# Rockmite ][-15 (ver 3) Power and Efficiency Modification

W5USJ Drawing 14 Apr 2014

This mod starts with an RM-20. All the same up to the Q6 output circuits

Note: Best to make these changes before assembling the rest of the kit

Change R18 to 3 Ohms (ORN, BLK GLD GLD)

Install the transformer in place of L1

Matching transformer:  1.6:1 turns ratio
Impedance (Z) Ratio = 2.56:1 (128:50)
Toroid FT23-43
8 turns #26 primary
5 turns #26 secondary
        wound between the pri turns.
Strip insulation to about 1/8 inch from core

Cut the short trace between Q6-C and C14

T30-6 Toroids
L2 = 434 nH  10 turns #26
L3 = 356 nH   9 turns #26    Measured
Strip insulation close to core

All Capacitors MLCC 5% C0G

C15 = 100 pF (101)
C16 = 15 pF (150)
C17 = 200 pF (201) (101+101)*
C18 = 75 pF (750) (390+390)*
C19 = 180 pF (181)

*Parallel capacitors can be
connected together or
tack-soldered on the
PCB bottom.

Q6 = 2N3866
Alt = 2N3553

**Matching Transformer:**
As seen in the LPF schematic, the input and output impedance is 50 Ω Output resistance of Q6 is much higher and is a power transfer mismatch.  Also, poor efficiency.  So, a matching transformer can be used to even things up.  The values chosen are median values between the range of Vcc (12-13.5).  A 1 min keydown only warms the heatsink.
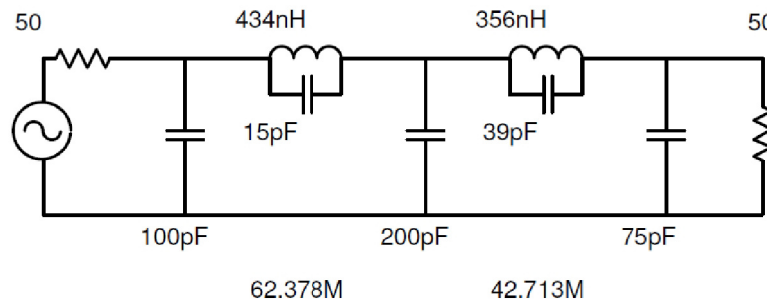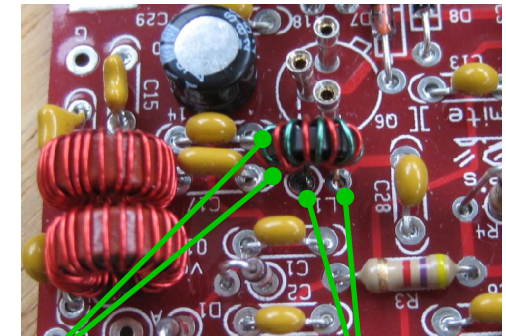
Matching Transformer



Secondary

Strip Leads

Primary

RM ][ PCB ver 3
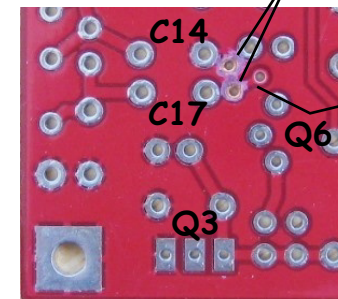First, cut short trace between Q6 C and C14 see illustration below



Connect secondary leads, to two S pads at ends of C14 and C17 pads

Connect primary leads in place of L1.

Gently scrape the solder mask from these two pads

Figure 1



C14

C17

Q6

Q3

Cut this short trace

10 Turns    9 Turns
434 nH     720 nH

Even turns distribution

Spot of clear nail polish on both sides



Adjust turns for L as needed

Strip Leads

Elsie Design LPF Schematic



50    434nH    356nH    50

15pF    39pF

100pF    200pF    75pF

62.378M    42.713M