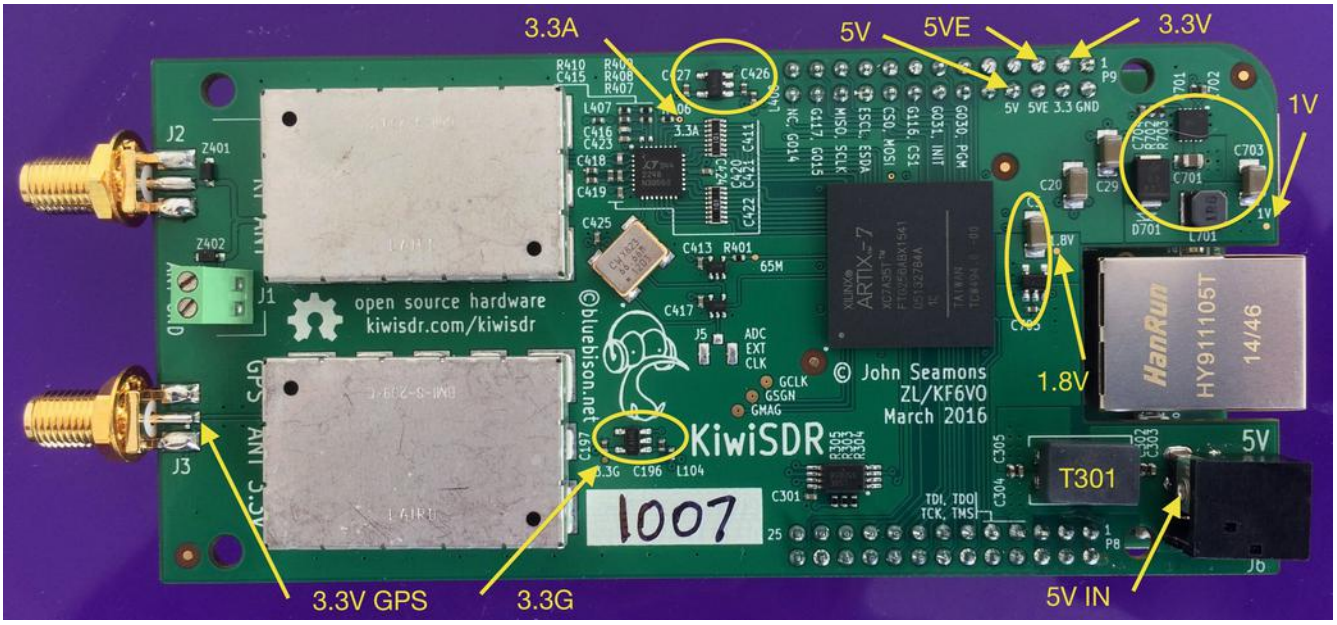
Troubleshooting the KiwiSDR PCB

The KiwiSDR circuit board (PCB) has test points and other locations where you can check for voltages and signals. The test points are very small and require a steady hand and possibly some magnification. When probing the voltage test points be very careful not to short to adjacent pins. This is especially true when probing the P9 header pins.

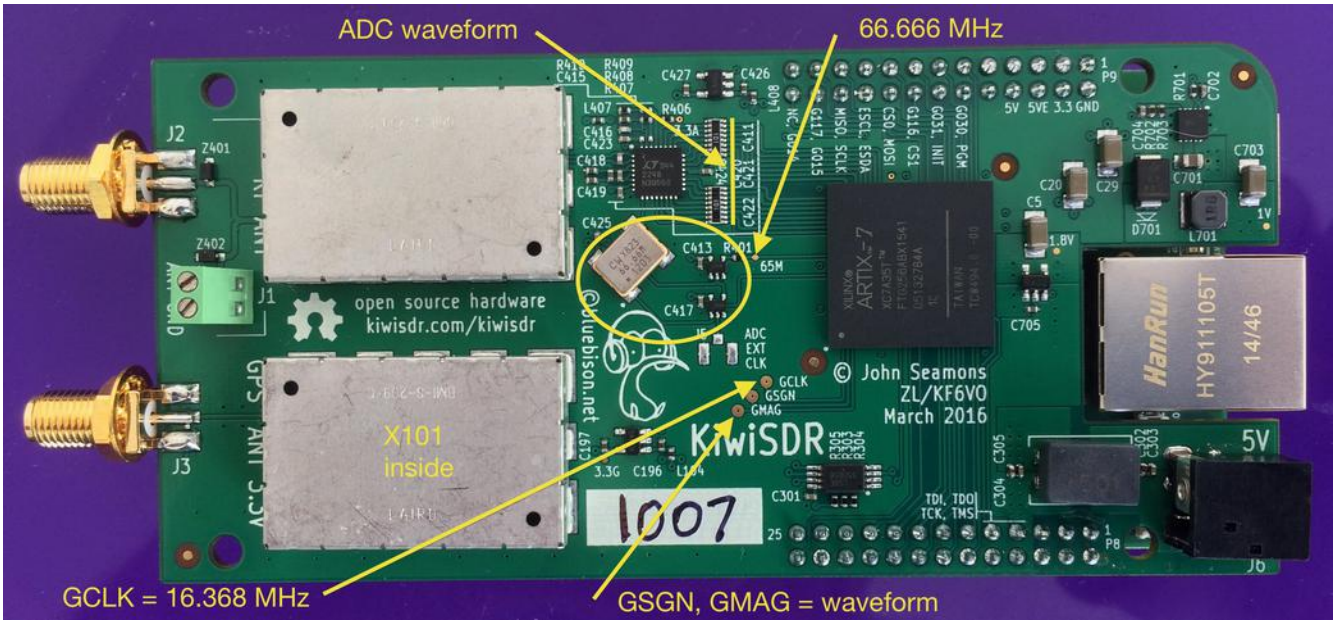
The single most common source of trouble is not the Kiwi itself, but an external 5V power supply that has momentary voltage drop under peak current conditions. Use a supply with 1.5 - 2A capacity minimum. Beware of voltage drop caused by too small a wire gauge in the cable between the power supply and Kiwi. 20 AWG minimum recommended.

1. Check for the voltages as shown in the picture below. For the test points the name in yellow also appears on the white PCB silkscreen.



- 5V IN - check for power on DC input jack. Range 4.8 - 5.25 V.
- 5VE - if missing check T301 soldering. Power from here goes to BBG only.
- 5V - comes from BBG. Goes to other regulators on PCB. See schematics. Range 4.75 - 5.25 V.
- 3.3V - comes from BBG. Should be okay if 5VE okay unless short someplace.
- 1V - if bad check components in circle, especially soldering of tiny voltage regulator chip.
  If higher than 1V FPGA will probably have been destroyed!
- 1.8V - if bad check components in circle, especially voltage regulator.
- 3.3A - if bad check components in circle, especially voltage regulator.
- 3.3G - if bad check components in circle, especially voltage regulator.
- 3.3V GPS - if bad check L101, U101 inside metal can. The can top can be removed without de-soldering.

2. Check for clocks and waveforms with an oscilloscope for the test point in picture below.

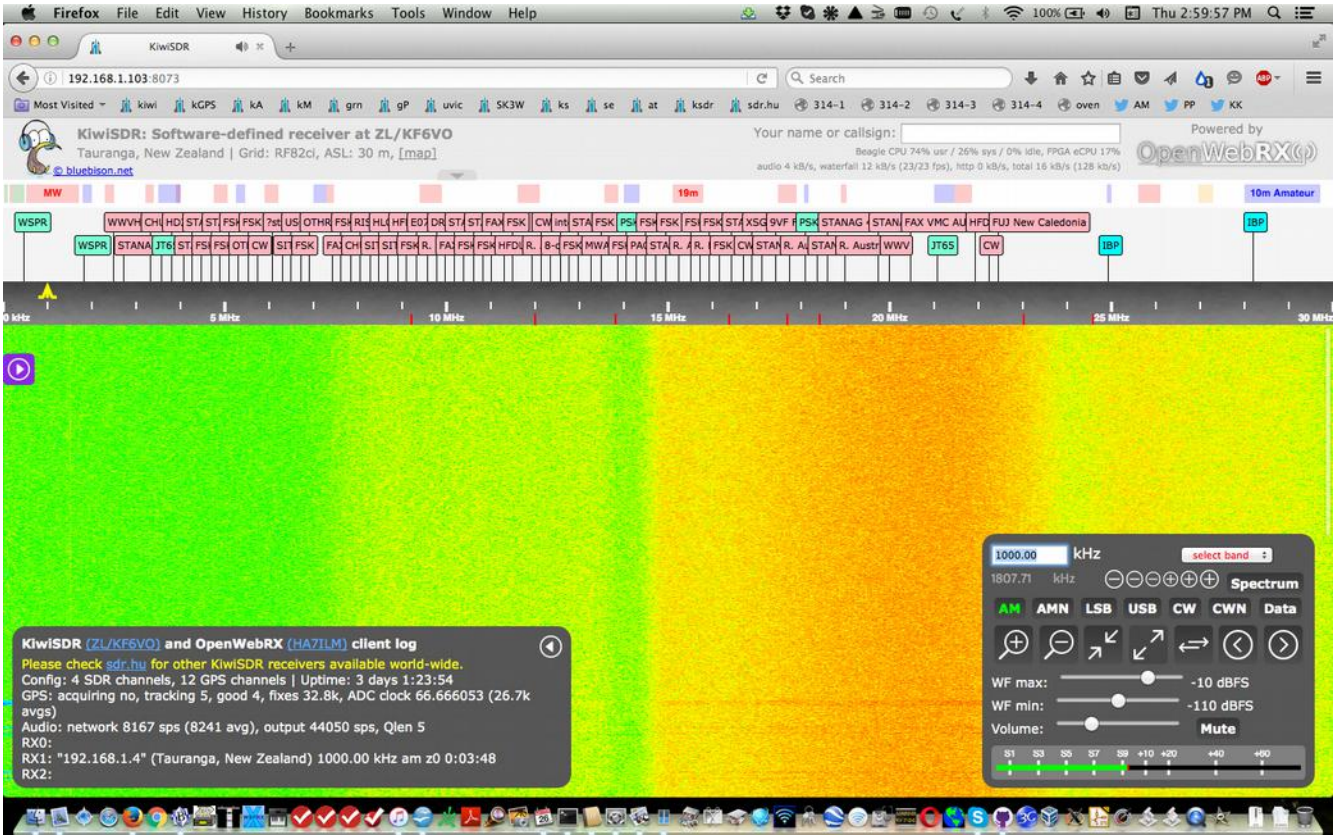


- 66.666 MHz - if bad check components in circle, especially U402 oscillator.
- GCLK 16.368 MHz - if bad check X101 oscillator and U101 chip inside metal can.
- GSGN, GMAG - see below. Should have data pattern even if no GPS antenna connected.
- If you don't have a scope check for these voltages as an alternative:
  - GCLK: 0.9V, GSGN: 1.3V, GMAG: 0.8V, all +/- 0.1V
- ADC output waveforms - see below. Either side of series resistors R404/R405. Check each bit for open/short. Should have data pattern even if no RF antenna connected. Waveform pattern will be slightly different.

GSGN, GMAG, 100 ns/div

ADC outputs, 100 ns/div

3. If any ADC outputs are open or shorted web display will look similar to this:



4. If a problem in the signal path from RF antenna SMA to ADC input web display will be dark: