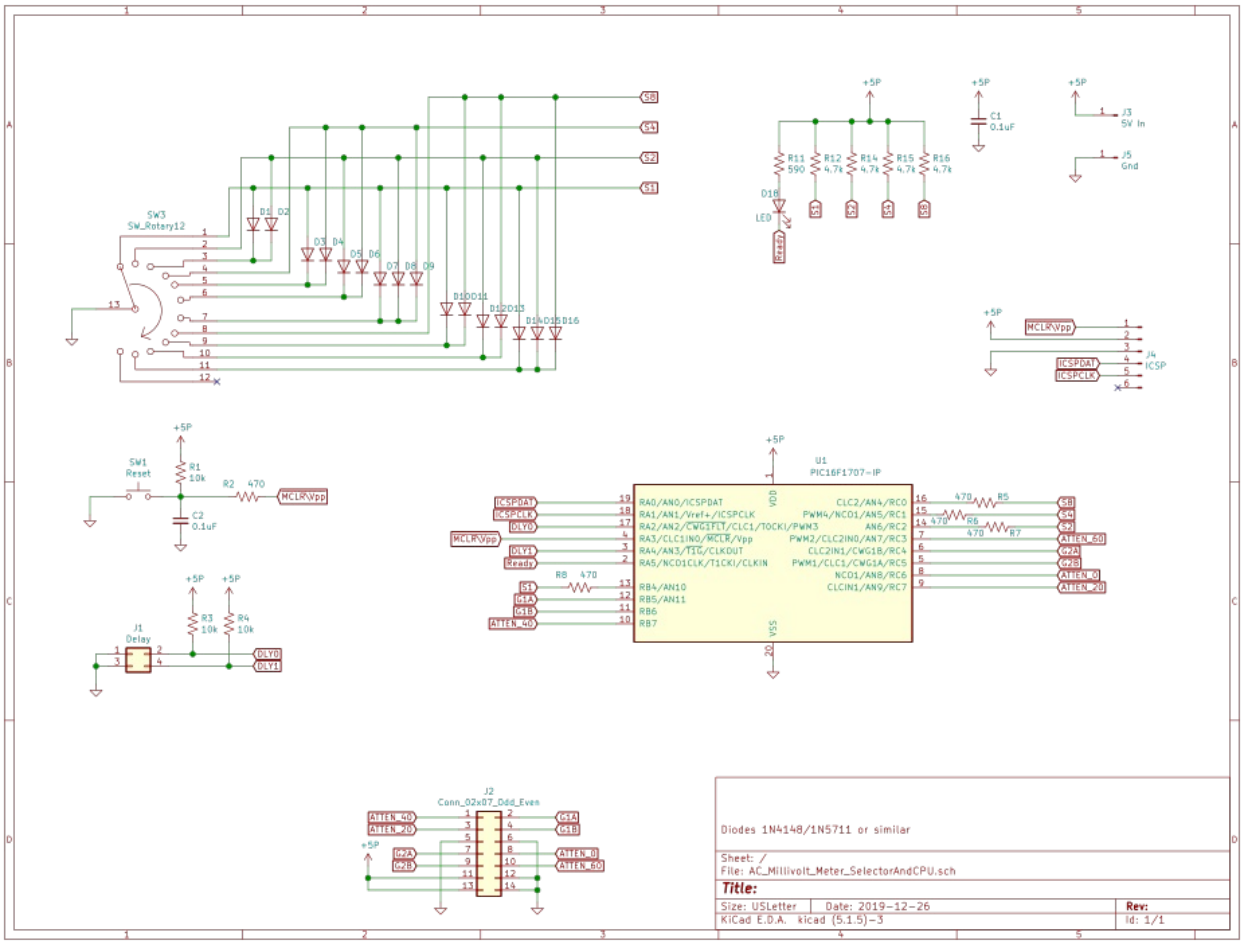
Update of the AC Millivolt Meter Project Dec 26, 2019

The Selector.



The selector has been modified from 12 positions to 11. The 300 Volt range has been removed. There is some concern about safety with a 300 Volt range and it complicated the attenuator.

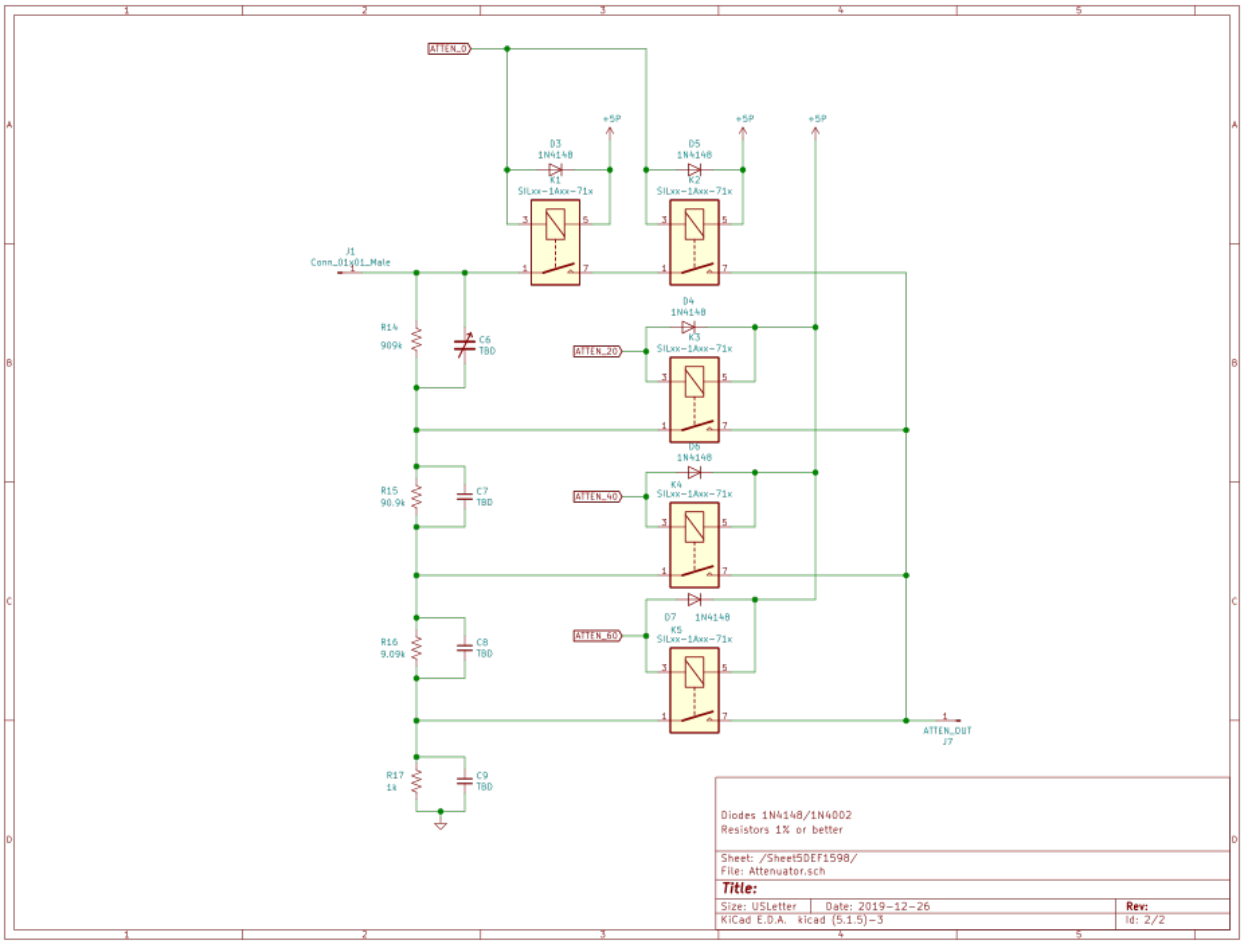
A PIC16F1707 was implemented to provide the 'glue'.

It will do the de-bounce of the selector switch with a de-bounce delay selectable from 50 – 200 ms.

The CPU has a rated output drive of 50ma which allows for direct drive of the relays and the led.

All in all a cleaner layout.

The Attenuator

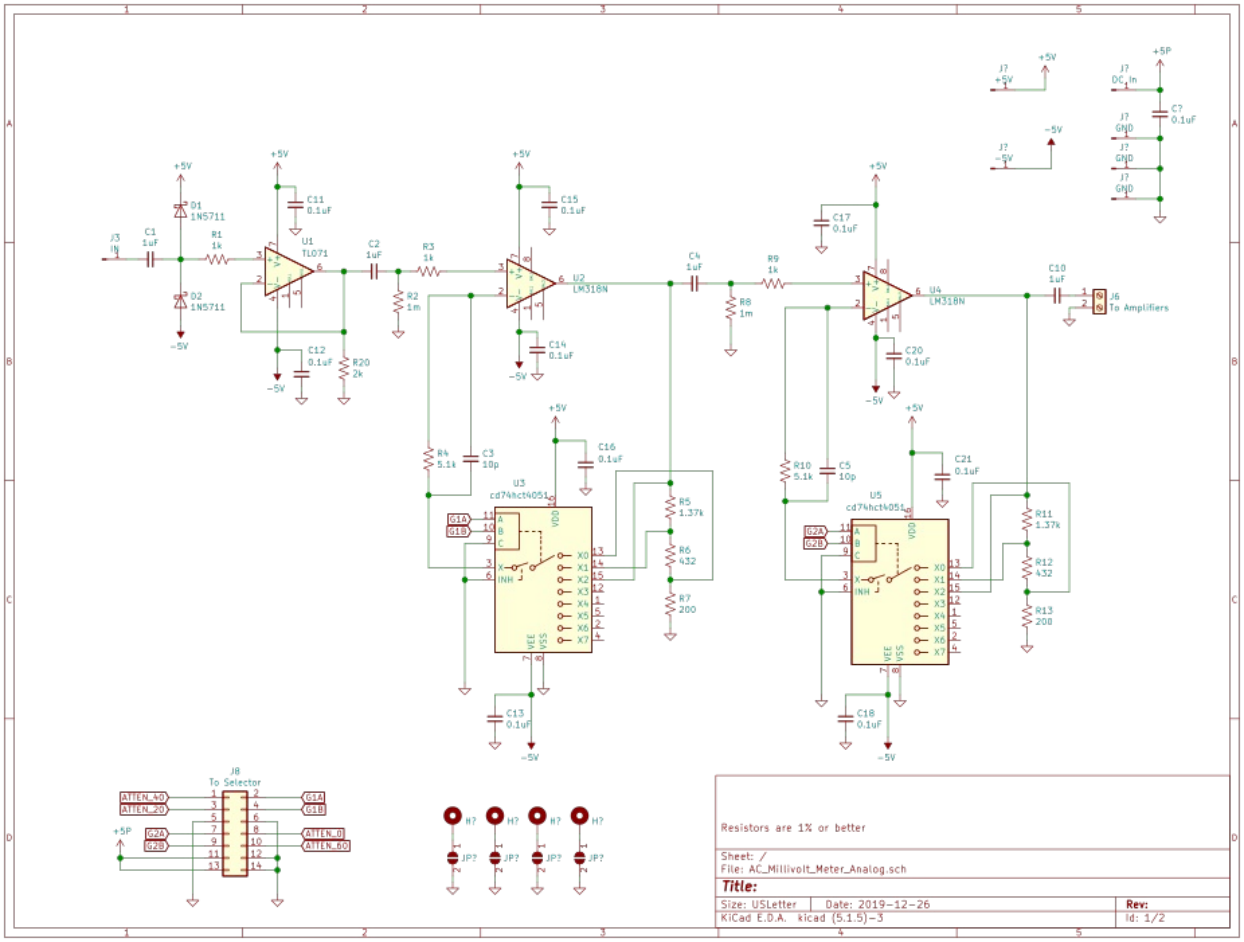


This is very similar to the original. The reed relays have a rating of 200 volts. With 100 Volts (rms) input the peak to peak value would exceed the rating and that is why there are two relays in series.

The relays are no longer on a regulated supply but are being powered directly from the external 5 volt supply.

20dB per step.

The amplifier chain



This is a total revision from the previous version.

The Current Feedback amplifiers are gone.

The LM318N meets the desired goal at a reduced cost.

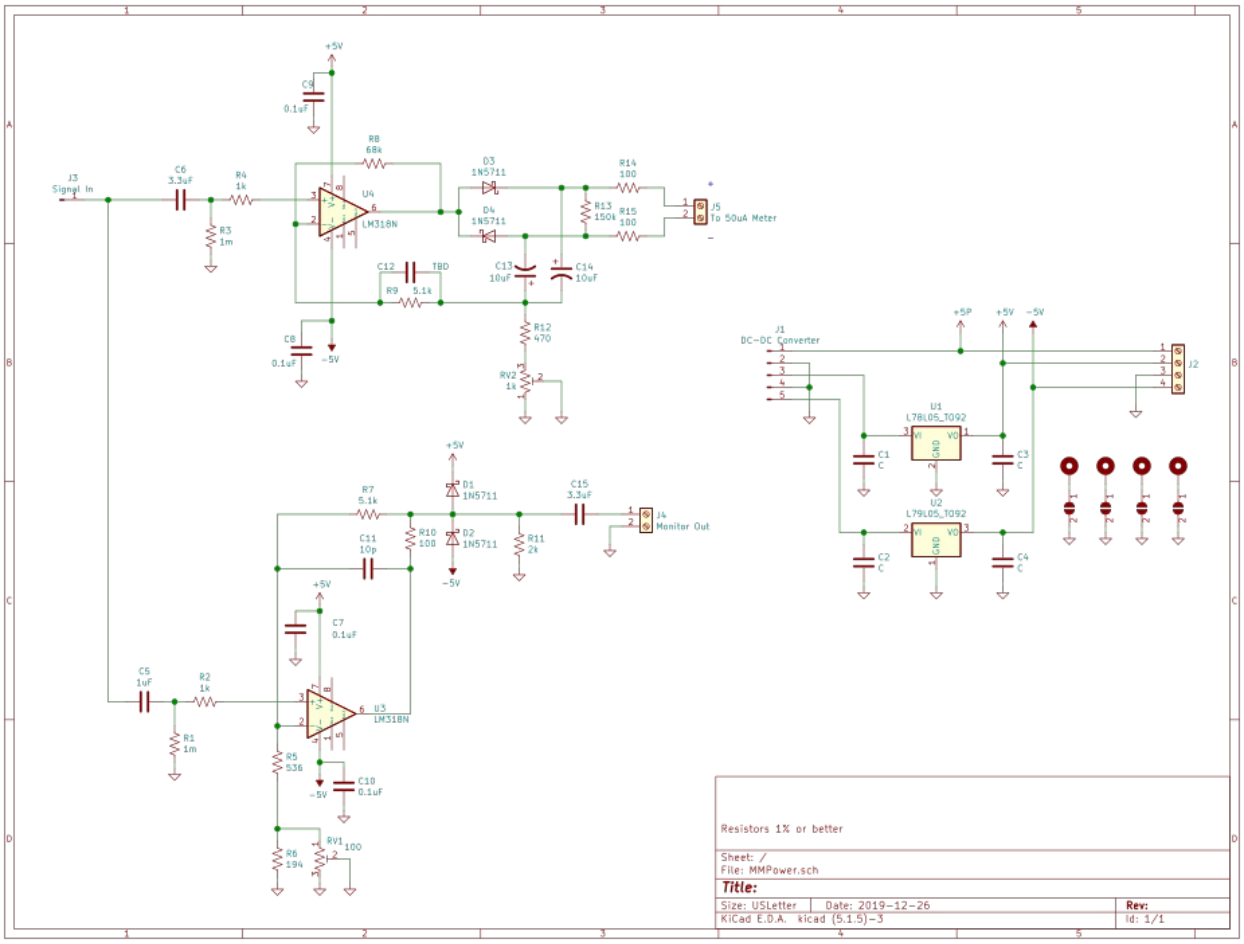
The mechanical relays have been replaced by the multiplexers. The multiplexers are directly controlled by the selector cpu.

Using the multiplexers the amplifiers U2 and u4 have independent gain selection of 0dB, 10dB and 20dB.

Gain selection is applied to U2 and if system gain exceeds 20dB additional gain is provided via U4.

The selection of the buffer U1 has not been determined but this will do for now.

The power section has the power supply, the meter amplifier and the monitor amplifier.



The system is powered by a 5 volt dc supply, this is labeled as +5P. A dc-dc converter will convert this to +/- 12vdc which is then regulated to 5 volts using linear regulators.

The meter amplifier is generic and has a sensitivity of about 100mv.

The monitor amplifier has a gain of 9.5 to 10.5 which allows setting the monitor level to 1 Volt (rms) with full scale deflection of the meter.

There are three adjustments in the system, attenuator frequency response, meter sensitivity and the monitor level.