

# VU meter buffer – technical manual

This assembly is a VU meter buffer, for driving a standard analog “VU” meter, with clips to mount on the back of a Nissei TN-73 meter. It is usually supplied with the meter.

## Specifications

### Input:

- Instrumentation balanced
- RJ-45 connector.
- 2 14 pin rectangular connectors in parallel for feedthrough
- Jumpers to select which input

### Calibration:

- Jumpers to select +4, -2, or -8 dbu nominal, with trim centered
- Adjustable -6db to +3 db relative to nominal

### Input impedance:

- 1 Megohm, -8 dbu
- 2 Megohm, -2 dbu
- 4 Megohm, +4 dbu

### Meter:

- Standard “VU” meter, 0 db = 0.775 V.
- NISSEI TN-73, illuminated

### Power:

- +15 v, 19 ma with LED
- +15 v, 4 ma without LED
- 15 v, 4 ma
- Either from 14 pin connectors or RJ-45, diode isolated

### Substitute parts:

U1 is LF353, TL072, or TL082. Any dual op-amp with matching pinout, preferably FET input, should work. If these are not available, try 4558 or 5532, which should work but may have a slight DC offset which may show as a residual meter reading.

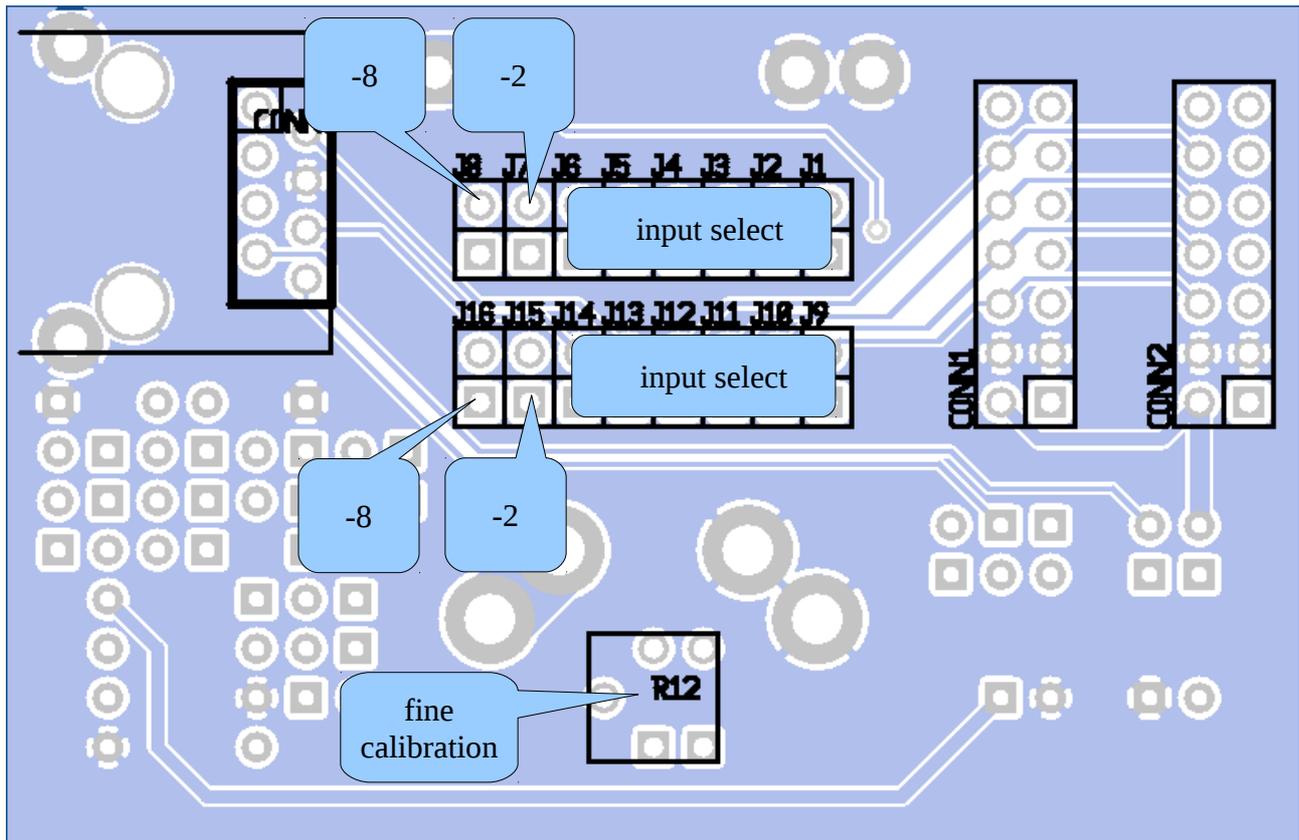
## Calibration

The trimpot R12 is for fine calibration. For standard calibration the trimpot should be set to the middle. All jumpers must be used in pairs, for both sides of the balanced input.

Jumpers J8 and J16 set nominal calibration to -8 dbu. Range is -14 to -5.

Jumpers J7 and J15 set nominal calibration to -2 dbu. Range is -8 to +1.

No jumpers set nominal calibration to +4 dbu. Range is -2 to +7.



## Input selection

Input selection is by jumpers:

J1, J9: 14-pin, Channel 1 right, pins 5,6

J2, J10: 14-pin, Channel 1 left, pins 7,8

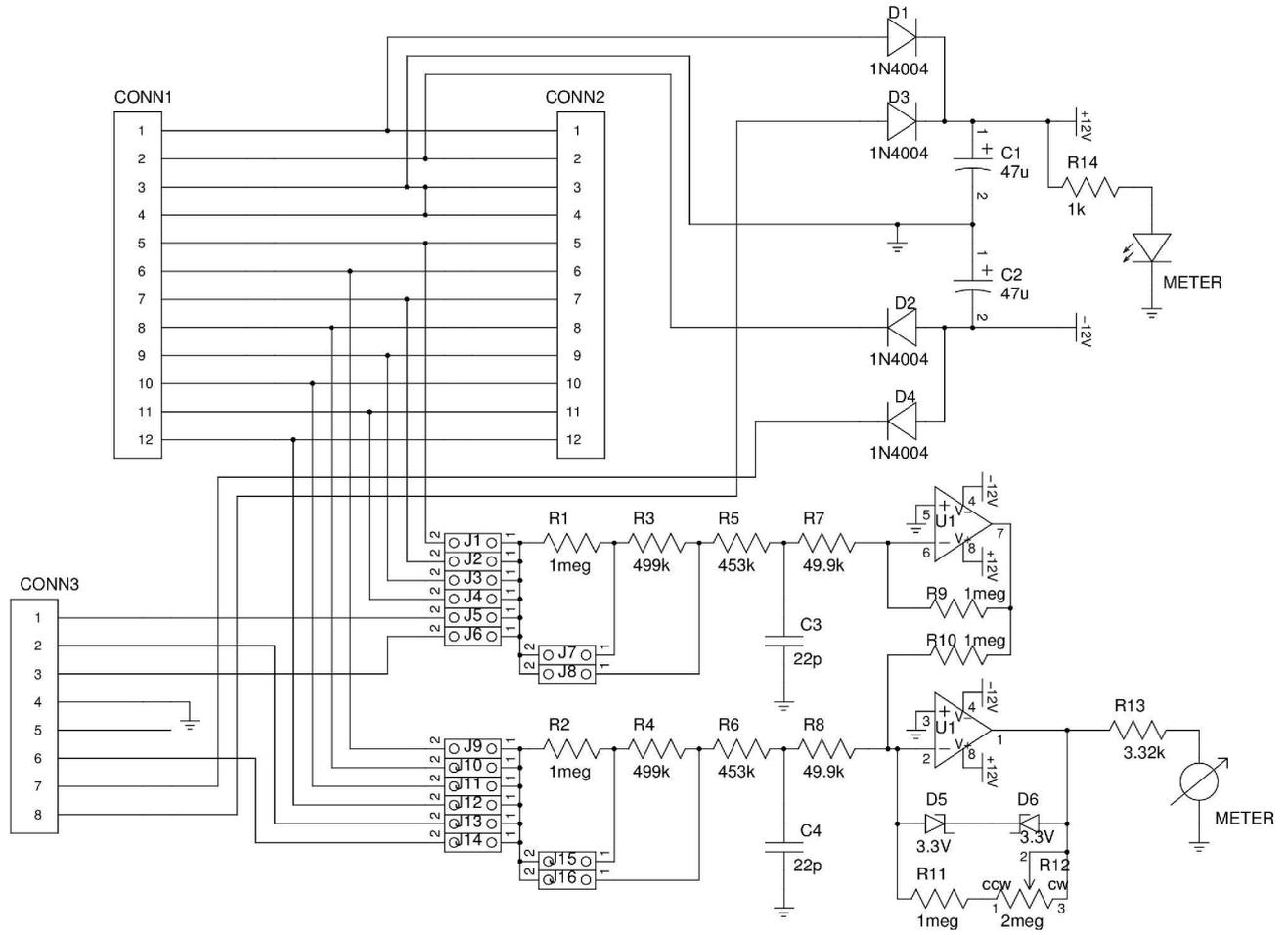
J3, J11: 14-pin, Channel 2 right, pins 9,10

J4, J12: 14-pin, Channel 2 left, pins 11,12

J5, J13: RJ-45 left, pins 1,2

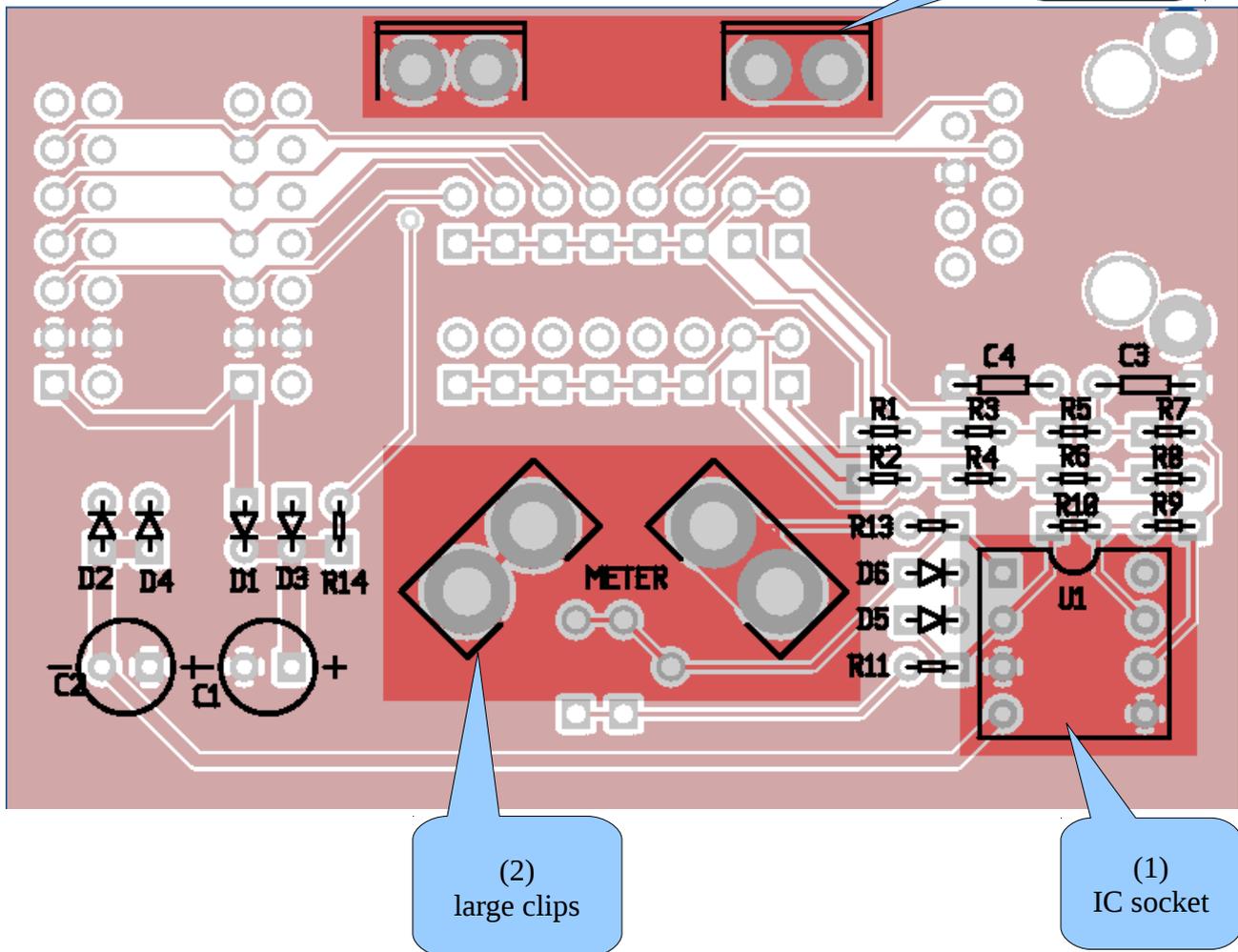
J6, J14: RJ-45 right, pins 3,6

# Schematic

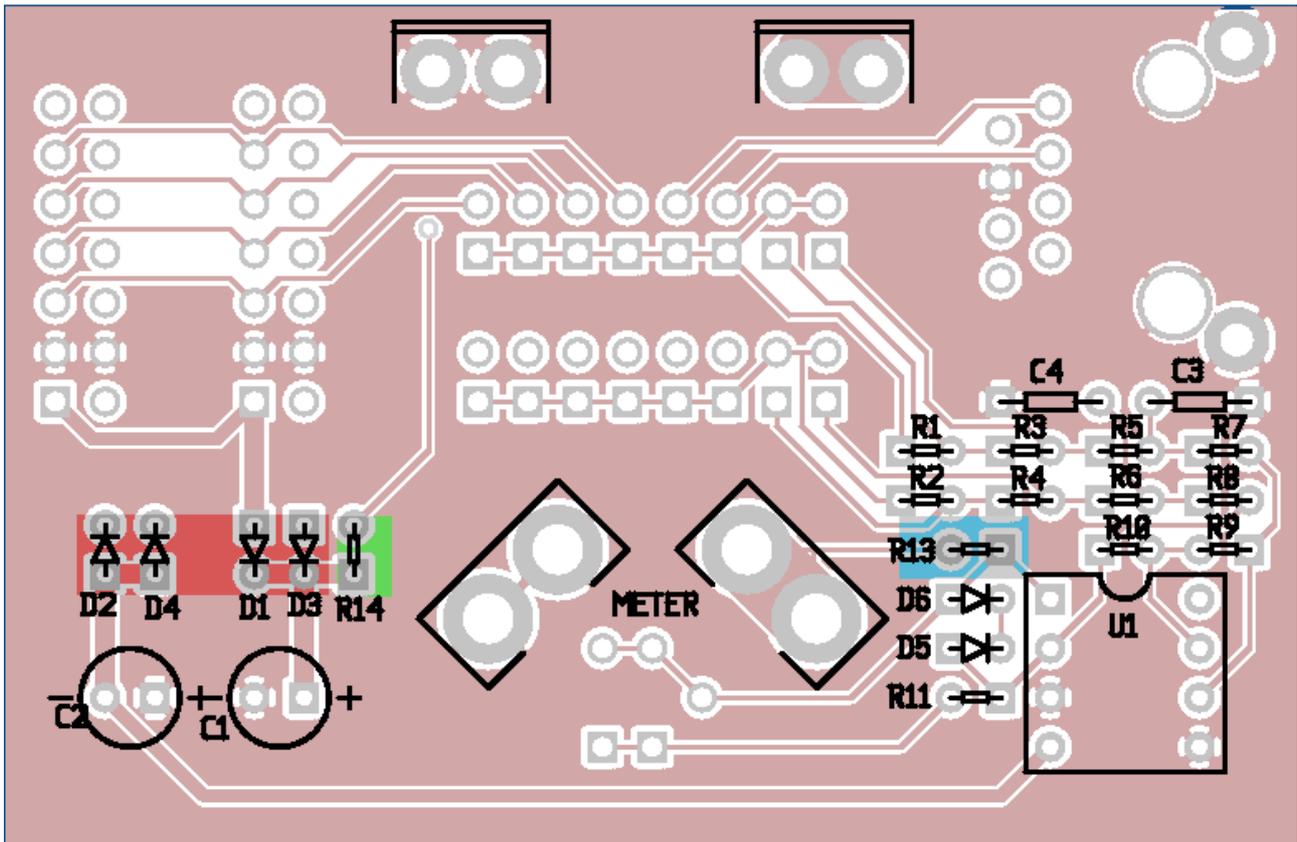


## PCB Assembly

1. 8 pin IC socket  
Note direction.  
To make sure it is seated, solder one pin then check, reheat if necessary.  
Then solder the other pins.
2. Large meter clips  
They should snap in, then solder.
3. Small meter clips  
They fit loose, so crimp the pins on the back to hold them in place.  
Make sure they are straight.



4. (4) Diodes 1N4007  
Note polarity! The stripe is the “cathode”, matches the bar on the diagram.  
Bend leads so stripe is up. Install so body is at the fat end of the triangle.
5. (1) 1k resistor (brown black black brown brown) (“10011”)
6. (1) 3320 resistor (orange orange red brown brown) (“33211”)



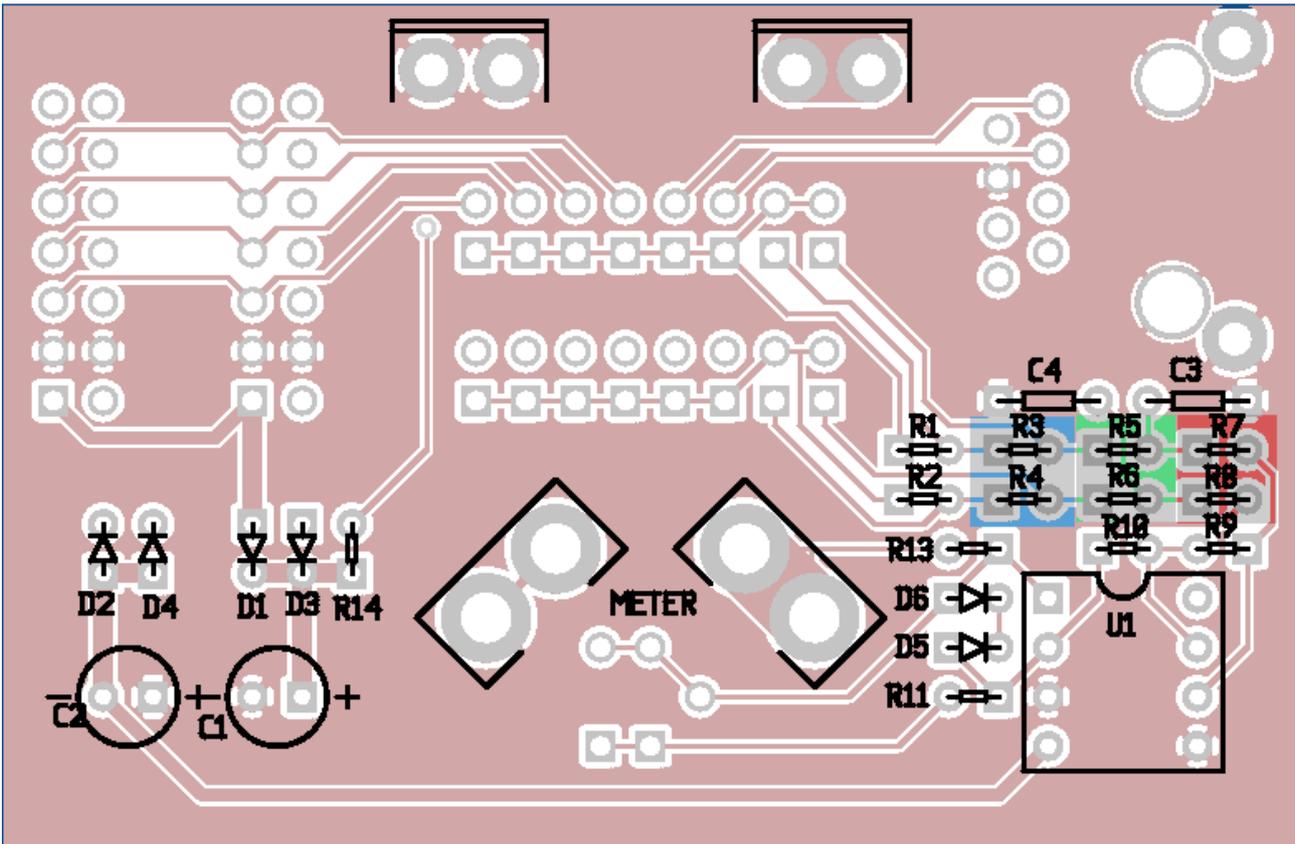
Polarity of resistors doesn't matter electrically, but it is better to be consistent.

For stand-up resistors:

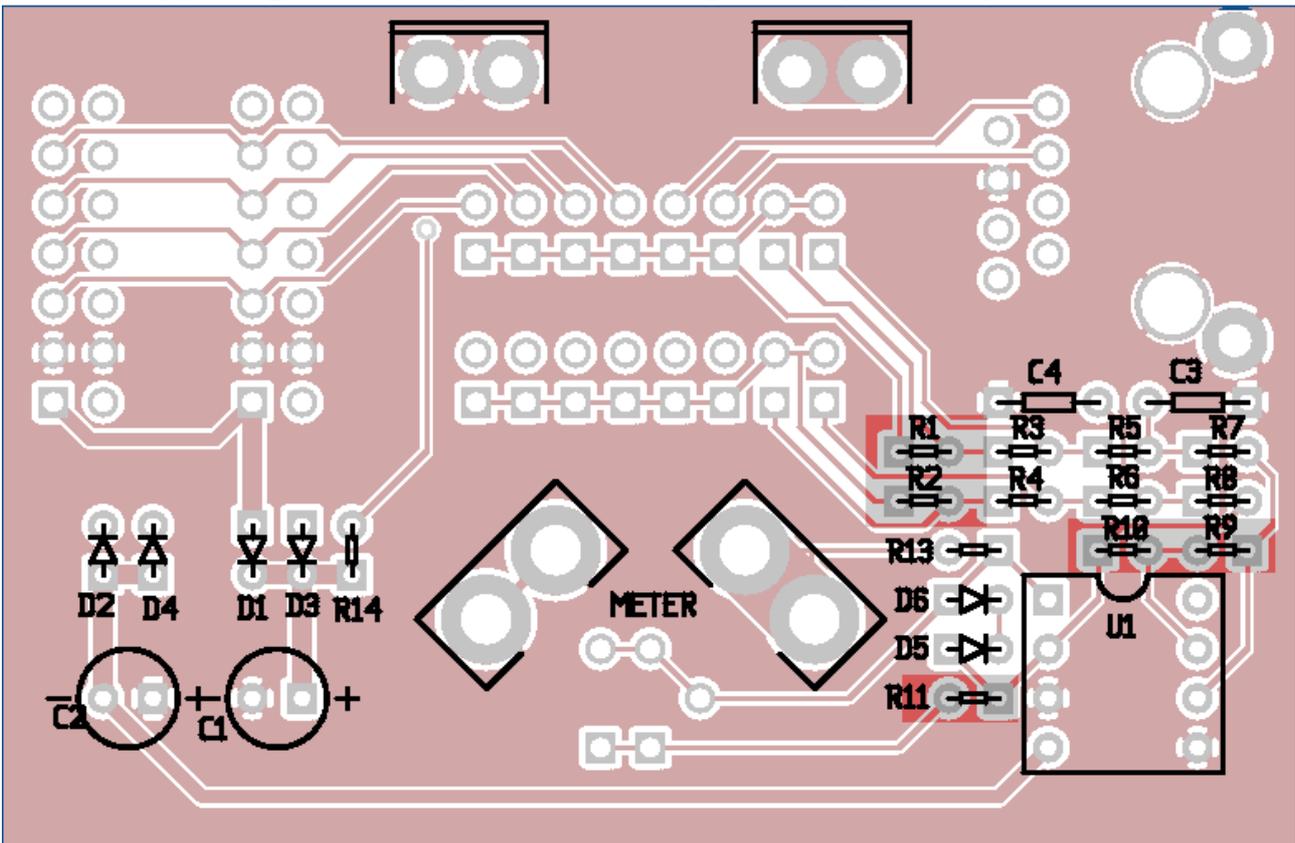
- Position the body to the right or bottom.
- Make the colors read top-down.

This will result in a better looking assembly that is less prone to errors.

7. (2) 49.9k resistors (yellow white white red brown) (“49921”)
8. (2) 453k resistors (yellow blue orange orange brown) (“45331”)
9. (2) 499k resistors (yellow white white orange brown) (“49931”)

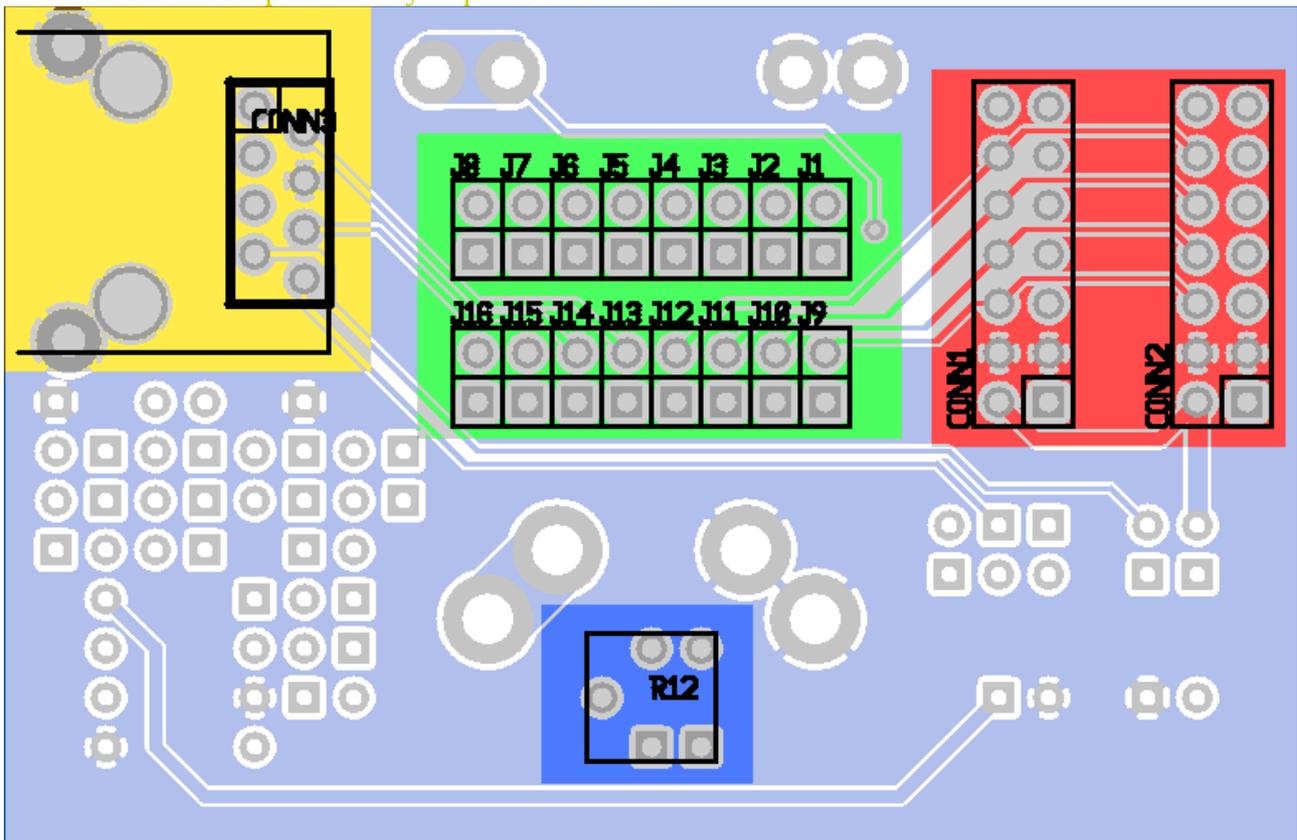


10. (5) 1 Megohm resistor (brown black black yellow red) (“10041”)



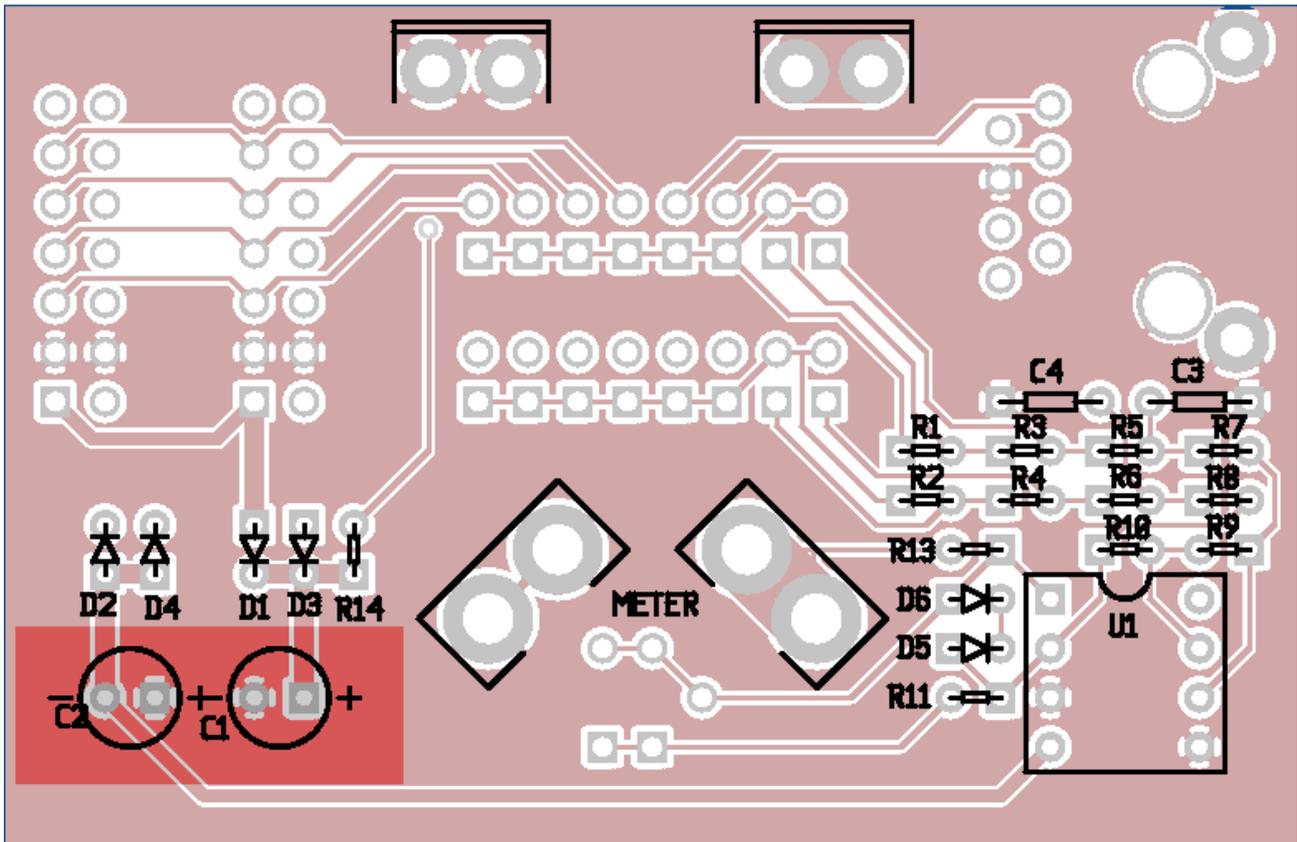
Turn the board over.

11. (1) 2 Megohm trimpot (205)  
Do not confuse this part with the more common 20k trimpot, marked "203".
12. (2) 16 pin headers (no shroud)  
A 16 pin header may be supplied as two 8 pin headers (total=4).  
To make sure it is seated, solder one pin then check, reheat if necessary.  
Then solder the other pins.
13. (2) 14 pin headers, shrouded  
Be sure they are oriented correctly.  
There is a mark for pin 1, which is the square pin on the PCB.  
Also note position of key.
14. (1) RJ-45 jack (optional)  
It should snap in. It may require some force.



15. (2) 47  $\mu$ F 25 V capacitor

These are polarized. The “+” lead is the longer one. It goes to the right.  
The “-” lead is marked on the side of the body.



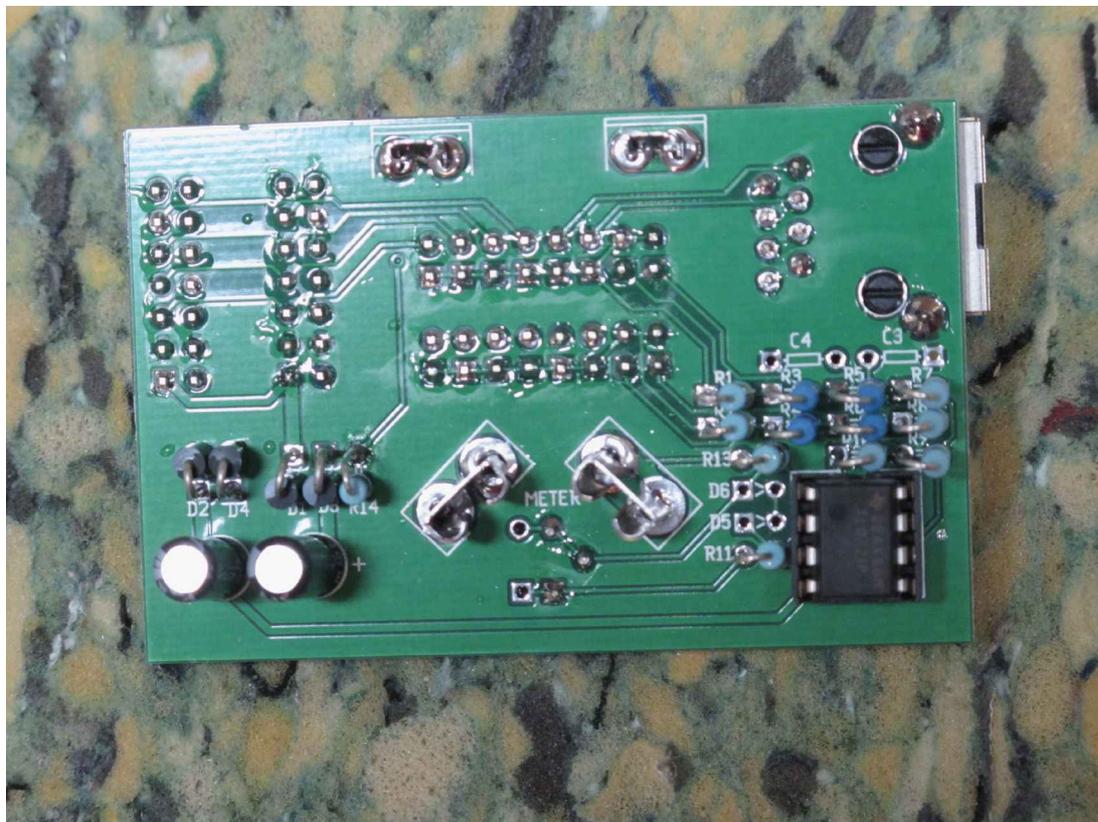
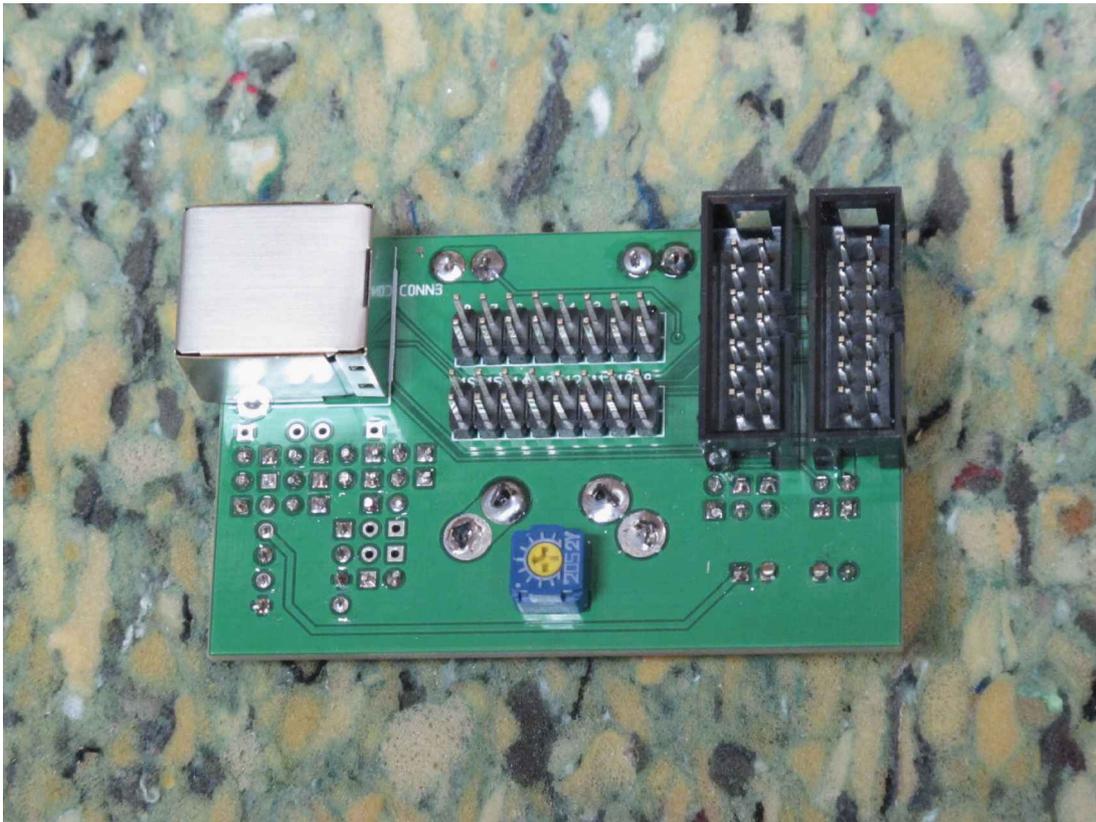
Now insert the IC (LF353, TL072 or equivalent) in the socket U1. Be sure it is in the correct direction.

The board is now complete.

C3 and C4 are for optional high frequency roll-off, not normally used.

D5 and D6 are for optional meter clipping, not normally used.

# Pictures of the finished board



## Mounting

To mount on the meter, first bend the meter's LED contacts to mate with the PC board, then push on.

