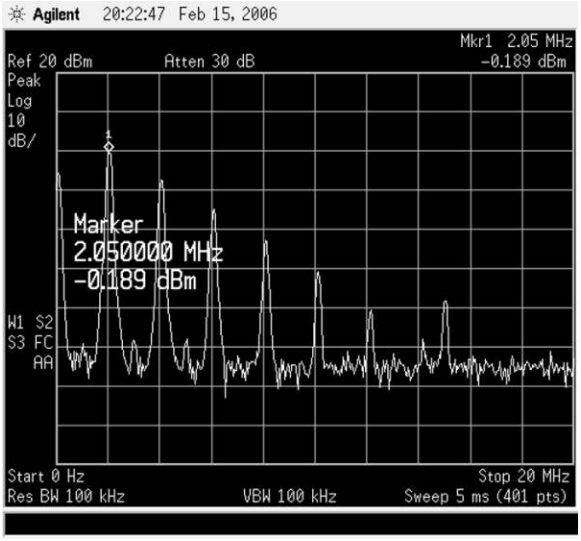
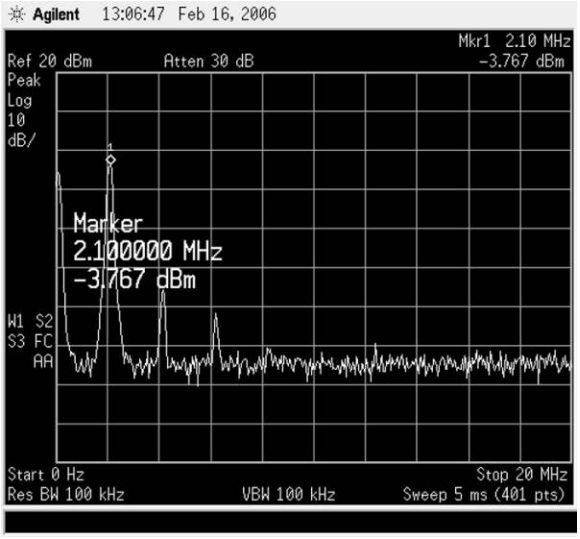
VFO



VFO spectrum at RX mixer input with original schematic.

fundamental = 0dBm
2nd harmonic = - 8dBm = - 8dBc
3rd harmonic = -14dBm = -14dBc
4th harmonic = -32dBm = -32dBc

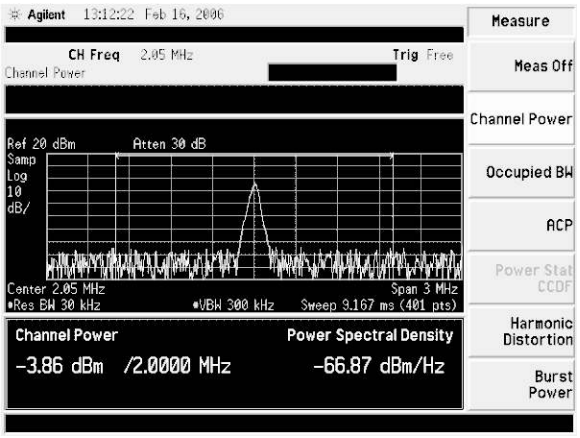


VFO spectrum at RX mixer input with R6 replaced by 10uH fixed inductor.

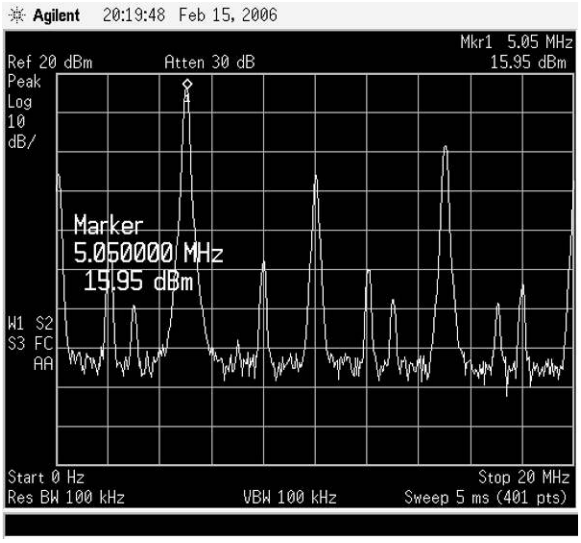
fundamental = - 4dBm
2nd harmonic = -36dBm = -32dBc
3rd harmonic = -42dBm = -38dBc
4th harmonic = "in the noise"

Quick check of the VFO Phase Noise.
At HF, phase noise is usually measured over 100KHz bandwidth; Elecraft measures their rigs and others at 4KHz. The -67dBm/Hz measured here is over 2MHz. Therefore,
at 100KHz 10log(100KHz/2MHz) = -13dBm/Hz
100KHz phase noise =-67-(-13)= -80dBm/Hz
at 4KHz 10log (4KHz/2MHz) = -27dBm/Hz
4KHz phase noise =-67-(-27)= -94dBm/Hz

Most <u>synthesized</u> rigs have a phase noise in the -100 to -115dBm/Hz range. -94dBm/Hz is not at all that bad for a variable capacitor based VFO.



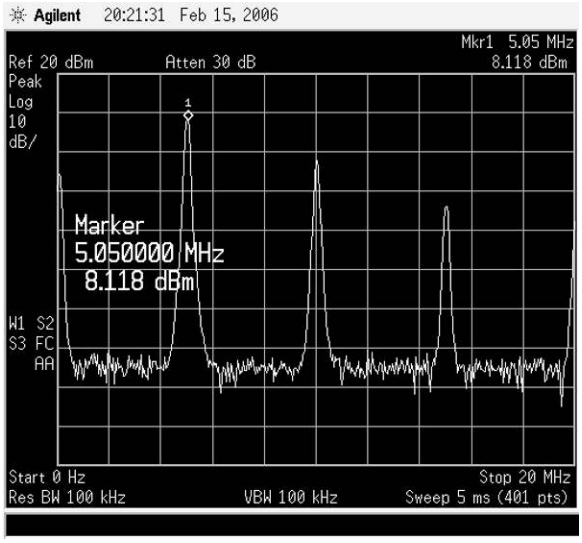
BFO



BFO output at U5-8.

The 5MHz BFO forms the 750Hz CW tone from the IF. Harmonics are less important here, with most images highly rejected by T6

TXO



TXO output at TX mixer input, showing some "cleanup" due to R38 filter. May substitute R38 with fixed inductor to reduce 2nd harmonic further if excessive RF 2nd harmonic present after T4-T5 (which contibutes to the PA output spectrum)