

How to modify a Cal Amp Integrated Antenna Down Converter TP38921



We want it to receive the 13cm (2300-2450MHz) amateurband ...

Local Oscillator Modification

Normally the LO = 2278MHz.

The Input Frequency Range = 2500 – 2700MHz

Output Frequency = 222 – 422MHz

After modification it will be:

LO = 2048MHz.

The Input Frequency Range = 2300 – 2450MHz

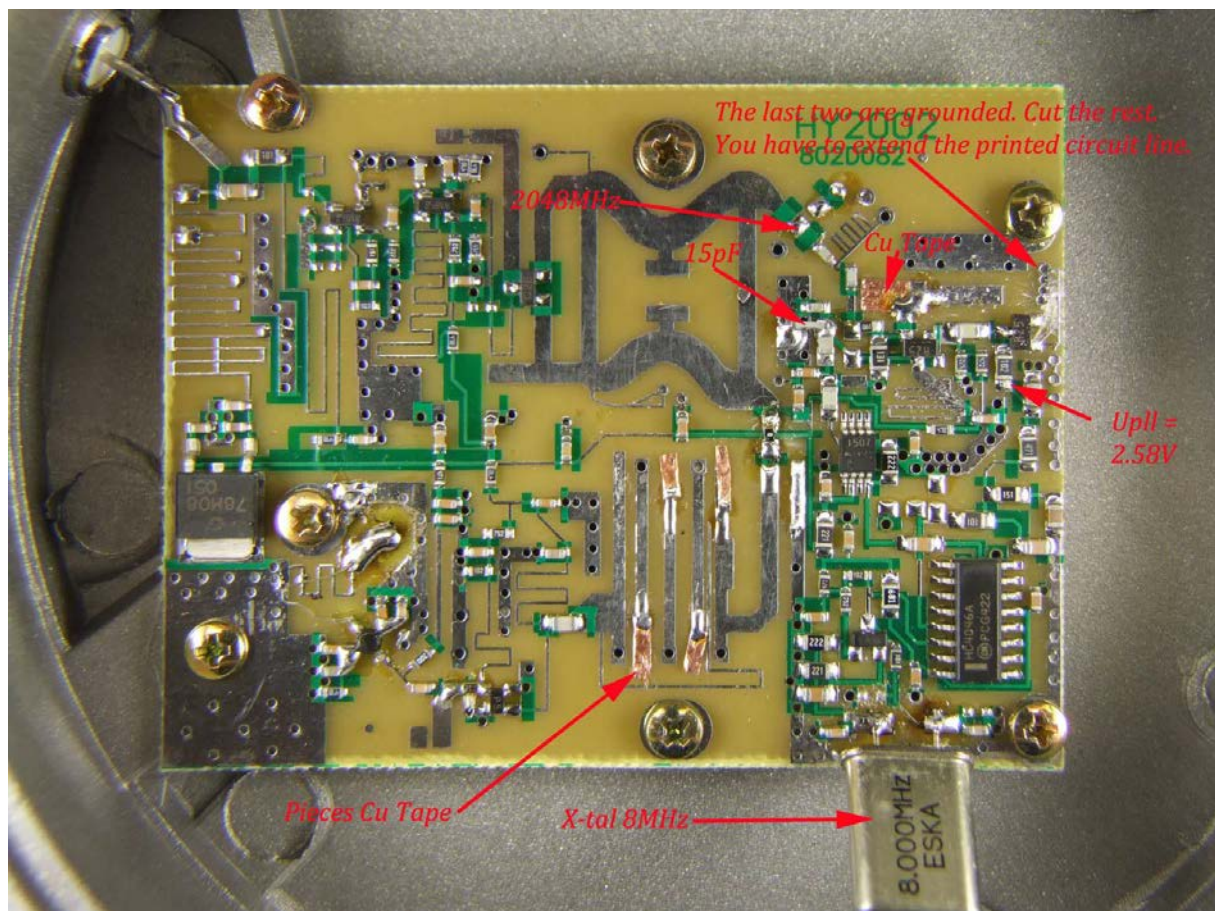
Output Frequency = 252 – 402MHz

The LO is a pll circuit. The LO frequency is 256 times the X-tal frequency.

The original X-tal frequency is 8.8984375MHz.

If we change the X-tal by a cheap 8MHz X-tal the new LO frequency will be 2048MHz.

We need to do some modifications at the LO circuit.



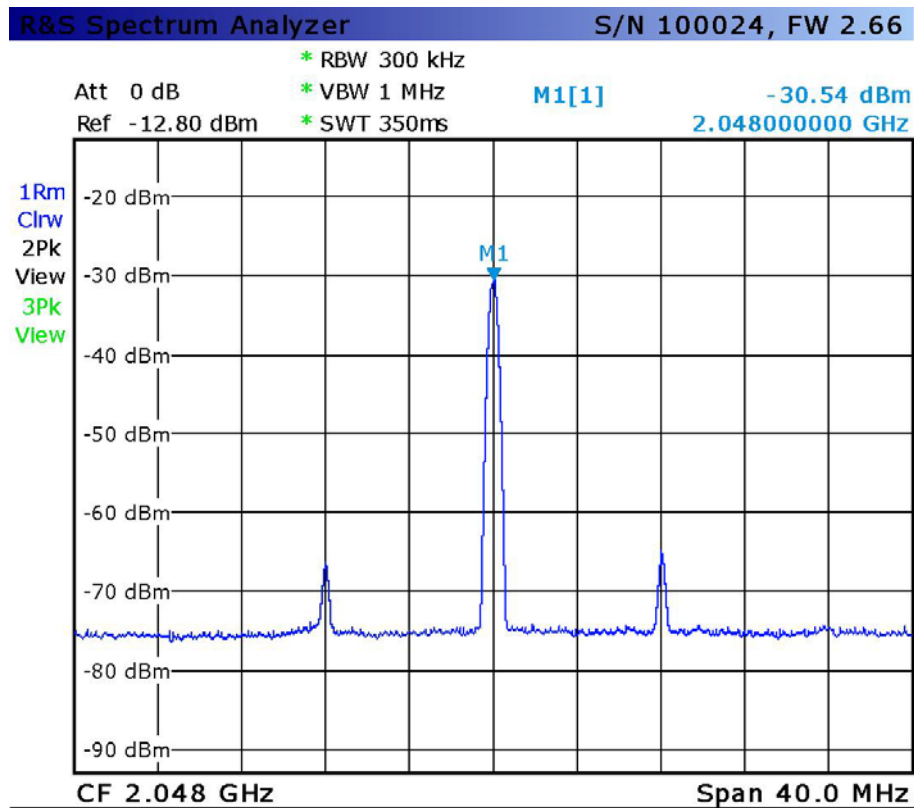
First you need a little piece of Cu tape and a 15pF SMD capacitor to modify the LO circuit. Now it will lock on 2048MHz. But there is a problem ...

Important !

Upll has to be around 2.5V. If it's lower the oscillator will produces spurious.

Just like you can see on the spectrum analyser picture here. To solve this problem I have extended the pcb line which goes from the varicap to the ground. It 's a line which has several connections to the ground. I have cutted 2 of them. Without a crystal soldered in to the circuit, the oscillator oscillates at 1857MHz. With this modification the spurious is 60dB down.

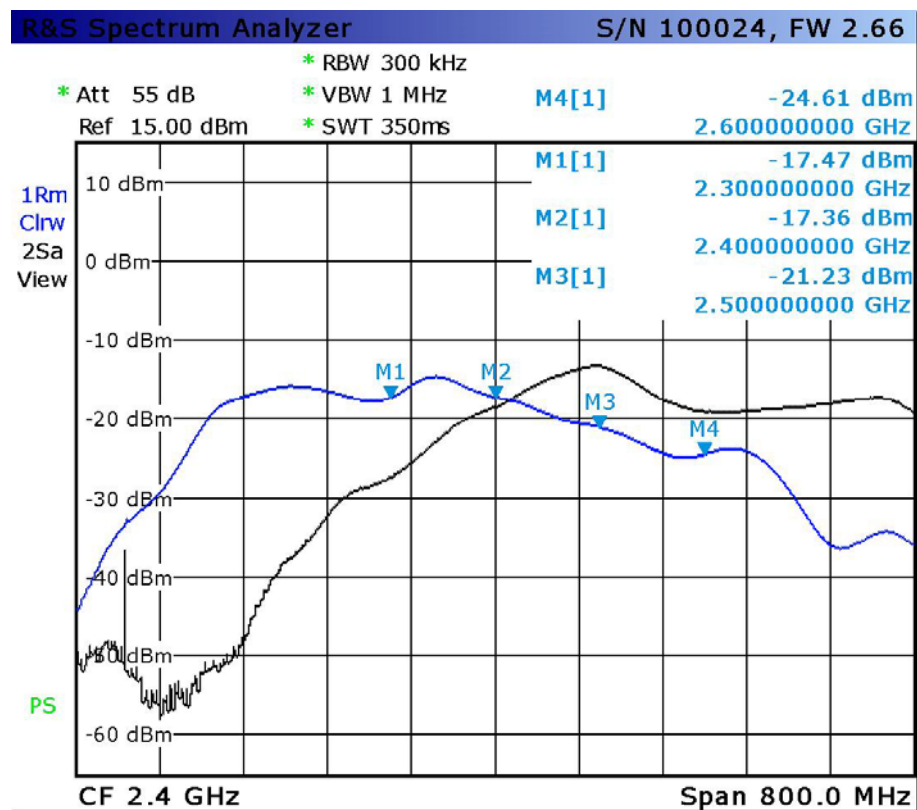
Picture with bad varicap biasing.



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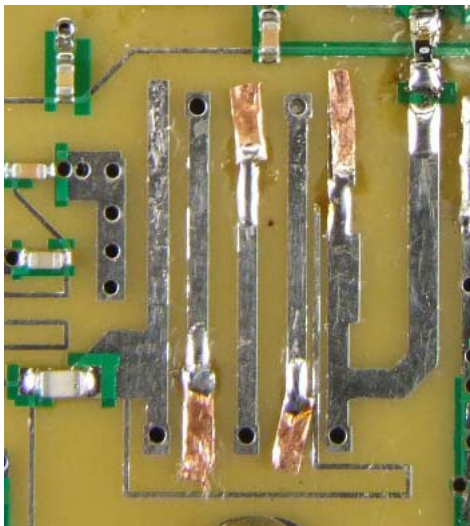
Bandpass filter modification

The black curve is the original one. The blue one is the curve after modification.



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This is how it's been modified.

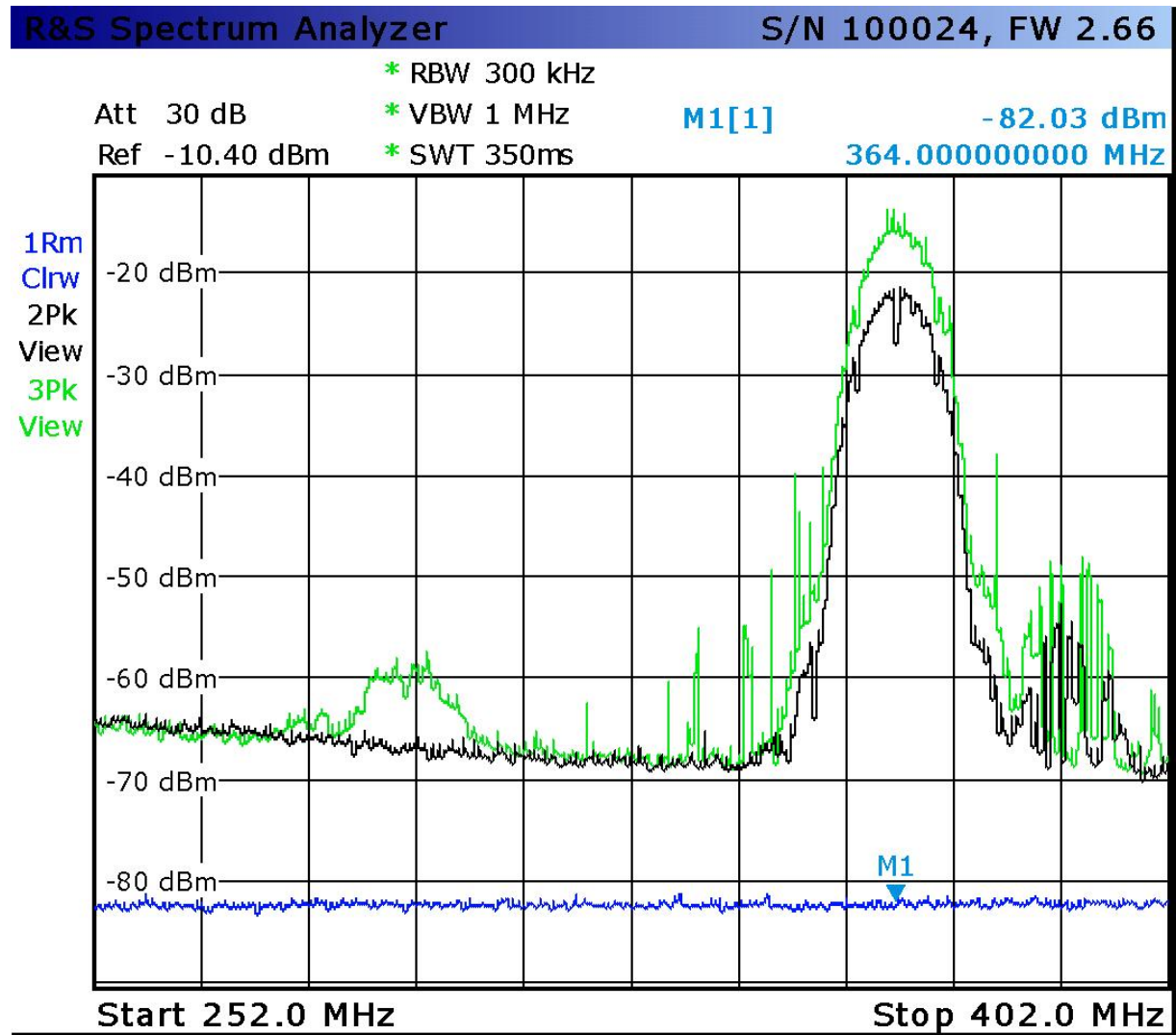


Receiving a Wifi signal on 2412MHz. Output : 2412MHz – 2048MHz = 364MHz

Black curve: reception with only reflector, radiator and one director.

Green curve: reception with the complete antenna.

Difference ... let's say 7dB.



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A few pictures ...

