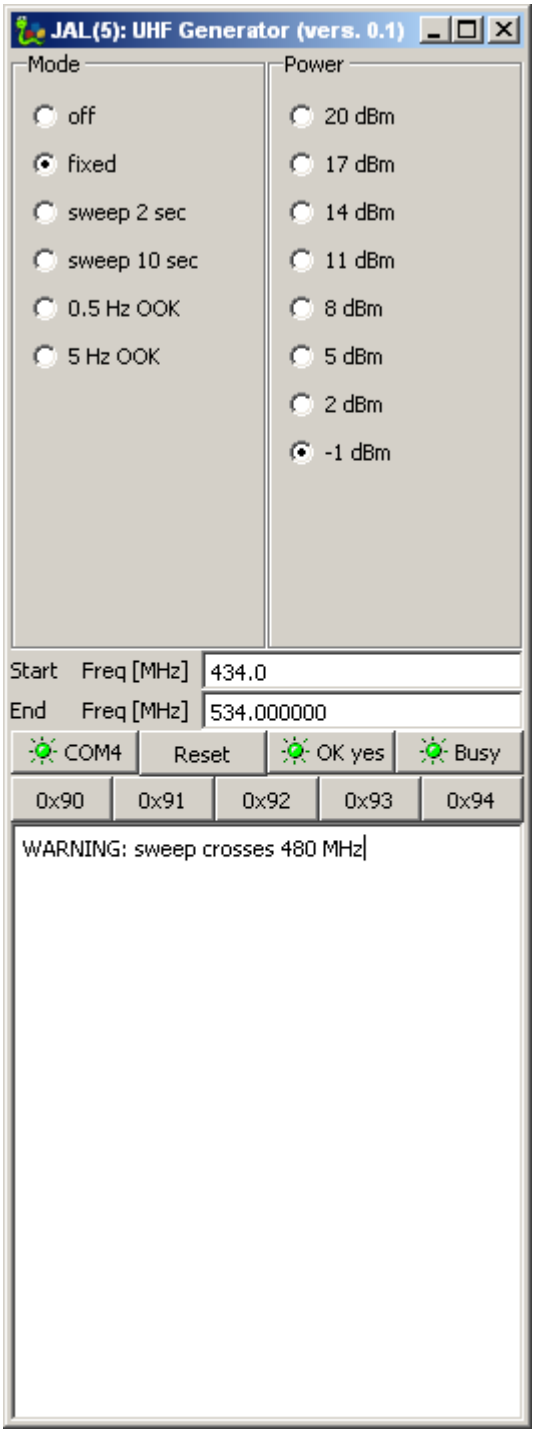
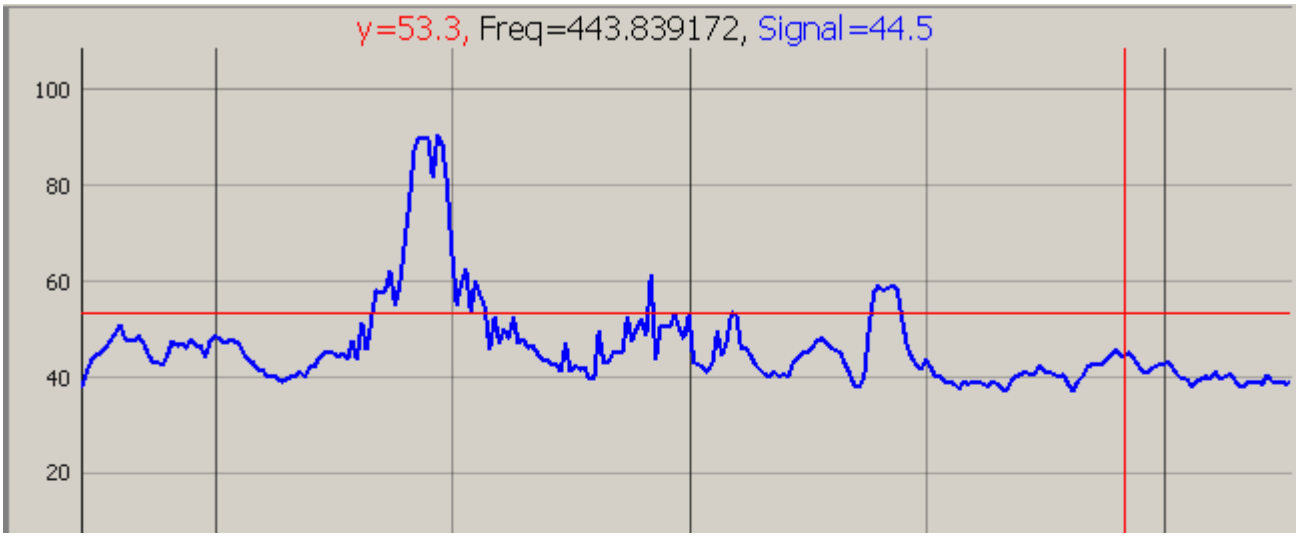
JAL: SI4432 UHF Generator

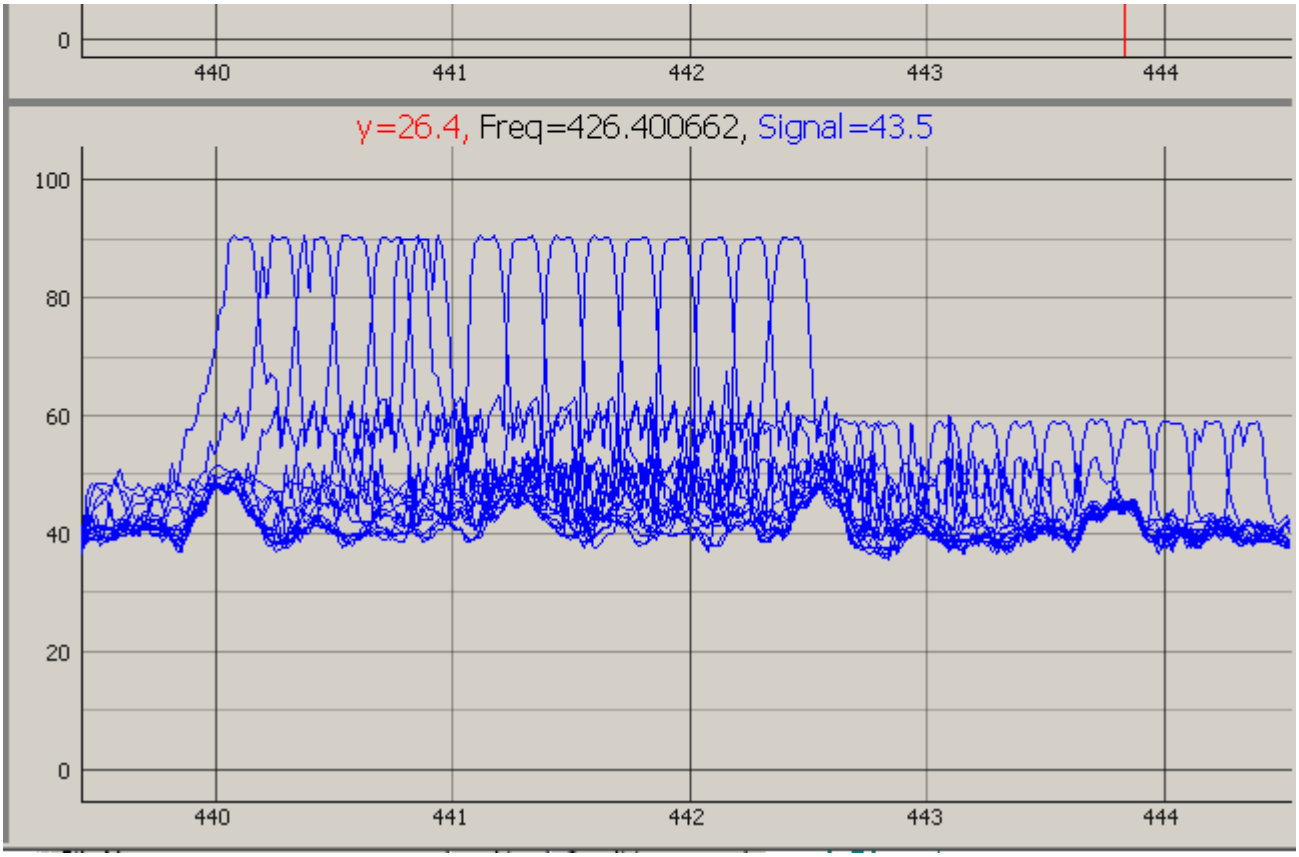
last updated: nov 2014, Stef Mientki

Introduction

This is a simple UHF generator using the SI4432 and a PIC programmed in JAL, which can produce frequencies from 200 ... 940 MHz and has some very simple modulation modes.


JAL(5): UHF Generator (vers. 0.1)
Mode
off
fixed
sweep 2 sec
sweep 10 sec
0.5 Hz OOK
5 Hz OOK
Power
20 dBm
17 dBm
14 dBm
11 dBm
8 dBm
5 dBm
2 dBm
-1 dBm
Start Freq [MHz]
434.0
End Freq [MHz]
534.000000
COM4
Reset
OK yes
Busy
0x90
0x91
0x92
0x93
0x94
WARNING: sweep crosses 480 MHz


y=53.3, Freq=443.839172, Signal=44.5
100
80
60
40
20



In the title bar, you can see both the **version of this program** (0.1 in the picture above) and the **version of JAL library** "SI4432_support" (version 5 in the picture above), this might be handy information if you've problems. The picture on the right shows a sweep recorded with SI4432_Spectrum_Analyzer.

After starting the program (assuming the PIC is connected), the program will automatically search for the correct CommPort and if found it will connect to that CommPort and initializes the PIC with the previous settings. If no correct PIC can be found on any of the avaliable CommPorts, the program will exit. The **green LED** in the above picture on the left shows that the program is correctly connected to a CommPort and the **name of the CommPort** is displayed in that button.

The **Busy Led** on the right will light red when the program is busy (most of the times waiting for the PIC).

With the **OK-button** you can test if the SI4432 is not in a hangup mode. If the OK-button lights red, the SI4432 is in hangup mode. Getting the SI4432 out of a hangup mode, sometimes a soft reset works (Reset button) but in general it's better to perform a hard reset by pressing the Comm-button to disconnect and connect again.

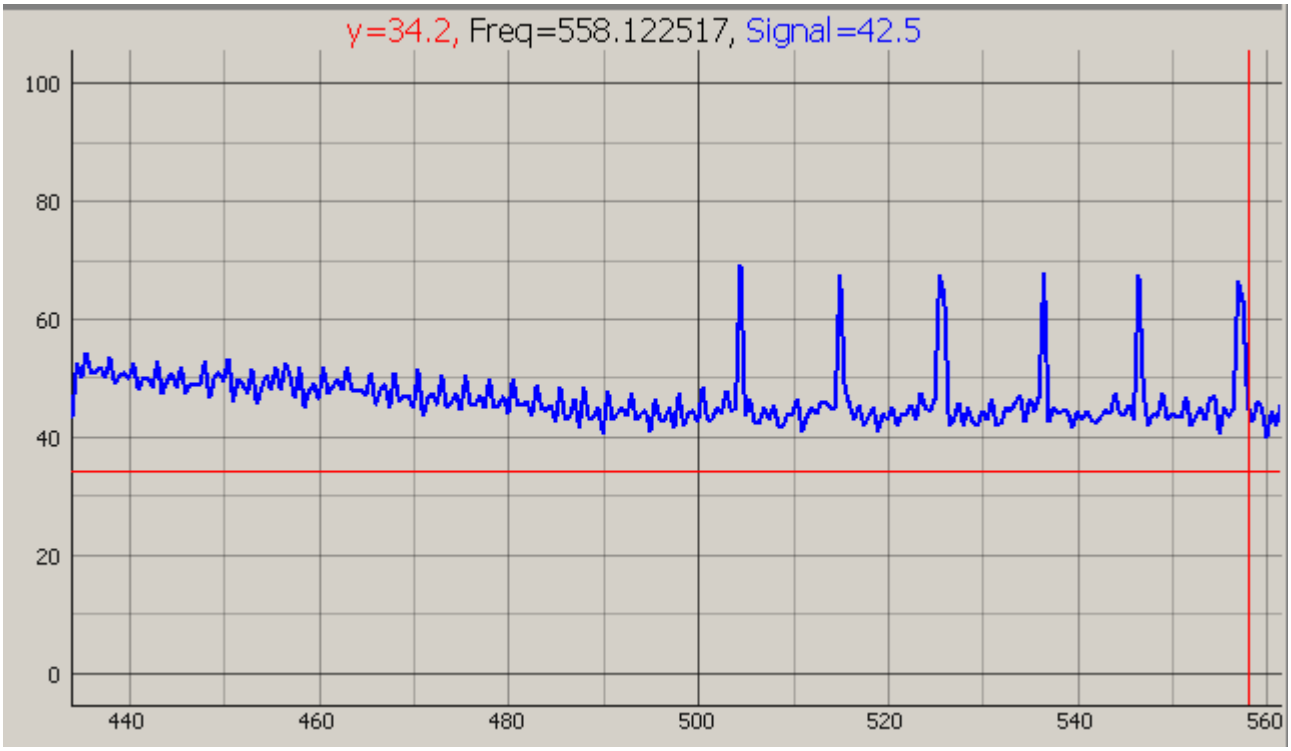
The **F1-key** will display this document.

Frequency Setting

In a non-sweep mode the carrier frequency is determined by the value of the **Edit box "Start Freq"**. After changing this value, you should press **Enter-key** to activate the modified frequency.

Sweep Mode

In one of the sweep modes, the frequency will slowly sweep from **"Start Freq" to "End Freq" in 256 equally divided steps** en then start again at "Start_Freq". Again pressing the Enter-key in one of the edit boxes will activate both the possible modified values of Start-Freq and End-Freq. One thing to realize is that the frequency range in the SI4432 is divided over 2 banks, **split at 480 MHz**. So if you sweep over this border (or in fact somewhat later) you'll find an instable SI4432, as shown in the picture below (this picture was recorded with the SI4432_Spectrum_Analyzer).



OOK Mode

In OOK mode the carrier frequency is switched on-off at the specified frequency. This is not an OOK-signal generated by the SI4432 itself, but it's generated by the JAL library.

Power

In fact this speaks for itself, but a warning is in it's place: **If your power supply is not good enough**, the high power modes can easily hang up the SI4432 (see also Tips & Tricks in the genral overview). Not only switching to an high power level but also other commands given to the SI4432 while it's in high power mode can hang the SI4432. See also the next paragraph.

Reset button

The Reset button can be used to reset the SI4432. If it's possible to reset the SI4432, specially when it hangs, is depending if you've connected the ShutDown pin (SDN), if not, you can forget it. When the SDN pin is not connected, the only way to reset the SI4432 is to remove the power-supply.

General purpose buttons

There are 5 general purpose buttons, which sends commands with codes 0x90 .. 0x94 to the PIC. You can easily attach (test) actions in the JAL-procedure "SI4432_UHF_Generator".

Downloads

for downloads see the general SI4432 overview
http://mientki.ruhosting.nl/data_www/raspberry/doc/si4432_support_package.html