Simple Multichannel- Multiband Crystal Oscillator for SDR -Make it Simple as Possible with Outstanding Performances

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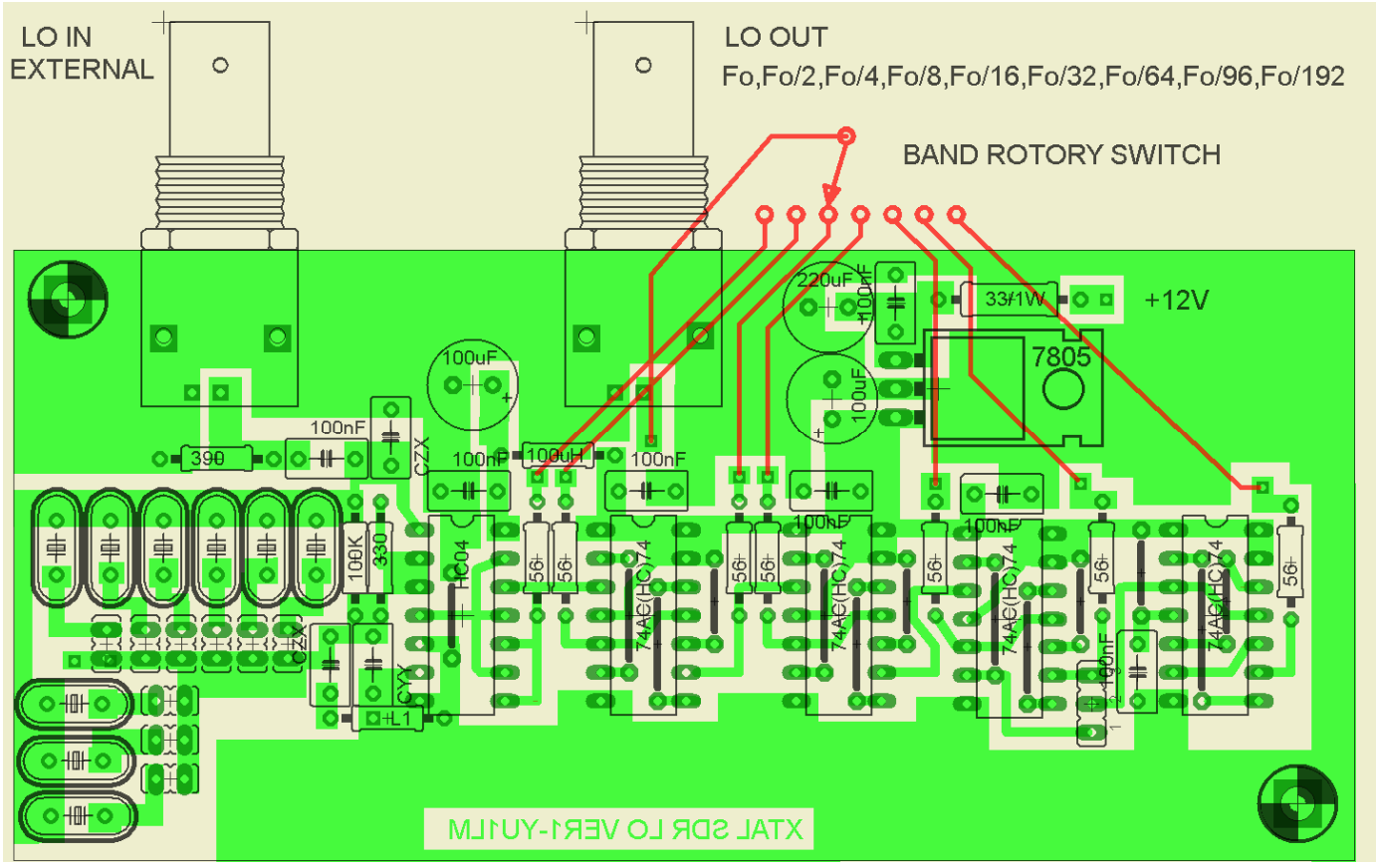
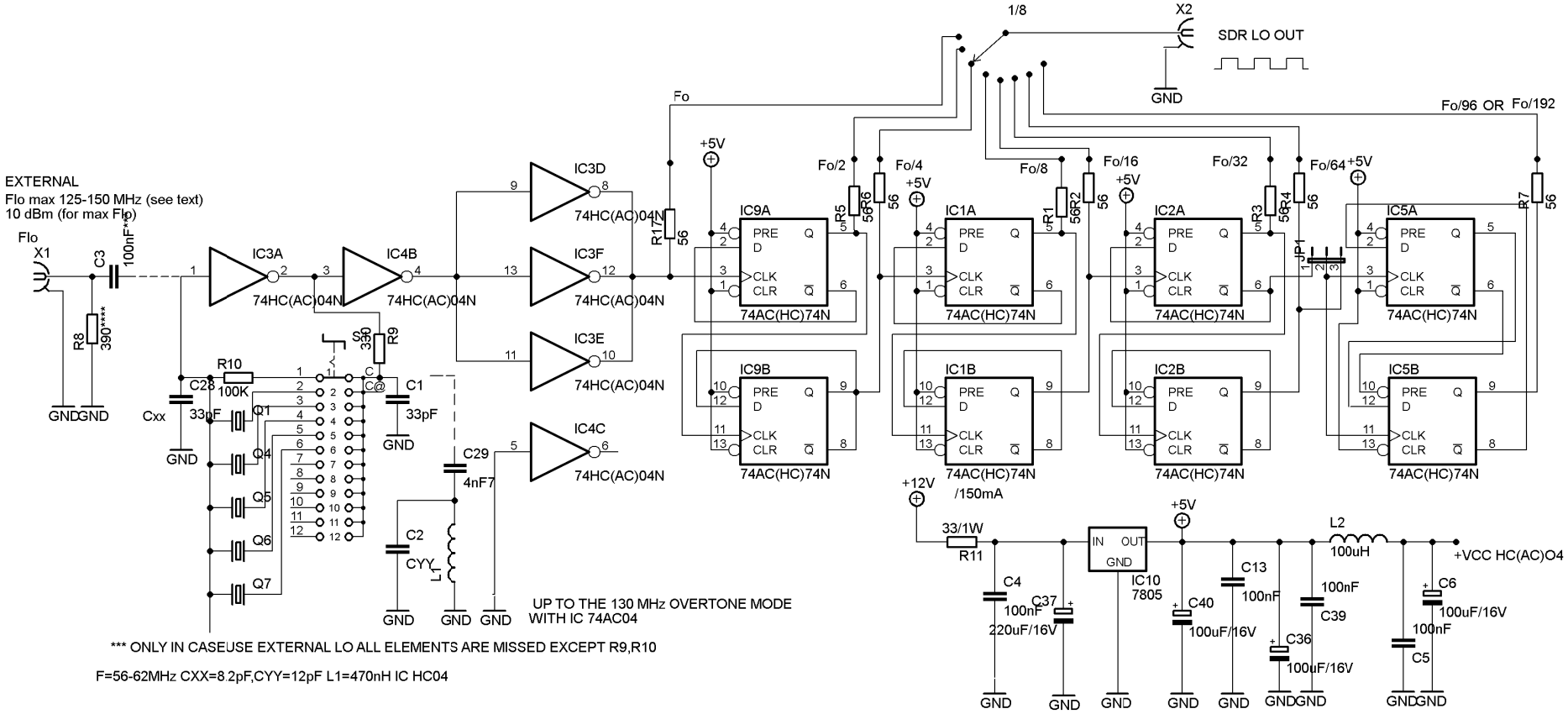
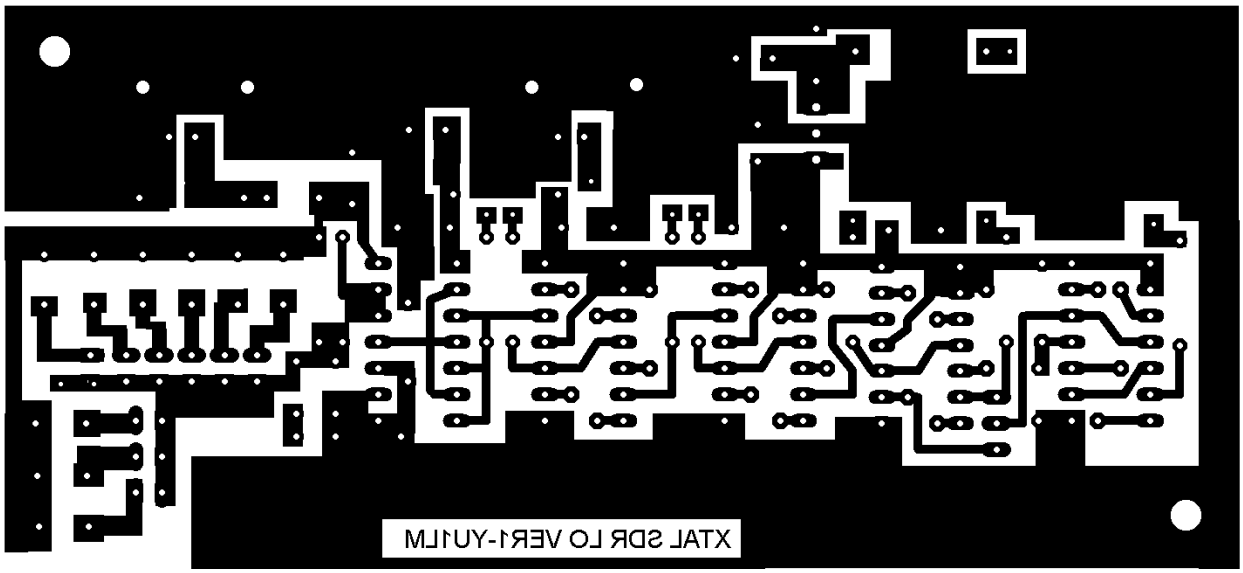
For the most reader and newbie in SDR technique practical realization some of mine SDR designs had been stopped for one simple reason LO (local oscillator). Making a simple and versatile LO is not easy task especially for beginners and unexperienced builders. Different solution like DDS, PLL or Si570 are offering relatively simple solution but not for beginner's experimenting. At the very beginning I made this simple multichannel – multiband crystal LO. With this LO I made very easy big number SDR experiments and after that over thousand QSOs at different bands. The initial LO was working in 40-58MHz bandwidth and it was 11 channels oscillator, see picture realized oscillator on proto-board. With them I worked at 28 MHz down to 1.8MHz and even at 500 kHz and 137 kHz at all bands which are harmonically related. All this was possible even with only "one" yes 1 crystal quartz sample from 56-56.4MHz. There is nothing special in this design and it is very easy repeatable design. Only one possible obstacle in realization can be realization overtone oscillators. Reason for possible problems is relative high sensitivity to component and IC producer tolerances. This solution can be ancient for modern LO solution but it is hard find simpler especially when you have big collection surplus quartz crystals like I do. For example with one PC 28322 KHz quartz you can work at 14, 7, 3.5, 1.8 MHz and 137 kHz. How big working segment (bandwidth) of each band depend from sound card sample rate!!



XTAL SDR oscillator parts placement



XTAL OSCILLATORS FOR SDR -YU1LM



XTAL SDR oscillator single side PCB dimensions 115.5 mm x 35.5 mm

The adjustment oscillator is a very easy and it depends from crystal quartz frequency. In fundamental mode to 20 MHz there is no adjustment. Oscillator will start at once if all components are OK and solder at right places.

For third overtone oscillators to 35 MHz it is necessary reduce Cxx and C1 to 22pF and R10 to 3K3.-4K7.

For frequencies over 35MHz it is necessary to make that oscillator without crystal quartz oscillate around wanted frequency for example for 56 MHz from 55-62MHz! After we have this we can connect crystal quartz unit and check final output frequencies at some of many outputs! That is all adjustment you have to do. Keep short as possible connection to rotary switch to enable reliable oscillation all units! It is possible for oscillator to work even at different frequencies very easy in fundamental mode or third overtone mode it is depending from crystal quartz unit only. At frequencies over 35MHz oscillator need to be adjusted to higher possible working frequency. The lower frequencies can be easy achieved adding some capacitance to crystal unit from end which is connected to rotary switch to ground.

If you have some other oscillator it is possible to connect them to external LO input and obtain all possible harmonic frequencies. The output signal is square ideal for almost all my designs with shape and necessary amplitude.

I wish you successful oscillator realization and I apologize for some possible mistakes. I made great effort to make SDR projects and share them with all who are interesting for. Anyway send me your comments positive or negative, results or photos of your realization please

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