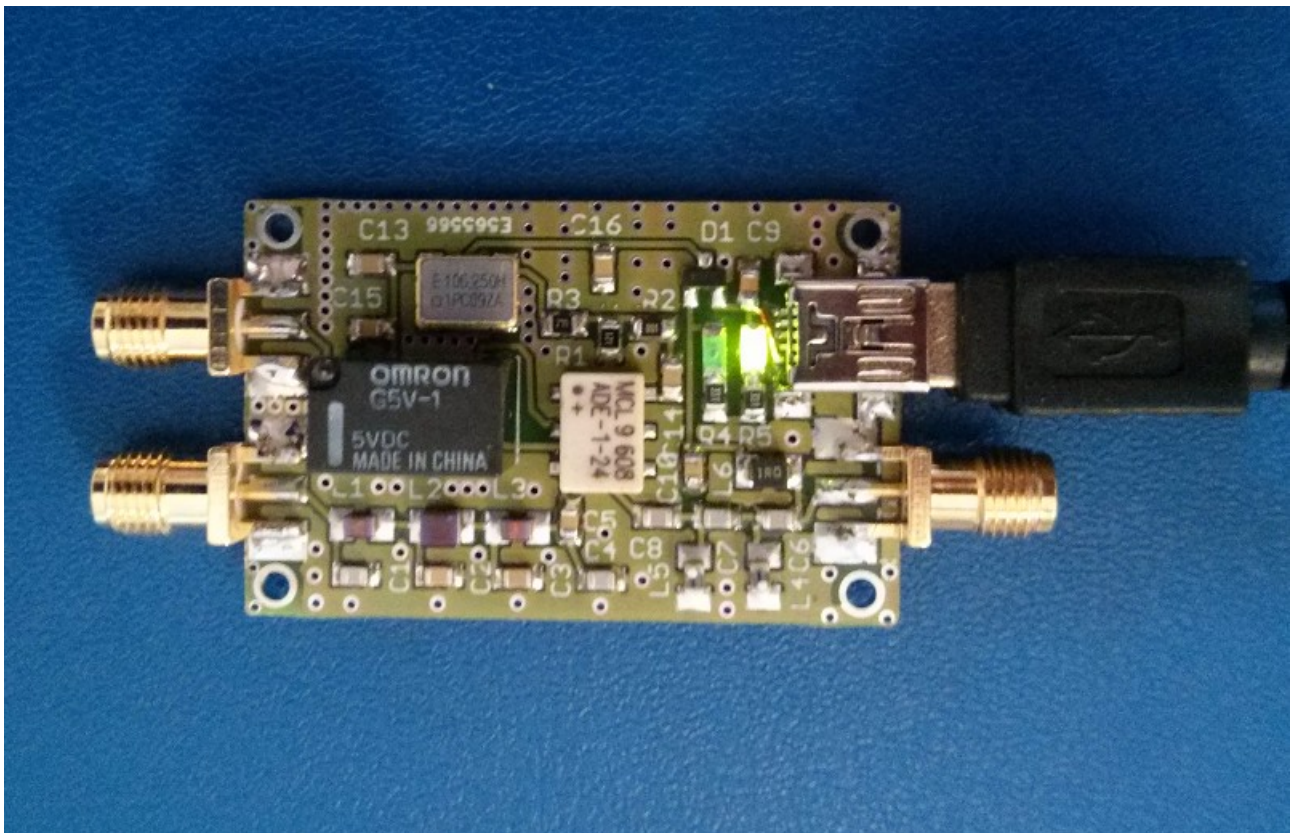


THE FUN CUBE DOGLE/ RTL HF CONVERTER

Version 5.0

By. Tony CT1FFU



New Version 5.0

Updated:

- . Smaller PCB size
- . 2 LED indicators for miniUSB or Phantom-Power 5V
- . mini-USB connector
- . 4 holes for screwing PCB

If you are a FCD owner or a RTL TV SDR receiver, i'm sure you are a very satisfied with the quality and performance

receiving satellites and all sorts of communications in VHF and UHF.

However, the FCD only starts receiving properly from 64Mhz up, RTL stick from 24MHz, and misses all the good fun that is receiving HF on a SDR.

That is why we decided to make a simple HF converter, and get access on all the bands, extending the RX now from DC to 1700Mhz.

The HF converter is very simple, as you can see in diagram

This new version have the capacity of switching the HF or the UHF/VHF antennas automatic

This will clear your reception from any neighbour FM broadcasting station interference.

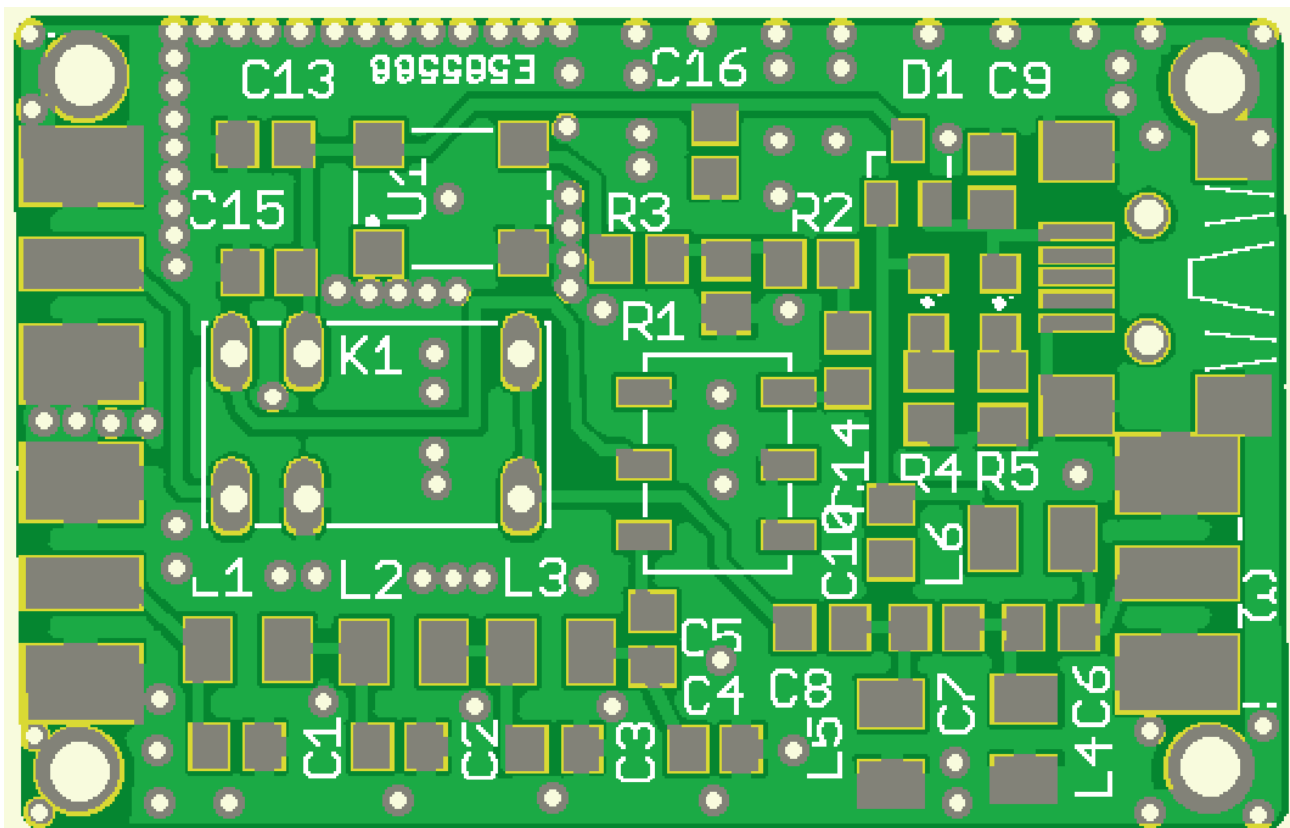
Designed the aloud only frequencies from DC to 52Mhz travel into the mixer.

The Local Oscillator is a crystal clock and runs on 106.250Mhz. (this is our IF)
The mixer DBM ADE-1 minicircuits, making the conversion of signals.
In the output we have another filter, Hi Pass Filter, preventing image frequencies and aloud only

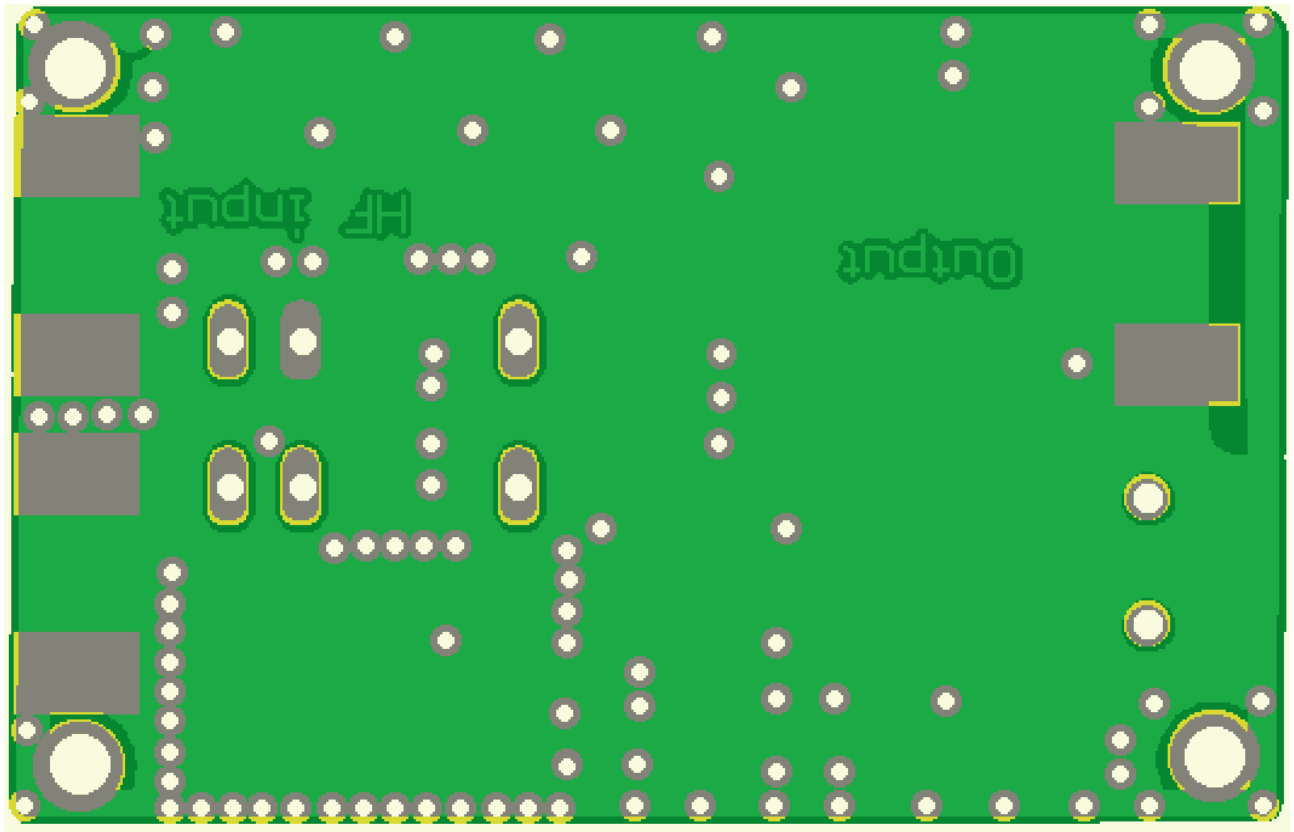
the signals up 108Mhz are received by the FCD

VCC, 5V are supplied from a USB connector or from Phantom-power of FCD.

Aspect of the Converter board top view



Board bottom view



Testing:

Plug in the converter to a USB, you will see a LED light ON. that's the 5V indicator.

If you have a Frequency counter or Oscilloscope you can now check for 106.250 Mhz carrier on the output of clock.

Test point.

Read 106.250Mhz on R1.

You will use this frequency on LO, the more accurate reading, the better

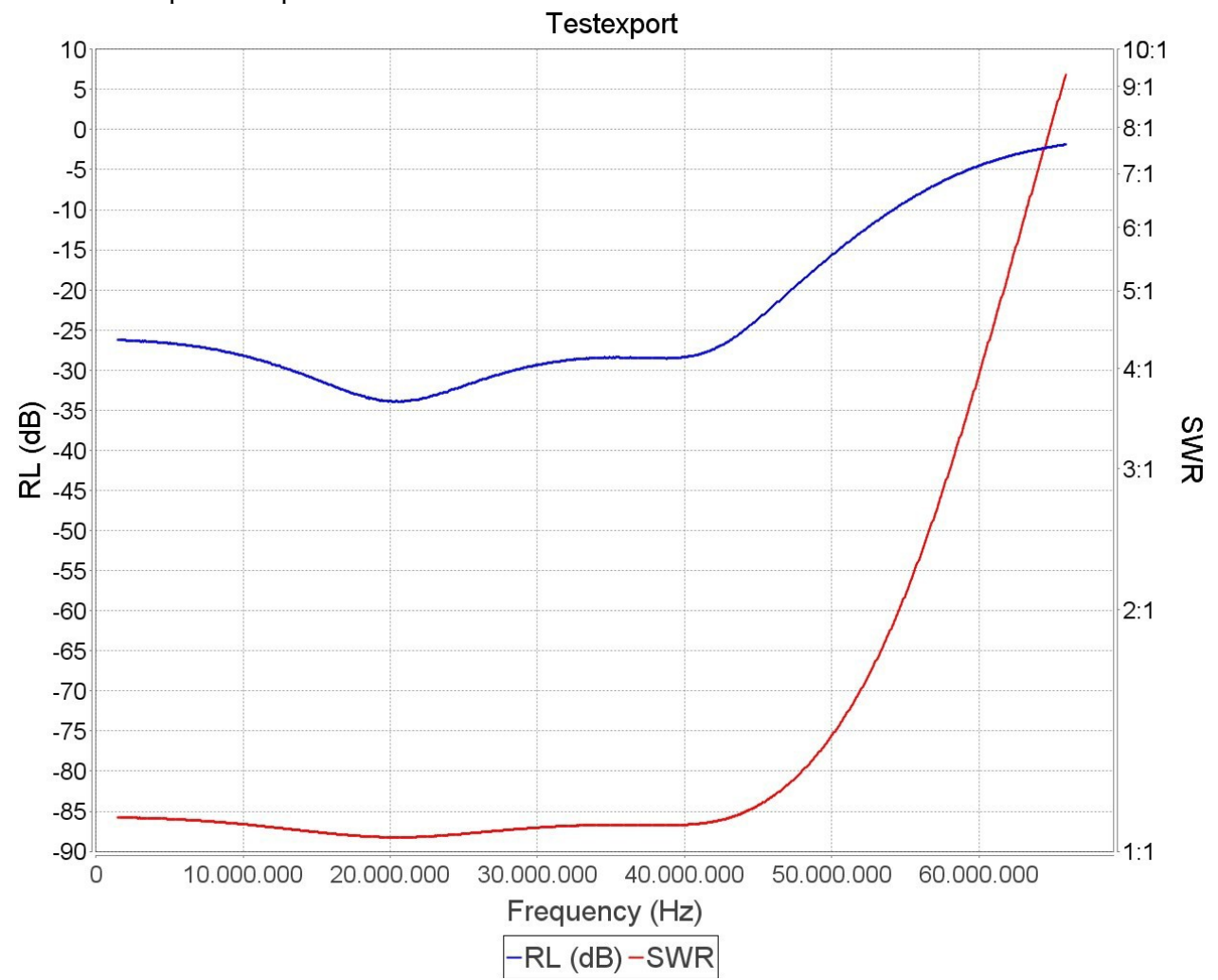
Nice sin wave from clock.

(in fact, the LO is not sin wave, it is more like square wave, but on a 100Mhz oscilloscope this is how it looks. You will need a higher frequency oscilloscope to see the real wave shape)

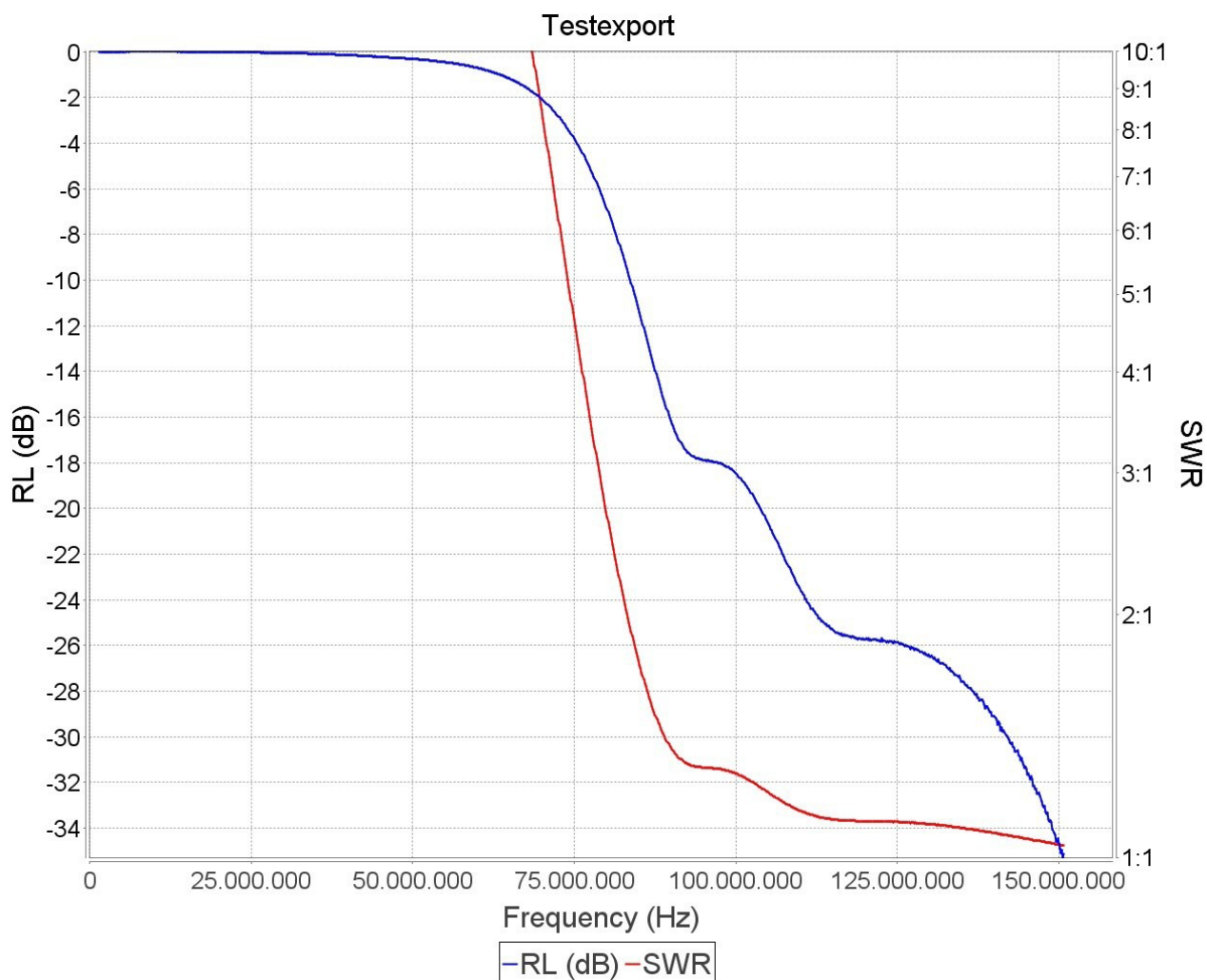
However, if you see a wave like this, it means you have LO running!

If you don't have a frequency meter or oscilloscope, you can listen to the LO carrier on a FM receiver or a Walkie-talkie tuned near the frequency 106.250 MHz

Plot for the input Low-pass-filter



Plot for the high-pass-filter



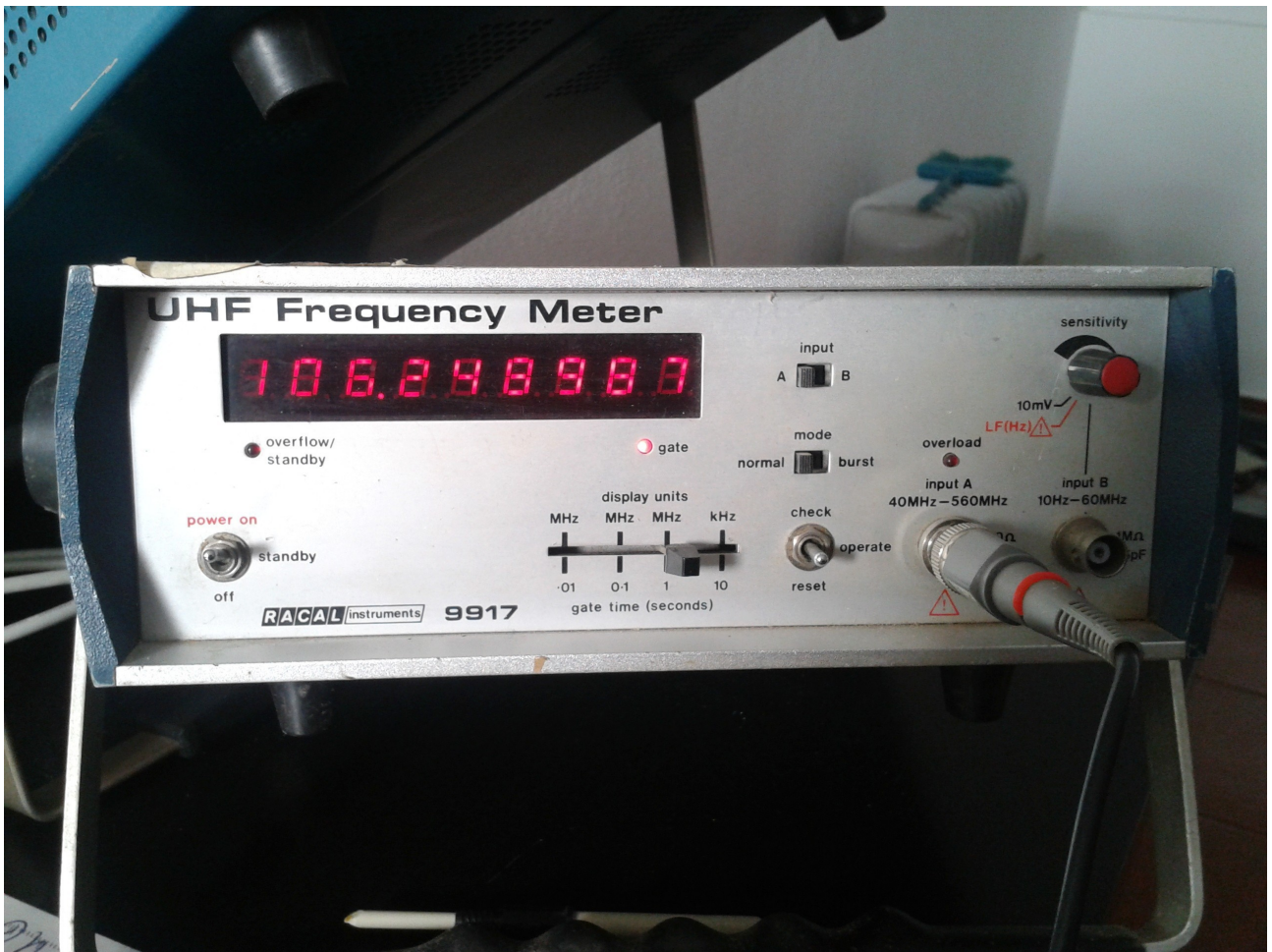
You can connect now the converter into your FCD/RTL with a SMA-SMA cable.
Connect your HF antenna to the Input of the HF input and VHF/UHF antenna to VHF input.

Turn on your favorite SDR program and start enjoy receive HF on the FCD.
If you want to go back to VHF/UHF, just unplug the USB or disable the Phantom-Power.

This new version 5.0 , with a new mixer ADE-1 from minicircuits have a higher performance and residual LO level on output.
This makes reception a lot more clear, less noise and inter-modulation.

FCD and HF Converter together.

To tune the bands on HF.
You just need to sum 106.250 Mhz with the frequency you want to receive.
Ex: if you want to receive 20m, Calculate $106.250 + 14.250 = 120.500$



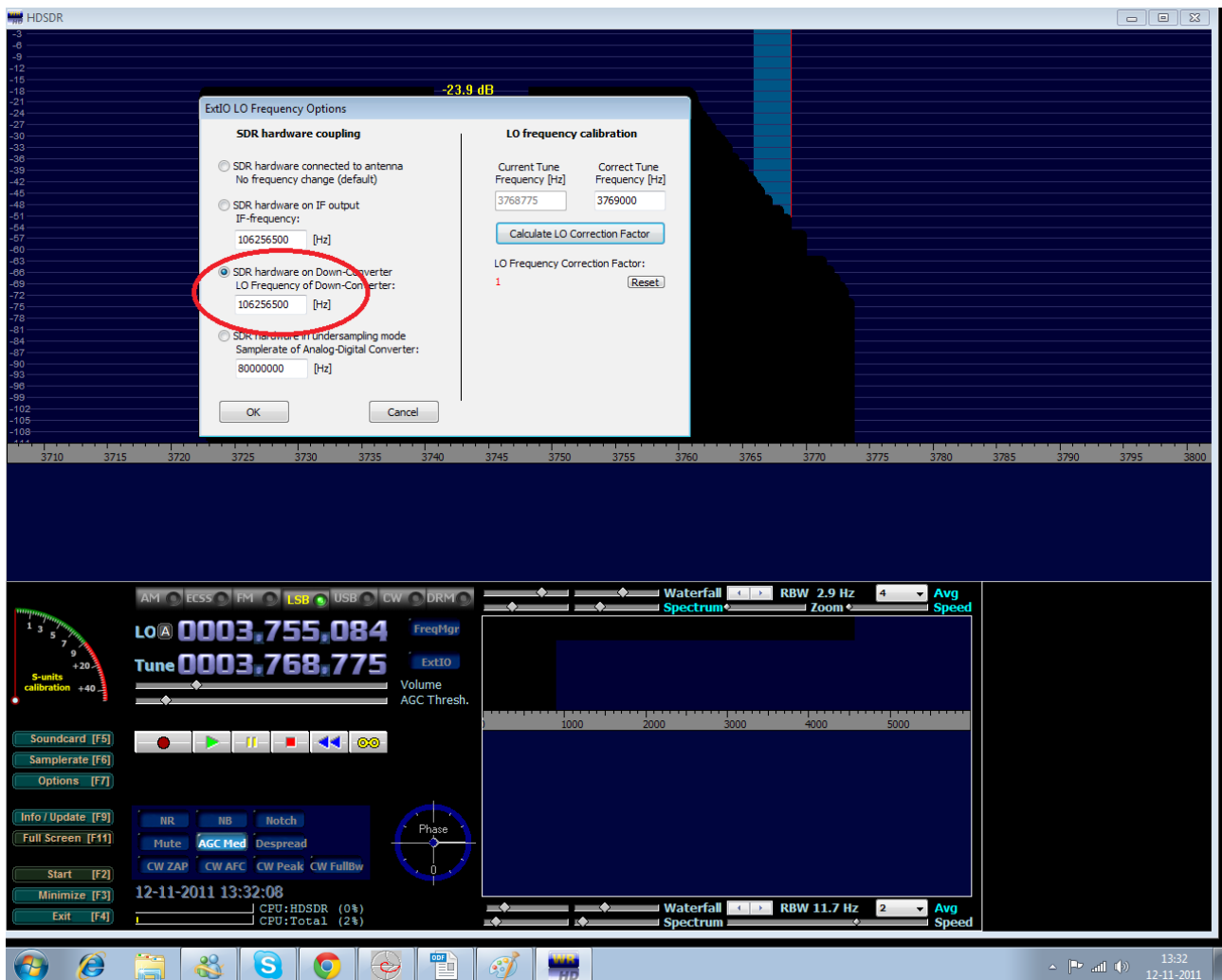


120.500 is the frequency you will tune your FCD
The easy way, use HSDR.
HSDR software has the converter option.

To work with the HSDR:
go to Options> Extio LO Options

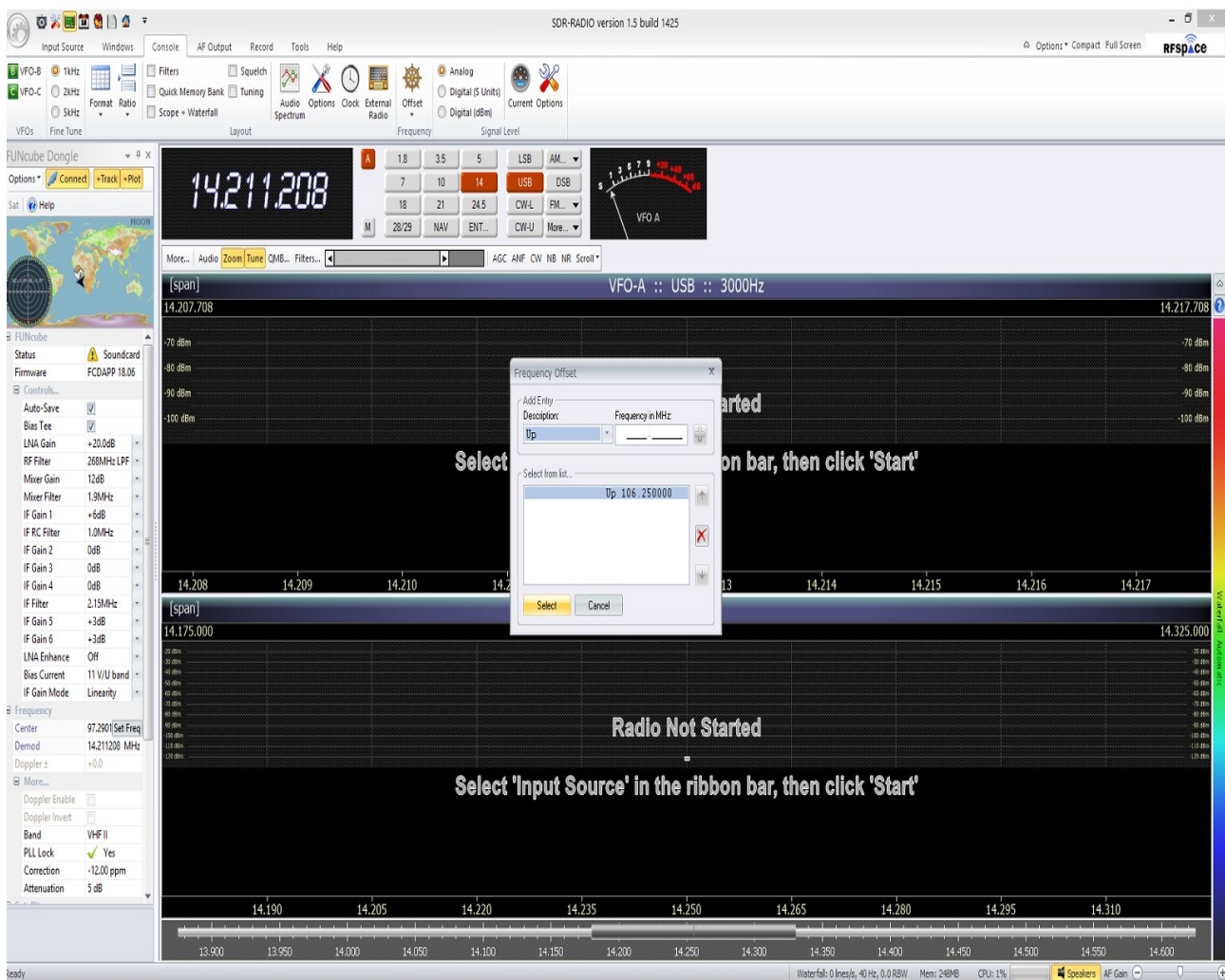
and insert the LO frequency: 106250000Hz (read from your frequency counter, must be in HZ)

Now you can tune you HF band with the correct frequency on screen .



About SDR-Radio:

As Version 5.0 have very high gain on conversion, you will improve the reception by reducing the LNA gain on FCD.

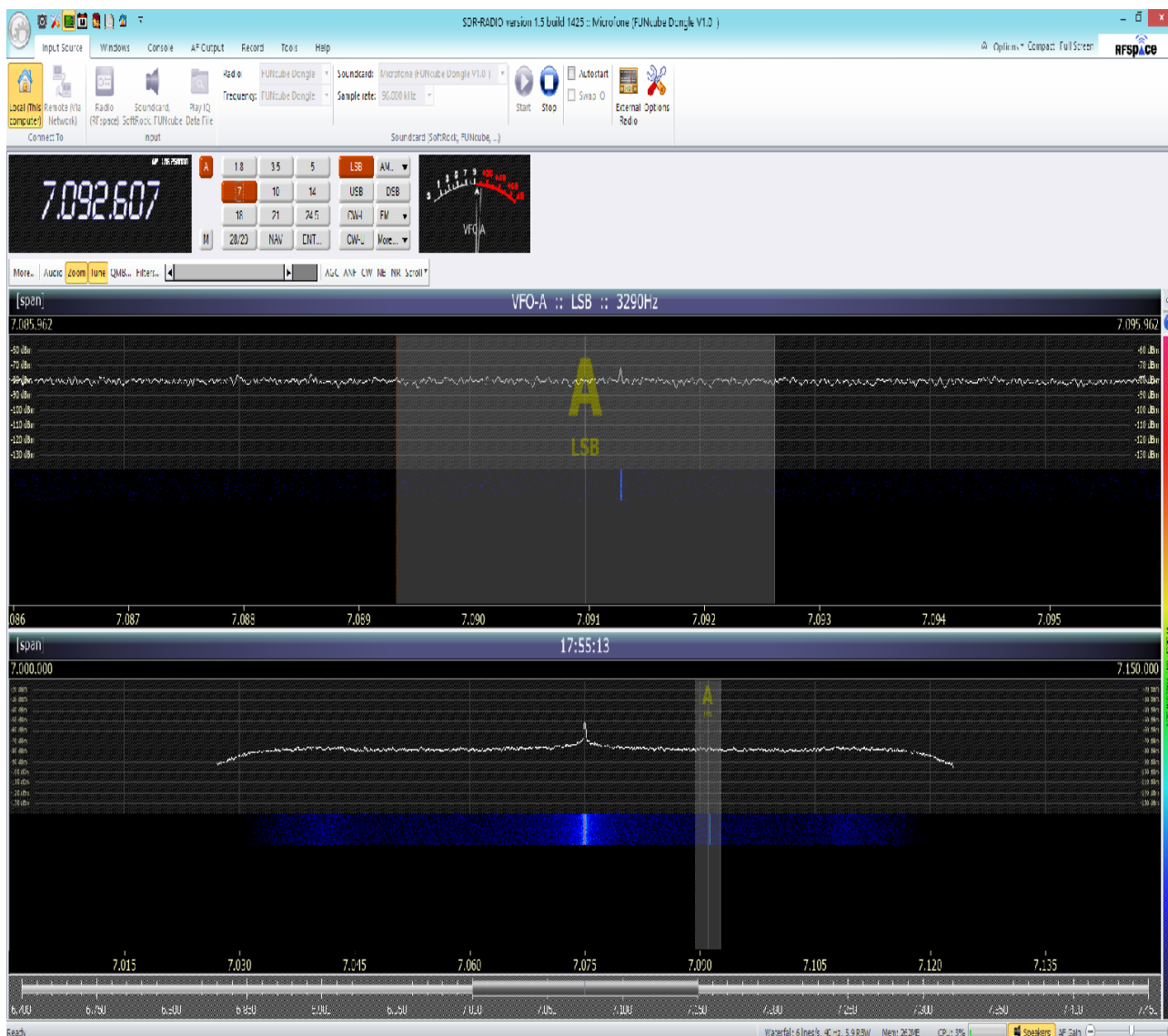


Adjust your Options table as here, reduce all gains to minimum.

Go to Console > Offset> insert 106.250000MHz and UP OK

running SDR-RADIO

You can download here: <http://sdr-radio.com/Download/tabid/178/language/en-US/Default.aspx>



For more info or any help
please contact ct1ffu@gmail.com

Best 73 all
enjoy HF on you Fun Cube Dongle or RTL SDR
Tony

www.dxpatriol.com

Thanks To:
Luís, CT1DMK filter/circuit design assistance
Sigi - DG9BFC Antenna Switching Idea.

Enjoy you new possibilities of SDR radio.

