A simple RTTY plugin for SDRuno

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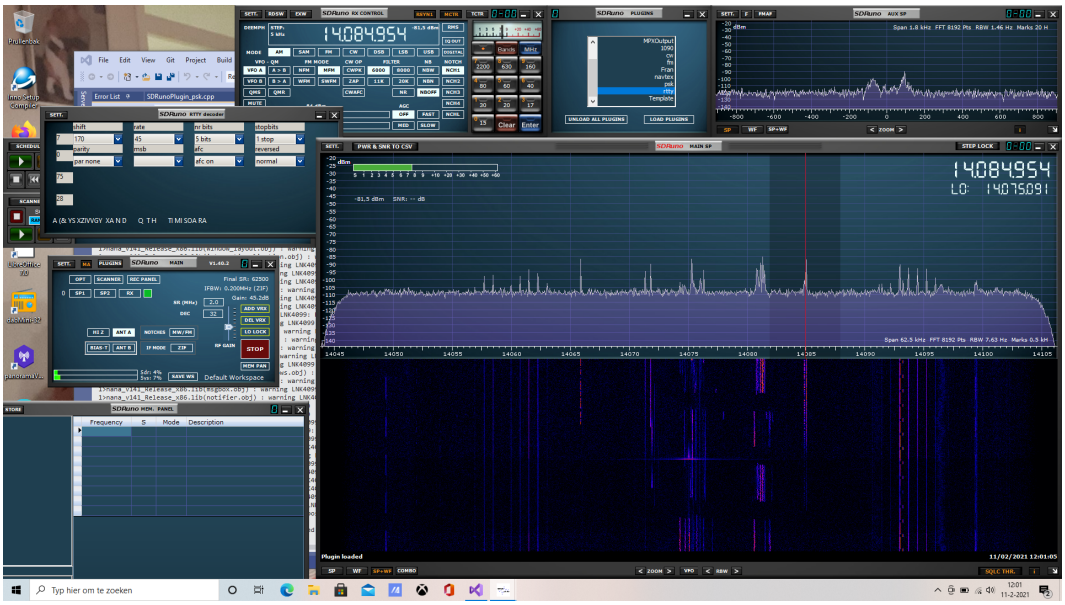


1 Introduction

The SDRuno rtty plugin is a simple plugin to decode rtty signals.

There are still some service transmissions on shortwave, one that I often use when testing is on 4583 KHz, and of course there are from time to time plenty amateur transmissions around 14085 KHz, The main difference between commercial and service transmissions and the amateur transmissions are the signal width and the duration.

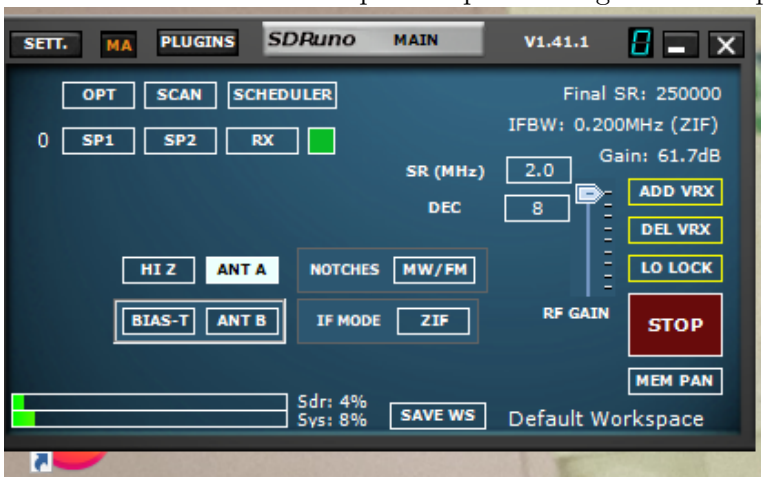
As is well known, an rtty signal is FSK modulated, during transmission of a letter or digit, mark and space signals are transmitted alternately. Mark and space differ 170 Hz in frequency for amateur transmissions and 850 to 1000 Hz for commecial and service transmissions.

2 Settings

For amateur modes, rrty is a signal with a small footprint, the distance betwene the mark and the space signal is 170 Hz, The decoder therefore works with a low intermediate samplerate, 12000 samples/second. Since the minimal samplerate for the SDRplay family is 2000000, a lot of decimation has to be done.

The plugin selects the SP1 channel, a channel that delivers 192000 samples per second. The internals of the plugin operate on a much lower level, the plugin will take care of further decimation and filtering.

It is adviced to select the input samplerate as given in the picture.



The plugin generates an audiotone of 800 Hz + the tuning offset, in my experience is sound very helpful in precise tuning.

The sound is output with a rate of 48000, setting "AM" in the RX control window will set this rate.

3 Tuning

As e.g. psk, rtty for amateur bands, is a signal with a small footprint, and since many of the amateur transmissions are brief messages (such as CQ CQ ...), tuning requires some training.

What is really helpful here is the zooming into the main spectrum, as shown in the first picture.

The way to tune is in two steps

- coarse tuning with the mouse on the main spectrum display;
- fine tuning with the mouse controlled numerical display until the mark and space signals are left resp. right of the '0' in the auxiliary spectrum display.

4 The plugin

The plugin widget is shown in the picture

The widget has eight control comoboxes and there are 4 small numeric labels.

The picture shows that the received message is slightly garbled at the start but then, synchdonization was obtained and the qth could be deciphered.

The controls are, from left to right and from top to bottom

- The shift, rtty supports a number of shifts, i.e. distances between mark and space signal;
- the baudrate, rtty supports a umber of different baudrate, for the amateur bands the rate is 45;
- the number of bits. The normal setting is 5 bits per letter, with
- stopbits, with one stop bit.
- Usually there are no parity bits,
- the bit order (i.e. is the first bit the msb or the lsb bit) is normal.
- not related to the decoding is the setting of the afc, as shown in the picture, the afc is on . The result is depicted in the top two number displays on the left. The top one indicates the accumulated offset for the frequency correction, the second indicates the error detected after applying the offset. Here it shows that the frequency was 7 Hz off, and after correcting the frequency, there was no residual error.
- the combobox with label *reversed* allows switching the mark and the space signals.

Finally, the two number labels at the left, these can be ignored, the top of the two denotes an attempt to estimate the baudrate (since the actual baudrate is 45, the estimate of 75 is off), the bottom one displays the measured average offset of the mark and the space signal relative to the center frequency.