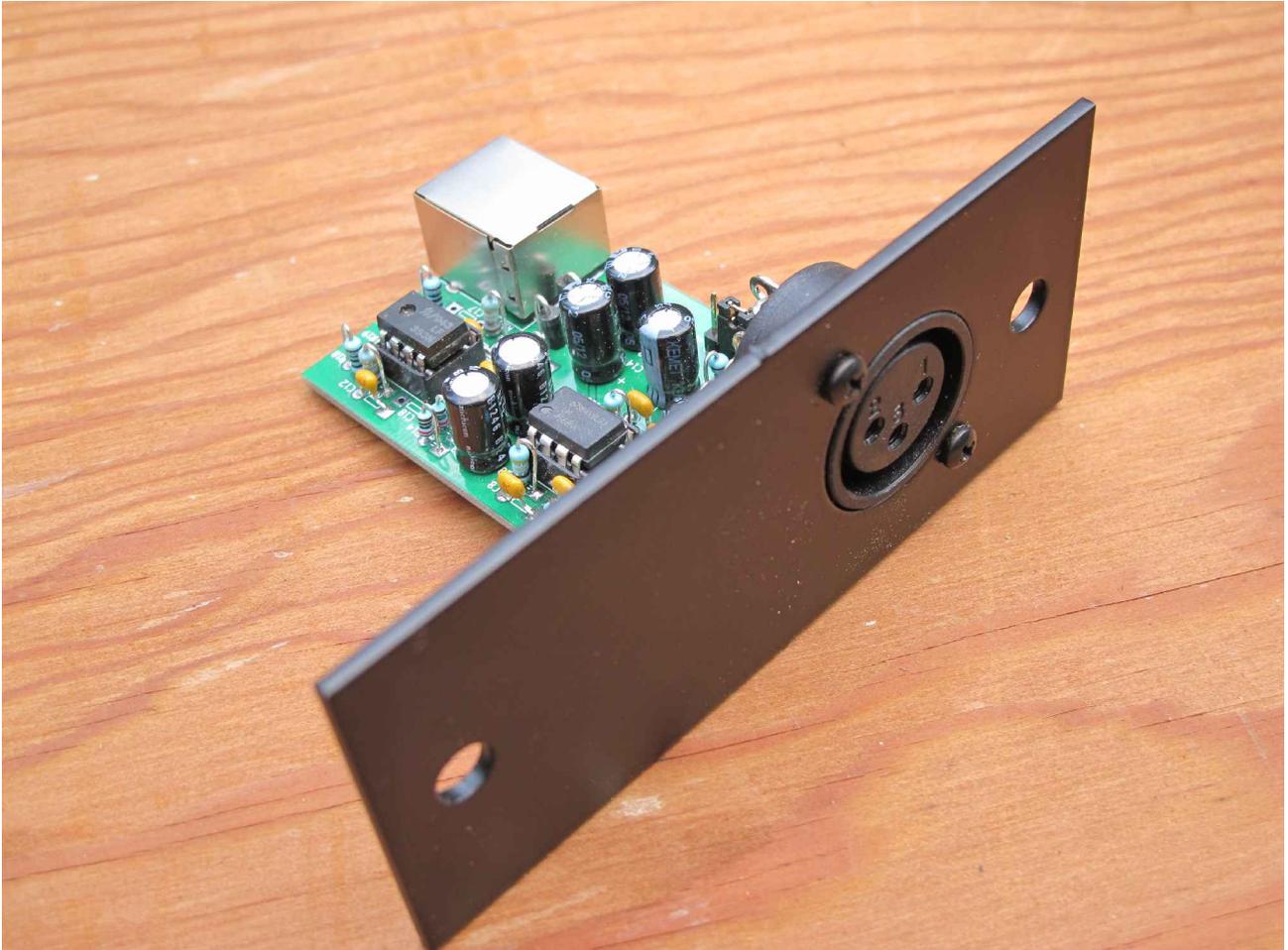


Microphone preamp panel

This assembly is a microphone preamp panel. Each unit contains a single mic preamp, suitable for mounting as a mic jack. It takes its power from the console, over the output cable.



Specifications

Connectors:

Input: Standard XLR

Output: RJ-45

1. L out +
2. L out -
3. R out +
4. Ground
5. NC
6. R out -
7. Power -15V
8. Power +15V

Input:

designed for professional low impedance (150 ohm) microphones

Load impedance: approx 8k, balanced bridging

Phantom power:

Jumper controlled, off or 15 volts.

Connector for external 48 volts.

Output:

Balanced, choice of floating or non-floating.

Power supply:

+/- 15 volts, supplied through the output connector.

Gain:

Jumper configured, approx 20, 30, 40, 50, 60 db.

IC's

First stage: LM4562 dual op-amp

NE5532 may be used as a substitute with slightly increased noise and reduced bandwidth at high gain.

LF353 or TL072 may be used with significantly increased noise and reduced bandwidth at high gain.

Second stage: LF353 dual op-amp

TL072 is an equivalent substitute.

NE5532 is an acceptable alternative with higher current drive, worse slew rate.

LM4562 is a high cost alternative with higher current drive.

Configuration

Before building the kit:

It can be built with output either floating or non-floating. In most cases, the non-floating configuration is preferred, but if you don't know what it will be driving the floating configuration may be preferred.

If it is being used with a Kaatskit console, or any high quality broadcast mixer with balanced inputs, non-floating is preferred.

If it is being used with an inexpensive mixer with unbalanced inputs, usually RCA connectors or TRS stereo connectors with left and right in a single plug, floating is required.

Advantages of floating:

You can safely ground one side, to feed an unbalanced load, such as a cheap mixer with an unbalanced input.

Disadvantage of floating:

Since the output is allowed to float, if the load does not provide a strong ground reference, it can float to either side leading to a DC shift and loss of headroom.

Advantages of non-floating:

The output is forced to be balanced, with equal and opposite signals, regardless of load. This can give you up to 6 db more headroom. This effect is most notable with the one-op-amp differential input circuit used by many consoles from others, and when driving a transformer without a center tap.

Disadvantage of non-floating:

It should not be used with one side grounded, because that would result in large ground currents.

After building:

There are two jumper options:

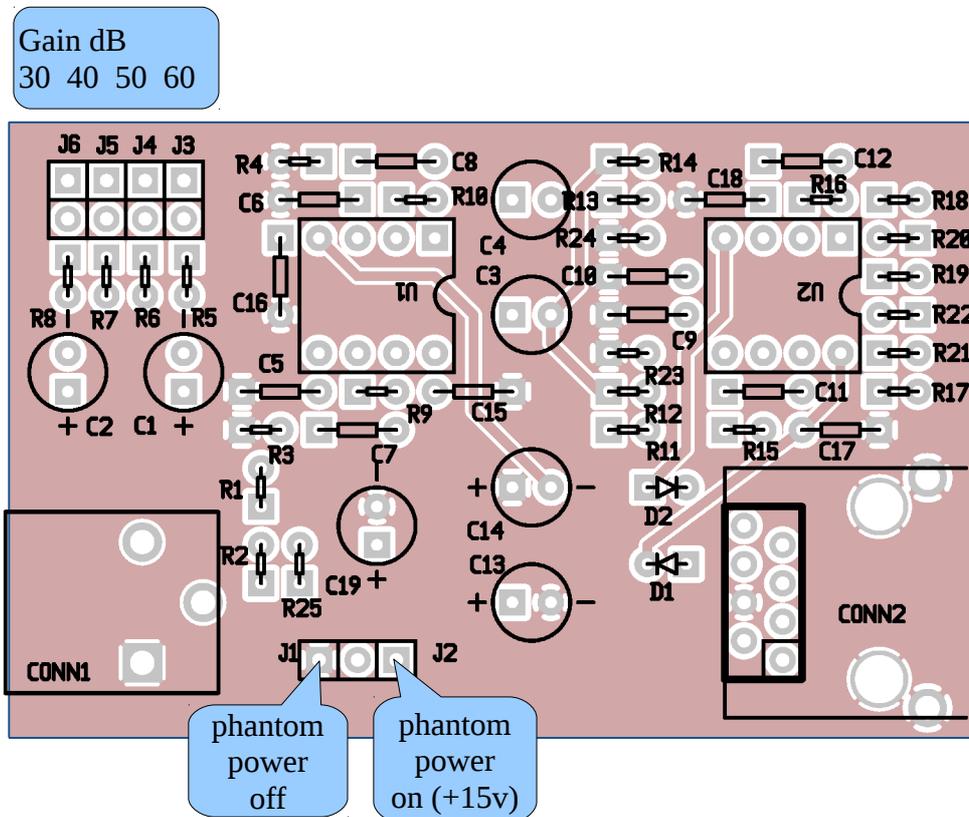
Gain:

The gain can be set to 60, 50, 40, 30, or 20 db, by jumpers J3, J4, J5, and J6 respectively, with no jumper for 20 db gain. In general, the lowest setting that provides sufficient output should be used.

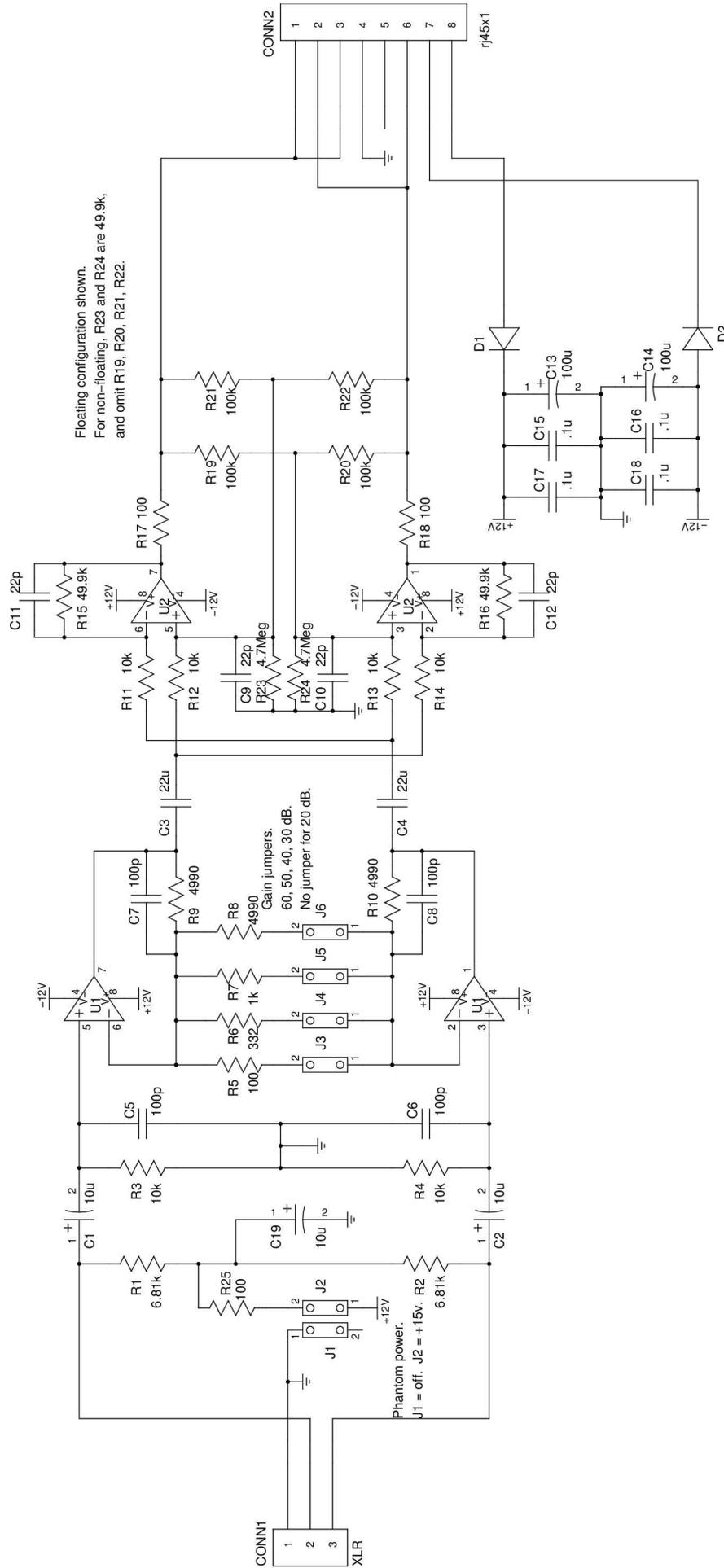
Phantom Power:

J1 turns phantom power off, J2 applies +15 volts phantom power.

Leaving this jumper out causes it to float, which is probably equivalent to no phantom power, allowing you to supply it externally. Up to 100 volts can be supplied externally this way.



Schematic



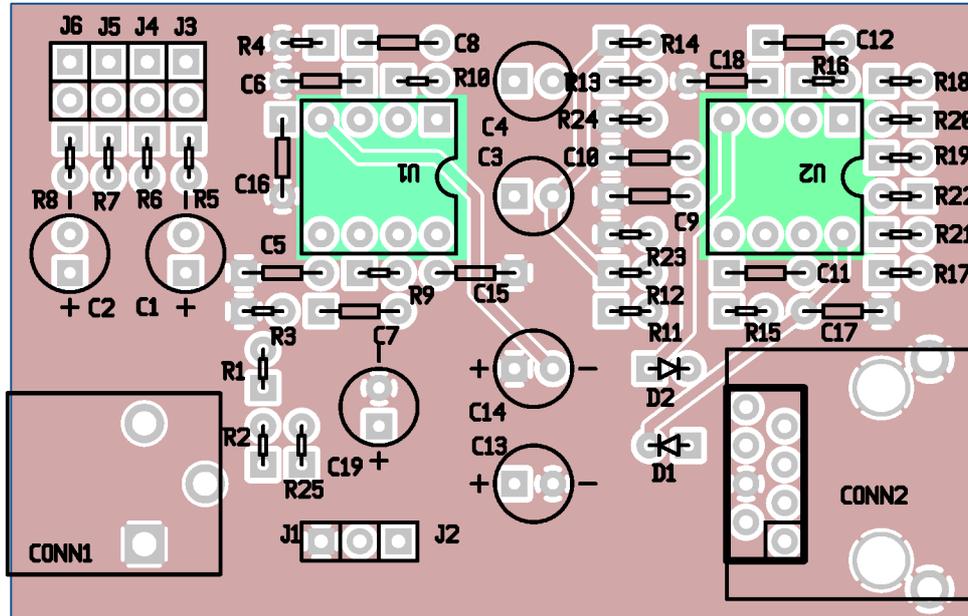
PCB assembly

1. 8 pin IC sockets.

Note direction.

To make sure it is seated, solder one pin then check. Reheat if necessary.

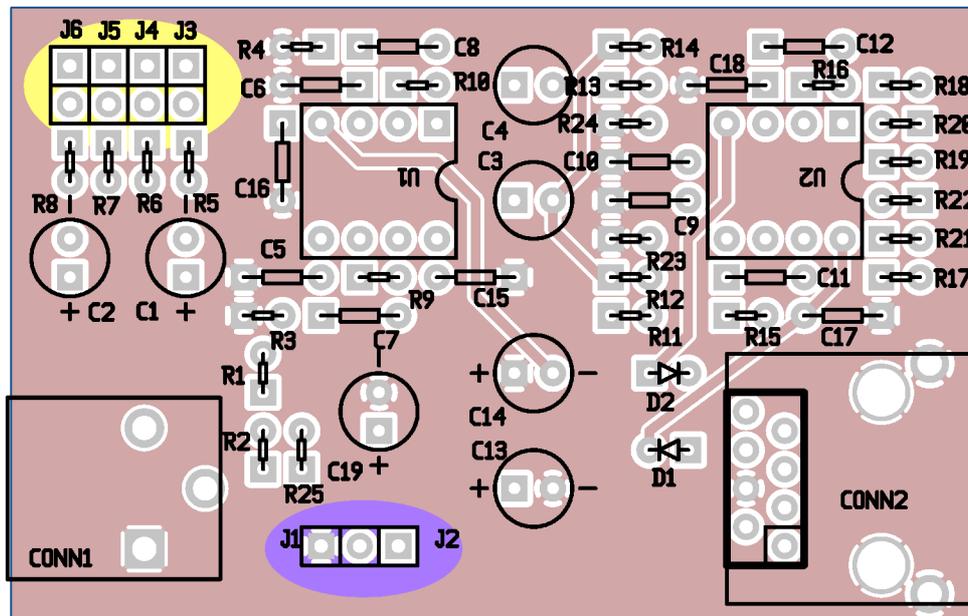
Then solder the other pins.



2. Jumper headers.

To make sure it is seated, solder one pin then check. Reheat if necessary.

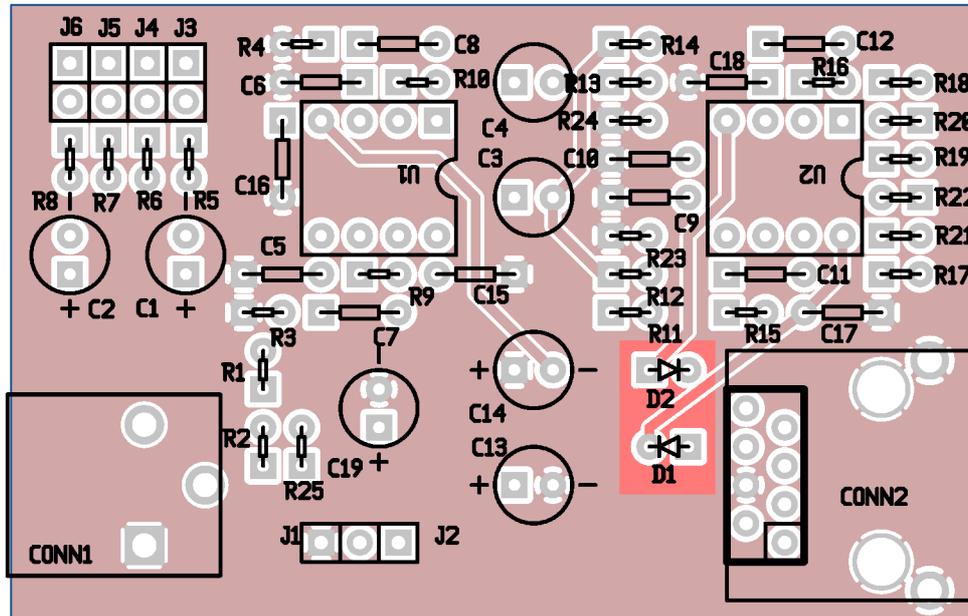
Then solder the other pins.



3. Diodes 1N4007

Note polarity! The stripe is the “cathode”, matches the bar on the diagram.

Bend leads so the stripe is up. Install so the body is at the fat end of the triangle.



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

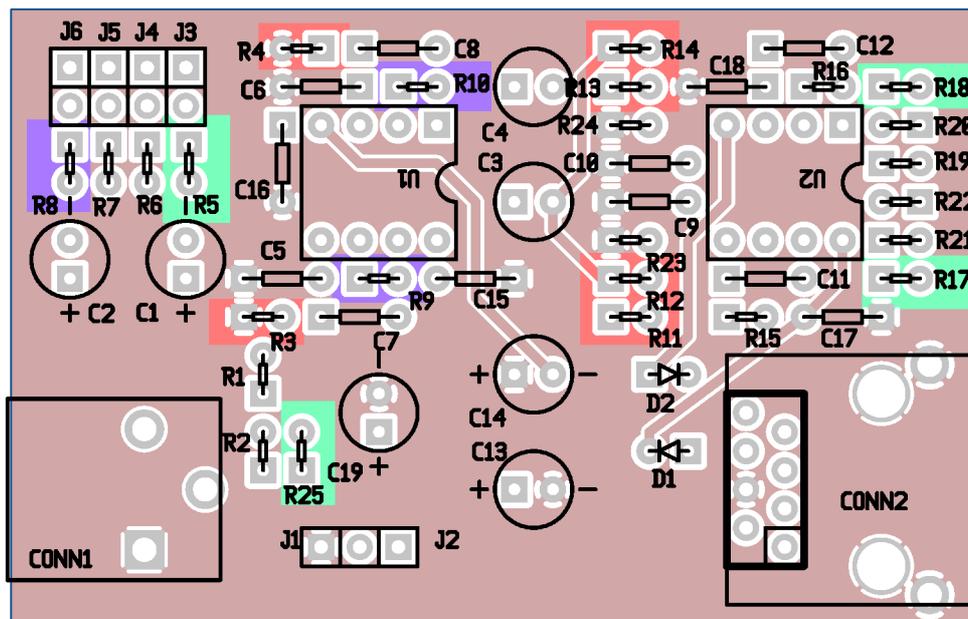
For stand-up resistors:

Position the body to the right or bottom.

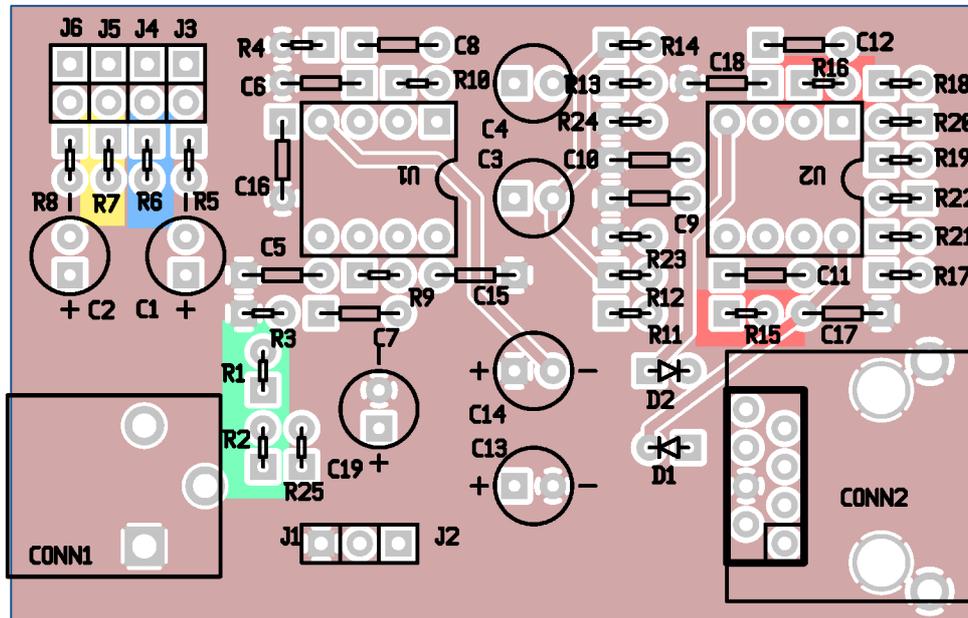
Make the colors read top-down.

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

4. 100 ohm resistors (brown black black black brown) (“10001”)
6. 10k resistors (brown black black red brown) (“10021”)
3. 4990 ohm (4.99k) resistors (yellow white white brown brown) (“49911”)



7. (2) 49.9k resistors (yellow white white red brown) (“49921”)
8. (2) 6810 ohm (6.81k) resistors (blue grey brown brown brown) (“68111”)
9. (1) 1000 ohm (1k) resistor (brown black black brown brown) (“10011”)
10. (1) 332 ohm resistor (orange orange red black brown) (“33201”)



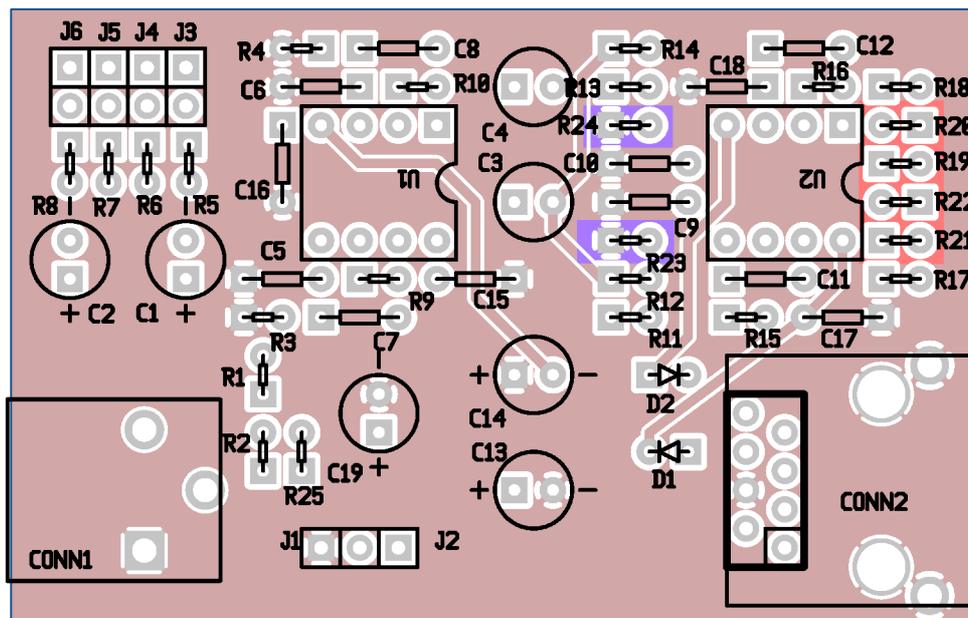
The next steps differ, depending on whether you are building the “floating” or “non-floating” configuration.

For “floating”:

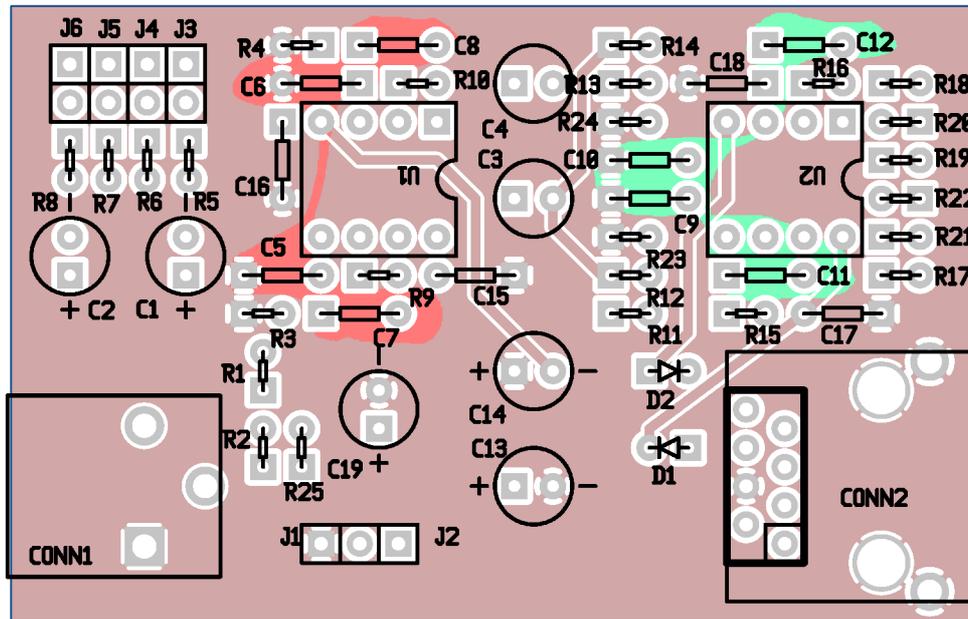
11. (2) 4.7 Megohm resistors (yellow violet green gold) (“473”)
12. (4) 100k resistors (brown black black orange brown) (“10031”)

For “non-floating”:

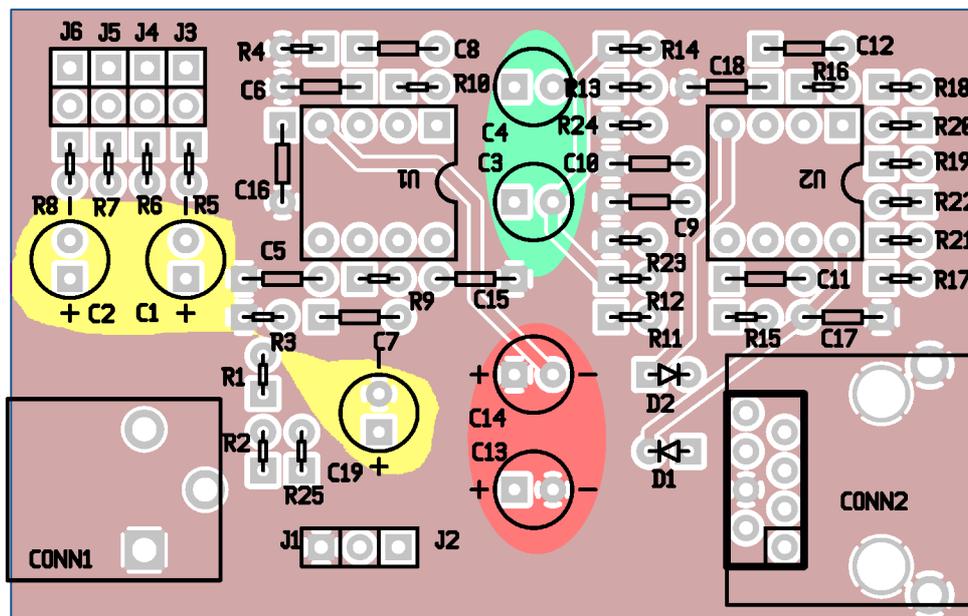
11. (2) 49.9k resistors (yellow white white red brown) (“49921”)
12. Omit these resistors



13. (4) 100 pf ceramic capacitors (marked "101")
14. (4) 22 pf ceramic capacitors (marked "220" or "22J")



15. (3) 10 uf 100 V capacitors. These are polarized. The "+" lead is the longer one. It goes nearest the bottom. The "-" lead is marked on the side of the body.
16. (2) 100 uf 25 V capacitors. These are also polarized. The "+" lead goes to the left.
17. (2) 22 uf "BP" (bi-polar) capacitors. These are not polarized.

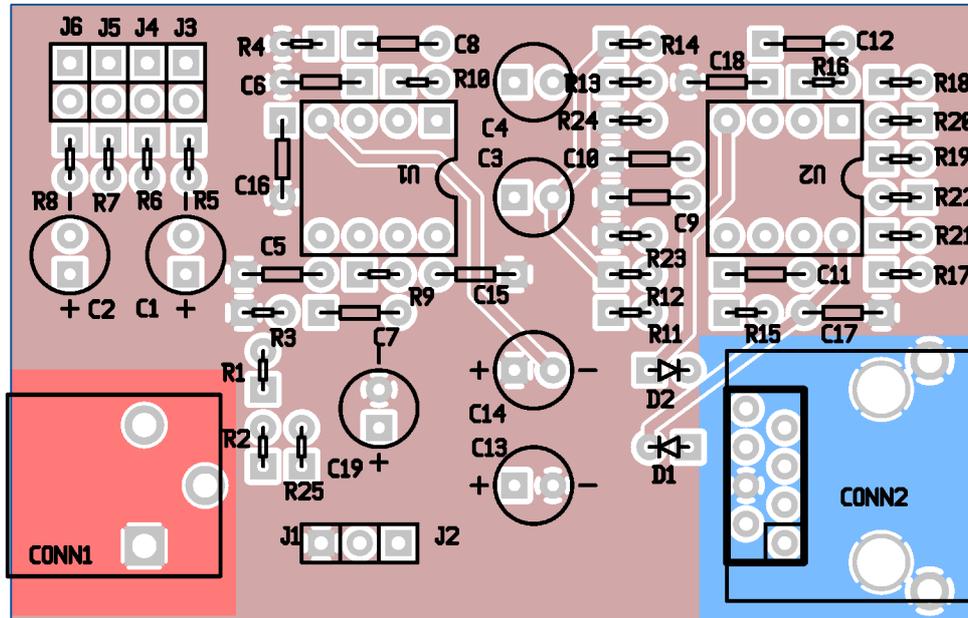


18. RJ-45 connector

To make sure it is seated, solder one pin then check. Reheat if necessary. Then solder the other pins.

19. XLR connector

To make sure it is seated, solder one pin then check. Reheat if necessary. Then solder the other pins.



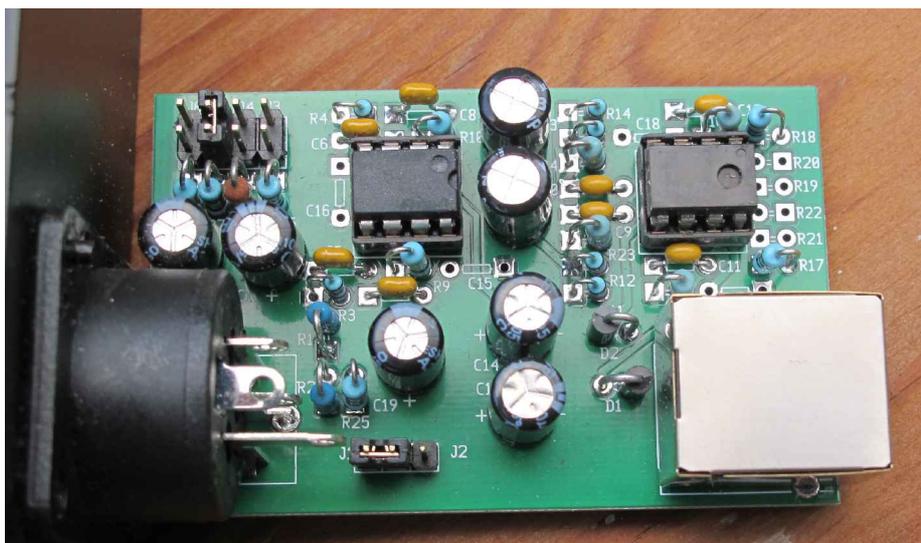
20. Install the IC's.

Note direction. The printing will be upside-down if the board is positioned as pictured.

U1 is type LM4562.

U2 is type LF353.

The board is now complete.



Final assembly

Mount the PC board to the panel with 2 self-tapping screws, as pictured.

