

OUTBOARD RELAY MODIFICATION.

ubitx

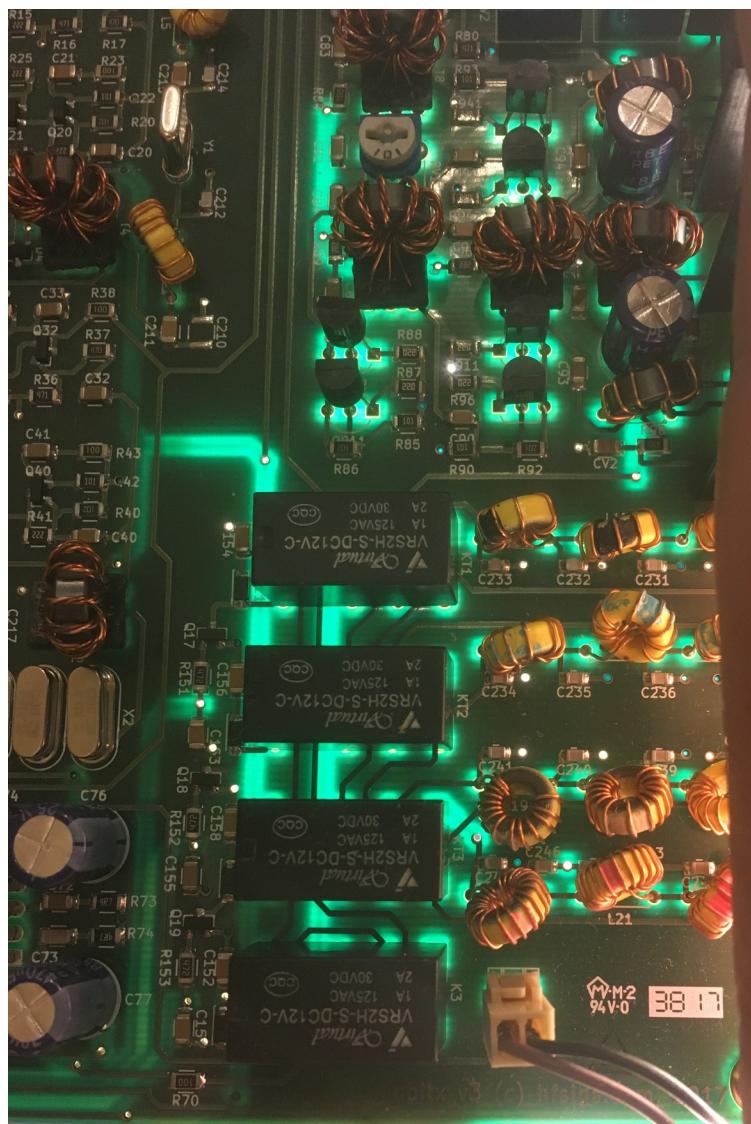
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Version 1.0

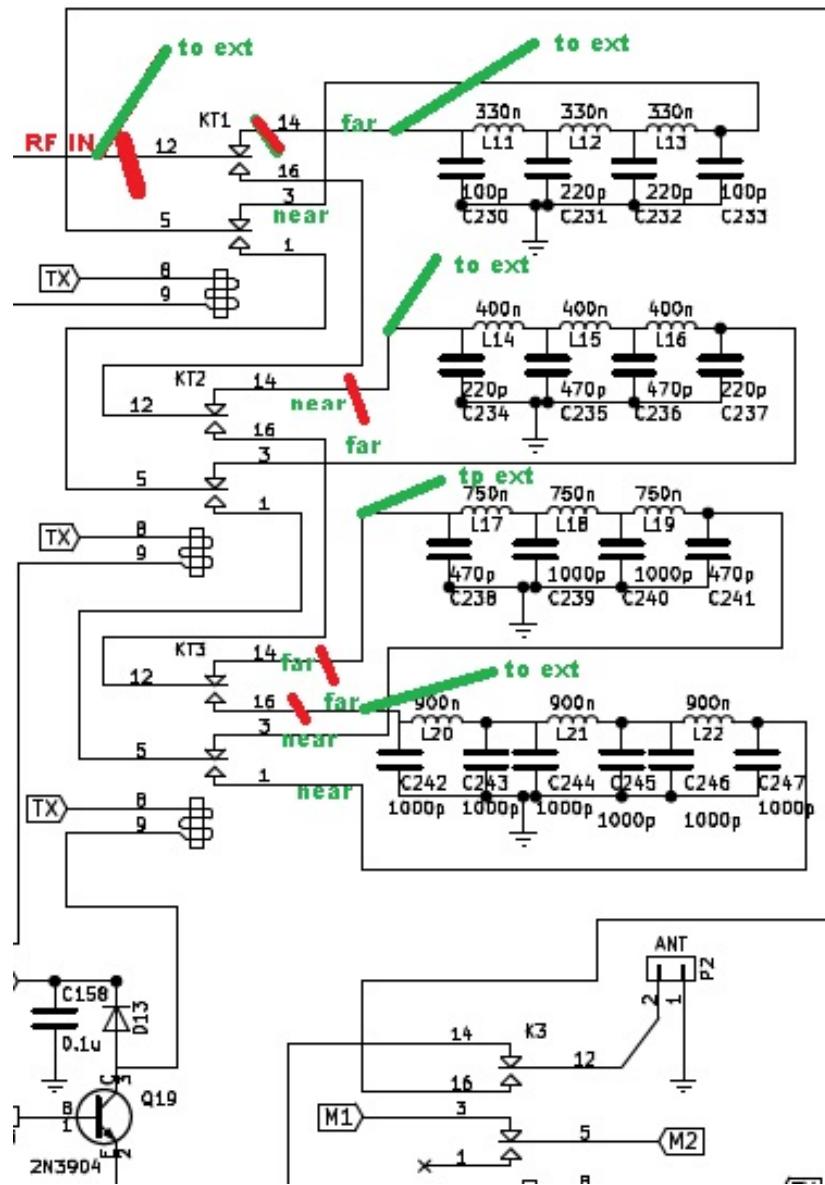
8/12/2018

- Move FIVE signal wires to an external daughterboard.
 - Move FOUR relay control lines to the external daughterboard.

Existing pcb traces:



SCHEMATIC OF SIGNAL LINE CUTS TO EXISTING UBITX BOARD



CIRCUIT DESCRIPTION

The basic idea is that we turn the job of switching the inputs of the low pass filters over to an external daughter board. The reason we switch the inputs is that the majority of the filter inputs are near the EDGE of the board and therefore a short distance to a daughterboard. The switching of the output of the filters is still handled by the existing circuitry. The daughterboard circuitry grounds the input of any “higher frequency” filter when as lower and lower frequency filter are selected, to reduce any blow-by through those filters.

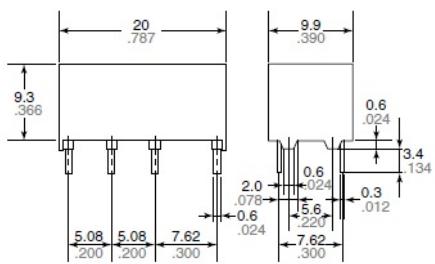
PANASONIC RELAY MECHANICAL

DIMENSIONS (mm inch)

Single side stable

CAD Data

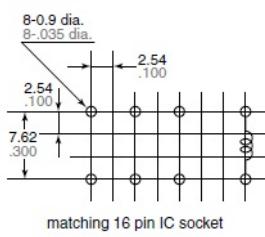
External dimensions



General tolerance: $\pm 0.3 \pm 0.012$

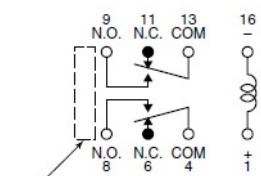
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

PC board pattern (Copper-side view)



Tolerance: $\pm 0.1 \pm 0.004$

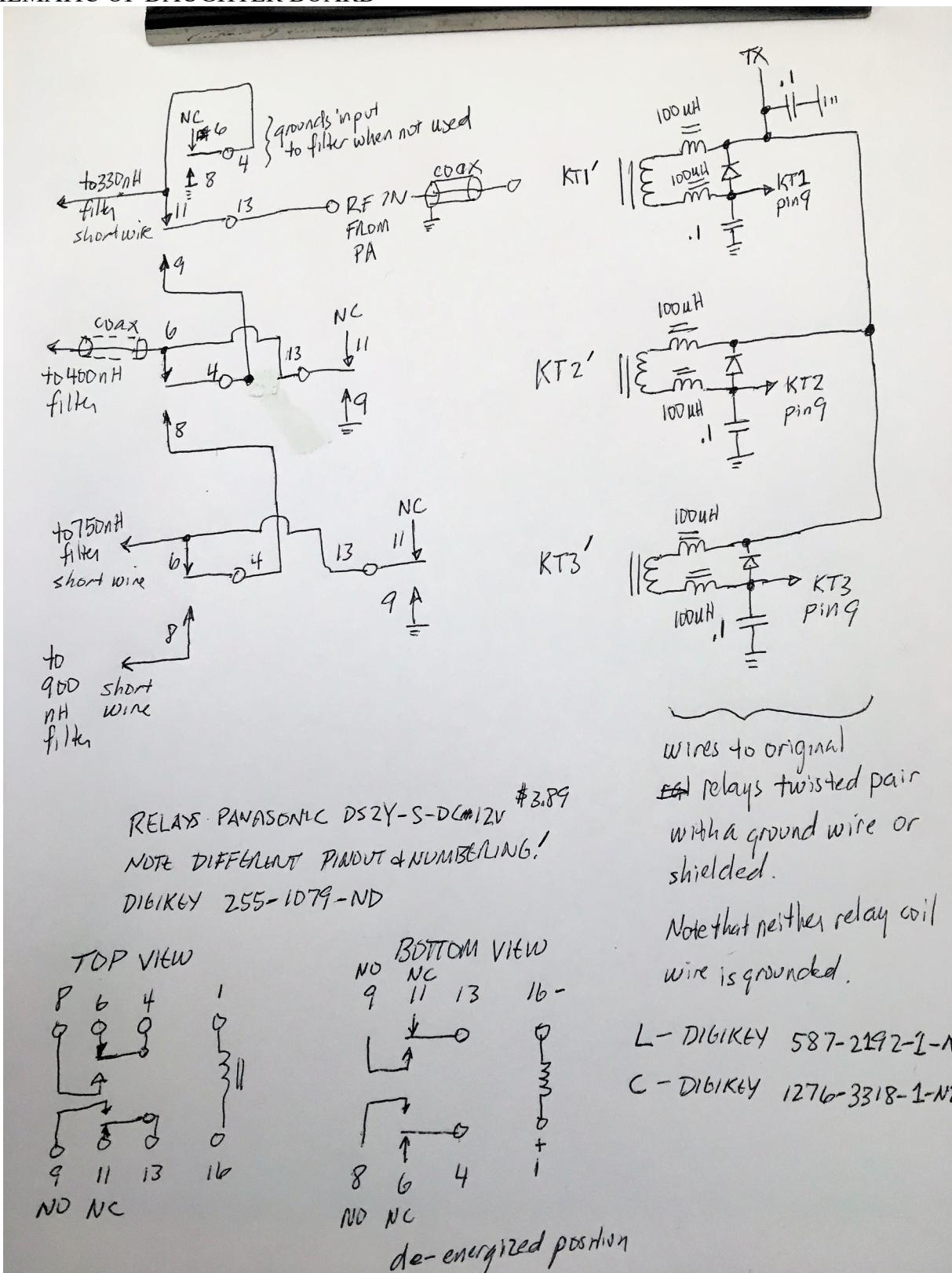
Schematic (Bottom view) (Deenergized position)



Direction indication*

*A polarity bar shows the relay direction.

SCHEMATIC OF DAUGHTER BOARD

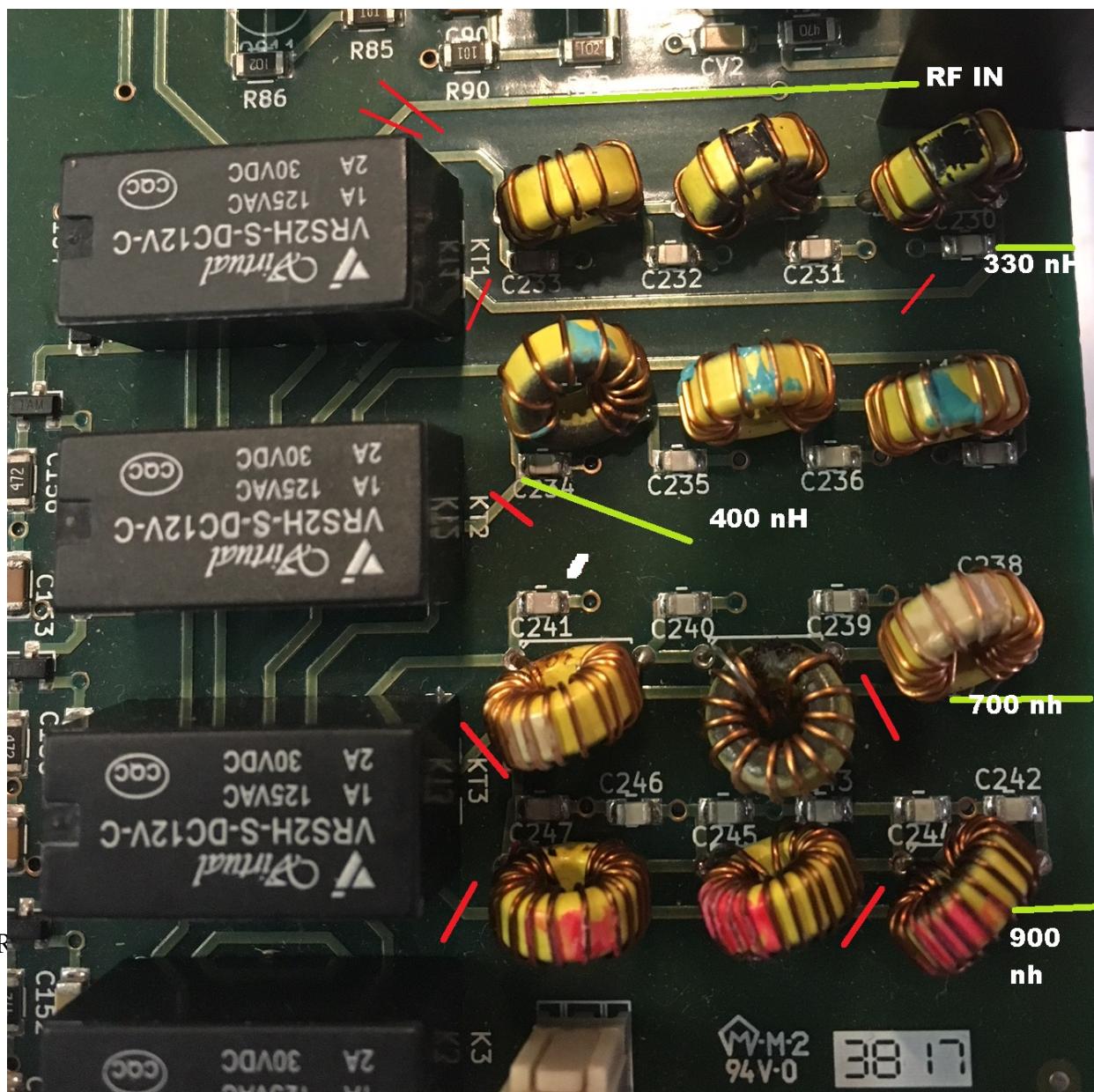


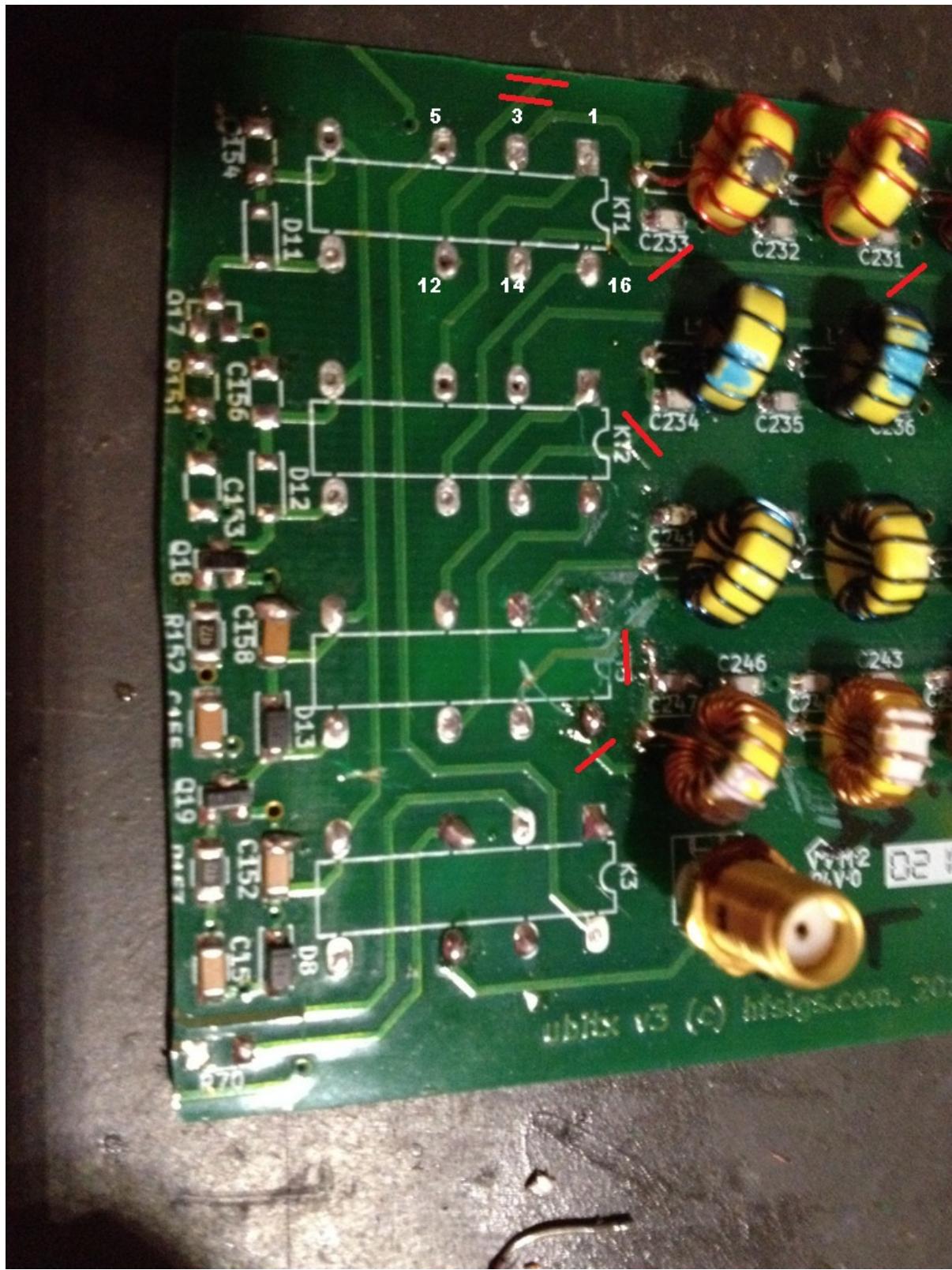
CUTS TO FIVE SIGNAL WIRES REQUIRED

1. RF INPUT from power amplifier
2. Long wire below the 330 nH filter (cut in two places if possible) -- runs to right (far) side of filter
3. Short wire to left side of 400 nH filter
4. Long wire below the 750 nH filter (cut in two places if possible) – runs to the right (far side) of filter.
5. Long wire below the 900 nH filter (cut in two places if possible) – runs to the far (right) side of the filter.

FIVE SIGNAL WIRES ADDED GOING TO EXTERNAL RELAYS

1. RG-174 coax (if possible) to RF IN on external relays comes from wire (1) cut above.
2. Short wire from the right hand side of the 330 nH filter (such as from the far side of the capacitor at the end of the filter).
3. RG-174 coax (if possible) from the left side of the 400 nH filter – this one is longer to reach the external board, so if able to use coax, better shielding.
4. Short wire from the right hand side of the 700 nH filter.
5. Short wire from the right hand side of the 900 nH filter





RELAY COIL WIRING:

TX AND KT1, KT2 KT3 WIRES – 4 WIRES PLUS A GROUND

Ground wire heavy from one board to the other if not soldered together.

TX switched +12 line.

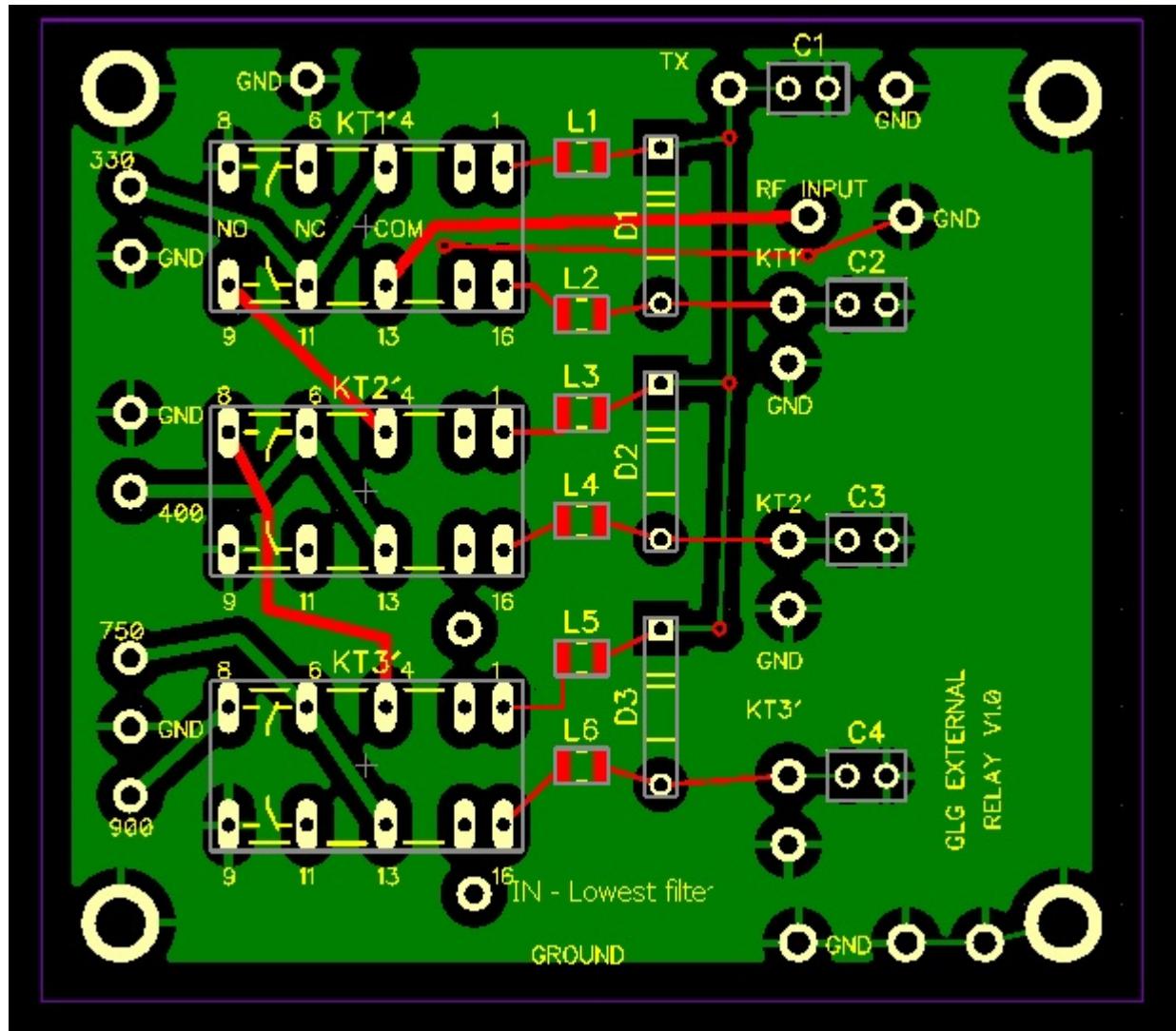
Three relay controllines

KT1 pin 9 goes to KT1' (“prime”)

KT2 pin 9 goes to KT2' (“prime”)

KT3 pin 9 goes to KT3' (“prime”)

If possible, twist these wires together and either put some kind of shield around them connected to ground. The goal here is to reduce their ability to act as antennas picking up RF energy and coupling it to the COIL of KT1, KT2, KT3, and from there capacitively coupling to the output of the transmitted. Their ends on the daughterboard are all bypassed to ground with 0.1 uf capacitors but a little more shielding is probably good.



NOTE CAREFULLY THAT THE PINOUT AND CONSTRUCTION OF THESE PANASONIC DS2^-S-DC 12V relays is different from that of the relay on the uBitx --- N.O. and N.C. have switched positions, and the numbering is different also. Correction (thanks Gary Anderson! The functions are the same, the numbering is different....

Part numbers:

Capacitors Digikey 1276-3318-1-ND 23 cents
 Inductors Digikey 587-2192-1-ND 18 cents
 Relay: Digikey 255-1079-nD \$3.89 each.