Softrock RXTX V6.2 - 40/30m _ Local Oscillator Stage

Introduction

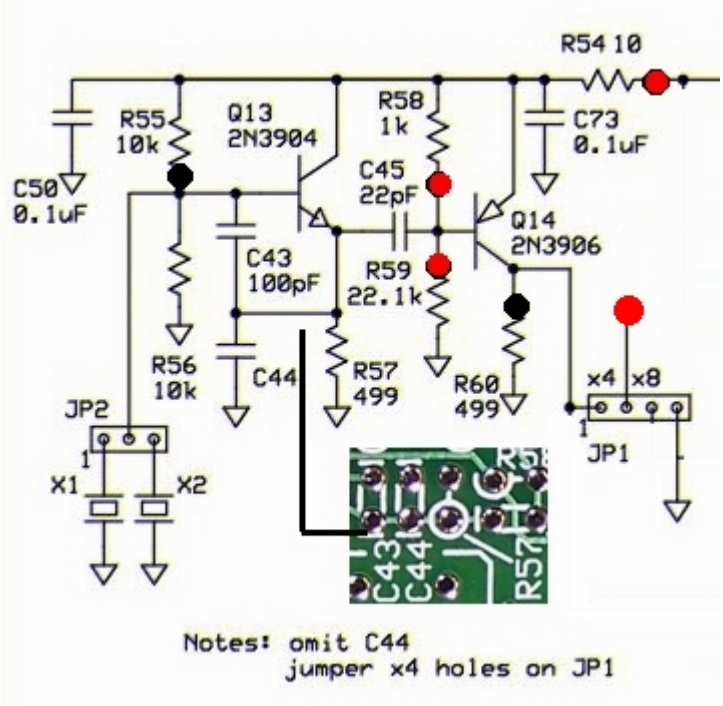
The second stage is the Local Oscillator. The circuit must provide the clock signal that is 4 times the desired center frequency. In the 40/30m kit, the two output frequencies correspond to the 2 crystals supplied:

- 40m: 28.06 MHz or 28.224 MHz,respectively, for 7.015 MHz or 7.056 MHz center frequency
- 30m: 40.5 MHz for the 10.125 MHz center frequency

Things to watch out for in this stage are:

- Mounting the crystals and attaching their ground straps.
- Soldering the leads on the transistors, Q13 and Q14. They are mounted to conform to the shape on the board silkscreen, After soldering the leads, double check them for solder bridges.

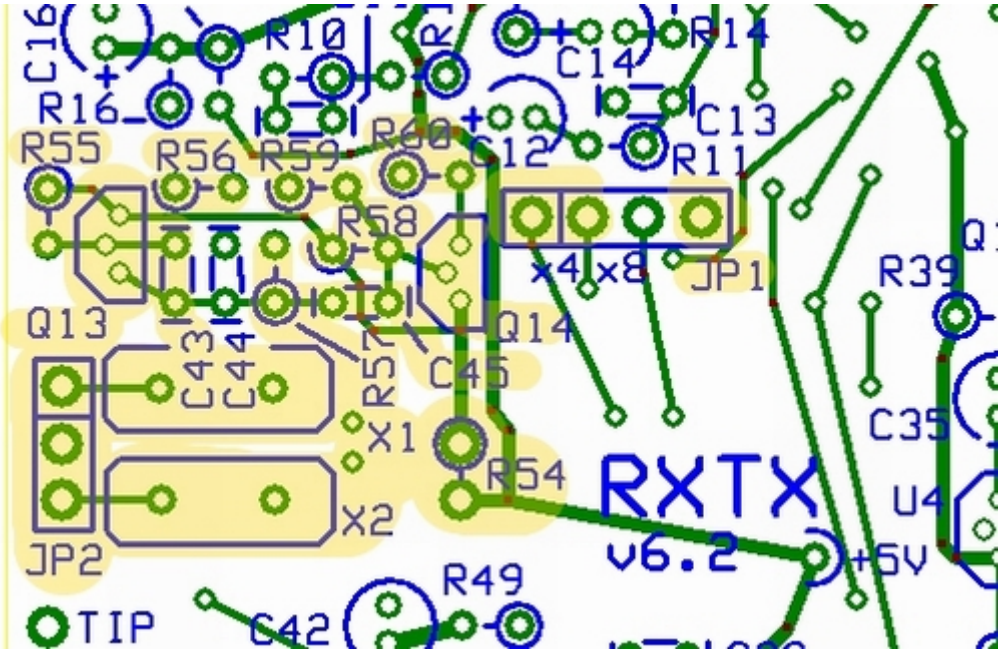
Schematic

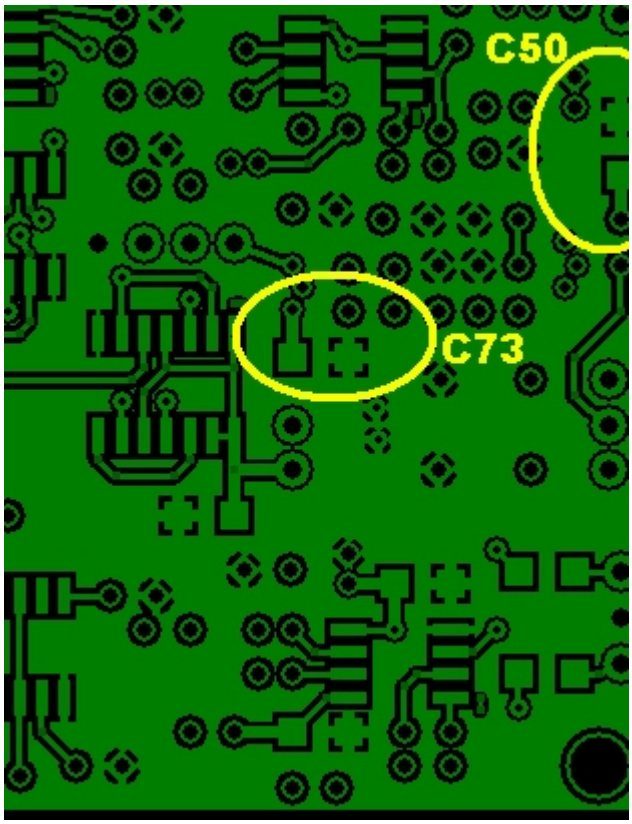


Bill of Materials

Designation	Value	Orientation
C43	100pF, ceramic, 5%	n/a
C45	22pF, ceramic, 5%	n/a
C50	0.1uF, smt 1206	smt
C73	0.1uF, smt 1206	smt
JP2	2-pin hdr & jumper plug	n/a
Q13	2N3904 NPN	TO 92
Q14	2N3906 PNP	TO 92
R54	10.0, 1/4 W, 1%	North-South
R55	10.0 K, 1/4 W, 1%	North-South
R56	10.0 K, 1/4 W, 1%	West-East
R57	499, 1/4W, 1%	South-North
R58	1.00 K, 1/4 W, 1%	West-East
R59	22.1 K, 1/4W, 1% (omit for 40/80)	West-East
R60	499, 1/4W, 1%	West-East
X01	28.06 MHz and / or 28.224 MHz	n/a
X02	40.5 MHz	n/a

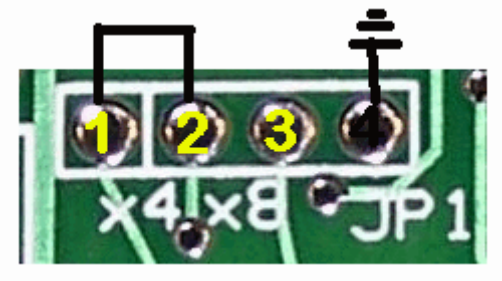
Build Notes


C16
R10
C14
R14
R16
C13
R55
R56
R59
C12
R11
R58
JP1
R39
Q13
Q14
C43
C44
R57
C45
X1
C35
R54
RXTX
U4
X2
v6.2
+5V
JP2
R49
TIP
C42


C50
C73

JP1

Mount a small wire loop to bridge the x4 holes, holes 1 and 2, of JP1. (This will result in each crystal frequency being divided by four in the clocking of the QSD and QSE circuits. The center frequency resulting from the x4 jumper will be approximately the crystal frequency divided by four) .



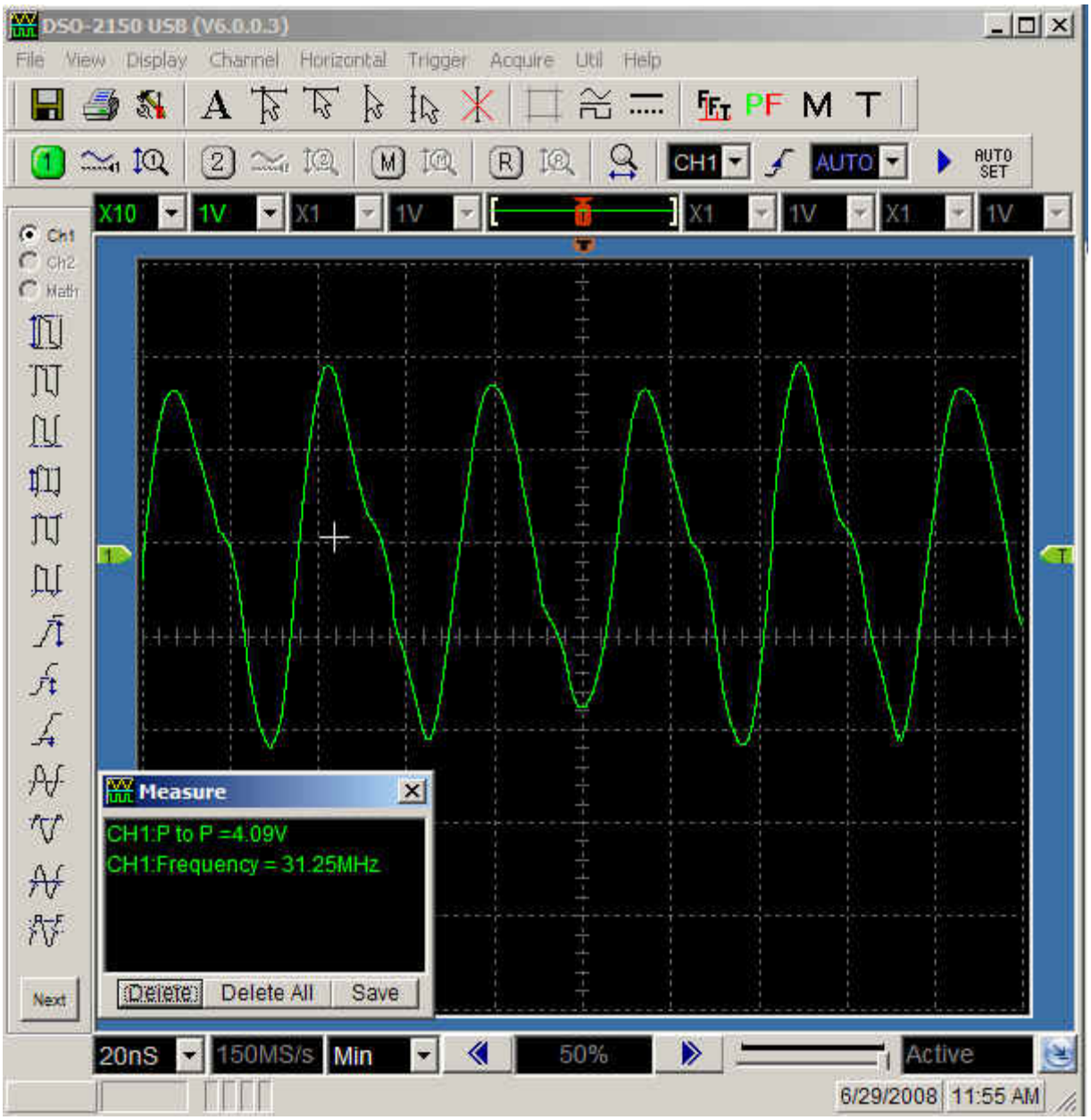
Testing

Current Draw

- **Initially, place a current limiting 1K resistor in series with one of the power leads,**
- **apply 12 Vdc power**
- **measure the current draw.**
- **You should see less than 10 mA draw. If the draw is greater than 10 mA, you should check your circuit for a short.**
- **Remove the current limiting resistor**
- **apply 12 Vdc power**
- **measure the current draw.**
- **The result should be around 11.5 mA.**
- **Set the ammeter back to voltage**

Oscillator Output Waveform

- **Connect your scope lead to the left-hand loop on JP1 and the ground clip to the right hand loop.**
- **Use the jumper and JP2 to select one or the other of the crystals.**
- **Power up and observe the trace on the scope.**
- **Depending upon the crystal selected, you should see a sinusoidal wave approximately 4.5 V p-p and frequency of 40.5, 28.224, or 28.060 MHz**



(note: the scope used is quite limited, especially above 20 MHz. Frequency and voltage measurements are, at best, approximations).

Home BOM Power Supply Local Oscillator Dividers RX RF; RX OpAmp RX Mixer(QSD)
TX OpAmps TX Mixer (QSE) PTT RX Switching Phones Antenna Switching PA Comments