

# HRPT reception using an Airspy R2 and Odroid running Spyserver

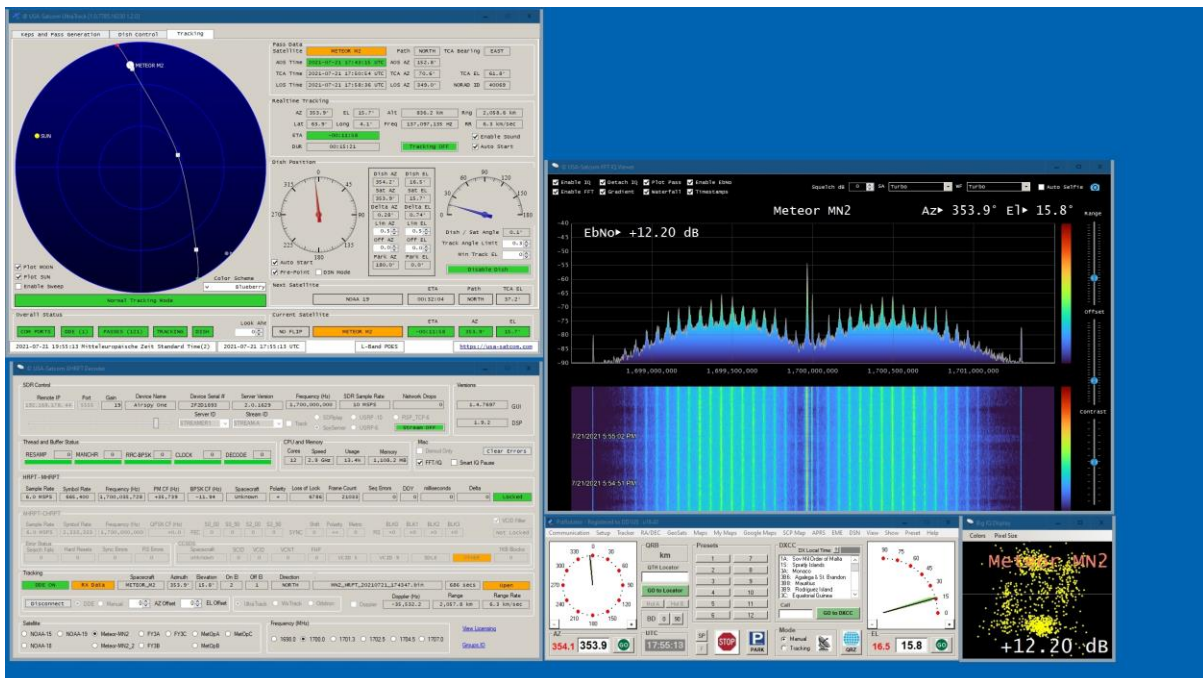
Matthias, DD1US, July 23<sup>rd</sup> 2021

For some time, I did not get my HRPT reception setup working properly when using an Airspy R2 connected to an Odroid XU4 SBC running SpyServer. I was using the latest version of ARMBIAN 5.34 with Ubuntu 16.04.7 on the Odroid.

I am decoding the HRPT satellites around 1.7 GHz using the software XHRPT from USA-Satcom.

Only when using an Airspy mini with a maximum sampling rate of 6MSPS the HRPT reception was possible.

With the Airspy R2 running with 10MSPS the constellation diagram was not stable and a reception was not possible. It looked like this:



I wanted to use the Airspy R2 for the following reason:

- The Airspy mini is operating quite at its limit receiving at 1.7 GHz. It helps to add additional cooling by cooling pads and heatsinks but still it is at the limit.
- The Airspy R2 has a reference frequency input and thus I can operate it locked to my GPSDO. This is not really needed for receiving the wideband signals of HRPT weather satellites. However, I am using my receive setup to also receive other satellites with more narrowband signals the higher frequency accuracy and stability is needed.
- The Airspy R2 has a maximum sampling frequency of 10MSPS which is helpful to monitor a wider spectrum and very wideband signals.

I did not experience network drops at the IP connection from the Odroid to the PC running XHRPT thus the suspicion was that it is related to the Odroid.

Finally, Arved DK5AV / M0KDS gave me the hint, that he had successfully used the Airspy R2 with Spyserver when reducing the sampling rate from 10 MSPS to 6 MSPS. This is an undocumented feature as officially the Airspy R2 can run at 10 MSPS and 2.5 MSPS. 10MSPS was not working properly and 2.5MSPS is not enough to decode the HRPT satellite signals.

After changing the sample rate setting in spyserver.config file

```
device_sample_rate = 10000000
```

to

```
device_sample_rate = 6000000
```

you only need to reboot the Odroid and now the setup works.

Many thanks to Arved for the hint.

Kind regards

Matthias DD1US

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