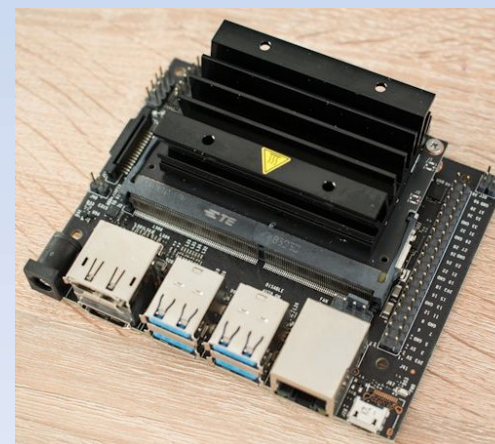




DATV Systems

Dave G8GKQ
Michel HB9DUG



Topics

-  Digital ATV Transmit Systems
-  Portsdown 2019
-  Portsdown 2019 on LimeNet Micro
-  The Future – The Jetson Nano?
-  Receive Systems
-  Questions



Commercial Solutions



SR Systems

- Current equipment limited to a minimum of 2 Mbits/s video encoding.



Ex-broadcast Equipment

- Normally limited to a Minimum of 1 MS

DATV Express Solutions



DATV Express hardware

- With PC DATV Express Software (DVB-S/S2)
- With Portsdown Software (DVB-S only)



DATV Express software (DVB-S/S2)

- DATV Express Hardware
- LimeSDR Mini and USB
- Pluto



F50E0 derived Solutions

-  **DigiLite (MPEG-2, DVB-S)**
-  **Portsdown 2018 (MPEG-2 & H264 DVB-S)**
 - Hardware Filter/Modulator board
-  **Portsdown 2019 (DVB-S and DVB-S2)**
 - LimeSDR Mini or USB
-  **Jetson Nano (H264 and H265)**
 - LimeSDR
 - Hardware H265 encoding

Portsdown 2019



Heritage – Portsdown 2018

- Take F50E0's code and make a user-friendly DATV transmitter (an appliance)



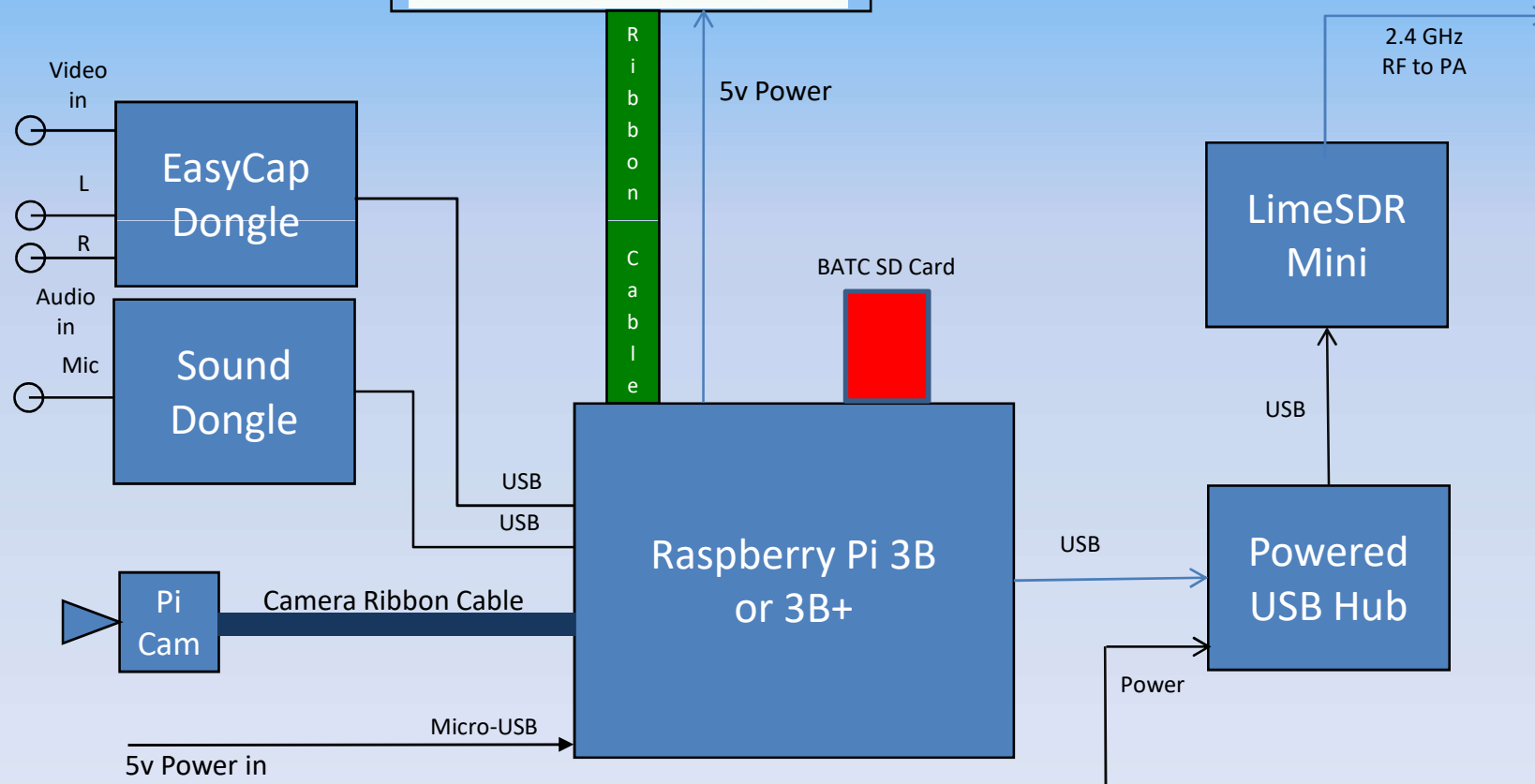
Portsdown 2019 uses the same codebase, but expanded to drive the LimeSDR



Now a “no-solder” solution

7 inch Touchscreen

BATC Portsdown Transmitter Main Menu				
TX		RX	M2	M3
Modulation	Encoder	Output to	Format	Source
DVB-S	H264	Ugly	4:3	PiScreen
Freq	Sym Rate	FEC	Band/Tvtr	Att Level
437 MHz	333	7/8	70_cm	-10.00
EasyCap	Caption	Audio	Atten	
Comp Vid	On	Auto	NONE	
Preset 1	Preset 2	Preset 3	Preset 4	Store
146.5_333	437_1MS	1255_HD	437-Ugly	Preset



The no-Solder Portsdown 2019

Portsdown 2019



Portsdown 2019 Limitations

-  Max Symbol Rate 1 MS
-  Current software has problems with some sources and SRs

SR	FEC	Pi Cam	EasyCap	Test Card	TCAnim	C920 Webcam
1000	1/4					
	1/2					
	3/4					
	9/10					
500	1/4					
	1/2					
	3/4					
	9/10					
333	1/4					
	1/2					
	3/4					
	9/10					
250	1/4					
	1/2					
	3/4					
	9/10					

Portsdown 2019 Strengths

-  Ideal for QO-100 (DVB-S2 and low SRs)
-  Output directly at 2400 MHz
-  Implements delayed PA Switching for LimeSDR calibration
-  Can be driven from OBS or vMix for video effects
-  Active online community support

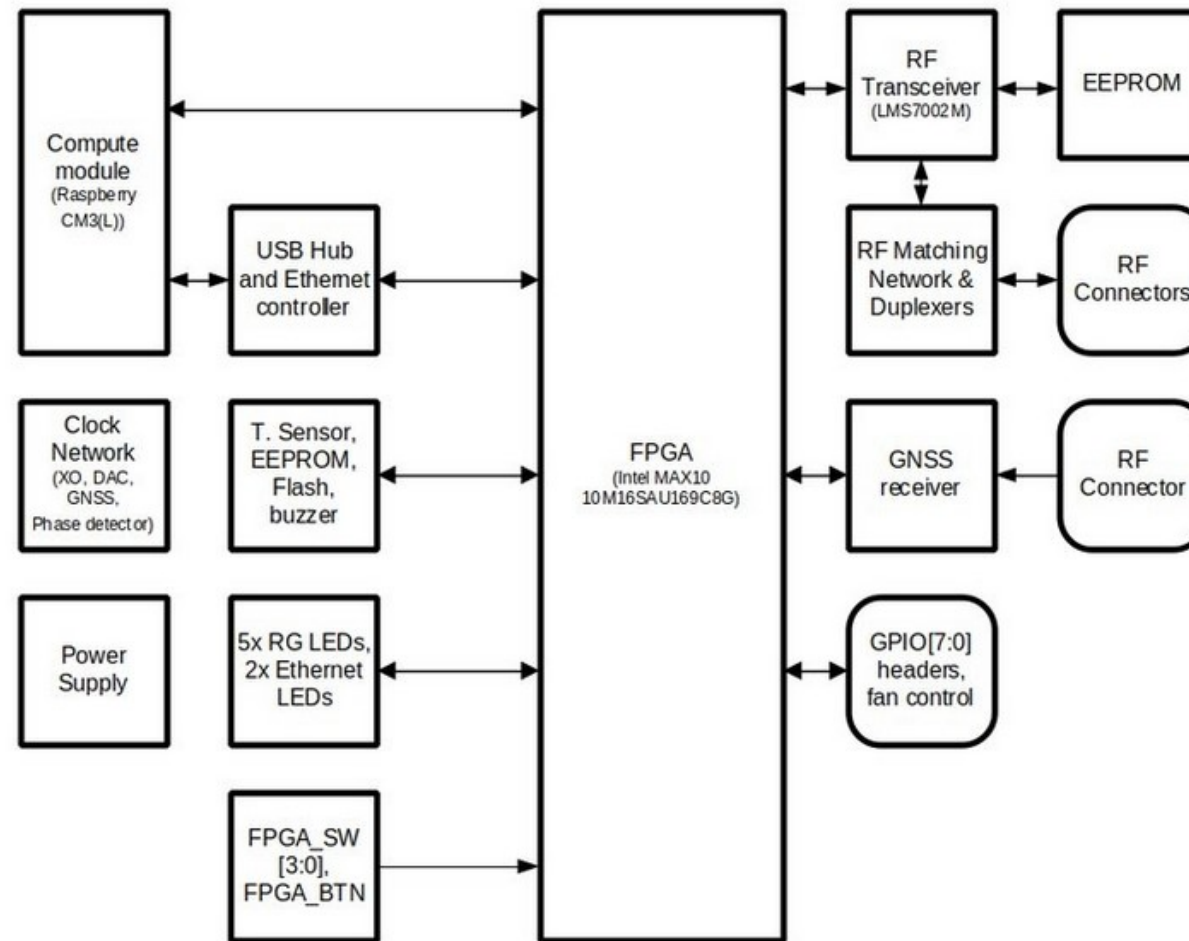
Portsdown on LimeNet Micro

-  All-in-One!
-  LimeSDR Mini like
-  Integrated GPS
-  RPI Compute Module CM3
-  RPI 7" Touchscreen and Camera
-  RJ45 Ethernet (POE) or 12 V DC Power
-  1st basic tests with Portsdown 2019 OK!



Portsdown on LimeNet Micro

Block Diagram



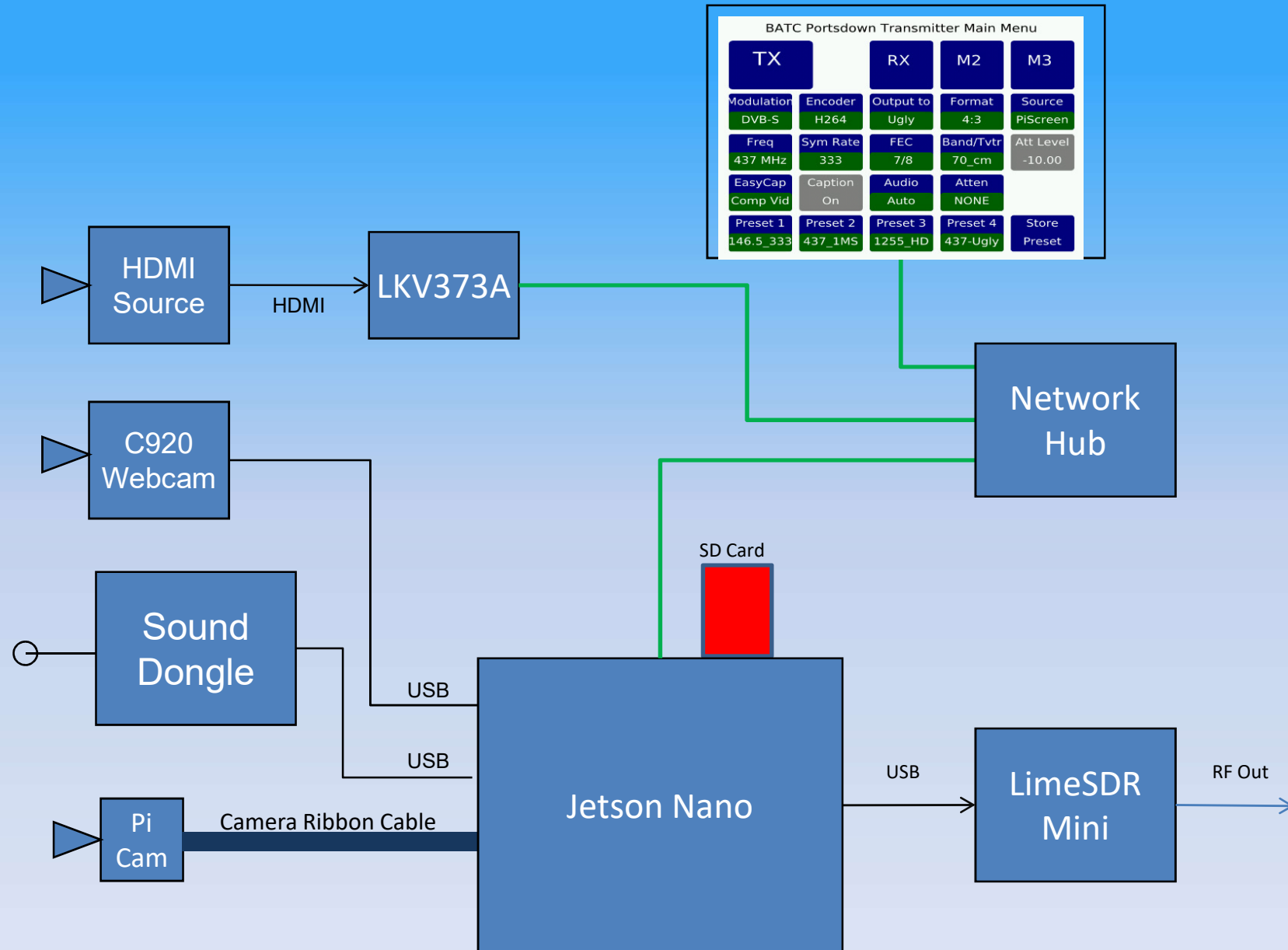
LimeNET Micro block diagram

The NVIDIA Jetson Nano

-  Similar to RPi
-  Hardware H264 and H265
-  Will take RPi Camera V2
-  No touchscreen interface
-  £101 + SD Card + PSU + Fan
-  Use LKV373A V3 (£20) for HDMI HD input
-  Configuration details on BATC Wiki



Portsdown 2019



Portsdown Control

Jetson Configuration Menu (44)

Set Jetson
Username

Set Jetson
Password

Set Jetson
Root PW

LKV373
UDP port

Shutdown
Jetson

Reboot
Jetson

Set Jetson
IP address

LKV373
UDP IP

Exit

Portsdown Control

Output Device Menu (42)

Jetson
Lime

Portsdown

Comp Vid

Ugly

DTX1

Express

IPTS out

Lime USB

Lime Mini

BATC
Stream

Cancel

Portsdown Control

Encoding Selection Menu (12)

MPEG-2

H264

H265

IPTS in

TS File

Cancel

Portsdown Control

BATC Portsdown Transmitter Main Menu

TX ON		RX	M2	M3
Modulation	Encoder	Output to	Format	Source
S2QPSK	H265	Jtsn Lime	4:3	Webcam
Freq	Sym Rate	FEC	Band/Tvtr	Lime Gain
437 MHz	125	9/10	70_cm	88
EasyCap	Caption	Audio	Atten	
Comp Vid	On	Auto	NONE	
Preset 1	Preset 2	Preset 3	Preset 4	Store
146.5_333	437_1MS	1255_HD	437-Ugly	Preset

H265 Encoding

MINITIOUNE v0.9beta8_9 - Receiver/Analyser DVB-S/S2 144 MHz to 2450 MHz - SRmini=32 kS/s - for MiniTouner/MiniTouner-Pro

MiniTouner V2
NIM : Serit FTS-4335

Symbolrate (kS)
SR set: 125021S
Deviation: -8S
SR → 125 kS/s

Frequency (kHz)
Freq asked: 437000kHz
Freq → 437004 kHz IF 437000kHz

LNA gain: 00 dB
Derotator Search
Carrier Width: 169 Khz
TV mode: DVB-S2

Web Station ID: 1
MY CITY
JJ00XX
Ant. Dir. East Gain 12 dB
Picture Video Lg Msg 0000
Timing 3 sec

SR (kS) Freq (kHz)
00125 00437000
Offset → 00000000
SR2000 Beacon
SR1000 10496250
SR500 10497250
SR333 10497750
SR250 10498250
SR125 10498750
SR66 11597MHz
SR27500 437 MHz
Oscar 100
DVB mode M1 FEC DVBS
DVB-S M2 All
DVB-S2 M3 1/2
Auto 2/3
Wide scan 3/4
Low SR 5/6
6/7
7/8
Fplug LNB volt 22kHz
A 0 OFF
B 13(V) ON
18(H) TS
Store into Memory
M1 M2 M3

Format 4/3 Width: 384
16/9 Height: 288
1/1 Audio
auto MPA
AAC
maxi AC3
Zoom adapt
x1
maxi
GRAPH
Reset

PIDs
Pid from .ini
G8GKQ Auto PID
F6DZP-Mpeg
HDlowSR
France24
QRZ DX
RaspberryP
PID Video 00256
PID audio 00257
Codec
Mpeg2
H264
H265
Program G8GKQ
infos: DVB-S2
Provider: G8GKQ
Codec: VH265 + AAC
photo
Audio level
Info

Extern. Request
Apply auto
232.0.0.11:6789

Carrier Lock
SR Lock
Full RF Pw -29dBm
C/N MER 51.0dB
Constellations

BCH errors 0
LDPC 0%
FEC 9/10 QPSK_L35
C/N must be > 6.42 dB
TS 0
Bytes recvd: 238 kb/s 254ms
D45

Beep Dsave UDP Record
Quit
Expert Web

Receive Systems

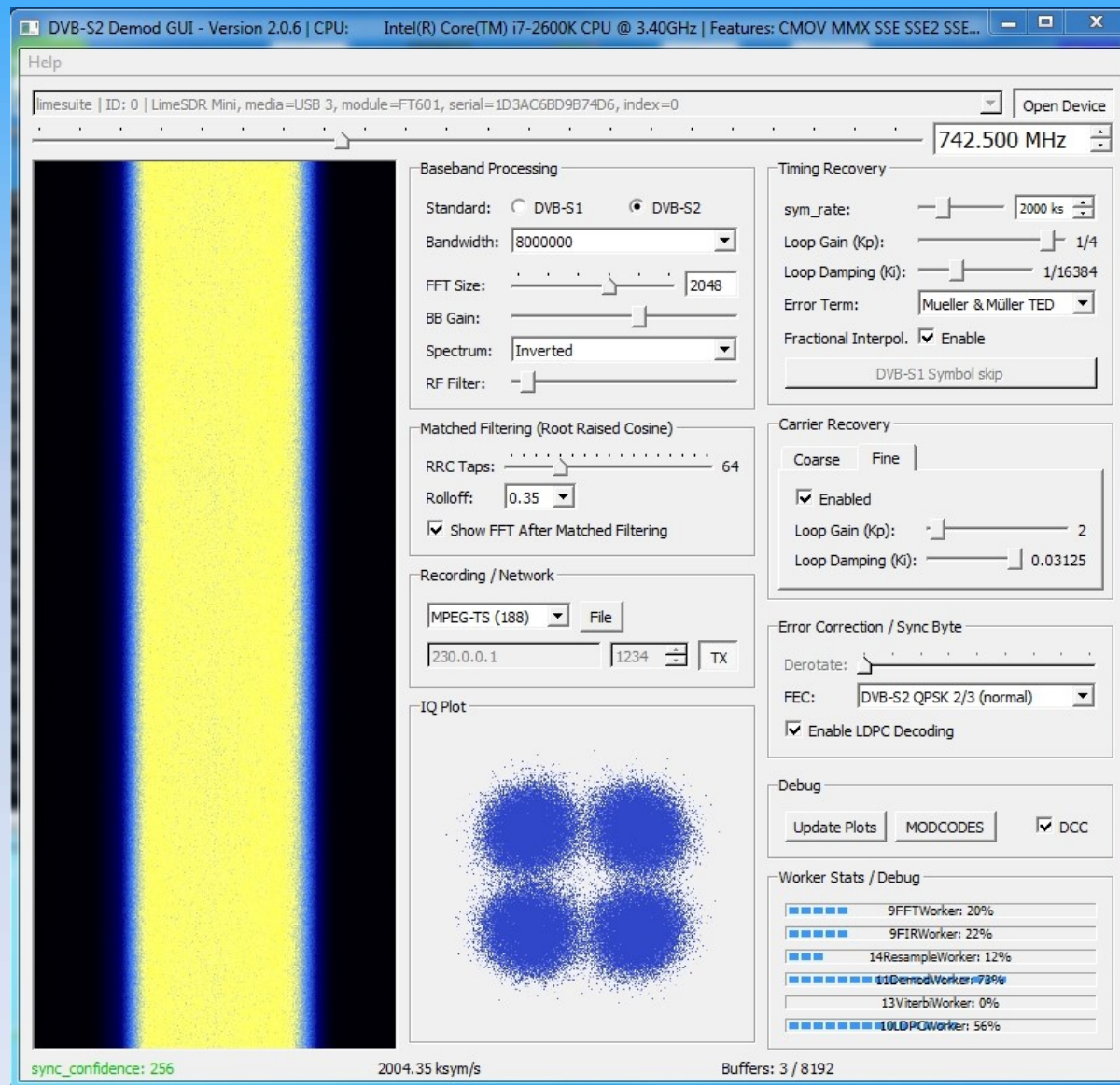
-  MiniTuner
-  LeanDVB
-  DVB-S2 GUI
-  SDR Angel



DVB-S2 GUI

-  Windows software DVB-S/S2 demodulator !
-  Limited to QPSK mode and $SR < 2000$ ks/s
-  Support LimeSDR Mini and Airspy products
-  Use VLC Media Player to display
-  Developed by Marcel
-  Info and link to the soft are on the
ASMAT-DL Forum under :
Software DVB-S Demodulator (SWL-marko92)

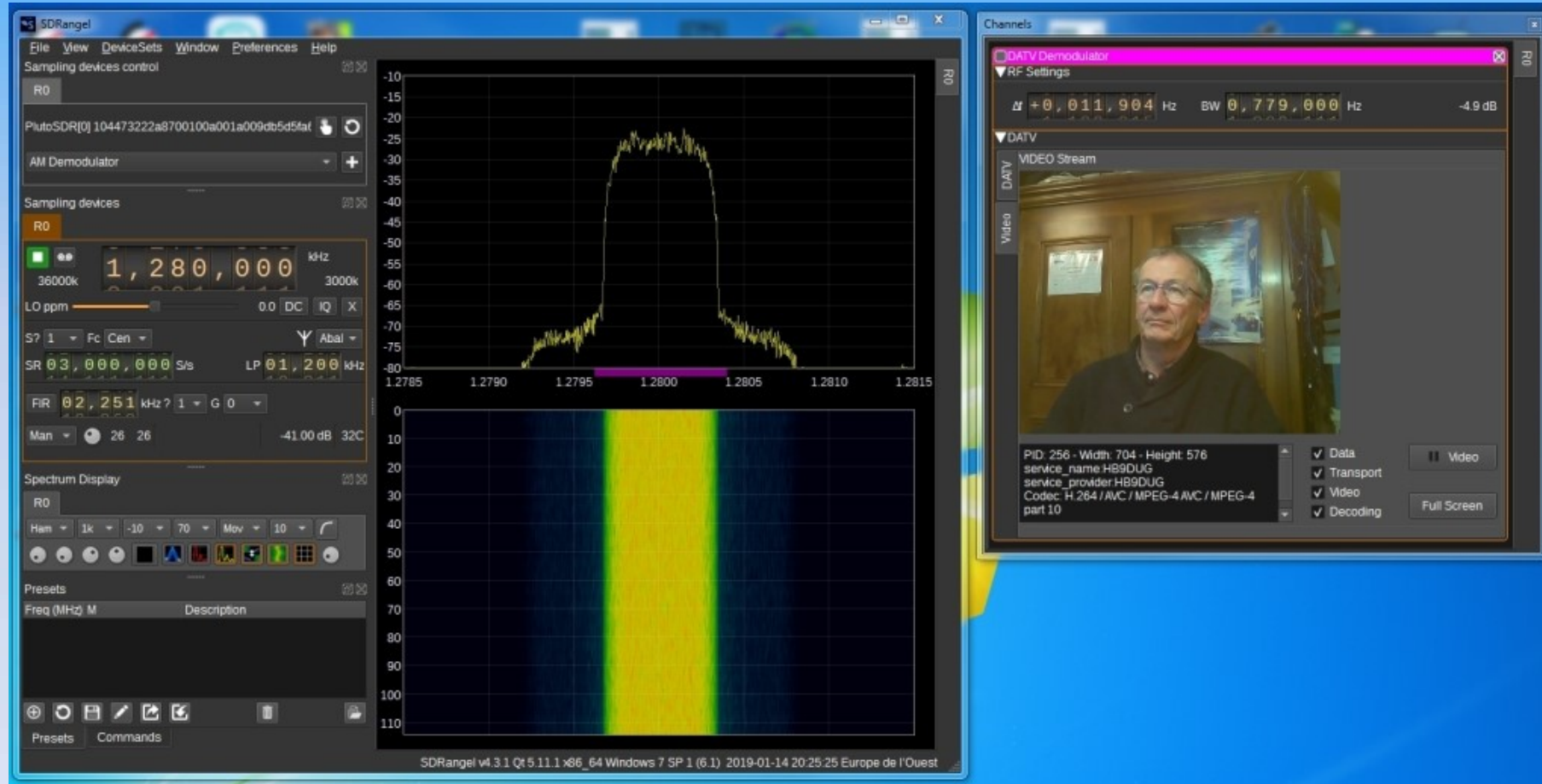
DVB-S2 GUI

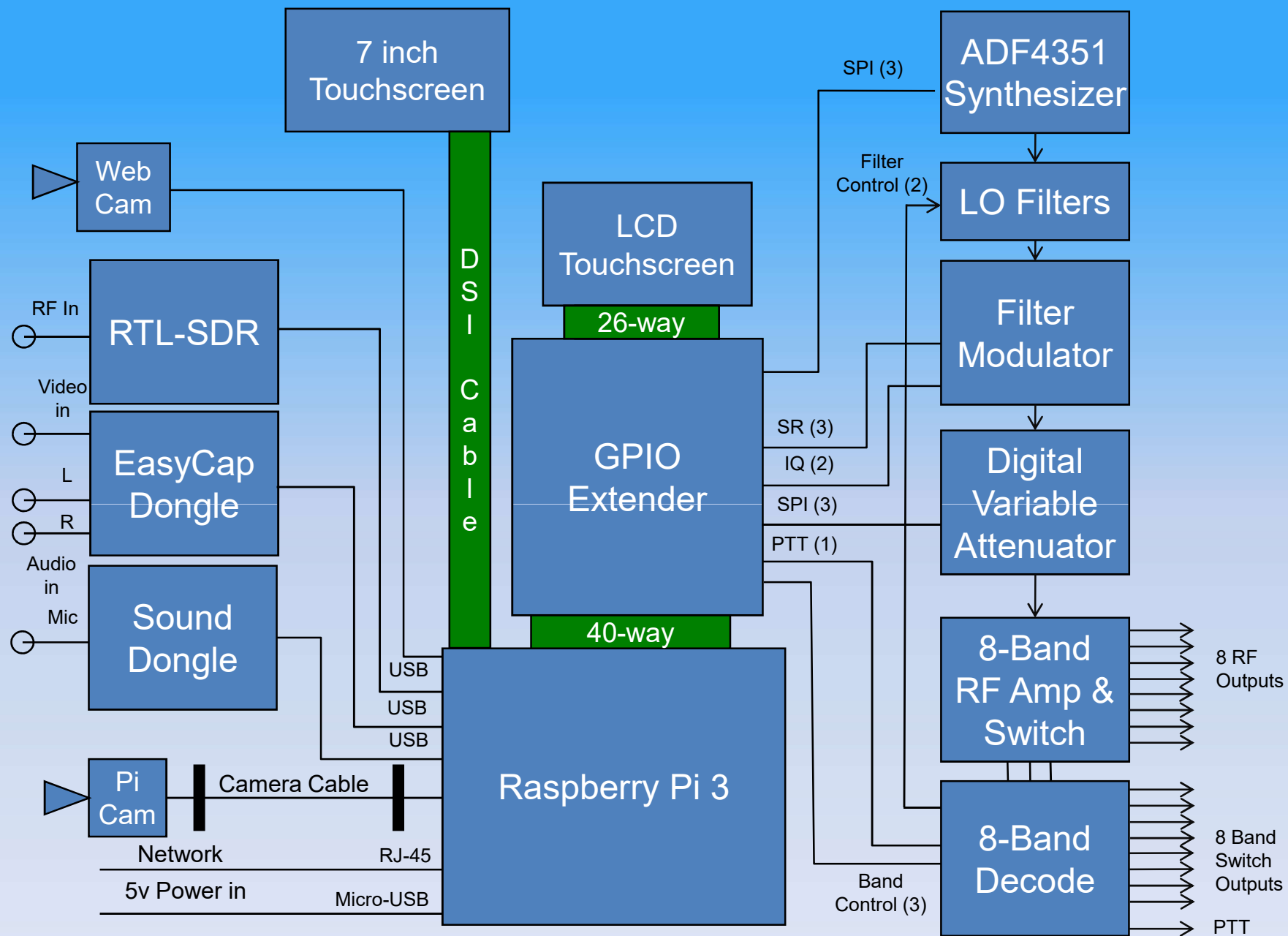


SDRAngel

-  Windows and linux software DVB-S/S2 ? demodulator
-  Based on leandvb from Pascal F4DAV
-  Limited to QPSK mode and $SR < 2000$ ks/s
-  Support Lime, Airspy, Pluto and RT-SDR products
-  Info and link to the soft are on :
<https://github.com/f4exb/sdrangel/releases>

SDRAngel





The Portsdown 2018 ATV Transmitter

G8GKQ 22 Mar 18

Questions



Portsdown: https://wiki.batc.org.uk/Portsdown_2019



DVB-S2 GUI: <https://forum.amsat-dl.org/index.php?thread/101-software-dvb-s-demodulator/>



SDRAngel: <https://github.com/f4exb/sdrangel/releases>