Penggunaan *kalibrate* di STB Untuk Kalibrasi RTL-SDR Dongle

1 Desember 2020 oleh YD0NXX

Install on STB-SatGate / APRS Tracker (192.168.5.45)
Link: https://karelkeers.nl/karelkeers.nl/rtl-sdr-calibration-with-r820t2-chip/

1. Instllation of RTL-SDR

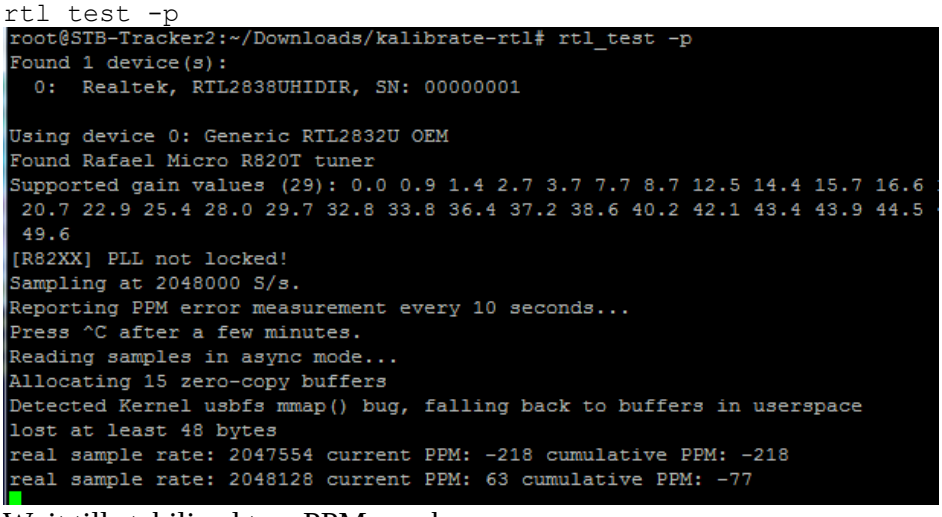
```
apt-get update
apt-get install cmake build-essential libusb-1.0-0-dev
cd ~
cd Download
git clone git://git.osmocom.org/rtl-sdr.git
cd rtl-sdr
mkdir build
cd build
mkdir make
cmake ../ -DINSTALL_UDEV_RULES=ON -DDETACH_KERNEL_DRIVER=ON make
make install
ldconfig
```

2. Installation of Kalibrate

```
cd ~/Download
apt-get install libtool autoconf automake libfftw3-dev
git clone https://github.com/asdil12/kalibrate-rtl.git
cd kalibrate-rtl
git checkout arm_memory
./bootstrap
./configure
make
make install
```

3. Test Procedure
   (Note: Plug the dongle directly on the STB, do not use USB extension cable)
   a. Warm up

```
rtl_test -p
```



Wait till stabilized to a PPM number

b. Test with External GSM Signal

Use the cumulative PPM as seed number, and maximum gain

```
kal -s 900 -g 49.6 -e 50
```

```
root@STB-Tracker2:~# kal -s 900 -g 49.6 -e 50
Found 1 device(s):
  0:  Generic RTL2832U OEM

Using device 0: Generic RTL2832U OEM
Found Rafael Micro R820T tuner
Exact sample rate is: 270833.002142 Hz
[R82XX] PLL not locked!
Setting gain: 49.6 dB
kal: Scanning for GSM-900 base stations.
GSM-900:
        chan: 51 (945.2MHz - 5.623kHz)  power: 4382038.86
        chan: 76 (950.2MHz - 4.861kHz)  power: 2831324.26
        chan: 77 (950.4MHz - 5.239kHz)  power: 2255576.90
        chan: 78 (950.6MHz - 5.668kHz)  power: 2802277.03
        chan: 79 (950.8MHz - 5.218kHz)  power: 2152110.19
        chan: 80 (951.0MHz - 5.595kHz)  power: 3367589.97
        chan: 81 (951.2MHz - 5.086kHz)  power: 2881790.33
        chan: 82 (951.4MHz - 5.543kHz)  power: 1775843.25
        chan: 83 (951.6MHz - 5.099kHz)  power: 1894681.32
        chan: 85 (952.0MHz - 4.938kHz)  power: 4516506.80
        chan: 86 (952.2MHz - 5.461kHz)  power: 2739740.02
        chan: 93 (953.6MHz - 5.533kHz)  power: 3440176.36
        chan: 98 (954.6MHz - 5.809kHz)  power: 2276172.28
root@STB-Tracker2:~#
```

Find the highest power channel number (channel 85 is higher than 51)

Use the highest power to find the PPM

```
kal -c 85 -g 49.6 -e 50
```

```
root@STB-Tracker2:~# kal -c 85 -g 49.6 -e 50
Found 1 device(s):
  0:  Generic RTL2832U OEM

Using device 0: Generic RTL2832U OEM
Found Rafael Micro R820T tuner
Exact sample rate is: 270833.002142 Hz
[R82XX] PLL not locked!
Setting gain: 49.6 dB
kal: Calculating clock frequency offset.
Using GSM-900 channel 85 (952.0MHz)
average         [min, max]      (range, stddev)
- 4.912kHz              [-4925, -4898]  (27, 6.693416)
overruns: 0
not found: 0
average absolute error: 55.159 ppm
```

Repeat with PPM 55, new number is 56, repeat wih 56, updated number is 55
So the final PPM is 55