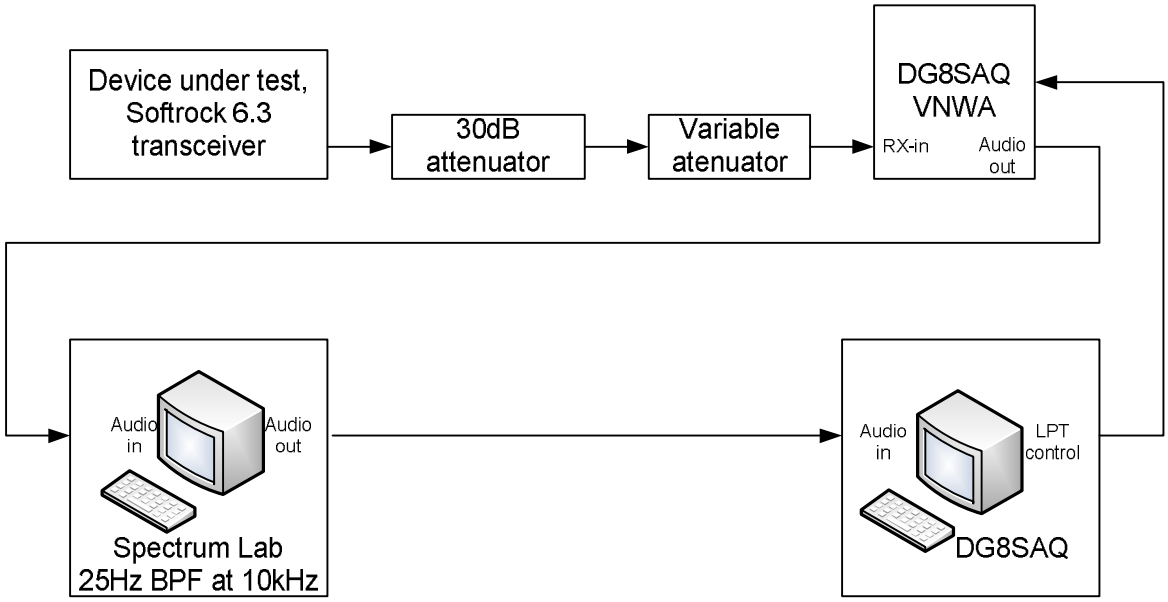
Softrock 6.3 TXRX Two Tone Test

using the DG8SAQ Vector Network Analyzer

in Spectrum Analyzer mode.

2009-05-10 TF3LJ

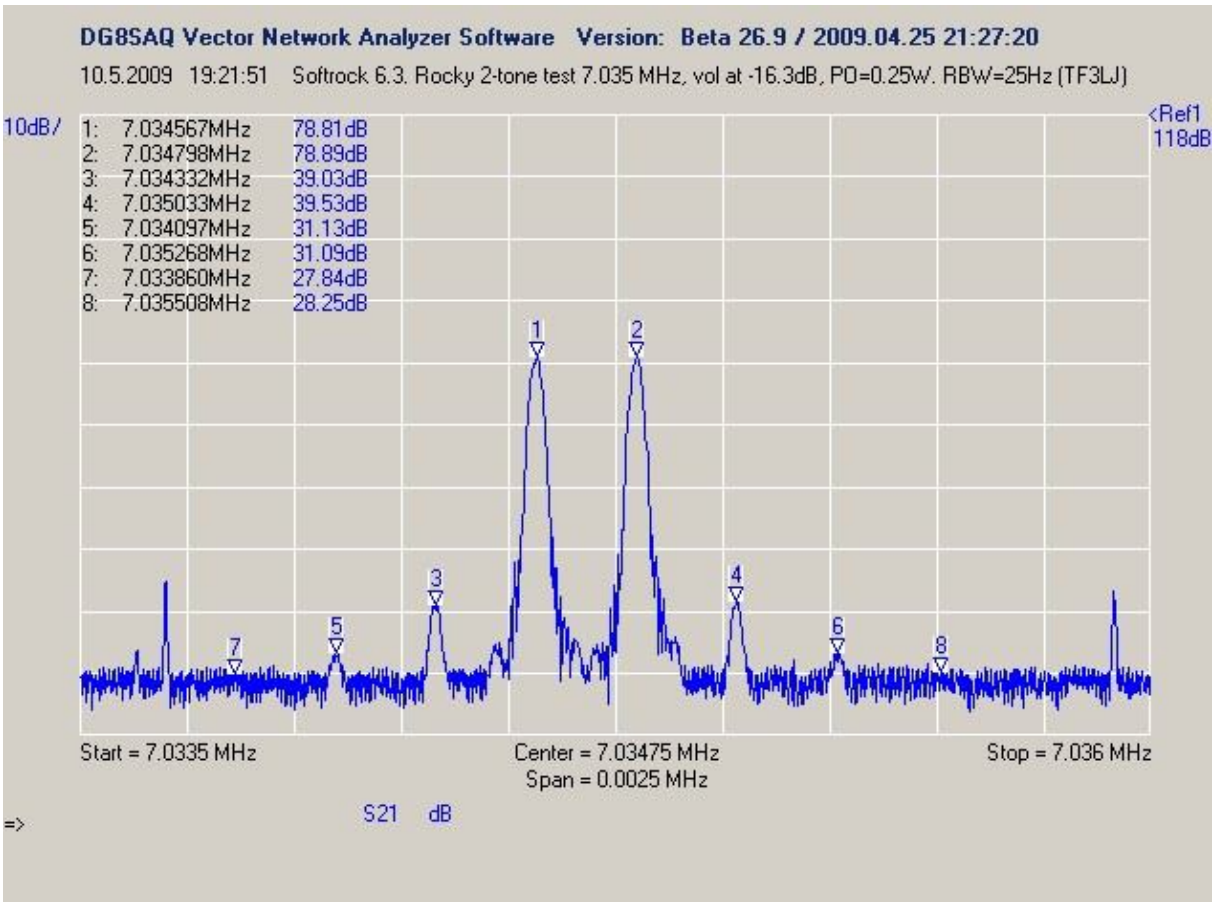
Test setup:

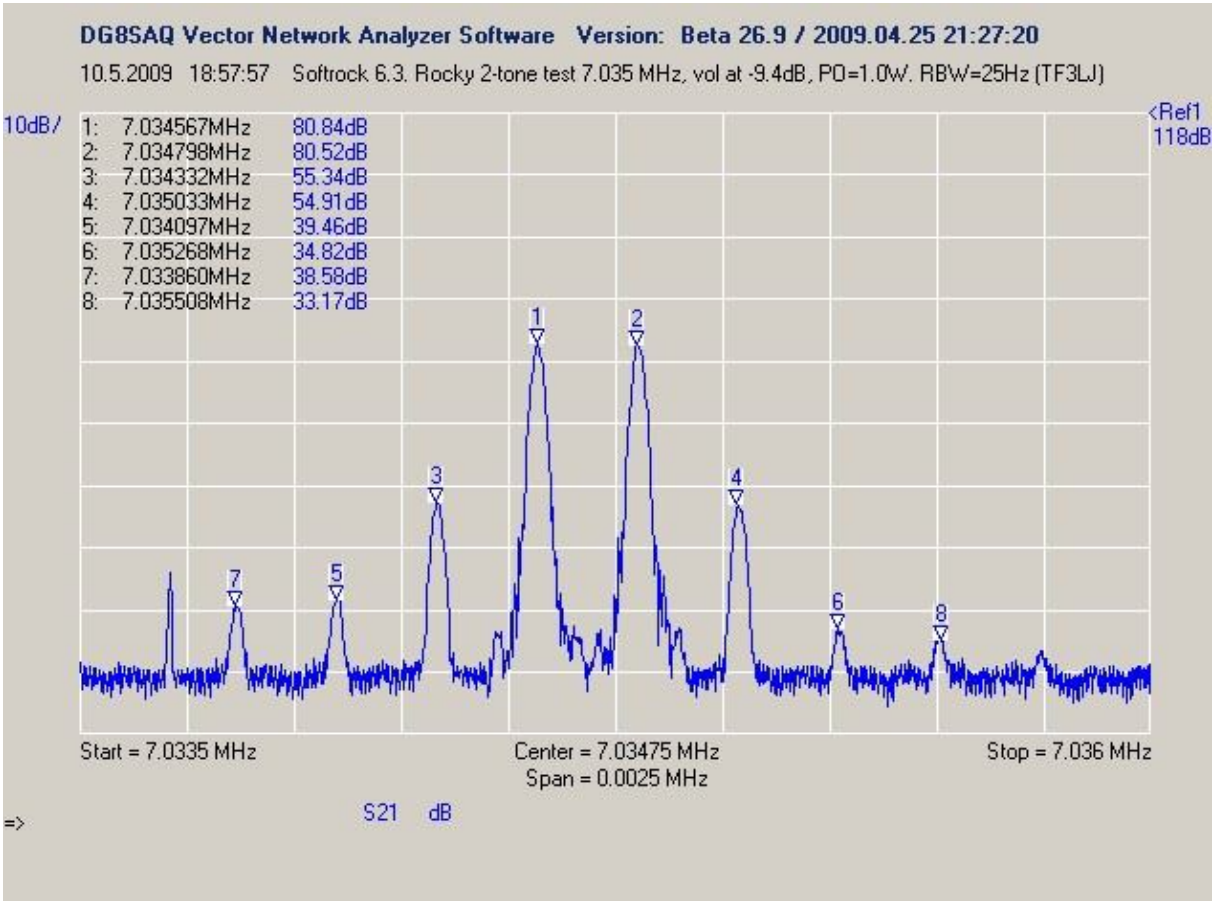


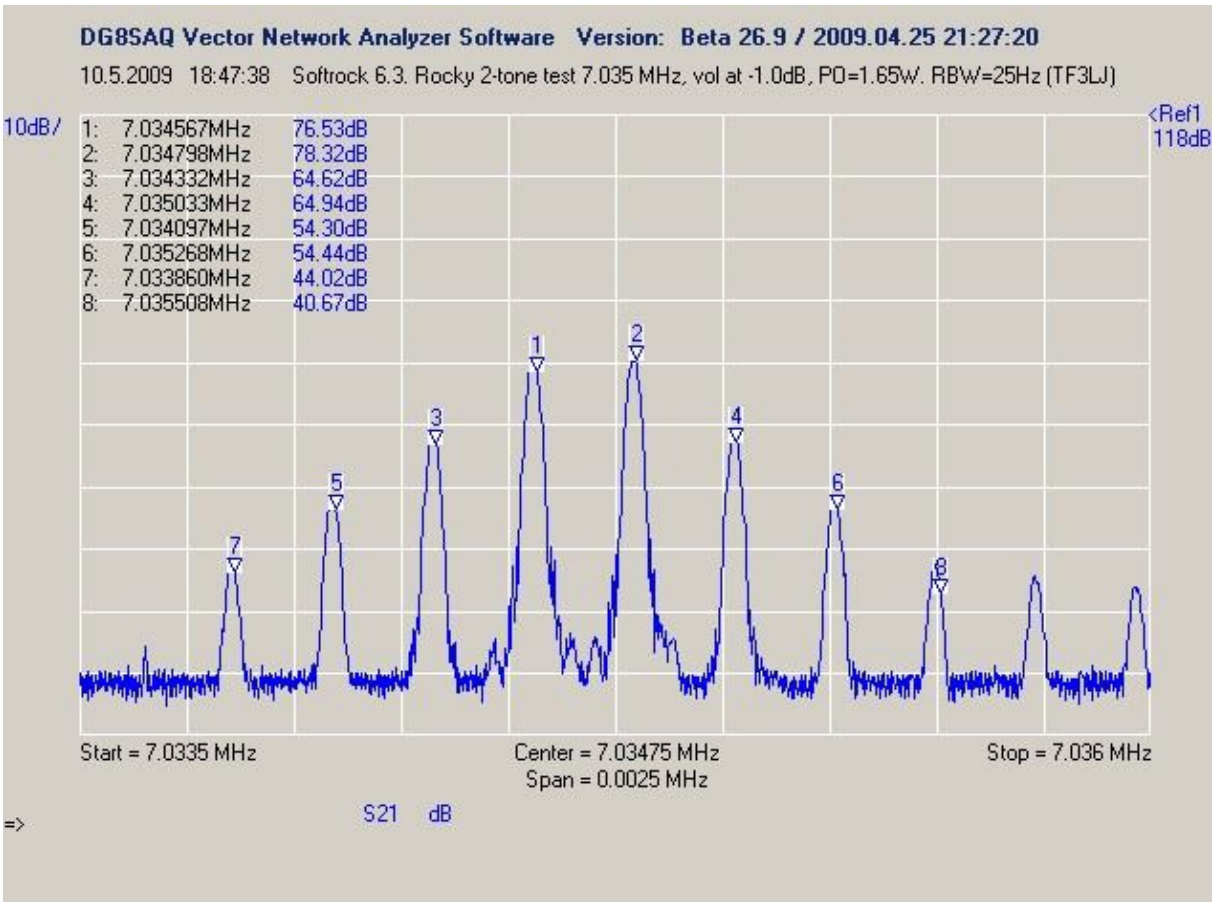
Variable attenuator set at 40 +/- 10dB, depending on input power. The DG8SAQ analyzer input appears to become nonlinear if input levels are too high. Useful range seems to be up to approximately 50dB above the noise floor. Higher levels result in compression of the input signal, exaggerating any overtone or IMD measurements.

The VNWA is set to a resolution bandwidth of 40000Hz, measurements shown use 1000 datapoints. The Spectrum Lab software by DL4YHF is run on a separate computer. For this proof of concept measurement it is used to implement a 25Hz BPF at 10 kHz, thus distancing the mirror image frequency far enough away to be invisible.

All measured values shown below are to relative scale. Three measurements were made, setting output of the Softrock 6.3 transceiver at 0.25, 1 and 1.67W power out respectively. The last measurement shows the maximum achievable power output of the Softrock transceiver. At this power level, the 3rd order intermodulation product is only 12dB below the two tone signal.


DG8SAQ Vector Network Analyzer Software Version: Beta 26.9 / 2009.04.25 21:27:20
10.5.2009 19:21:51 Softrock 6.3. Rocky 2-tone test 7.035 MHz, vol at -16.3dB, PO=0.25W. RBW=25Hz (TF3LJ)
10dB/
<Ref1
118dB
1: 7.034567MHz 78.81dB
2: 7.034798MHz 78.89dB
3: 7.034332MHz 39.03dB
4: 7.035033MHz 39.53dB
5: 7.034097MHz 31.13dB
6: 7.035268MHz 31.09dB
7: 7.033860MHz 27.84dB
8: 7.035508MHz 28.25dB
Start = 7.0335 MHz
Center = 7.03475 MHz
Span = 0.0025 MHz
Stop = 7.036 MHz
S21 dB
=>


DG8SAQ Vector Network Analyzer Software Version: Beta 26.9 / 2009.04.25 21:27:20
10.5.2009 18:57:57 Softrock 6.3. Rocky 2-tone test 7.035 MHz, vol at -9.4dB, PO=1.0W. RBW=25Hz (TF3LJ)
10dB/
<Ref1
118dB
1: 7.034567MHz 80.84dB
2: 7.034798MHz 80.52dB
3: 7.034332MHz 55.34dB
4: 7.035033MHz 54.91dB
5: 7.034097MHz 39.46dB
6: 7.035268MHz 34.82dB
7: 7.033860MHz 38.58dB
8: 7.035508MHz 33.17dB
Start = 7.0335 MHz
Center = 7.03475 MHz
Span = 0.0025 MHz
Stop = 7.036 MHz
S21 dB
=>


DG8SAQ Vector Network Analyzer Software Version: Beta 26.9 / 2009.04.25 21:27:20
10.5.2009 18:47:38 Softrock 6.3. Rocky 2-tone test 7.035 MHz, vol at -1.0dB, PO=1.65W. RBW=25Hz (TF3LJ)
10dB/
<Ref1
118dB
1: 7.034567MHz 76.53dB
2: 7.034798MHz 78.32dB
3: 7.034332MHz 64.62dB
4: 7.035033MHz 64.94dB
5: 7.034097MHz 54.30dB
6: 7.035268MHz 54.44dB
7: 7.033860MHz 44.02dB
8: 7.035508MHz 40.67dB
Start = 7.0335 MHz
Center = 7.03475 MHz
Span = 0.0025 MHz
Stop = 7.036 MHz
S21 dB
=>