

How to modify a Cal Amp Integrated Antenna Down Converter TP38921



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

Local Oscillator Modification

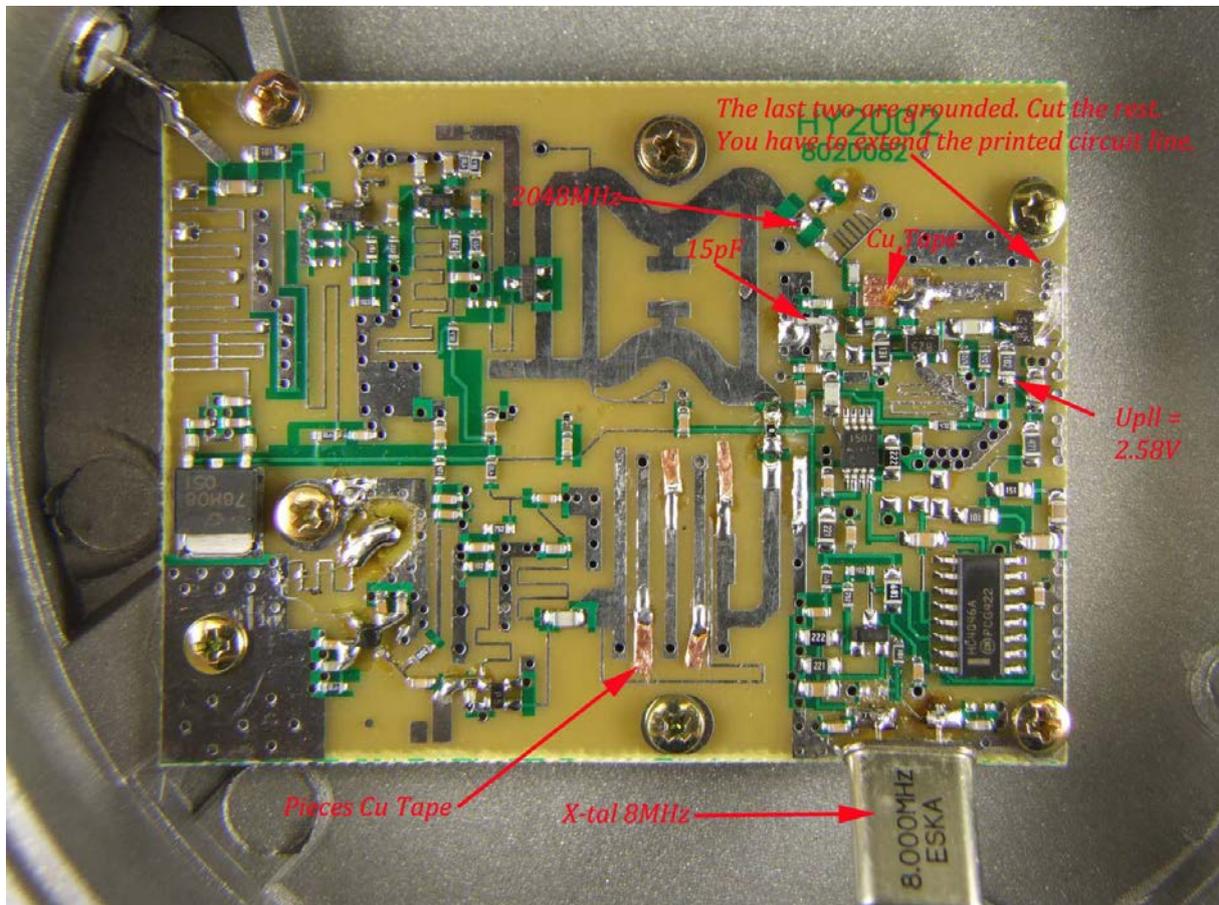
Normally the LO = 2278MHz.
The Input Frequency Range = 2500 – 2700MHz
Output Frequency = 222 – 422MHz

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.

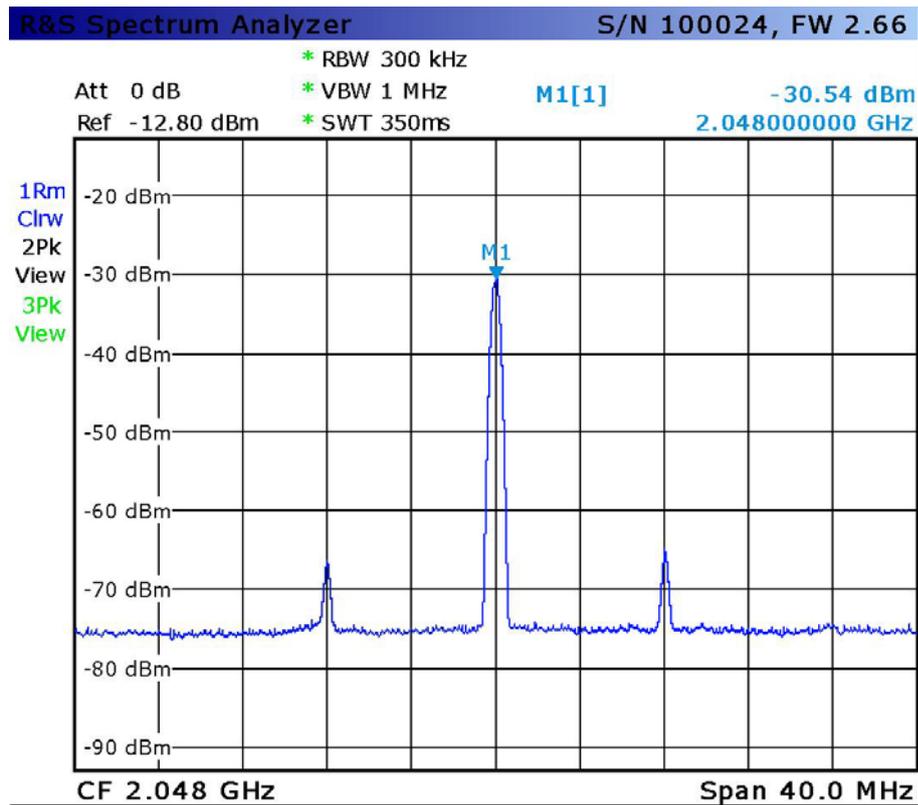


First you need a little piece of Cu tape and a 15pF SMD capacitor to modify the LO circuit.
Now it will lock on 2048MHz. But there is a problem

Important !

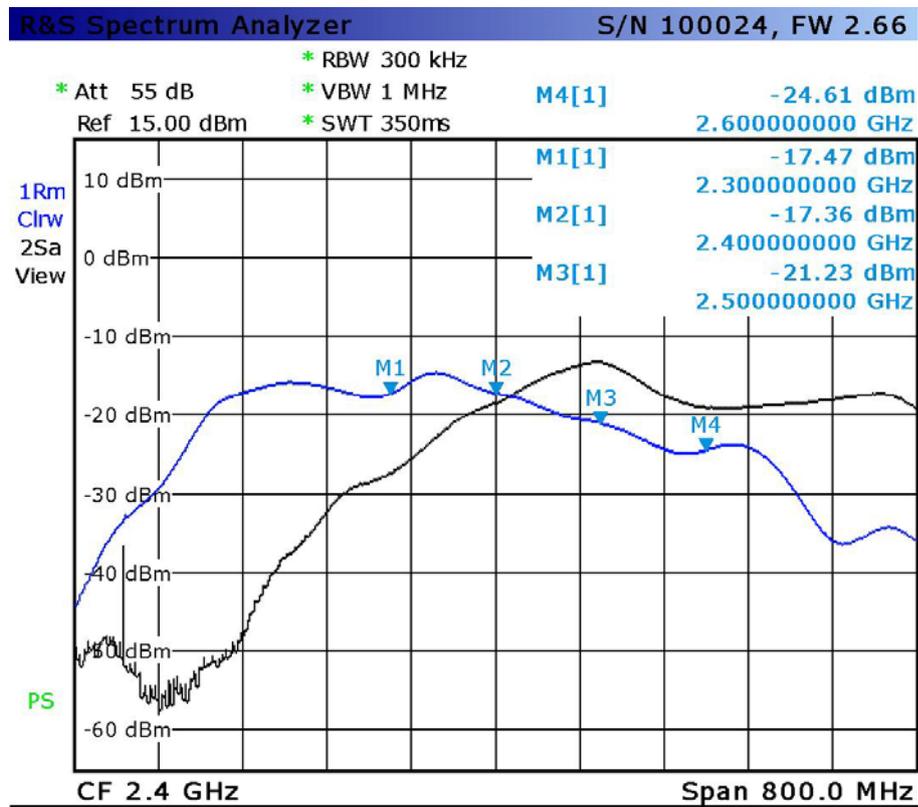
Upll has to be around 2.5V. If it's lower the oscillator will produce spurious. Just like you can see on the spectrum analyser picture here. To solve this problem I have extended the pcb line which goes from the varicap to the ground. It's a line which has several connections to the ground. I have cutted 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.



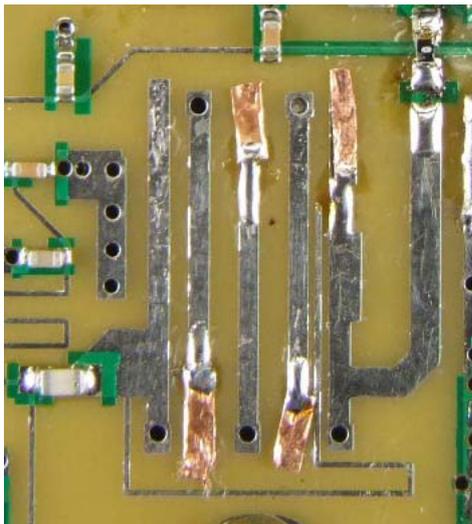
Bandpass filter modification

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.

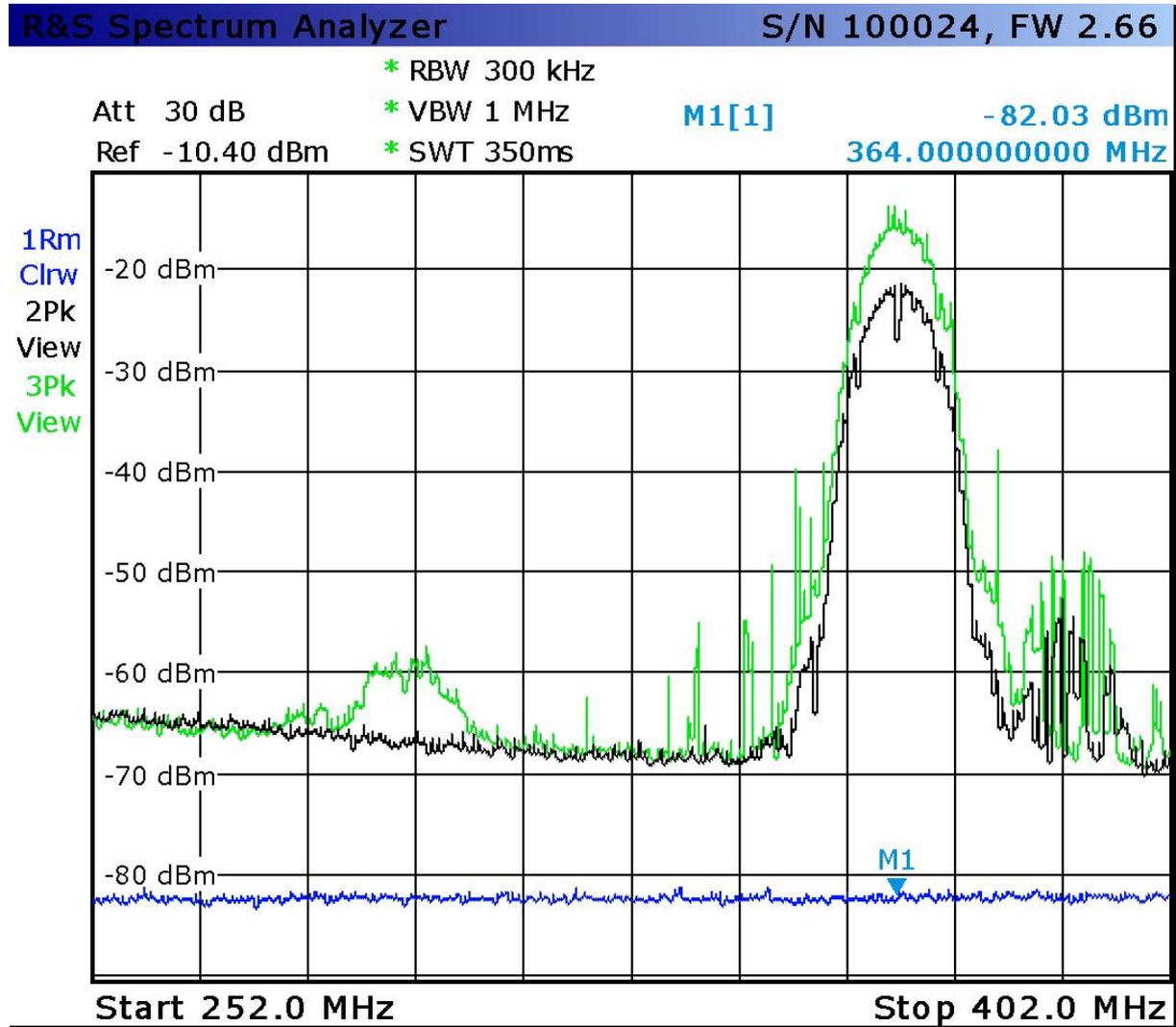


Receiving a Wifi signal on 2412MHz. Output : 2412MHz – 2048MHz = 364MHz

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 ...

