A simple NAVTEX plugin for SDRuno

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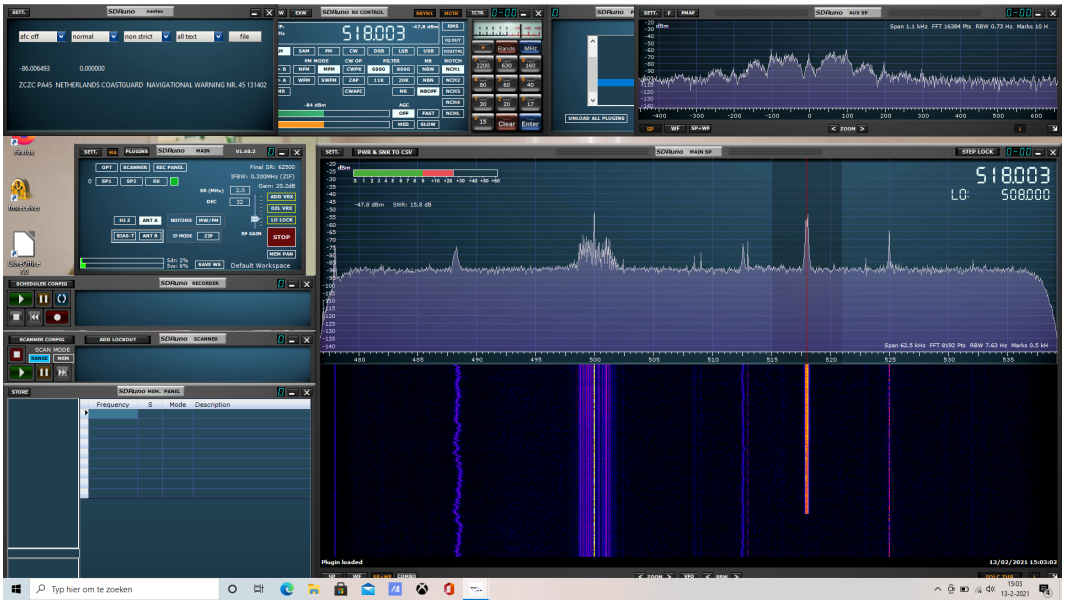


1 Introduction

NAVTEX (NAVigational TEleX) is a service for delivery of navigational and meteorological warnings and forecasts, as well as urgent maritime safety information (MSI) to ships.

The transmissions are layered on top of SITOR collective B-mode. SITOR-B is a forward error correcting (FEC) broadcast that uses the CCIR 476 character set. NAVTEX messages are transmitted at 100 baud using FSK modulation with a frequency shift of 170 Hz.

The NavTex plugin can be used to receive and decode these messages, the plugin will set tuning to 518KHz, the standard frequency for navtex messages (Another frequency for navtex messages is 490 KHz.)

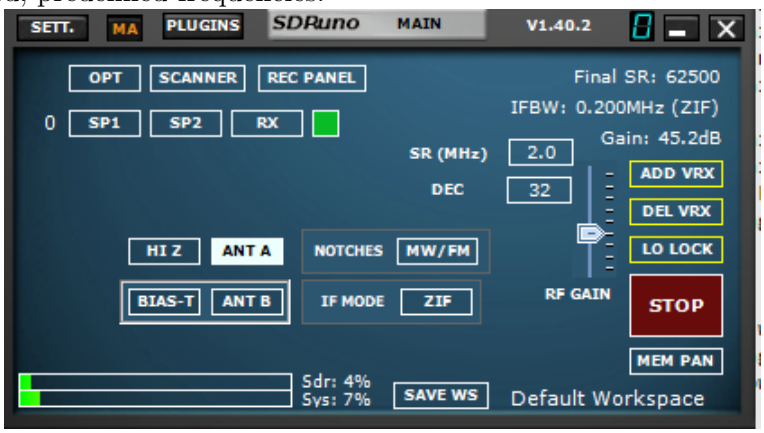
2 Settings

navtex is a signal with a small footprint, the signal is transmitted as an FSK signal, similar to RTTY, with a shift of 170 Hz and a baudrate of 100.

The decoder works similar to the rtty plugin, with an intermediate samplerate of 12000 samples/second. Since the minimal samplerate for the SDRplay family is 2000000, a lot of decimation has to be done.

This implementation requires an input sample rate of 62500 samples/second, this requires the setting of the mainwidget to a samplerate of 2000000, and a decimation of 32, as shown in the picture

One should realize that the SDRuno spectrum display shows a band of 62.5 KHz, the advantage is that one sees a lot of signals, Fortunately, navtex messages are transmitted on fixed, predefined frequencies.

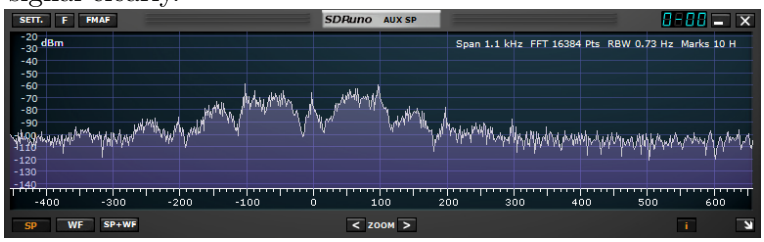


The plugin generates an audiotone of 800 Hz + the tuning offset, In my experience a sound signal is very helpful in precise tuning. The sound is output with a rate of 48000, setting "AM" in the RX control window will set this rate.

3 Tuning

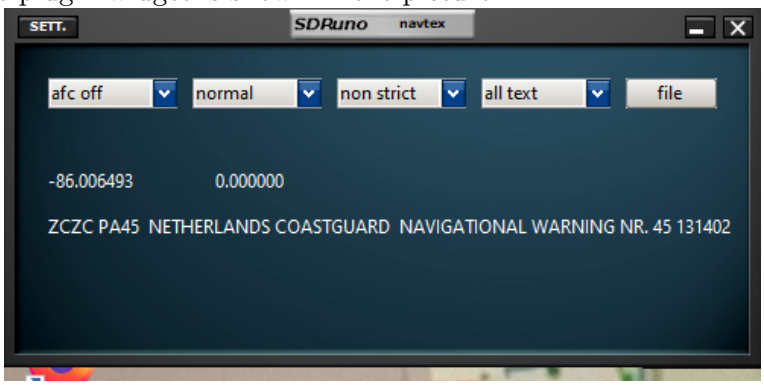
As said, natex is a signal with a small footprint, however, it is known in advance on which frequency the transmission will take place and experience shows that tuning with the SDRplay family of devices is pretty accurate.

Enlarging the auxiliary spectrum display, and zooming in as shown on the picture shows the signal clearly.



4 The plugin

The plugin widget is shown in the picture



The widget has four control comoboxes and a button, from left to right

- the afc setting, choose between *afc on* and *afc off*. As usual, with *afc on* the software will try to correct the tuning. The correction found is displayed in the number display on the right.
- normal or reverse, choose switching the positions of the mark and space elements in the signal;
- the navtex signal has two levels of signal protection, the first one is the Forward error correction. If *non strict* is chosen, data will be output whether or not is passed the error check;
- the second level is the format of the navtex message, if *all text* is chosen all text is displayed, otherwise only messages passing the check will be shown.
- the file button, when touched shows a menu for file selection. All output will - if a file is selected - be written as plain text in that file. Touching the button again (or unload the plugin) will close the file. This feature is useful in combination with the selection of *message* rather than *all text*. As known navtex messages are transmitted only a few times per hour. Leaving the receiver tuned on 518 KHz, with this plugin and this option selected, the radio can run for some time unattended, and later on received messages may be looked at.