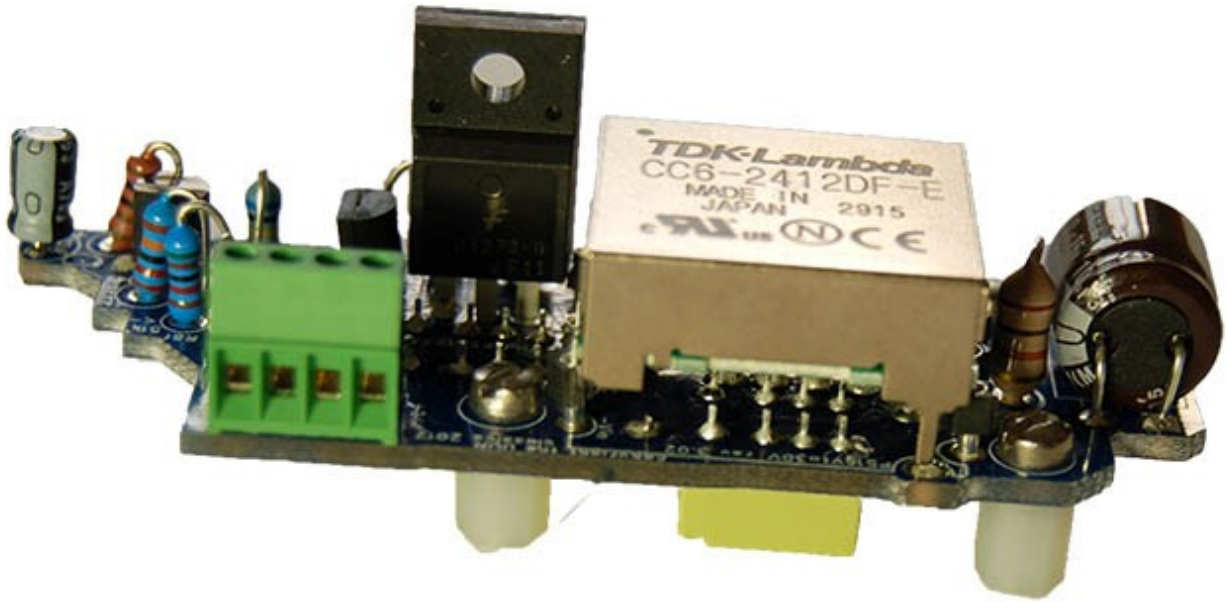
Line up the meter PCB so that the 4 legs are above the respective PCB sockets on the CA PCB. The trim pot screw should line up to the front panel. (as shown in the picture of the finished unit below)



Next we will attach the PS16Vto30V PCB.



Fasten the 3 standoffs to the PS16Vto30V PCB as shown.

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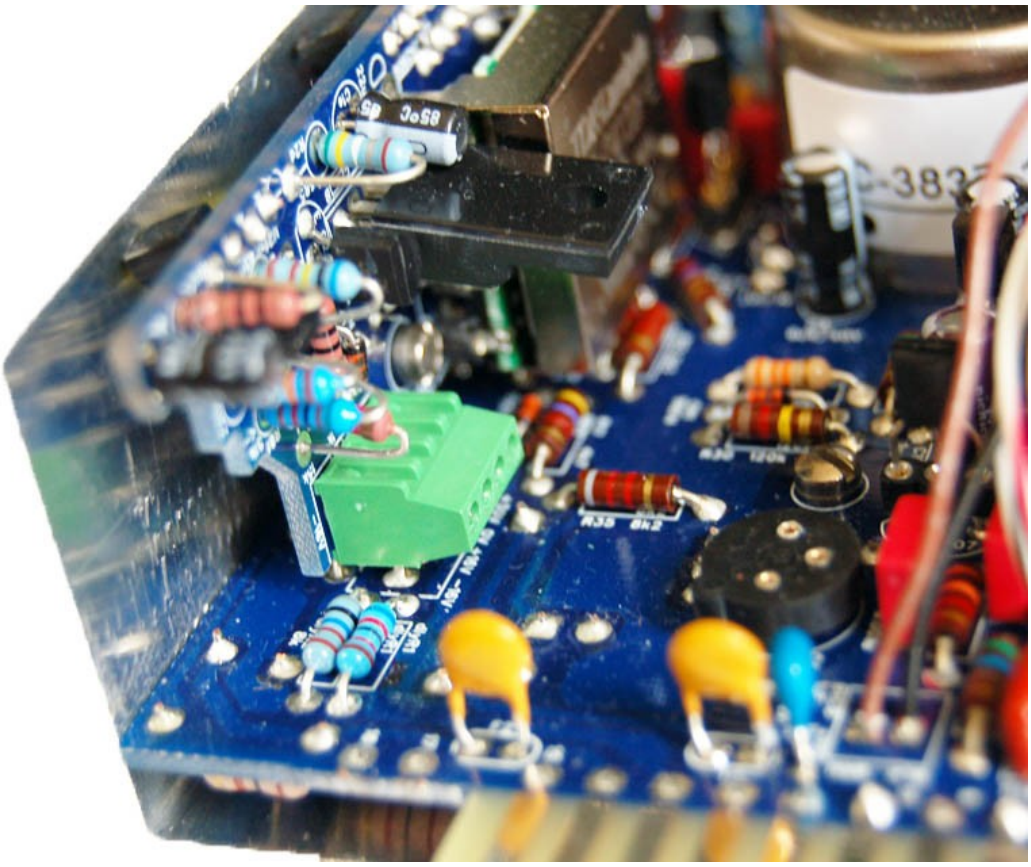
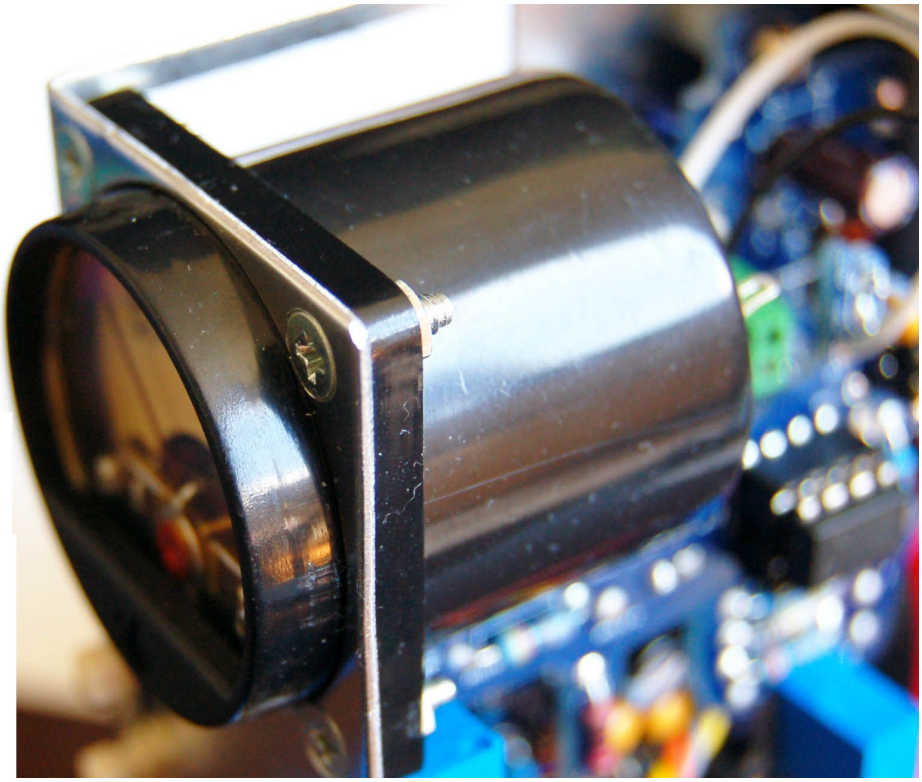
Screw it into the metal work as shown and then tighten the green molex screws.



Screw meter into metal work using 4 long countersunk screws and 4 small nuts.



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5. Insert the transistors & op-amp

*** Make sure to check transistor orientation ***

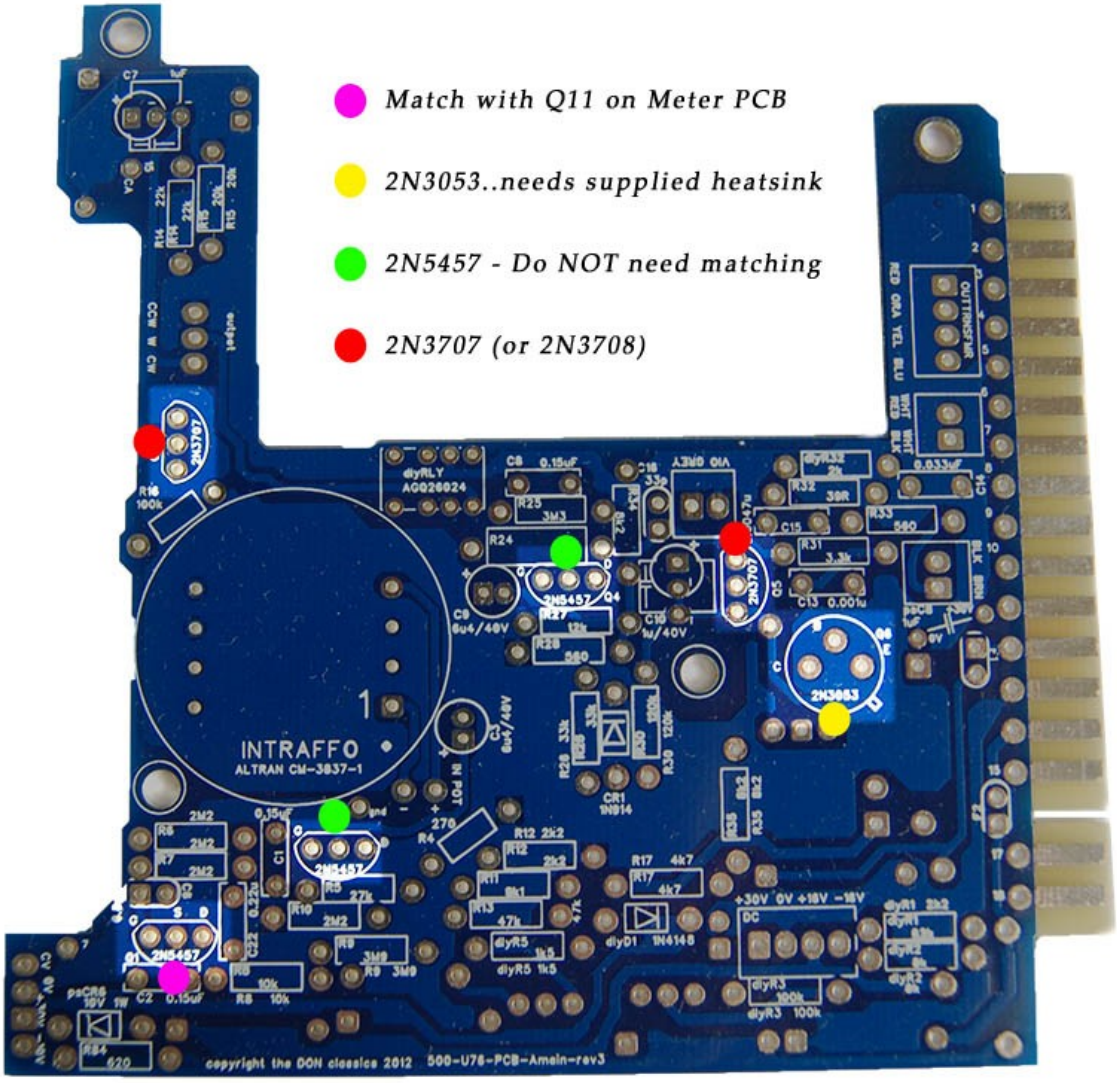
Leave out Q1 and Q11 FETs for now.

Insert all other FETs/transistors into the sockets.

The CA PCB is all 2N3707. (Can also use 2N3708)
The 2N3053 (Q6) needs the heatsink provided.

Insert op-amp into its socket on the meter PCB.

*** Make sure to check op-amp orientation – the dot should be closest to front panel ***



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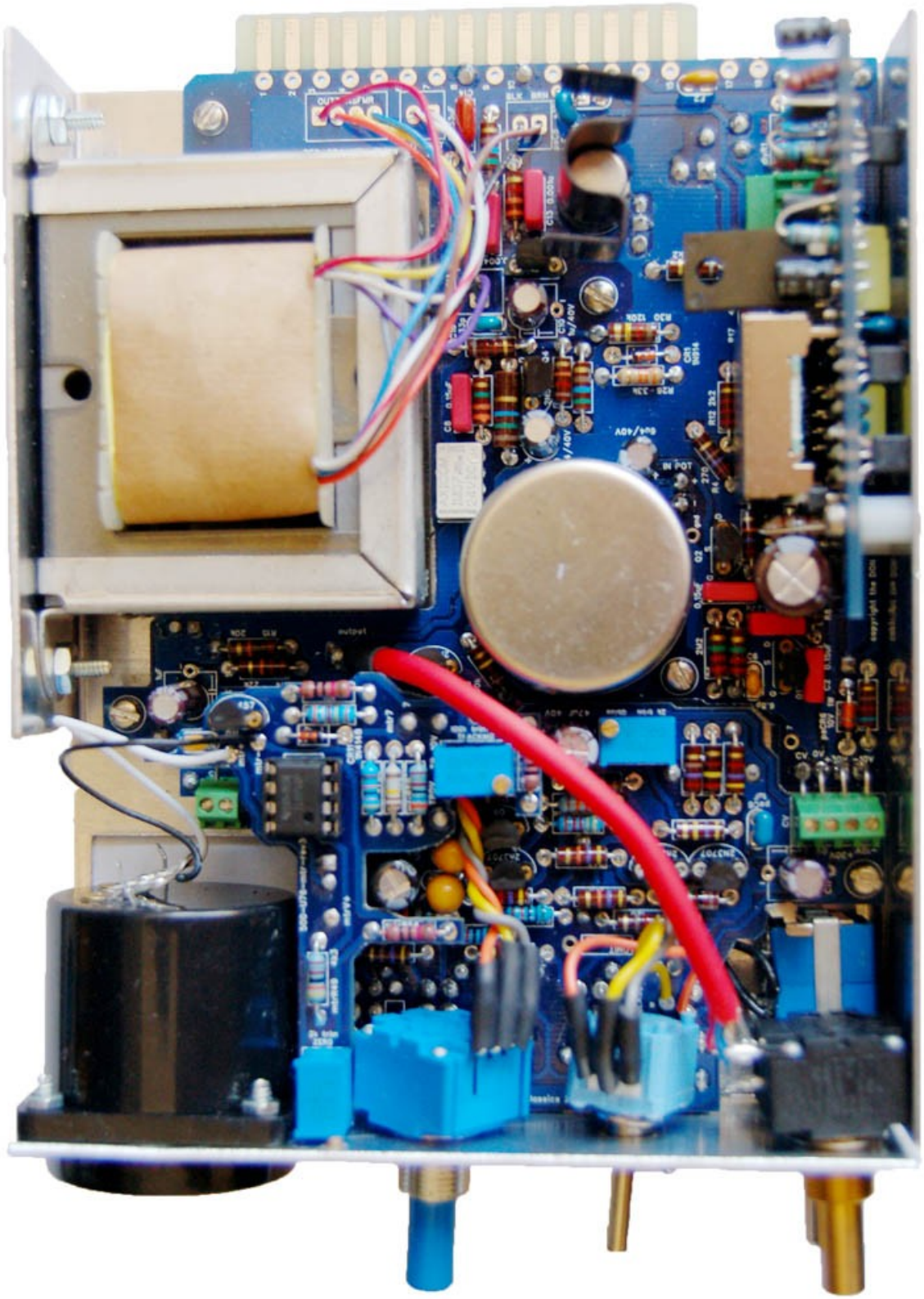

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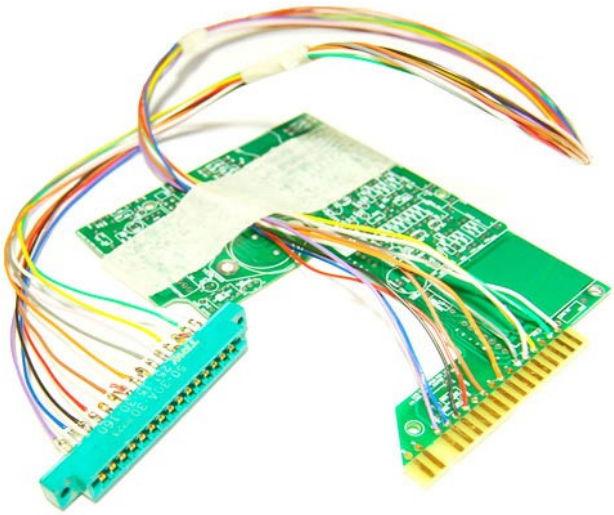
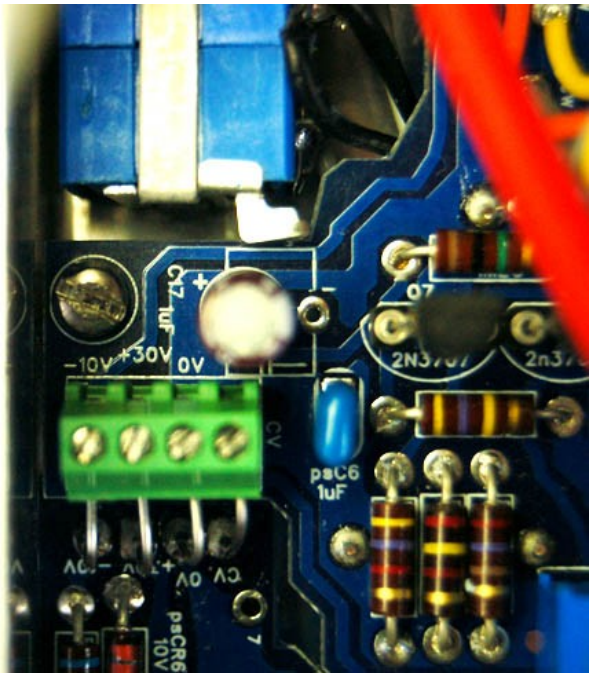
6. Initial test

For initial tests, it may be worthwhile to build or buy a little jig to test units without having to root around in a lunchbox. eg. An EDAC attached to long wires attached to a PCB with the 15/18 gold fingers to insert to the lunchbox.
(One source of card edge connectors and edge adapters is Jeff's excellent store classicAPI)



Before turn on - Make sure there is no shorts between the power rails. (pin 12, 13, 14)
Don't insert the 2 FETs in case there is any problem on turn on.

Turn the unit on. You should notice a little squeal from the start up circuit turning on. This is normal and will stop after a couple of seconds.



Once the unit is on, measure to make sure you are reading +30V and -10V.
You can check on the CA PCB molex.

Run some audio through the unit with GR off and check that it sounds good and the gain controls work correctly.
You should get about 50dB gain with pots up full.

Make sure there is no buzz or hum from the unit.

Turn off and move to the next step.

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7. Match & insert FETs

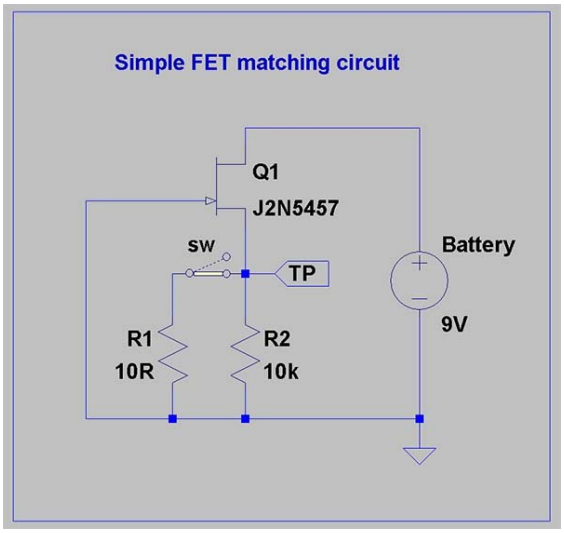
The reason we match FETs (Q1 and Q11) in a unit is so the meter will track properly. (So it is non critical to the sound, but necessary if you plan to use the meter!)

If you have bought matched FETs then just insert them and move to step 8...

To match FETs, you need to build a simple jig...

There are many ways to match FETs... such as on the great site:
AXT systems

If you are unsure of the one above and want a very basic circuit, a circuit proposed by PRR of groupdiy.com is a very easy circuit to match FETs:



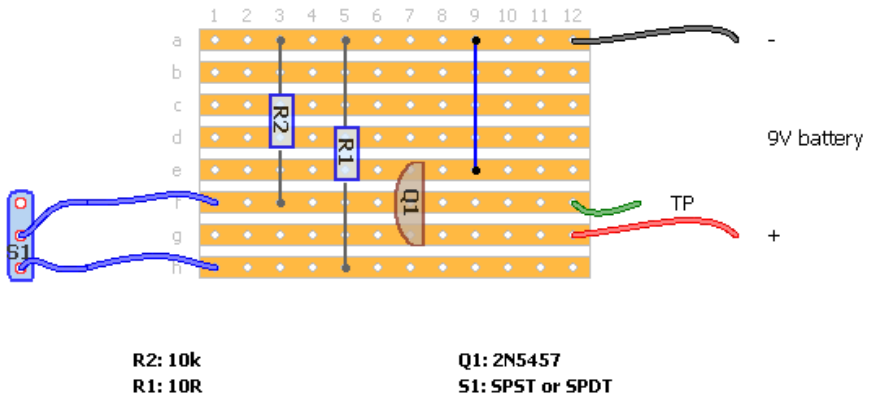
Use a socket for the FET. TP = test point (negative probe on ground, positive probe on TP)

Measure the voltage with the switch open, then again with it closed. Write down the voltages. When you find two FETs with similar results, you've found a match.

Easy!

simple FET matching

TP = testpoint.. black and red = 9V battery.. blue = switch



R2: 10k
R1: 10R

Q1: 2N5457
S1: SPST or SPDT

Created with freeware DIY Layout Creator by Storm Software
http://www.storm-software.co.yu/diy/

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8. Test and calibrate

Once you have inserted your FETs, you are ready to set up and calibrate.
Allow the unit to warm up for 10mins before adjusting.

TIP: *To monitor levels, you can use your DAW meters, or a VU meter plug-in is handy. For example, ProTools Bomb Factory VU meter at -18dB setting makes a perfect VU meter for our purposes.*

- **"Q" bias setup:**

Most important set up for the compressor to function right.

Set up pots as follows:

Input:	Fully CCW
Output:	Fully CW
Attack:	Fully CCW
Release:	Fully CW
GR switch:	OUT
Ratio:	20:1
Q-Bias (2k trimpot, CA PCB)	Fully CCW

From your DAW, insert a 1kHz -18dBFS tone (0dBu, 0.775V). Turn up the input pot until in your DAW you read -17dBFS (+1dBu, 0.869V). You can do this using either the DAW meters or a VU meter plug-in.

What we now need to do is turn the Q-bias pot CW until we read the output as dropping 1dB back to -18dBFS tone (0dBu, 0.775V).

Once achieved, the Q-bias is set.

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- **Gain Reduction Meter Tracking**

To ensure the meter performs correctly. You need to repeat this a few times, due to the interaction of the adjustments.

Set up pots as follows:

Input:	Mid rotation
Output:	Fully CCW
Attack:	Fully CCW
Release:	Fully CW
GR switch:	OUT
Ratio:	20:1
Tracking (100k trimpot, meter PCB)	¼ from fully CCW

With no signal applied, adjust Zero pot (2k pot, meter PCB – accessible through front panel) until the meter reads 0.
From your DAW, insert a -18dBFS tone (0dBu, 0.775V).

1. Adjust output pot until in your DAW you read -18dBFS tone (0dBu, 0.775V).
2. Now turn on GR switch.
3. Observe what level drop is in your DAW. We're looking for a 10dB drop. If it's less, turn up the input a little and repeat the last 3 steps. If it's more, turn down the input a little and repeat the 3 steps.

When you have your 10dB drop, don't touch the input/output pots.

We now need to make the meter read a -10dB drop...

- With GR on, turn the tracking (100k trim pot) CW until the meter reads -10dB.
- Turn GR off, adjust the zero (2k trim pot on front panel) until the meter reads 0dB.

Due to the interaction of these two controls you'll need to repeat these 2 steps until both are correct.

- **Meter zero adjust:**

Allow the unit to warm up for 10mins before adjusting.

Every now and again the meter may need adjusting through the front panel.
With GR off, adjust until the meter reads 0dB.

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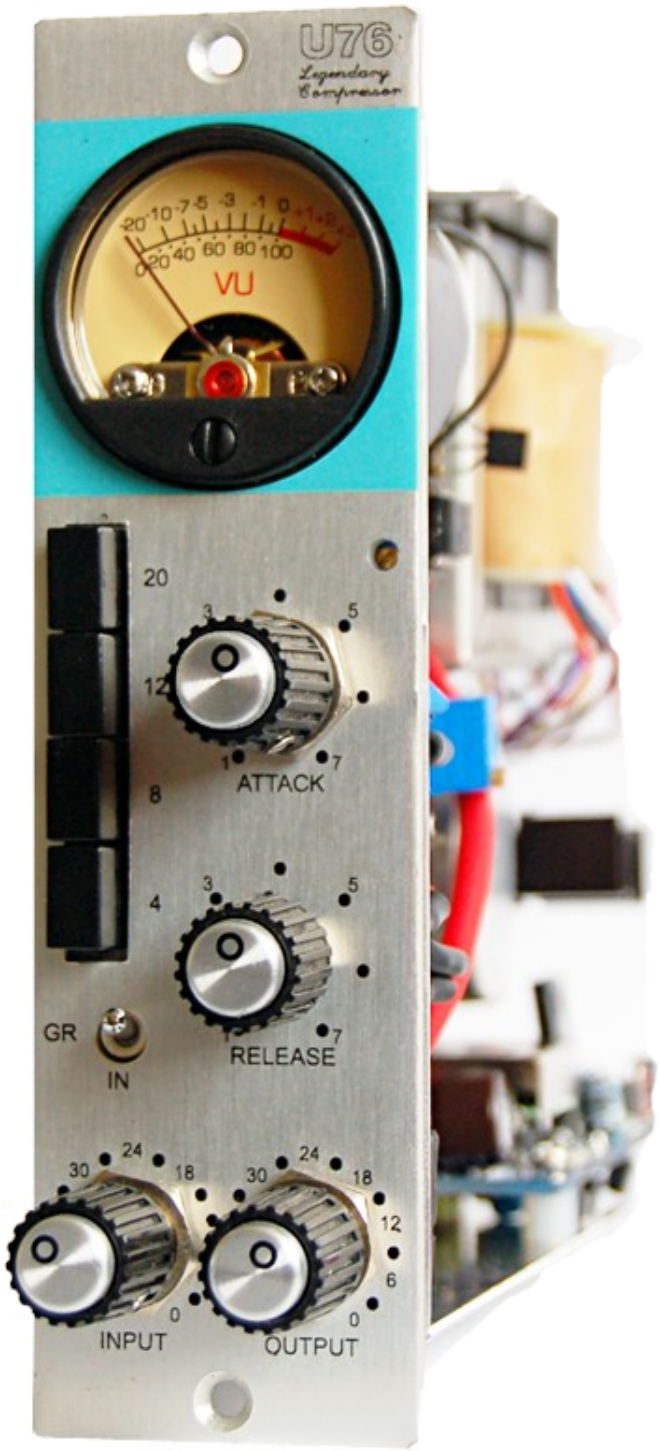
9. Attach front panel and knobs

Attach front panel. Screw pots to front panel. Break off pot tab and use lock washer on the inside of the L-bracket. Place the knobs on the pot shafts. To have knobs a little closer to the front panel, mark how much you need to cut off the pot shafts. Either carefully using a dremel, cut off the excess length of the shaft.. or remove front panel, and then cut off excess pot shaft lengths.

Once this is done, put the front panel on again, screw pots in, screw knobs on and you're finished!



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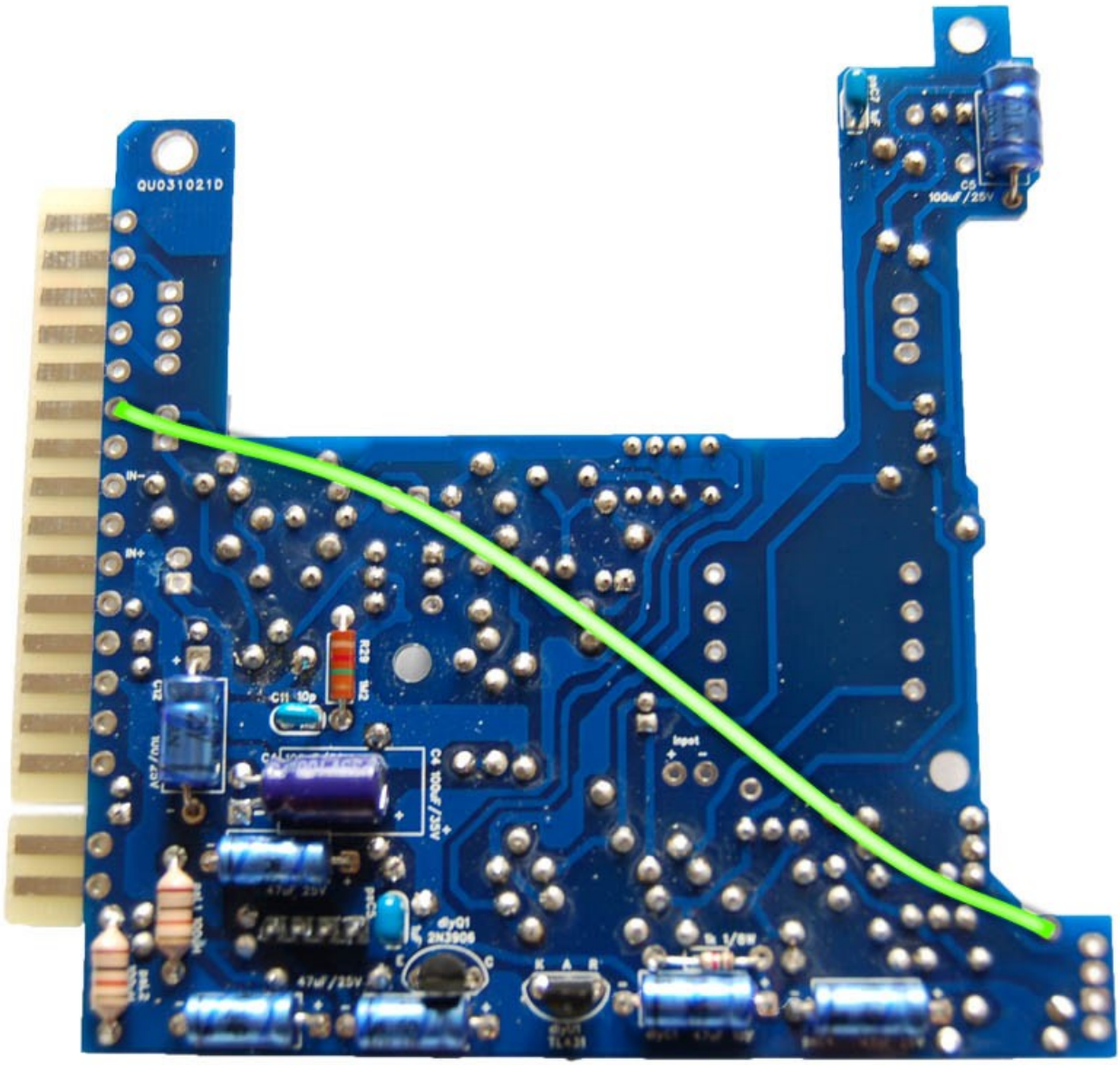
Stereo operation

For stereo operation:

Match 4 FETs together (for Q1 & Q11 on each unit).

Then just connect the 6th edge finger to the hole marked “7” near the CA PCB 4 hole molex.



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