Spock

1. Compiling Spock and getting it ready to work

Spock was developed using Microsoft Visual Studio Community 2017 with SDRplay APIHW Driver 3.07 installed. To compile Spock, I copied the content of C:\Program Files\SDRplay\API\inc and C:\Program Files\SDRplay\API\x64 to Spock's folder.
After compiling Spock, I copied the content of C:\Program Files\SDRplay\API\x64 (sdrplay_api.dll and sdrplay_api.lib) to the folder containing Spock's executable file.

1. Operating Spock

The following figure shows Spock' form:

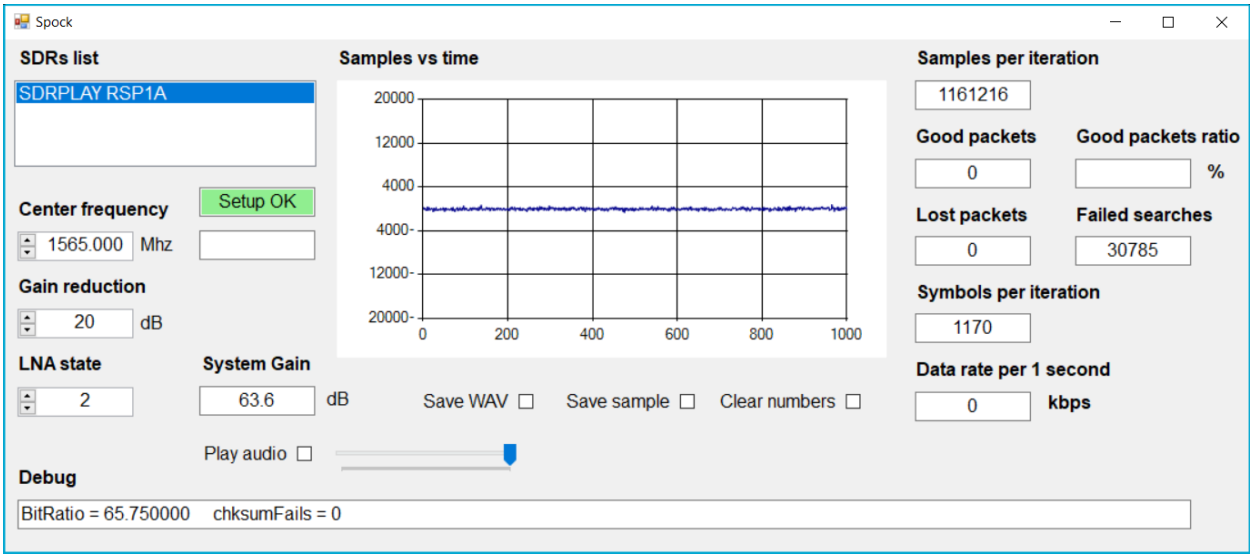

Figure 1: Spock' Form

SDRs list

The SDRs list shows the list of available SDR dongles connected to the computer.
NOTE: I wanted Spock to be able to work with a single SDR selected from a list, but since I didn't have other SDRs I didn't develop the code to support it.

Center frequency

The Center frequency holds the frequency value that the SDR receiver is tuned to.
NOTE: This is not necessarily the frequency measured at Scotty. One should use spectrum analyzer software to find the center frequency of transmission.

Gain reduction & LNA state

SDRplay RSP1A has two options to control the RF channel's gain: LNA state and gain reduction. When setting these values, one should read the SDR receiver's manual to understand the limits of each control. I general: The bigger the values of Gain reduction and LNA state, the bigger is the gain reduction of the RF channel (bigger numbers = less gain). LNA state shifts the reduction in predefined values. RF reduction enables a fine tune of the reduction. In general – high gain isn't necessarily good, as it also amplifies noise. One should set the receiver to a level at which the signal is well received at minimum gain. The total RF channel's gain is displayed at System Gain (External LNA gain is not included).

System Gain

The System Gain shows the total RF gain of the SDR receiver. It does not include the gain of an external LNA.

Play audio checkbox & Volume slider

When the play audio checkbox is checked, Spock plays the audio it receives. The volume slider next to it controls the volume.

Samples per iteration

The Samples per iteration show the number of samples that the software processes in every processing cycle.

Good packets

The Good packets shows the number of good packets received so far.

Lost packets

The Lost packets show the number of lost packets. The number advances each time Spock calculates a gap between two good packets.

Good packets ratio

The Good packet ratio = Good packets / (Good packets + Lost packets).

Failed searches

Failed searches count the number of times the software searched for a good packet so far.

Symbols per iteration

Symbols per iteration show the number of symbols recovered from the samples processed during the last processing cycle.

Data rate per 1 second

The Data rate per 1 second shows the number of bits processed during a period of 1 second.

Debug

The debug line is used to write debug information for the software developer.