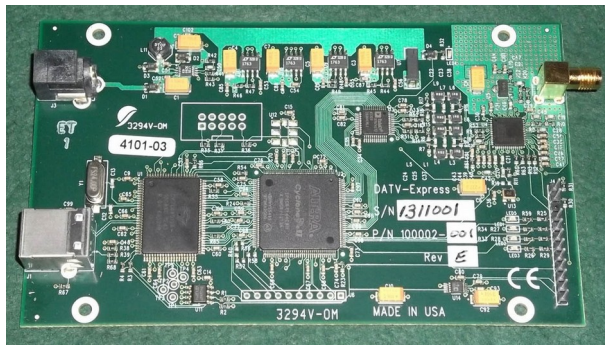
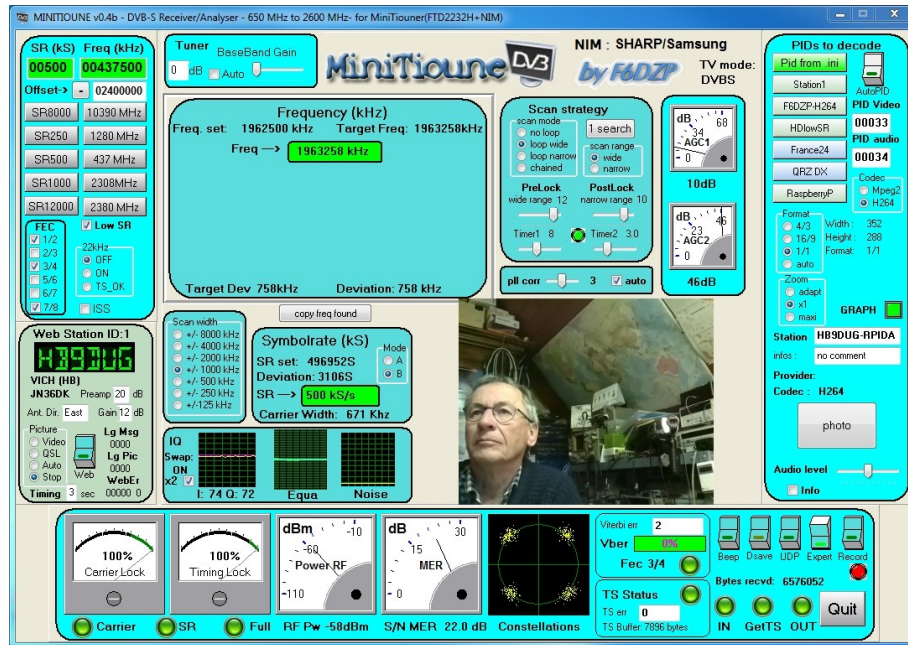


DATV – What is the best solution today ?



HAMRADIO 2016

HB9DUG Michel

24 June 2016



IAPC - ATV Technical Goup

It depends ...

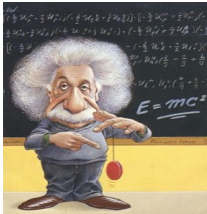
On your goal



I want to try DATV at the lowest price



I want a turnkey solution

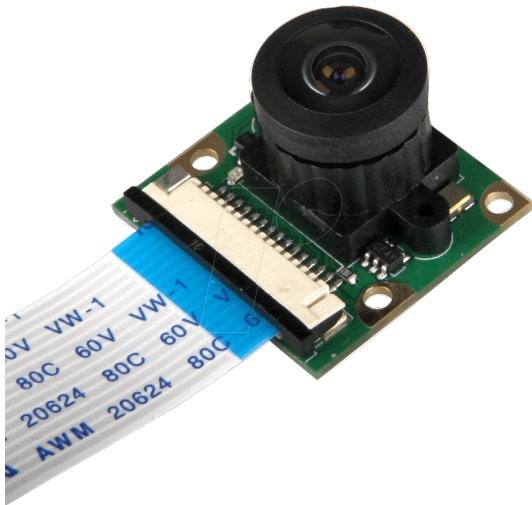


I want to be at the front end of the technology

Raspberry PI 2/3 solution



- A 900MHz quad-core ARM Cortex-A7 CPU
- 1GB RAM
- 4 USB ports
- 40 GPIO pins
- Full HDMI port
- Ethernet port
- Combined 3.5mm audio jack and composite video
- Camera interface (CSI)
- Display interface (DSI)
- Micro SD card slot
- VideoCore IV 3D graphics core
- H.264 hardware codeur-décodeur
- Camera 5 Mpixels, 1080p

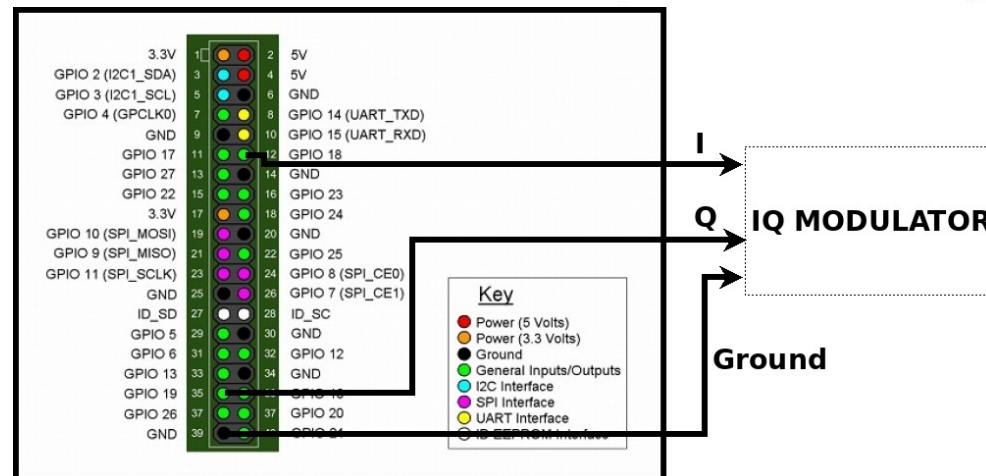
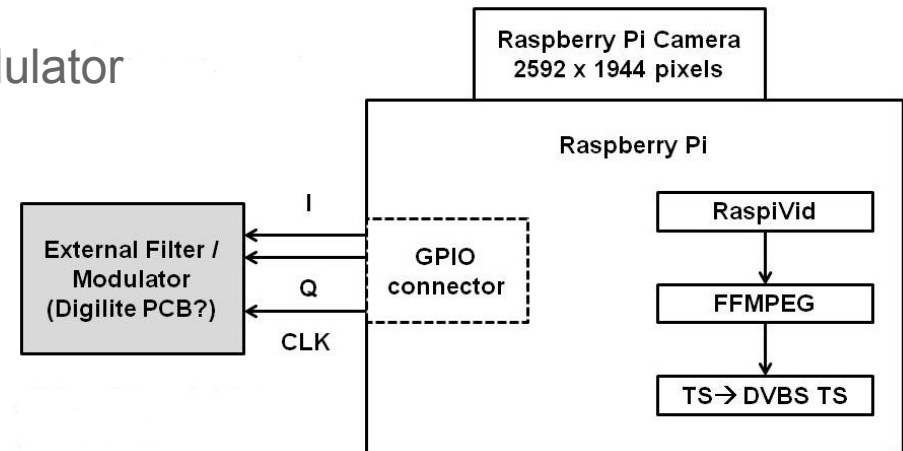


RpiDATV

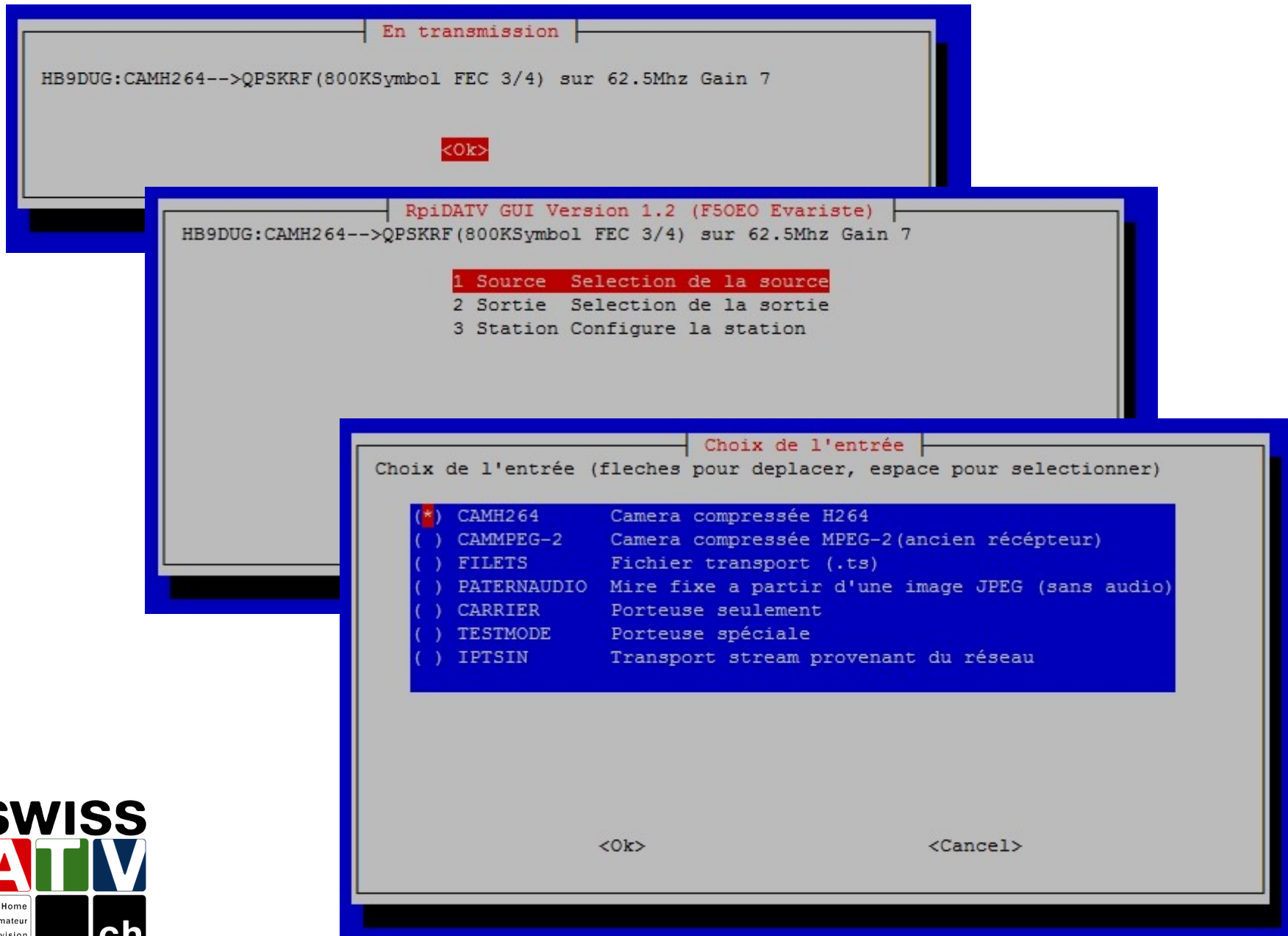


The software developed by par Evariste F5OEO

- « turnkey solution »
a system image is available. Load it on a SD card, install it on the Rpi 2, switch on and RpiDATV is ready.
- Output mode:
 - IQ bit stream to feed an external QPSK modulator
 - A direct HF QPSK modulator
 - DigiThin card
 - TX DTX1
 - DATV-Express



RpiDATV



RpiDATV



Paramètres de sortie

Choix:

- 1 SymbolRate Configure le débit symbole
- 2 FEC choix du FEC
- 3 Output mode Configure le mode de sortie

Mode de sortie

Choix de la sortie

- () IQ IQ pour alimenter un modulateur en quadrature
- (*) QPSKRF Modulation directe en RF QPSK
- () BATC Envoi vers le site du BATC
- () DIGITHIN Carte Digithin
- () DTX1 DTX1
- () DATVEXPRESS DatvExpress

Frequence RF QPSK

Frequence de sortie(MHZ)

62.5

<Ok> <Cancel>

Gain RF

Gain RF(0=-3.4dbm 7=10.6dbm)

7

<Ok> <Cancel>

Indicatif

Paramétrage indicatif

HB9DUG

<Ok> <Cancel>

RpiDATV Ugly mode



Called Ugly because the RF modulation is done with square signals which implies a lot of harmonics.

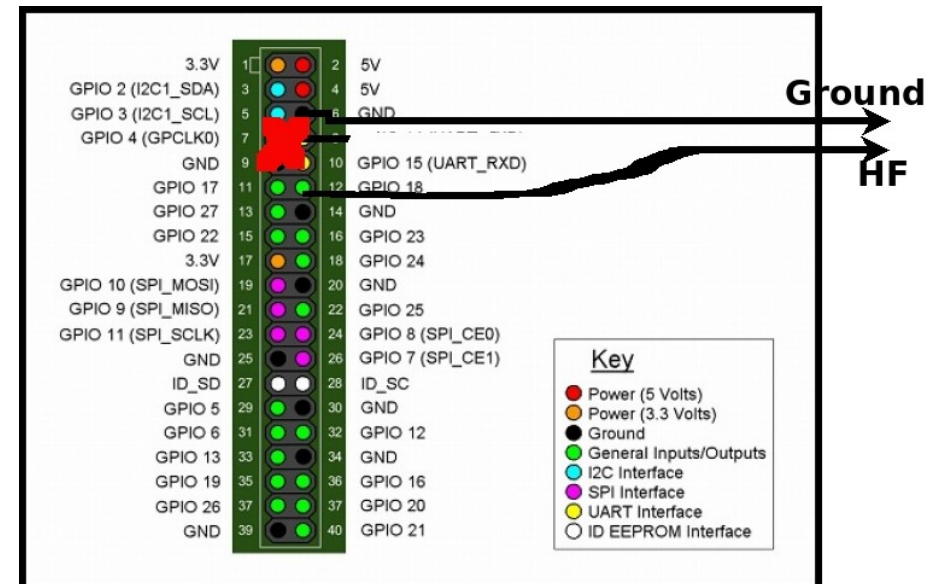
- DVB-S QPSK modulation
- Symbol rate 250 - 1500 Ks/s

Use the PLL programmable clock up to 250 MHz. We can therefore generate a QPSK signal up to 62.5MHz.

As the signal is square, we can receive also all even harmonics.

Harmonic 7 of 62.5 MHz is 437.5 MHz

Harmonic 17 of 62.5 MHz is 1.0625 GHz



RBTVMOD



Based on a prototype from Jean-Pierre F6DZP, realized by BATC members

- DVB-S modulation
- Covers 437 MHz, 146 MHz and 51 MHz (AD8345) and 1280 MHz (AD8346)
- Tunable filter SR100 - SR650 kS/s by pot, jumpers or digital pot

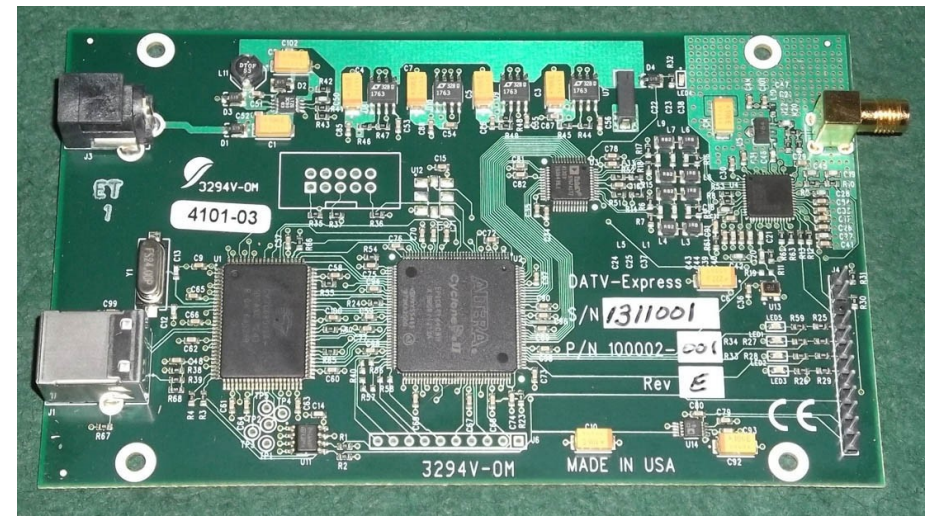
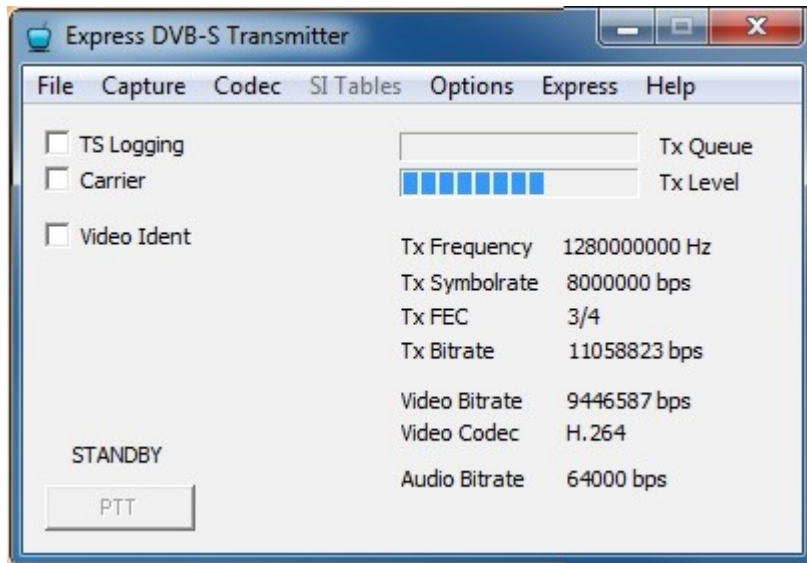


DATV-Express



Express DVB-S Transmitter is developed par Charles G4GUO

- Run on Windows and support also reduce bandwidth transmission
- DVB-S modulation



TX between 100 MHz and 2.45 GHz
Linux software version support also DVB-T

DATV-Express



vMix – Video Mixing Software



Express DVB-S Transmitter



Video Capture Settings

Device name: Logitech HD Webcam C525

Device Formats: 720 576 25 YUY2

Aspect Ratio: ☒ 1:1 ☐ 4:3 ☐ 16:9

Video Codec Settings

☐ H.262 ☒ H.264 ☐ H.265

Video Bitrate: 9446587

GOP: 10 Performance: ultrafast

B Frames: 1

OK

Output Format

Transmitted (on air) format: 720 576 25

Express Settings

Tx Frequency: 1280000000

Tx Symbol Rate: 8000000

Tx Level: 60

Tx FEC: 3/4

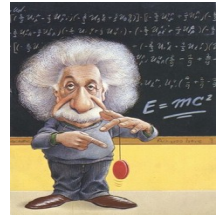
Cancel

SI Table Settings

Video Pid	33	PMT Pid	4095	Network ID	1
Audio Pid	49			Stream ID	1
PCR Pid	33			Service ID	4095
Provider Name	HB9DUG JN36D		Program NR	1	
Service Name	HB9DUG				
Event Title	Ham Radio Now	Event Duration mins	60		
Event Text	Program about Amateur Radio				

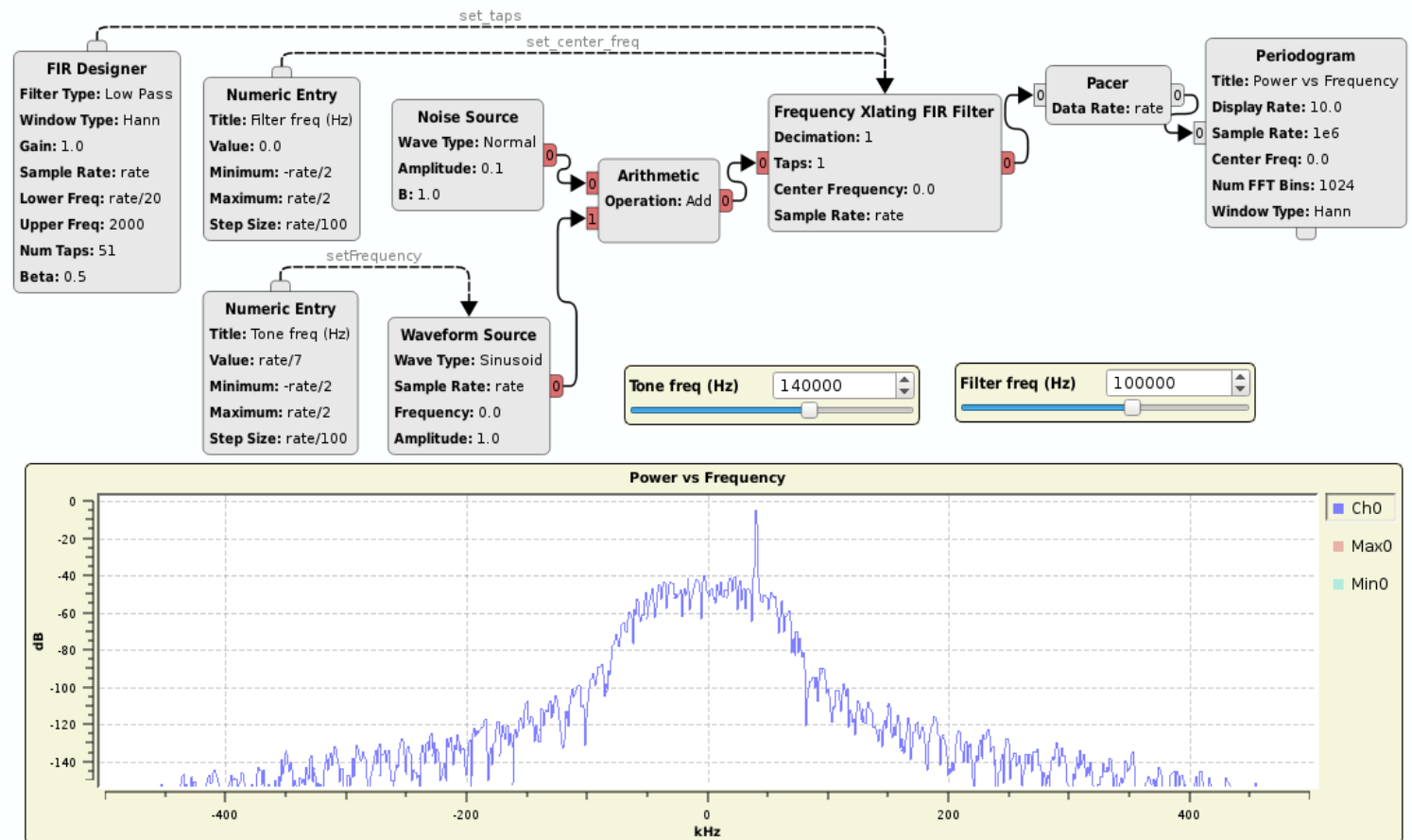
OK Cancel

Pothos environment with a SDR device



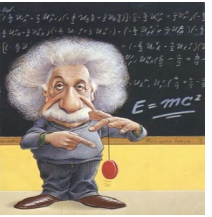
Pothos is developed par Josh Blum

- Run on Windows, linux and OSX
- ATSC, DVB-T, DVB-T2, DVB-C and DVB-S2 modulation



Pothos

Pothos



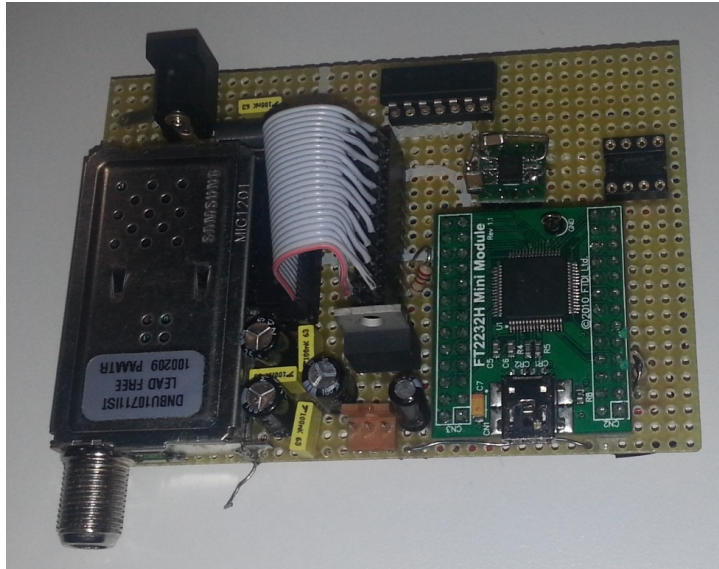
To support SDR, Pothos has a toolkit for interfacing with SDR hardware

- UHD Ettus, Blade RF, Hack RF, RTL-SDR, Red Pitaya, Lime Suite



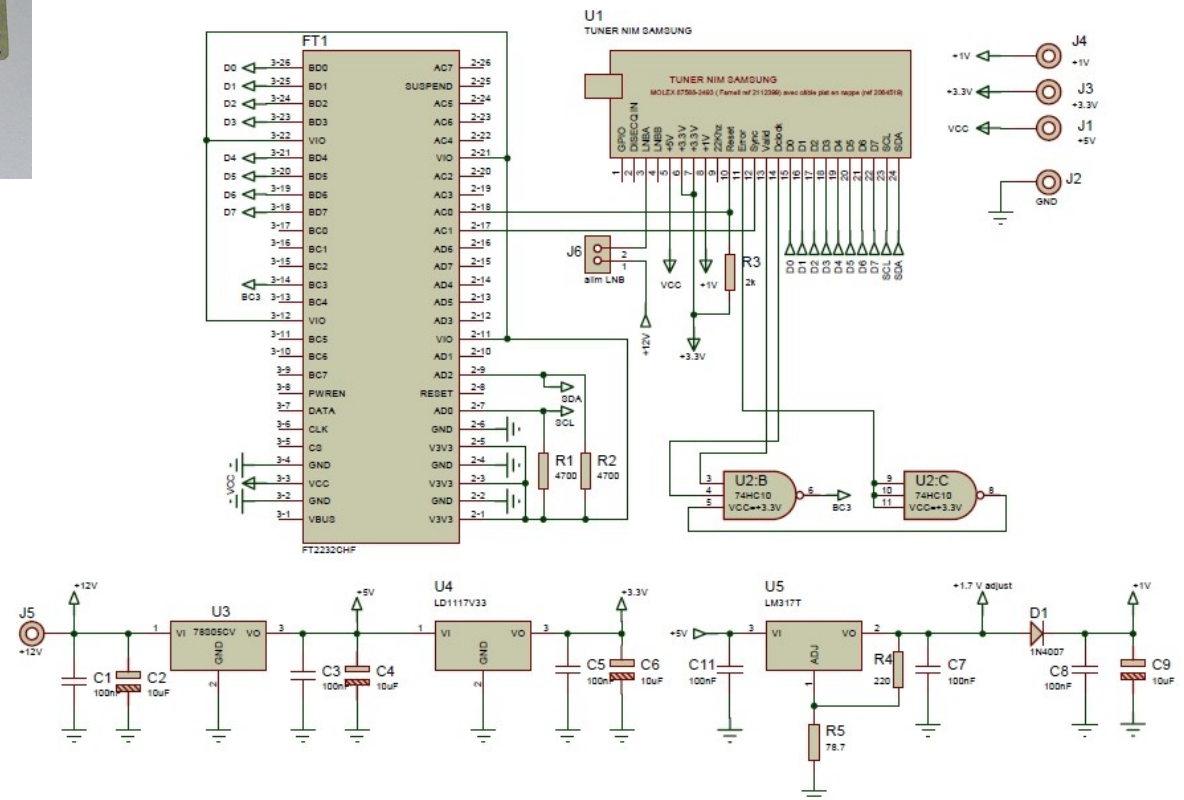
LimeSDR 100 kHz – 3.8 GHz, 2 RX et 2 TX channels

MiniTouner (USB)

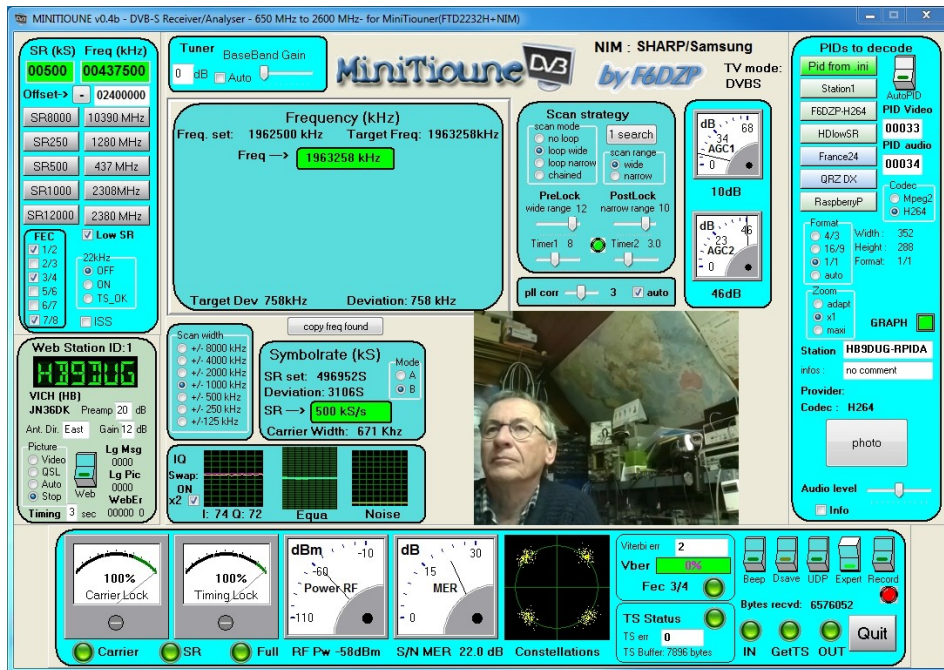


Concept by Jean Pierre F6DZP

- The goal : a USB DVB-S tuner running with MiniTouine software on a laptop



MiniTioune

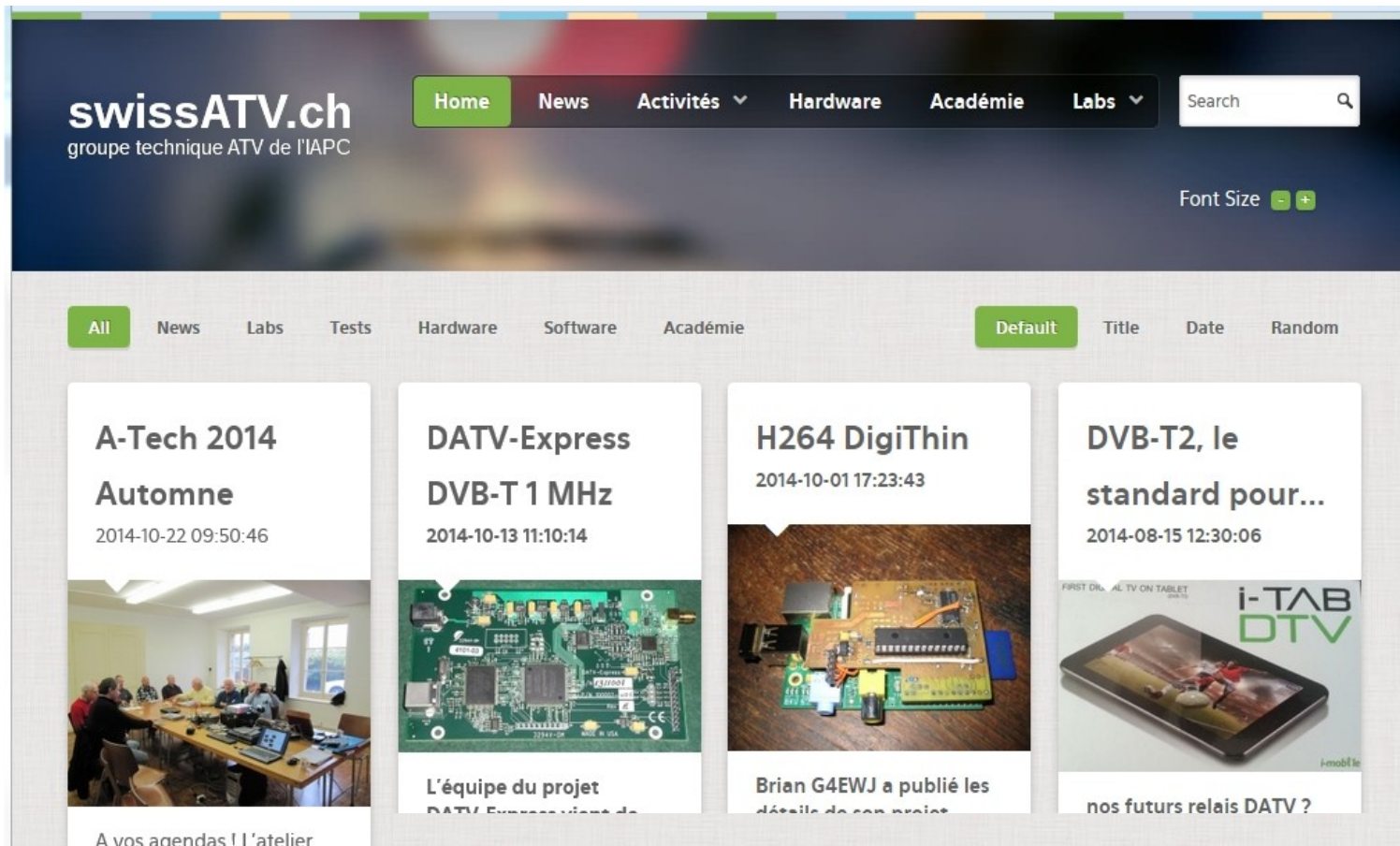


Software developed by Jean Pierre F6DZP

- Soft for reception and measures
- H.264 or MPEG2
- SR 115 - 27500
- Rx 950 – 2450 MHz (tuner dependent)
with SUP2400 437 MHz (144 MHz?)
- Up to Full HD 1080

with MiniTiouner (USB)

References



Good hack !