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QRP2000 USB-Controlled Synthesizer

Interfacing Silicon labs Si570LVDS to KB9YIG Softrock RXTX and Softrock Lite PCBs

Introduction: Although the Si570CAC CMOS (Kit 1) is recommended to interface directly with Softrock RXTX and Softrock Lite boards, a number of constructors want to make use of the Silicon Labs Si570BBC LVDS device which, although not proven may provide slightly better performance. The information below shows how I successfully interfaced the Si570LVDS to work with Tony's KB9YIG Softrock RXTX6.1 transceiver kit for 80 and 40 meter operation and with Softrock Lite Receiver kit. The example below assumes the QRP2000 USB-Synthesizer kit is used.

Note: this information is given in good faith but no responsibility is assumed for any errors or omissions.

1. Interfacing with Softrock RXTX 6.1

Description of Modification: The Si570LVDS delivers approx 0.7V pk-pk RF in a medium/high impedance load. By connecting this RF output to Q11 buffer stage of the RXTX or Lite Crystal Oscillator biased in linear mode, sufficient amplification is achieved to drive U5 a 74HC74 divider. Please note that the use of Transformer T1 is optional. T1 is included to improve drive into 50 Ohm loads and to reduce common mode spurious output.

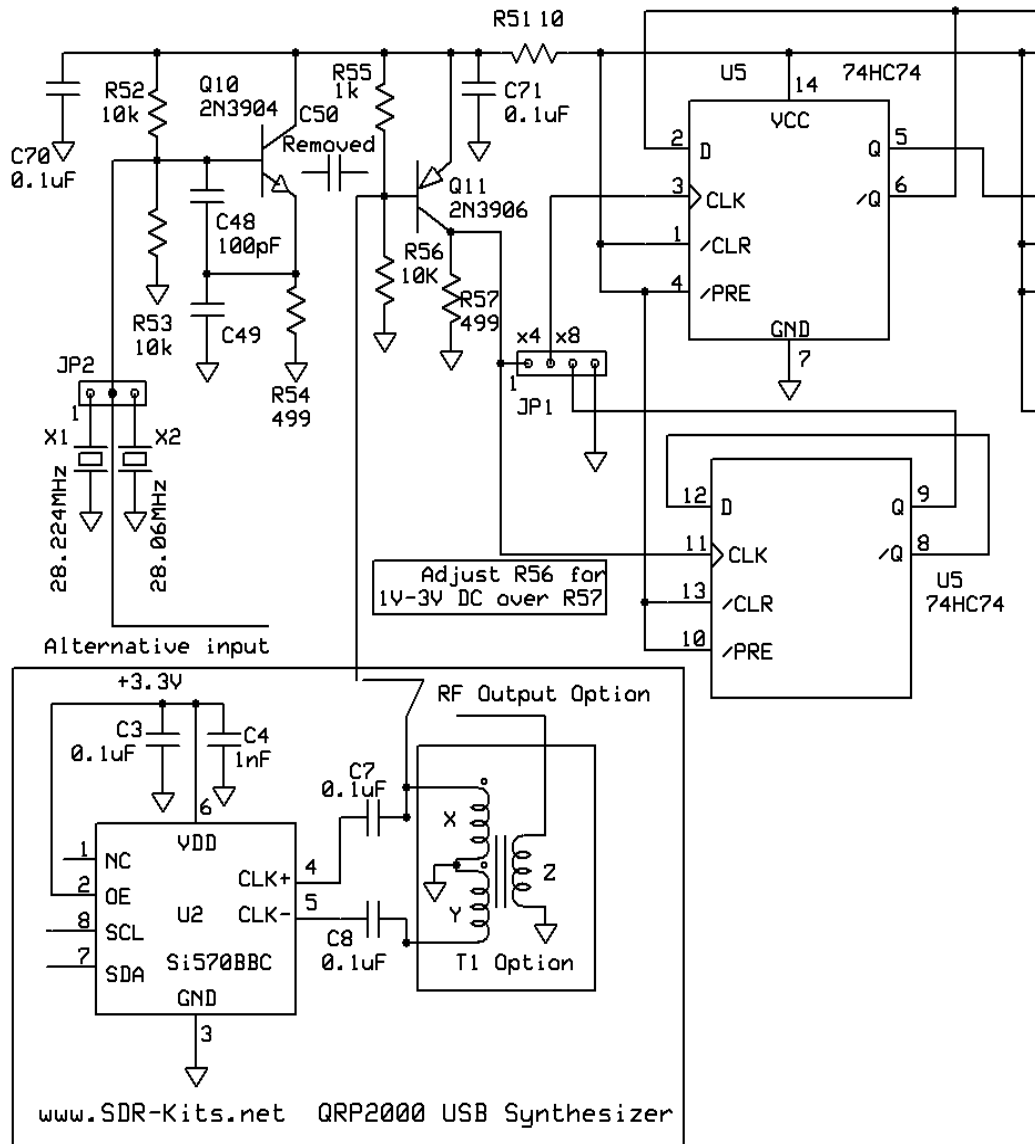
2. Modifications for RXTX 6.1

- 1) Remove C50 (22pF) in RXTX v6.1 (Easiest method is to crush the capacitor and remove the capacitor's wires to avoid damage to PCB)
- 2) Prepare a short length of miniature RG174 coax cable and solder inner conductor to the pad of C50 connected to Q11 base.
- 3) Solder outer braid of coax cable to ground (Crystal X1 is a convenient point)
- 4) Set the correct bias of Q11 for linear operation by inserting R56 = 10K resistor. (Instead of mounting R56 it may be easier to solder the 10K resistors over the USB Synthesizer RF output terminals.
- 5) Set Jumper JP1 to X4 position
- 7) Remove Jumper JP2 to disable the Crystal oscillator.
- 8) Solder the other end of RG174 coax to the USB-Synthesizer module RF output connections.

3. Trouble shooting & alternative suggestion for modification

- If the modification does not work then check with whether the output of U5 pin 8 is switching 0 – 4v squarewave. This can be conveniently done by connecting a scope or frequency counter probe to JP1 pin x8
- If not switching then change the value of the 10K resistor and ensure the DC voltage over R57 is somewhere between 1.5V to 3.0V
- Transformer T1 is not required for interfacing. You may connect the RG174 coax via a 0.1uF capacitor to either Si570 LVDS pad 5 or pads 6 as shown in figure 1. below.

- Alternative connection option (NOT TESTED) is to interface to Q10. This would entail:
 - Crushing C48 and C49
 - Removing jumper JP2 and connecting Coax inner to centre pin.
 - Fit R56 10K and making sure C50 is present.



Interfacing Si570LVDS to SOFT ROCK RXTX V6.1

Jan G0BBL - QRP2000 Design Team

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Figure 1 – Softrock to Si570 LVDS interfacing – Use of T1 is optional

4. Softrock Lite Receiver – Interfacing

Modification and connections are as described for RXTX v6.1, however component designation is different as shown in Fig 2 below.

- Instead of C50 crush and remove C5
- Mount R6 = 10K to obtain a DC voltage of approx 1V to 3V on JP1 Pin 1.

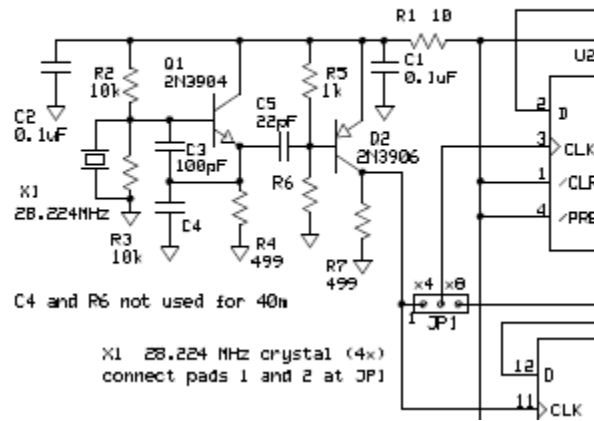


Fig 2 Softrock Lite circuit -

Good luck with the mod. Please report any issues via the Softrock reflector or you may contact me direct.

Best 73s

Jan G0BBL
QRP2000 Design Team