

RpiDATV



Stand alone DATV modulator on Raspberry Pi

Evariste

F5OEO

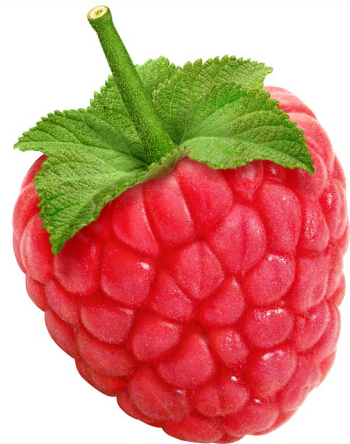
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What is a DATV Modulator

- Video source (Live, Pattern, Record file..):YUV
- Encoder (MPEG-2, H264) : MPEG-ES
- Multiplexer (ffmpeg, gstreamer, opencaster, libmpegts) : MPEG-TS
- Canal coding : DVB-S /QPSK
- Output to HF via
 - USB (Transport Stream or IQ)
 - Parallel LVDS (Transport stream)
 - IQ
 - HF direct modulation

Raspberry All in one

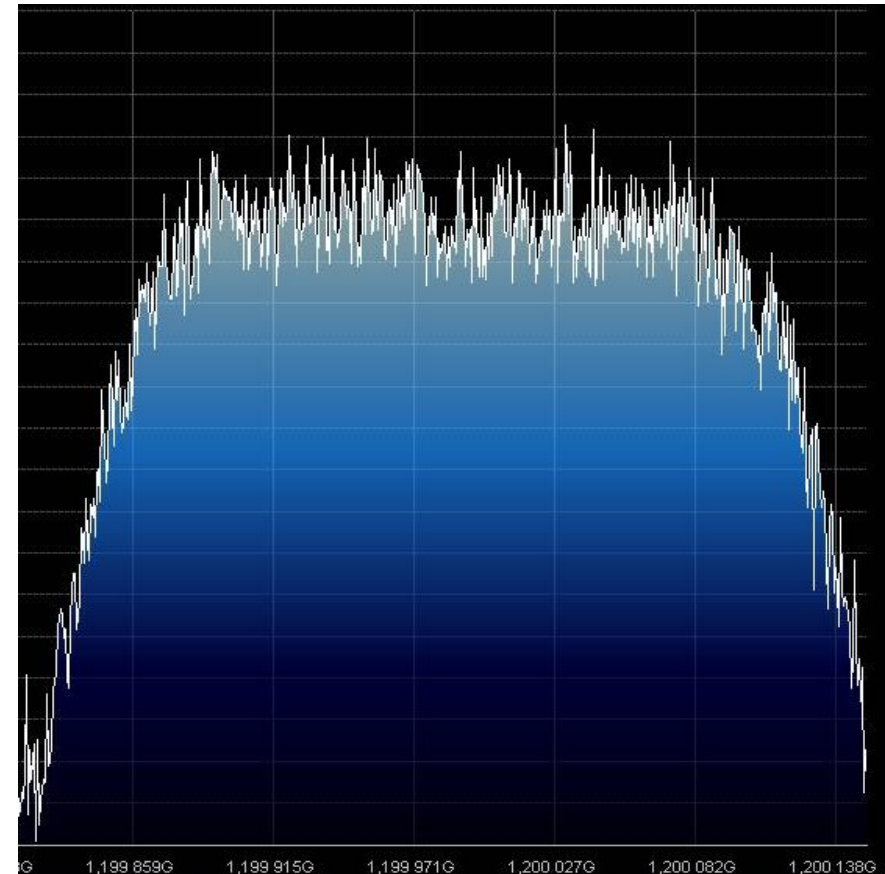
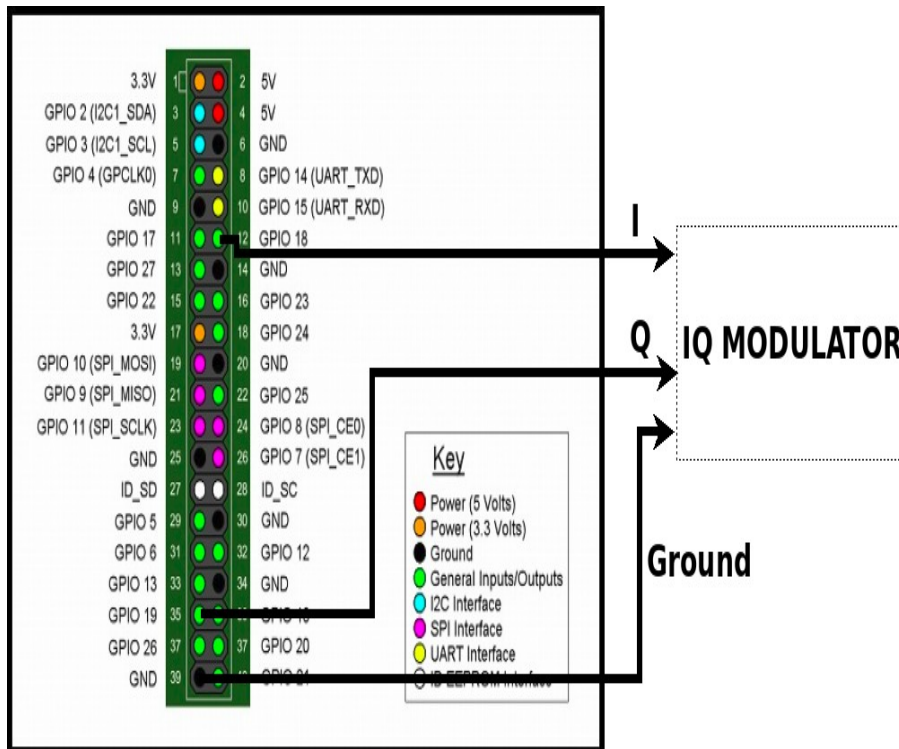
- Low cost HD camera
- Hardware video encoder H264
- Fast GPIO
- Using DMA to have coherent frequency
- Serial PWM mode



Output

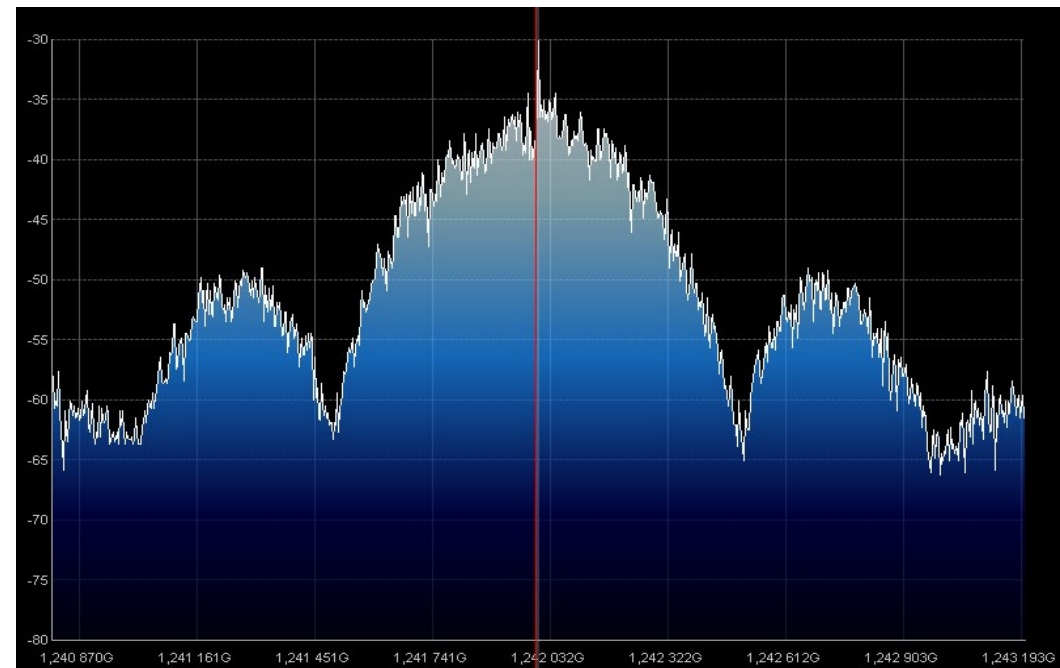
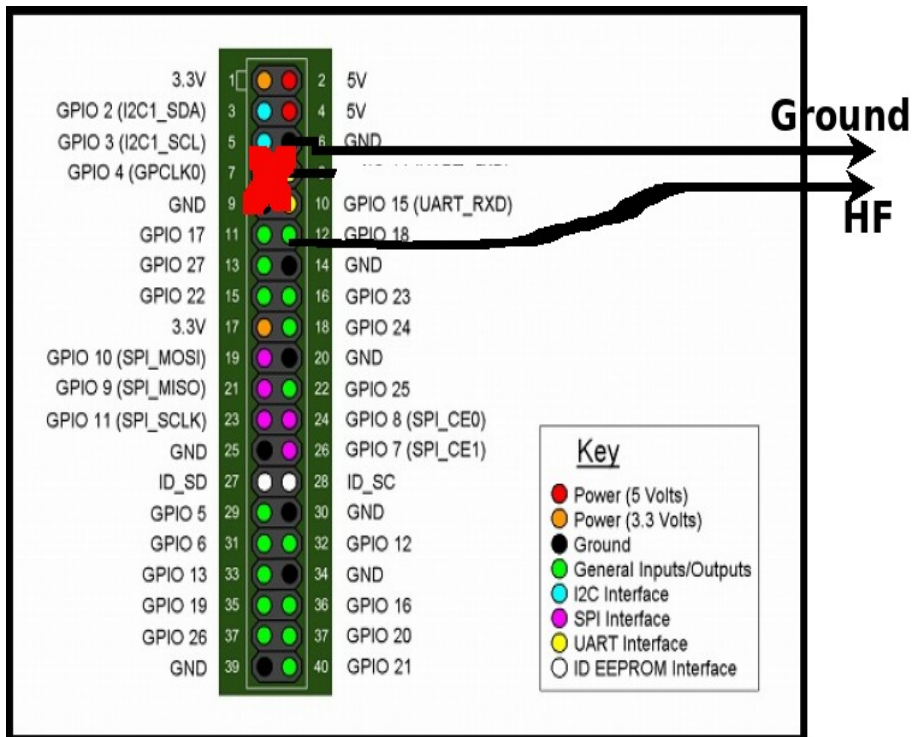
- IQ

Could be filtered by nyquist filter before quadrature modulator (Digithin numerical filtering, analog style)



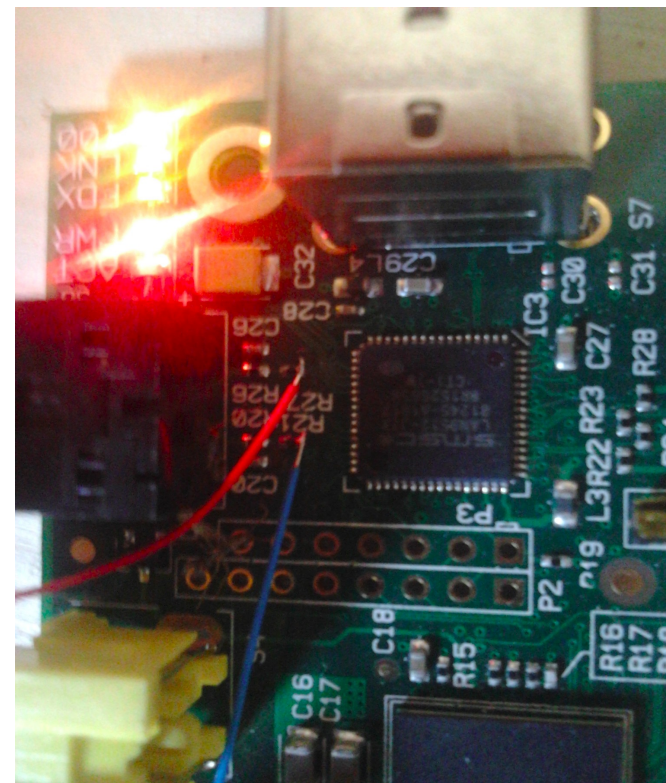
Output

- HF
 - Need bandpass filter
 - Use PLL and harmonics to have agility



Hardware already available

- HF mode :
 - need filtering !!!
 - Pre ampli (only 10 dbm)
- IQ
 - Digithin
 - Digilite
 - F4DAY
 - F1DOJ
 - Old professional DVB-S modulators (F1GE)



Hardware available

- USB
 - DATV-Express
 - Hides DVB-T should be included again
- Parallel
 - DTX1
 - SR-SYSTEM
 - LVDS

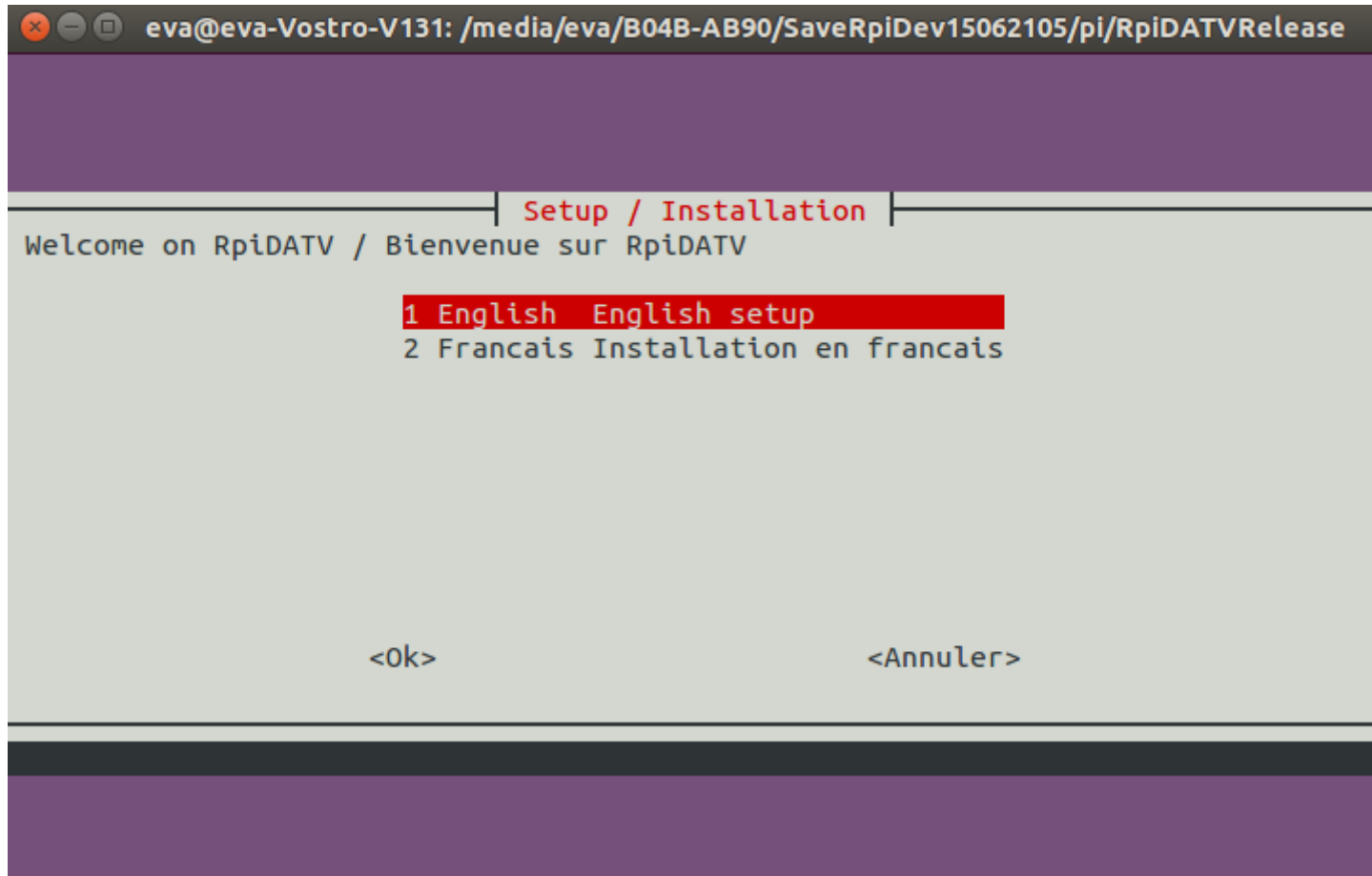
Quick story

- March 2014 : DVB-T Hides USB
- June 2014 : Digilite USB
- August 2014 : IQ through Digilite
- Sept 2014 : QPSK RF
- Feb 2015 : « graphical » menu
- March 2015 : Digithin support / Physical setup
- May 2015 : Parallele TS
- June 2015 : Complete automatic SD Image

Practical setup

- Raspberry B, B+ ou 2
- Camera Picam
- Micro SD card
- Download the image file
- Computer to write SD image
(Win32DiskImager)
- Screen (HDMI or Composite) OR network cable

First Installation



```
eva@eva-Vostro-V131: /media/eva/B04B-AB90/SaveRpiDev15062105/pi/RpiDATVRelease
Setup / Installation
Welcome on RpiDATV / Bienvenue sur RpiDATV
1 English English setup
2 Francais Installation en francais
<ok> <Annuler>
```

The image shows a terminal window with a purple title bar. The window title is "eva@eva-Vostro-V131: /media/eva/B04B-AB90/SaveRpiDev15062105/pi/RpiDATVRelease". The terminal content displays a menu for the RpiDATV installation. The menu title is "Setup / Installation" in red. Below it, the text "Welcome on RpiDATV / Bienvenue sur RpiDATV" is shown. The menu options are "1 English English setup" (highlighted in red) and "2 Francais Installation en francais". At the bottom, there are two options: "<ok>" and "<Annuler>".

Output menu

```
eva@eva-Vostro-V131: /media/eva/B04B-AB90/SaveRpiDev15062105/pi/RpiDATVRelease
```

Output type

Press down/up arrows to move, space to select

<input type="checkbox"/>	IQ	IQ output for external modulator
<input checked="" type="checkbox"/>	QPSKRF	QPSK direct in RF
<input type="checkbox"/>	BATC	Stream to BATC
<input type="checkbox"/>	DIGITHIN	Digitin card
<input type="checkbox"/>	DTX1	DTX1
<input type="checkbox"/>	DATVEXPRESS	DatvExpress

<Ok> <Annuler>

Example for HF Direct

- Locally receive on a set top box (L-BAND 1.0625GHz)
- Add a filtering filter on 70cm band
- Receive with upconverter
- Add amplifier and antenna
- You ARE QRV on RB DATV

Future and experiments

- Portable transceiver
- Multi video switching sources
- Stand alone relay
- IP/DVB
- Modem Data with other modulations up to 1MSymbol
- Reception with NIM