

François MOCQ

f1gyt

18 avril 2021

Présentation Raspberry Pi®



18
AVRIL
WARD
2021

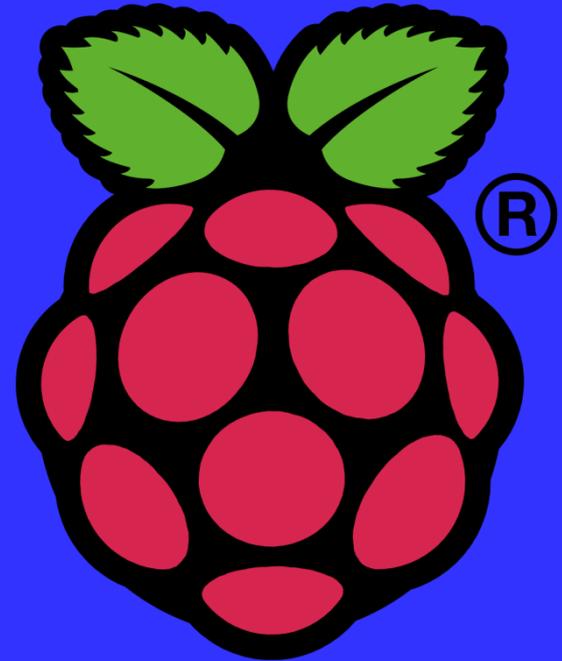
APPEL A CANDIDATURES
**WORLD AMATEUR
RADIO DAY**
Journée mondiale de la radio amateur

FRAPPE
ON AIR ON AIR
LRADIOSCOPE.FR

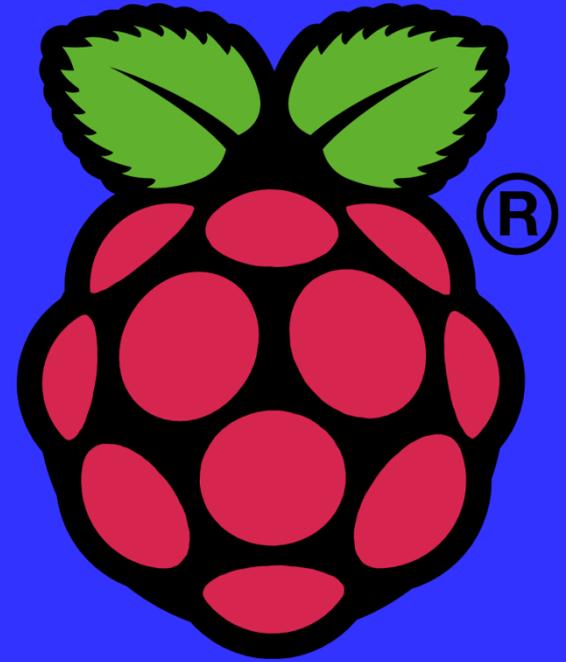
The poster features a red background with a white microphone icon in the center. The microphone is surrounded by a circular pattern of white lines, suggesting sound waves. The text is arranged in a structured layout, with the date and event name at the top, the call for applications in the middle, and the event title and date at the bottom. A small logo for 'FRAPPE' is also visible.

Au programme

- Présentation du Raspberry Pi 4
- Le Raspberry Pi les makers et les OM
- Le Raspberry Pi dans l'espace

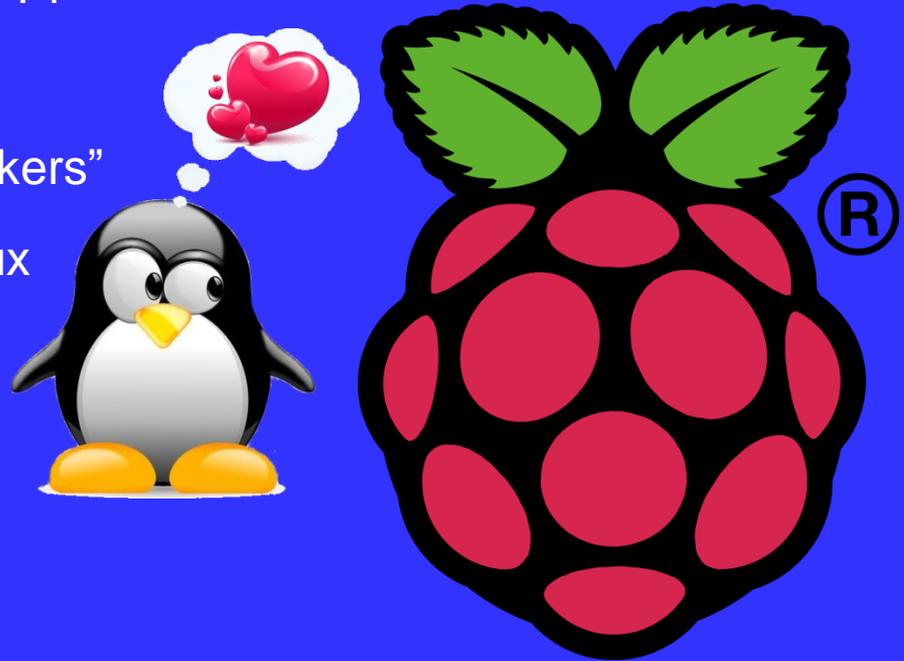


Origines du Raspberry Pi

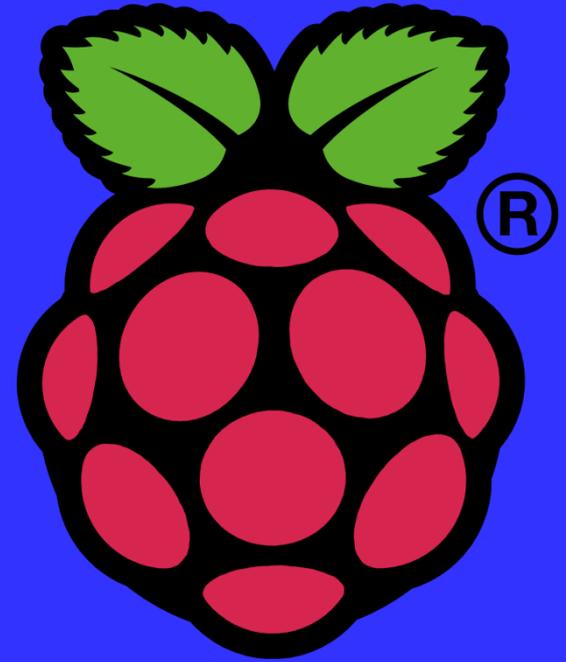


Origines du Raspberry Pi

- Créé par la Fondation Raspberry Pi
- Apprendre aux enfants à coder
- Adopté par les “geeks” et les “makers”
- Système d’exploitation libre : Linux
- Vidéo de qualité 4K
- 10 000 exemplaires prévus
- Plus de **32 000 000** vendus !
- 40% utilisés par les entreprises

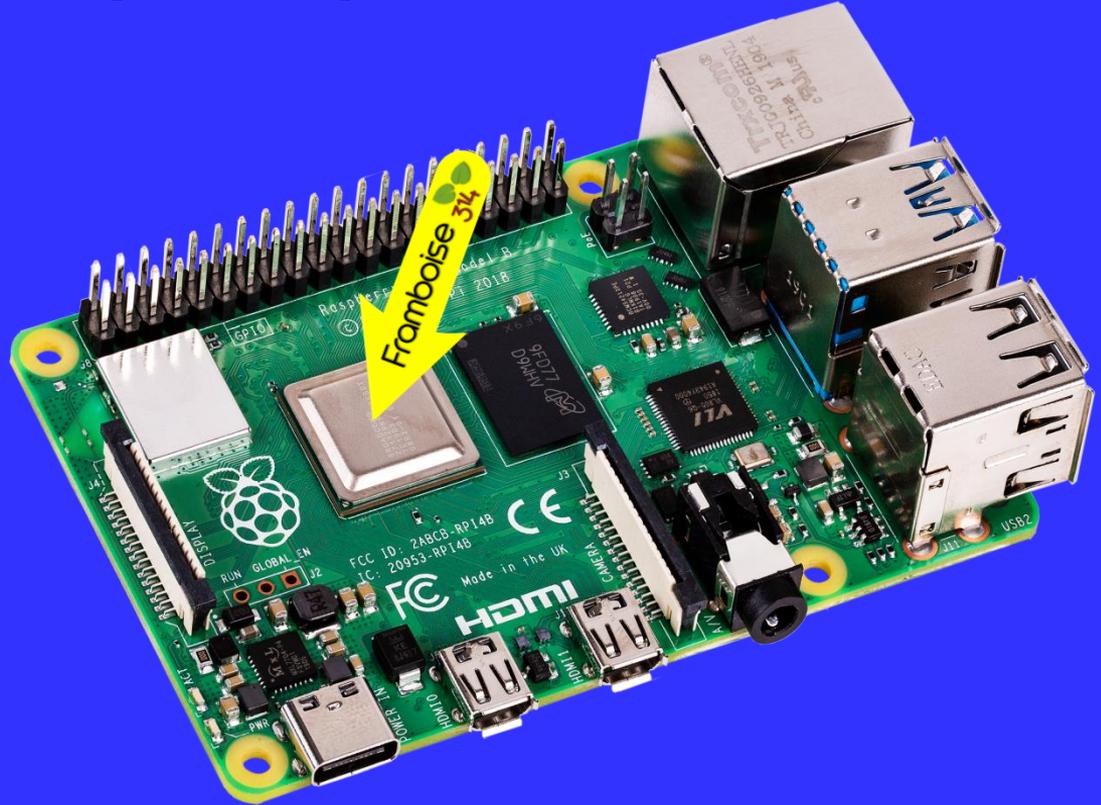


Présentation du Raspberry PI 4



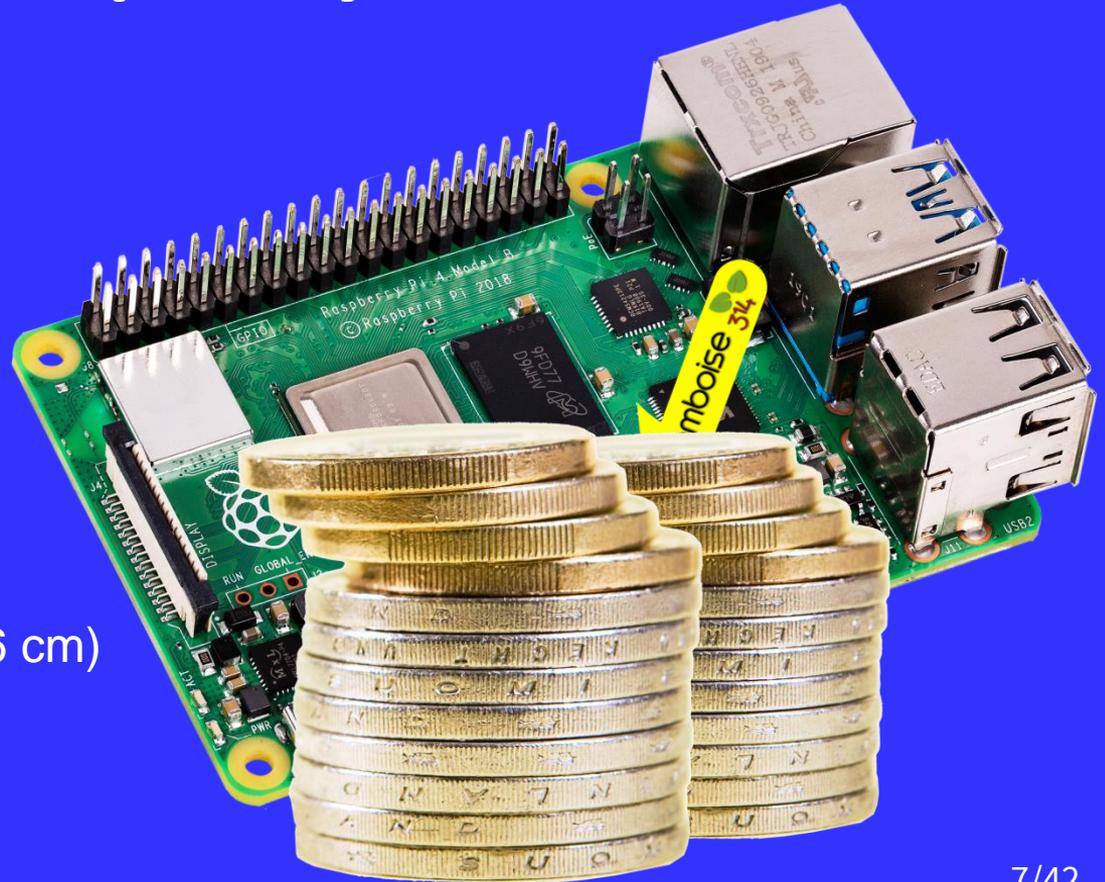
Présentation du Raspberry Pi 4

- **Processeur ARM Cortex-A72**
4 Cœurs - 64 bits à 1,5GHz
 - **GPU Broadcom VideoCore VI**
2 Sorties HDMI 4K
 - **Mémoire RAM 2, 4 ou 8 Go**
 - Disque dur = Carte SD
 - Audio/vidéo analogique
 - 2 ports USB 3.0
 - 2 ports USB 2.0
 - 1 port Ethernet Gigabit
- Bus PCIe



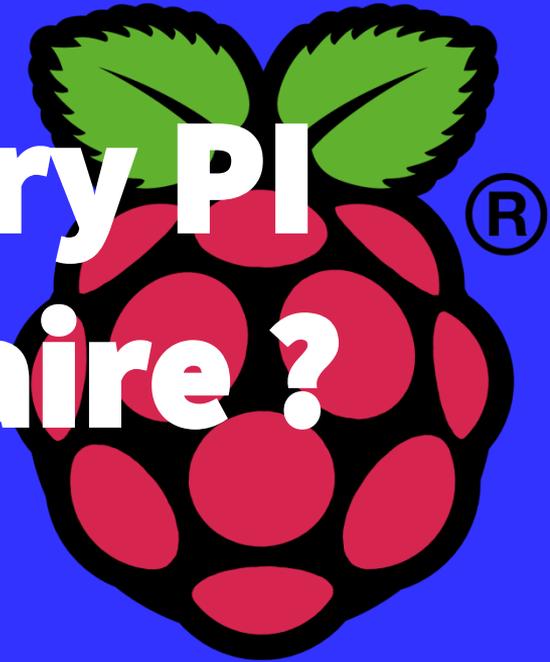
Présentation du Raspberry Pi 4

- Port Caméra – CSI
- Port afficheur – DSI
- WiFi 802.11ac et Bluetooth 5.0
- 40 broches d'entrée/sortie
- Connecteur PoE
- Alimentation **USB-C** 5V/3A
- Format carte de crédit (8,5 x 5,6 cm)
- 45 grammes
- 40 €



Le Raspberry PI

Pour quoi faire ?



Le Raspberry Pi et les makers

Retrogaming



Le Raspberry Pi et les makers

Un mediacenter



Le Raspberry Pi et les makers

Piloter une imprimante 3D

OCTOPRINT

- Imprimer à distance
- Envoyer un fichier en WiFi
- Slicer du STL dans Octoprint
- Surveiller les paramètres
- Voir l'impression en vidéo



Le Raspberry Pi et les makers Commander un robot

BUILD A RASPBERRY PI ROBOT

Say hello to the £150 Linux-powered robot anyone can make

 There's never been a more exciting time to be into robotics.

Until more recently even building the most basic robot that moves, senses its environment and reacts to external stimuli cost thousands of pounds construct. Thanks to devices like the Raspberry Pi, though, it can be done at a mere fraction of that price today. In fact, assuming you've already got a Raspberry Pi and have dabbled in electronics in the past, it's unlikely you'll need to spend more than £100 to put our project robot together. Over the course of the feature we'll be exploring aspects of electronics,

programming and basic artificial intelligence. You don't need to have any experience in any of these fascinating fields, but we do hope you'll be inspired to learn. We'll be returning to our robot in future issues too, giving him new skills and abilities, but you don't need to spend a fortune on sensors and actuators to do real computer science. Just by following our progress over the next 18 pages, the door to exciting fields like navigation, maze solving and artificial intelligence will already be firmly open to you and your amazing robot-creations.

Russell Barnes, Editor

Maker profiles

 **Russell Barnes** is the editor of Linux User and has been an open source advocate and technology writer for 15 years. He currently has three Raspberry Pis, two Arduinos and a robot called COPPO.



Jason Barnett is a Raspberry Pi enthusiast, hardwareinker, robot builder, STEM ambassador and Code Club volunteer. He also is the creator of successful Kickstarter project, MotorPiX.

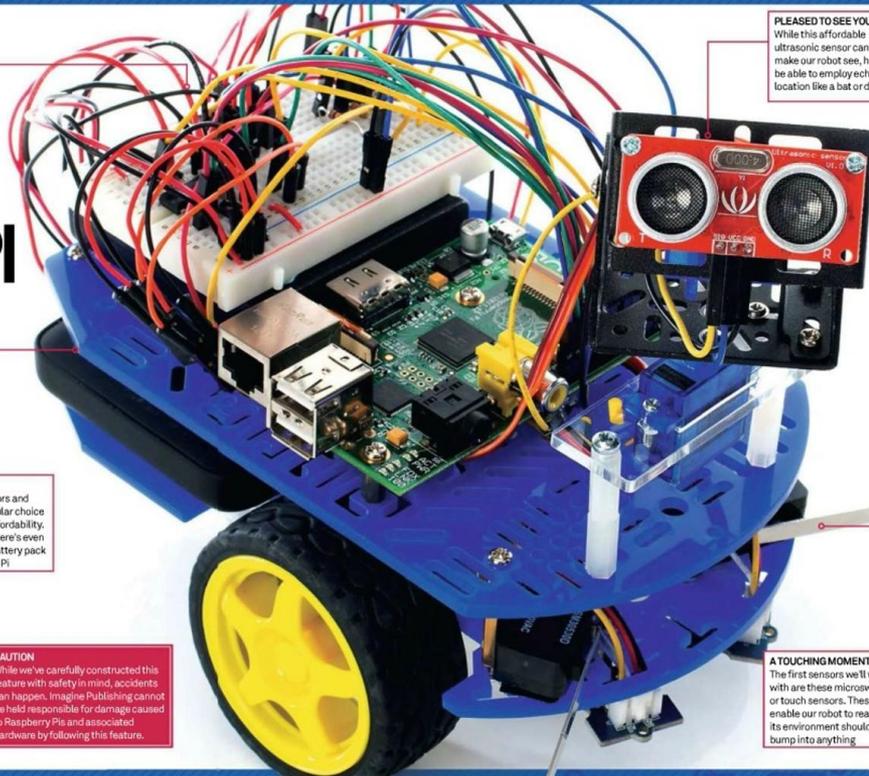
SPAGHETTI JUNCTION
It might look like a terrible tangle of wires now, but by adding motors and sensors gradually and testing and checking as you go, it will soon make perfect sense

ALL ABOARD
The chassis, motors and wheels are a popular choice thanks to their affordability. As you can see, there's even room for a USB battery pack for the Raspberry Pi

CAUTION
While we've carefully constructed this feature with safety in mind, accidents can happen. Imagine Publishing cannot be held responsible for damage caused to Raspberry Pis and associated hardware by following this feature.

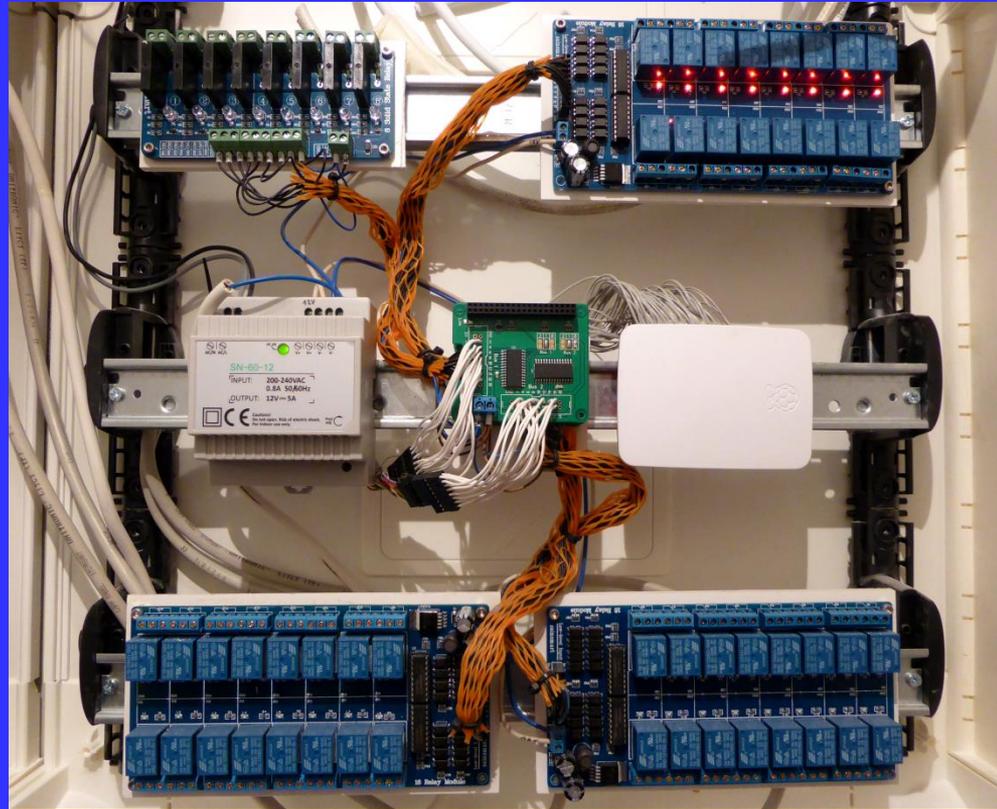
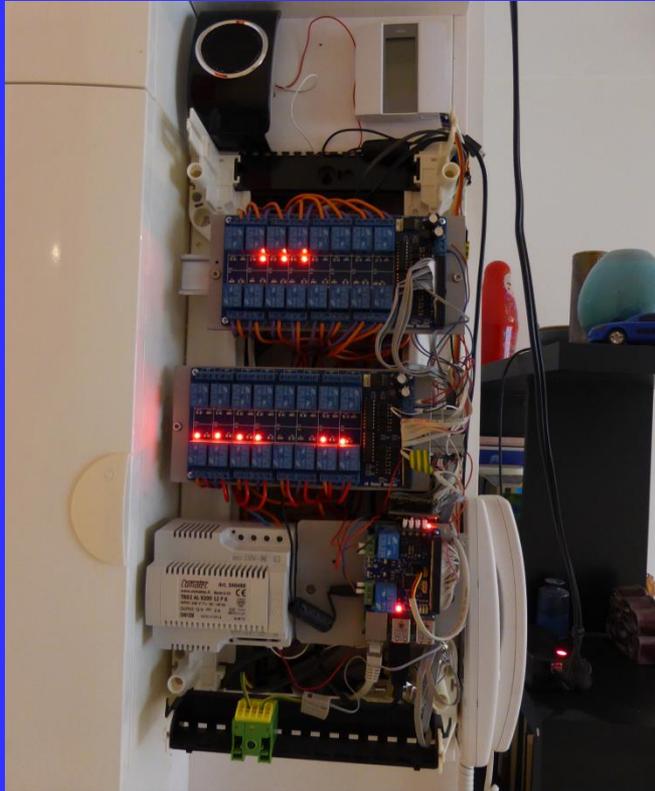
PLEASED TO SEE YOU
While this affordable ultrasonic sensor can't really make our robot see, he will be able to employ echolocation like a bat or dolphin

A TOUCHING MOMENT
The first sensors we'll work with are these microswitches or touch sensors. These will enable our robot to react to its environment should it bump into anything



Le Raspberry Pi et les makers

Une centrale domotique



Le Raspberry Pi et les OM

Expédition scientifique

- Par Fabrice – *f4hhv*
- Altitude 27 km
- 200 mbar / -60°C
- Localisation par tracker APR + balise 436 MHz
- 2 heures de vol
- Récupération à 55 km de Nîmes
- Des images superbes !







Le Raspberry Pi et les OM

Des possibilités étendues

<http://www.raspberrypi.com/packages-list/item/71-raspbian-hamradio>

HAMRADIO

A

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- acfax** Stretch & Jess:(981011-17) Receive faxes using your radio and sound card
- aldo** Stretch & Jess:(0.7.7-1) 🟢 😊 1 😞 0 🗨️ 1 Morse code training program
- ampr-ripd** Stretch:(1.15-1) Routing daemon for AMPRnet gateway announcements [www](#)
- antennavis** Stretch:(0.3.1-4) Jess:(0.3.1-3) antenna radiation pattern visualization software [www](#)
- aprsd** Stretch & Jess:(1:2.2.5-13-5.2) Internet Gateway for the Automatic Position Reporting System [www](#)
- aprsdigi** Stretch:(3.10.0-2) Jess:(3.5.1-1) digipeater for APRS [www](#)
- aprx** Stretch:(2.9.0+dfsg-1) APRS Digipeater and iGate [www](#)
- ax25-apps** Stretch:(0.0.8-rc4-2) Jess:(0.0.8-rc2+cvs20130510-4) AX.25 ham radio applications [www](#)
- ax25-node** Stretch & Jess:(0.3.2-7.4) Amateur Packet Radio Node program
- ax25-tools** Stretch:(0.0.10-rc4-1+deb9u1) Jess:(0.0.10-rc2+cvs20120204-4) tools for AX.25 interface configuration [www](#)
- ax25-xtools** Stretch:(0.0.10-rc4-1+deb9u1) Jess:(0.0.10-rc2+cvs20120204-4) tools for AX.25 interface configuration -- X11-based [www](#)
- ax25mail-utils** Stretch:(0.13-1) Jess:(0.11-7) hamradio packet utilities for fbb [www](#)
- axmail** Stretch:(2.6-1) Mail user agent for ax.25 users, accessed via a node frontend [www](#)

B

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- baycomusb** Stretch:(0.10-13) Jess:(0.10-12.2) Drivers for the HB9JNX packet radio usb modem [www](#)

Le Raspberry Pi et Gestion des Log

PyQSO

Mais aussi :

- Gestion des QSL
- Calculs distance
- ...

The screenshot displays the PyQSO application window. At the top, there is a menu bar with 'Logbook', 'Records', 'View', and 'Help'. Below the menu is a toolbar with icons for file operations and a search filter labeled 'Filter by callsign:'. The main area is a table with columns: Index, Callsign, Date, Time, Frequency (MHz), Band, Mode, TX Power (W), RST Sent, RST Received, and Grid Square. The table contains 10 rows of log entries, with the last row (index 25) highlighted in green. Below the table is a 'Toolbox' section with buttons for 'DX Cluster', 'World Map', and 'Awards'. The 'World Map' button is active, showing a world map with a grid of grid squares. Two locations are marked on the map: 'ZMOSQL Southampton' and 'EA4CYO'. At the bottom right of the map area, the coordinates '38.38, 75.78 (75.778932°N, 38.379229°E)' are displayed. At the bottom of the window, the logbook path is shown: 'Logbook: /home/christian/Documents/amateur-radio/M0UOS.db'.

Index	Callsign	Date	Time	Frequency (MHz)	Band	Mode	TX Power (W)	RST Sent	RST Received	Grid Square
16	MI6GT	20171103	1056	145.850	2m	FM	5	59	59	IO64
17	F4DX/V	20171103	1057	145.850	2m	FM	5	59	59	JN05je
18	IW1FZR	20171128	2040	145.850	2m	FM	5	59	59	JN45
19	ON4AUC	20171230	1910	145.850	2m	FM	5	59	59	
20	G7SVF	20171230	1914	145.850	2m	FM	5	59	59	
21	EB1AO	20180223	2125	145.850	2m	FM	5	59	59	IN52
22	G7SVF	20180327	1954	145.850	2m	FM	5	59	59	IO90
23	G0ABI	20180327	1956	145.850	2m	FM	5	59	59	IO80bu
24	EB1AO	20180327	1957	145.850	2m	FM	5	59	59	
25	M0JFP	20180401	1840	145.850	2m	FM	5	59	59	IO91sk

Le Raspberry Pi et les OM

Apprendre/recevoir/envoyer la CW

The image displays a Raspberry Pi workstation setup for recording Morse code. It is divided into three main sections:

- Top Left:** A photograph of the physical hardware, including a Raspberry Pi board, a monitor, and various cables.
- Top Center:** The SimpleScreenRecorder application window. It shows recording settings such as "Pause recording", "Enable recording hotkey", and "Hotkey: Ctrl + Shift + Alt + Super + R". It also displays recording statistics like "Total time: 0:00:31", "FPS in: 30.01", and "File size: 9501 kB".
- Top Right:** A VNC Viewer window showing a DOSBox 0.74 interface. The program being run is CWTERM, which displays a Morse code message: "AR 20-T 23 -CF10)wncms -05:30:33-". Below the message, there is a line of text: "Cq cq cq de ae8hw ae8hw ae8hw Kcq cq cq de ae8hw ae8hw ae8hw Kcq cq cq de ae8hw Kq ae8hw ae8hw Kcq cq cq de ae8hw ae8hw ae8hw Kqzgzdzdae8hwbsly into st 1uis (today) name leve is cluck".
- Bottom:** An audio waveform visualization showing a series of pulses, characteristic of Morse code. The waveform is green and plotted on a black grid. The interface includes controls for "Pause/Freeze", "Cursor", "Level", and "Trigger".

Le Raspberry Pi et les OM

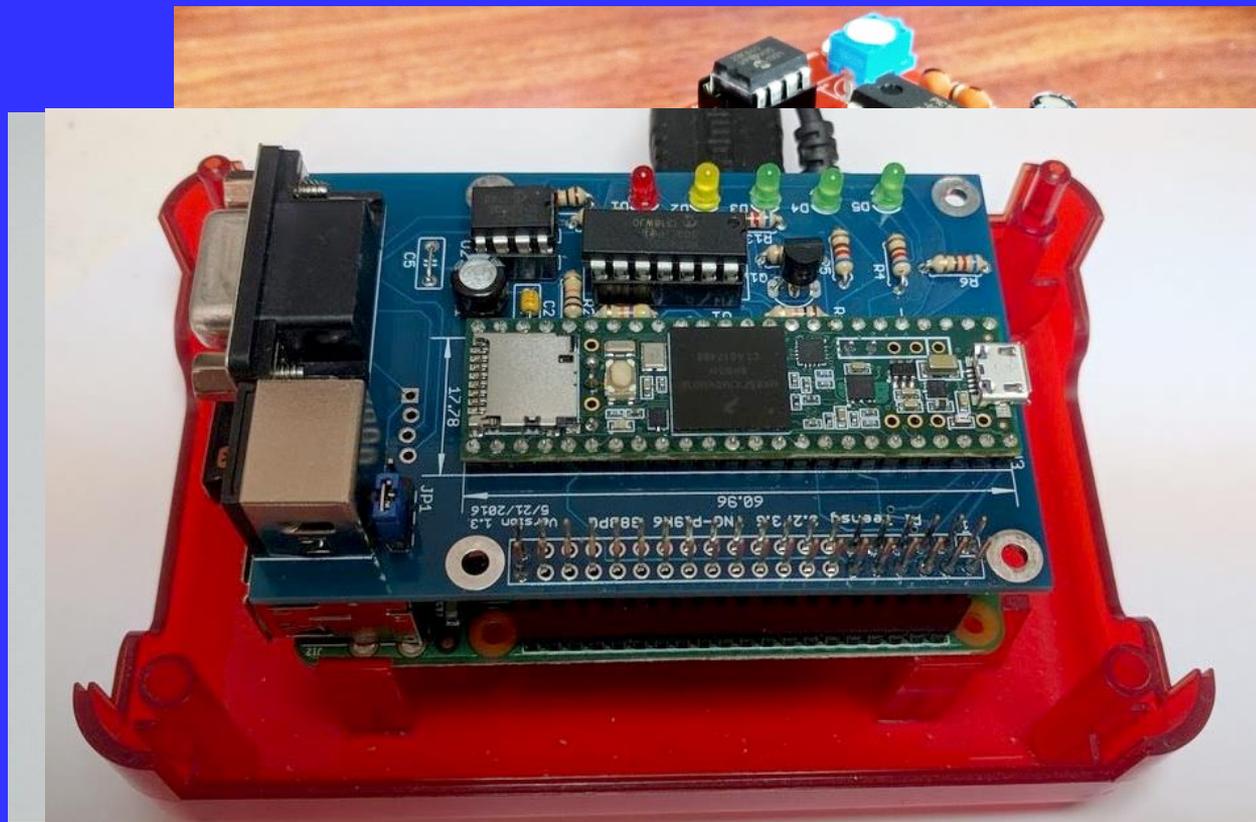
AX25

TNC-Pi2

En Kit

1200 bauds

9600 bauds



Le Raspberry Pi et les OM

APRS Automatic Packet Reporting System : système transmission automatique par paquets

GPS + Packet Radio

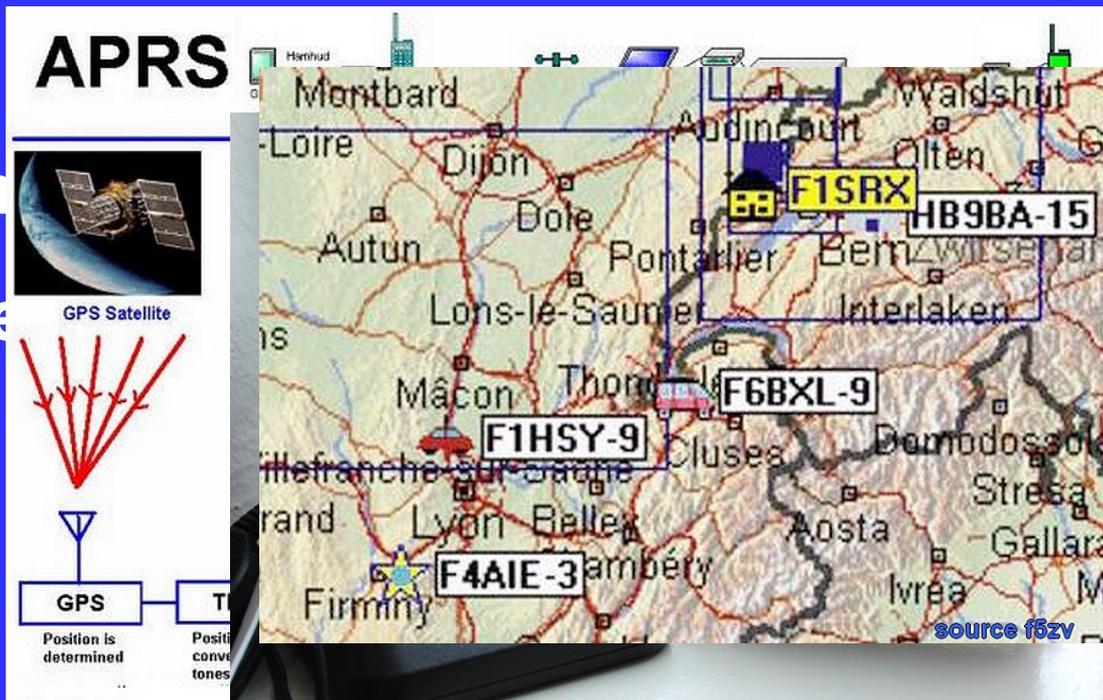
Diffusion données en

Vers tous les utilisateurs

Temps réel

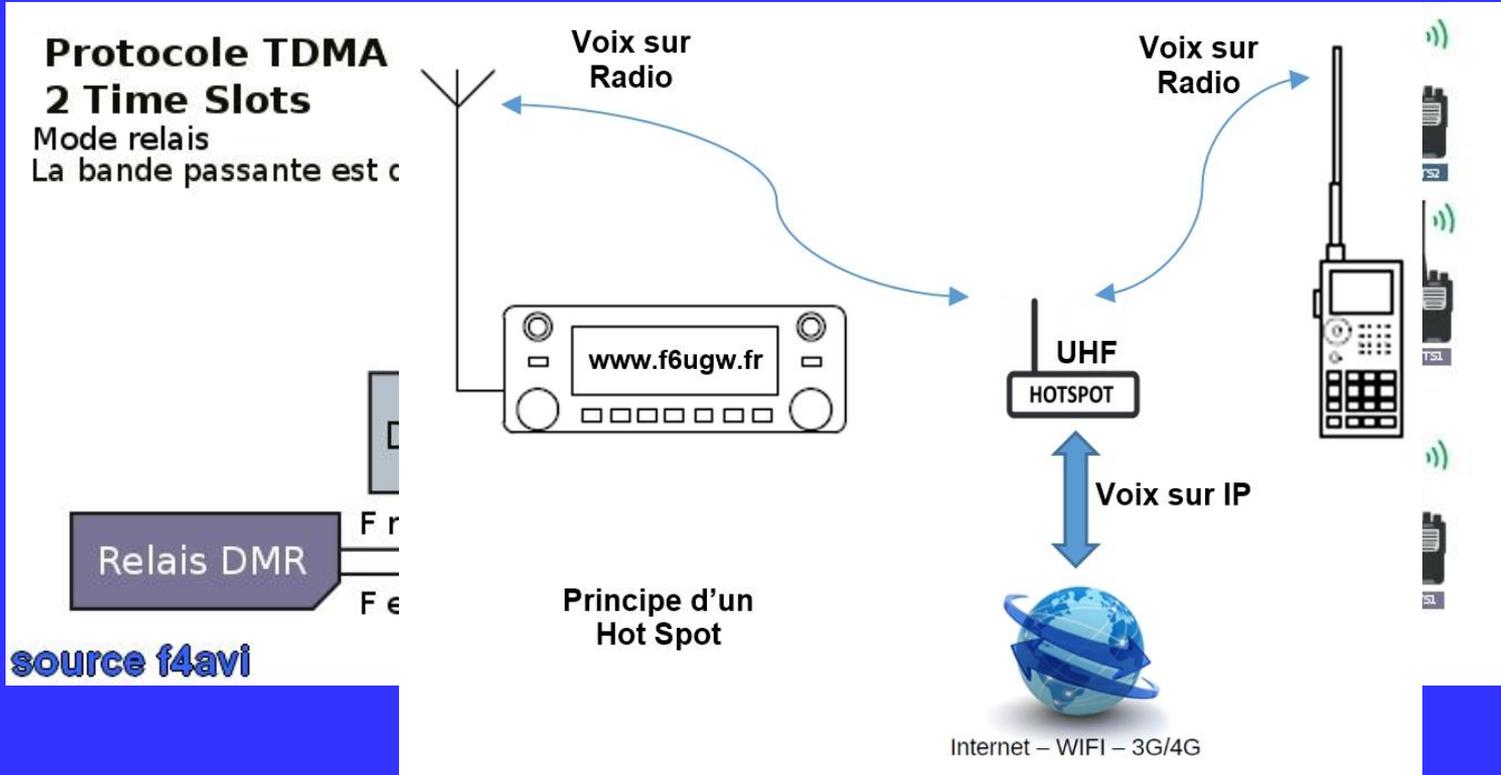
Affichage sur carte

+ météo, messages...



Le Raspberry Pi et les OM

MMDVM Multimode Digital Voice Modem



Le Raspberry Pi et les OM

MMDVM Multimode Digital Voice Modem

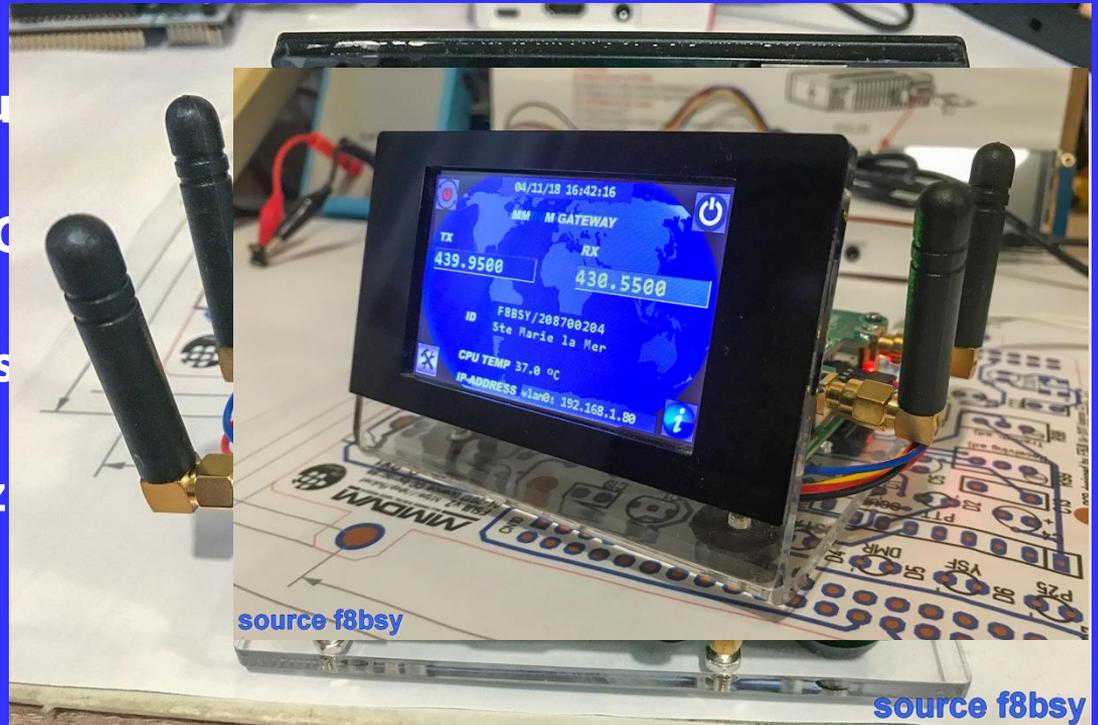
Point d'accès numérique multi

D-Star, DMR, C4FM, P25, POC

Version DUPLEX = mini relais

RX et TX de 60MHz à 650MHz

Compatible avec Pi-Star



Le Raspberry Pi et les OM

MMDVM

Hotspot Pi Zero | DMR D-Star C4FM POCSAG

Point d'accès numérique multimode

D-Star, DMR, C4FM, P25, POCSAG

RX et TX 144MHz ou 432MHz

Compatible avec Pi-Star



Le Raspberry Pi et les Programmer un Rx-Tx

Chirp

Gratuit – Open Source

Nombreuses marques
et modèles

CHIRP

File Edit View Radio Help

Baofeng UV-5R: Baofeng_UV-5R_CTCSS_TSQ_CHIRP.img

Memories Memory Range: 0 - 127 Refresh Special Channels Show Empty Properties

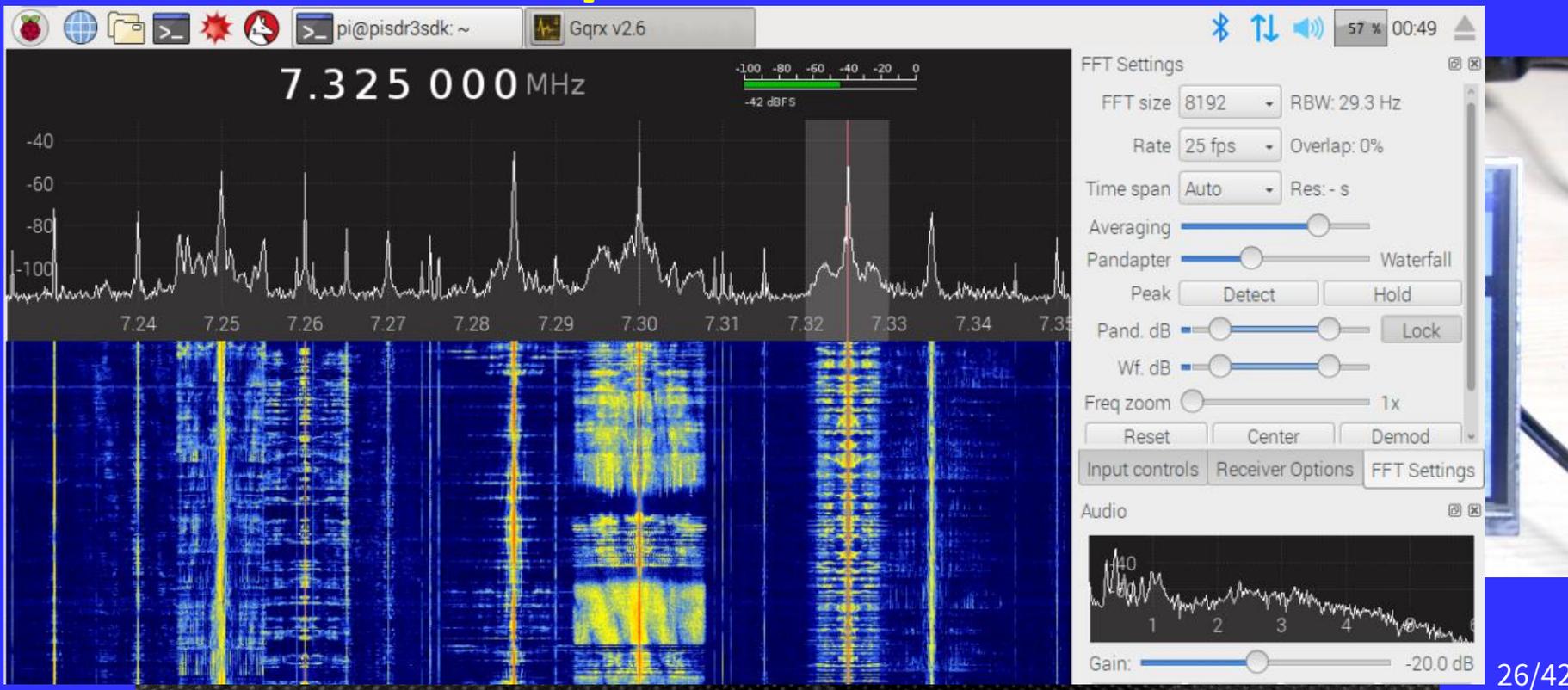
Settings	Loc	Frequency	Name	Tone Mode	Tone	ToneSql	DTCS Code	DTCS Rx Code	Dup
	9	0.000000		(None)					No
	10	446.006250	PMR 1	(None)					No
	11	446.006250	PMR 1-1	TSQ	67.0				No
	12	446.006250	PMR 1-2	TSQ	71.9				No
	13	446.006250	PMR 1-3	TSQ	74.4				No
	14	446.006250	PMR 1-4	TSQ	77.0				No
	15	446.006250	PMR 1-5	TSQ	79.7				No
	16	446.006250	PMR 1-6	TSQ	82.5				No
	17	446.006250	PMR 1-7	TSQ	85.4				No
	18	446.006250	PMR 1-8	TSQ	88.5				No
	19	446.006250	PMR 1-9	TSQ	91.5				No
	20	446.018750	PMR 2	(None)					No
	21	446.018750	PMR 2-1	TSQ	67.0				No

[0] Completed Getting memory 127 (idle)

Text Editor

Le Raspberry Pi et les OM

Recevoir des fréquences



Le Raspberry Pi et les OM

Recevoir des fréquences

Plus loin avec
SDRPlay RSP2 PRO

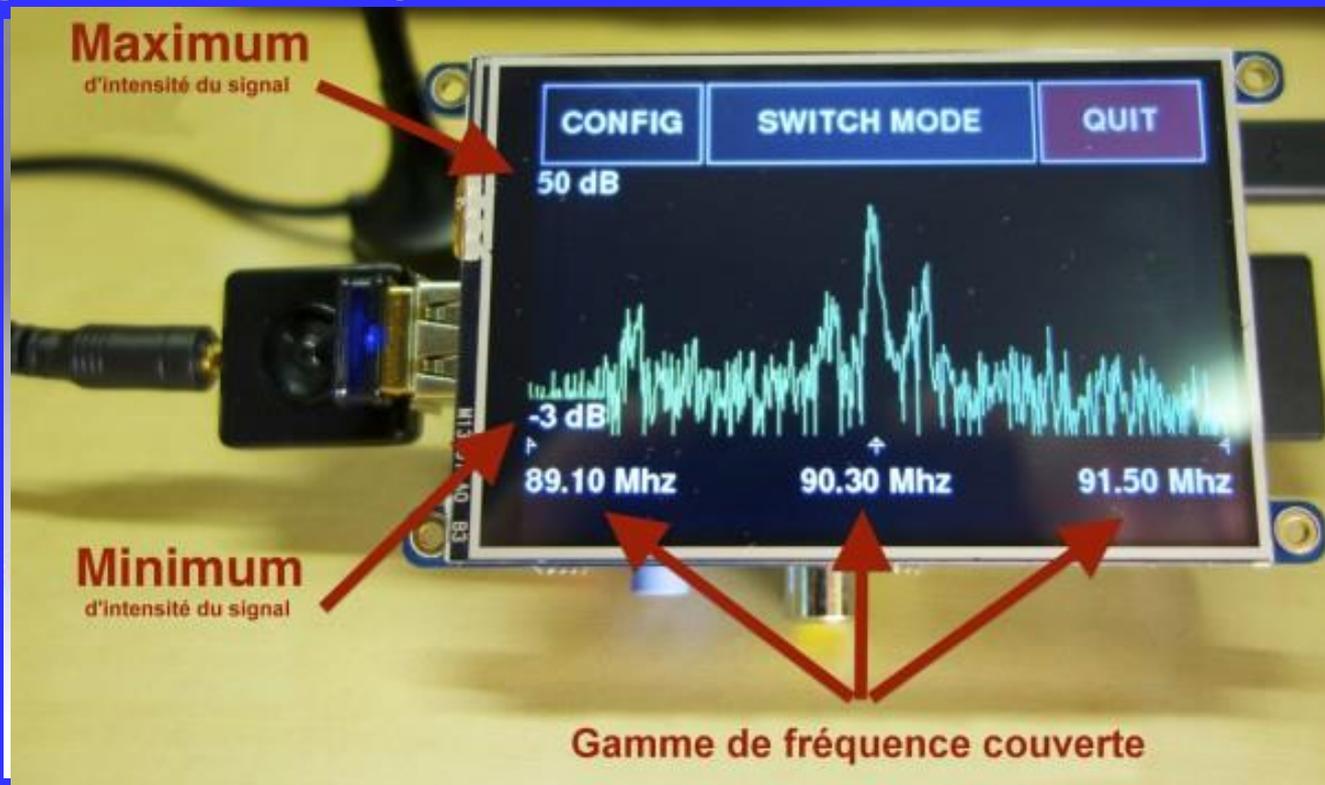
- 1kHz à 2 GHz
- Entrée 0-30MHz
- TCXO 0.5PPM
- préampli LNA

Remote SDR



Le Raspberry Pi et les OM

Analyseur de spectre

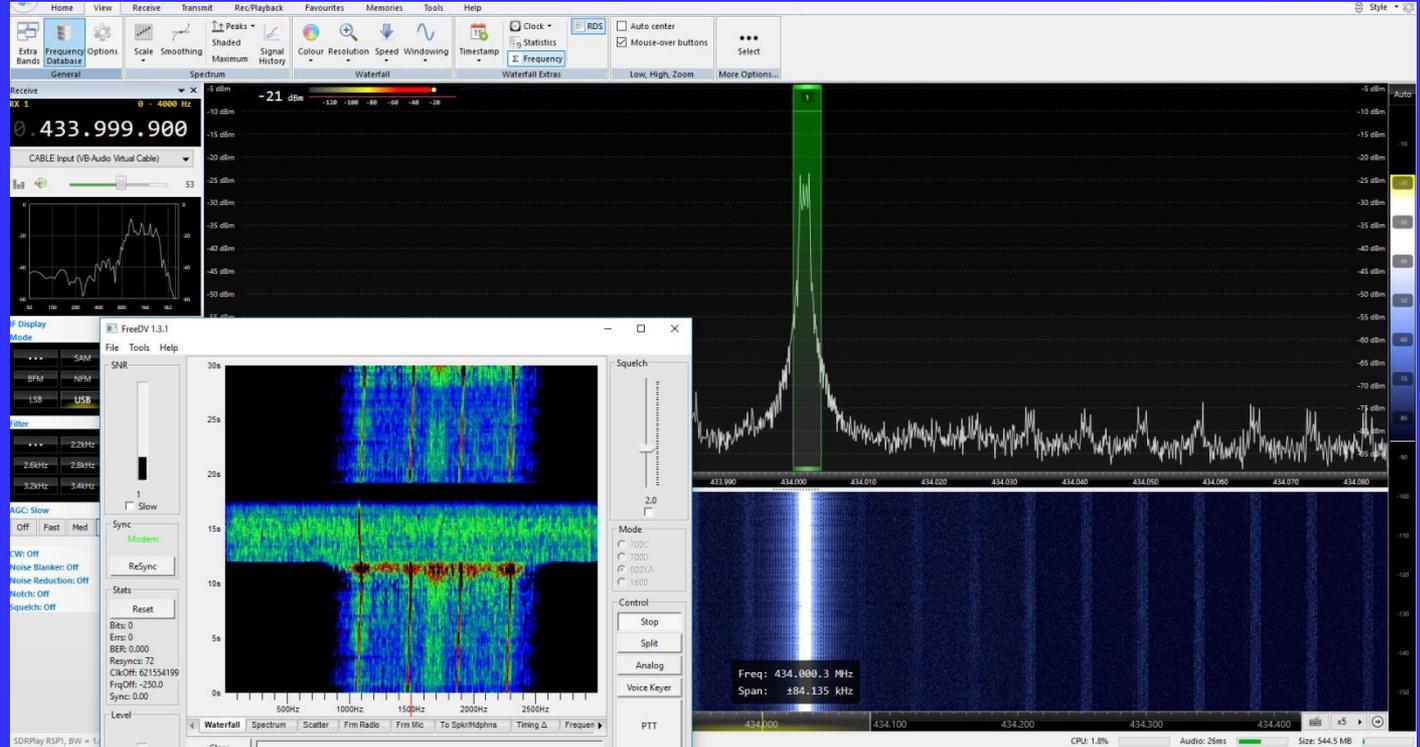


Le Raspberry Pi et les OM

Emetteur avec rpiTx f5oeo

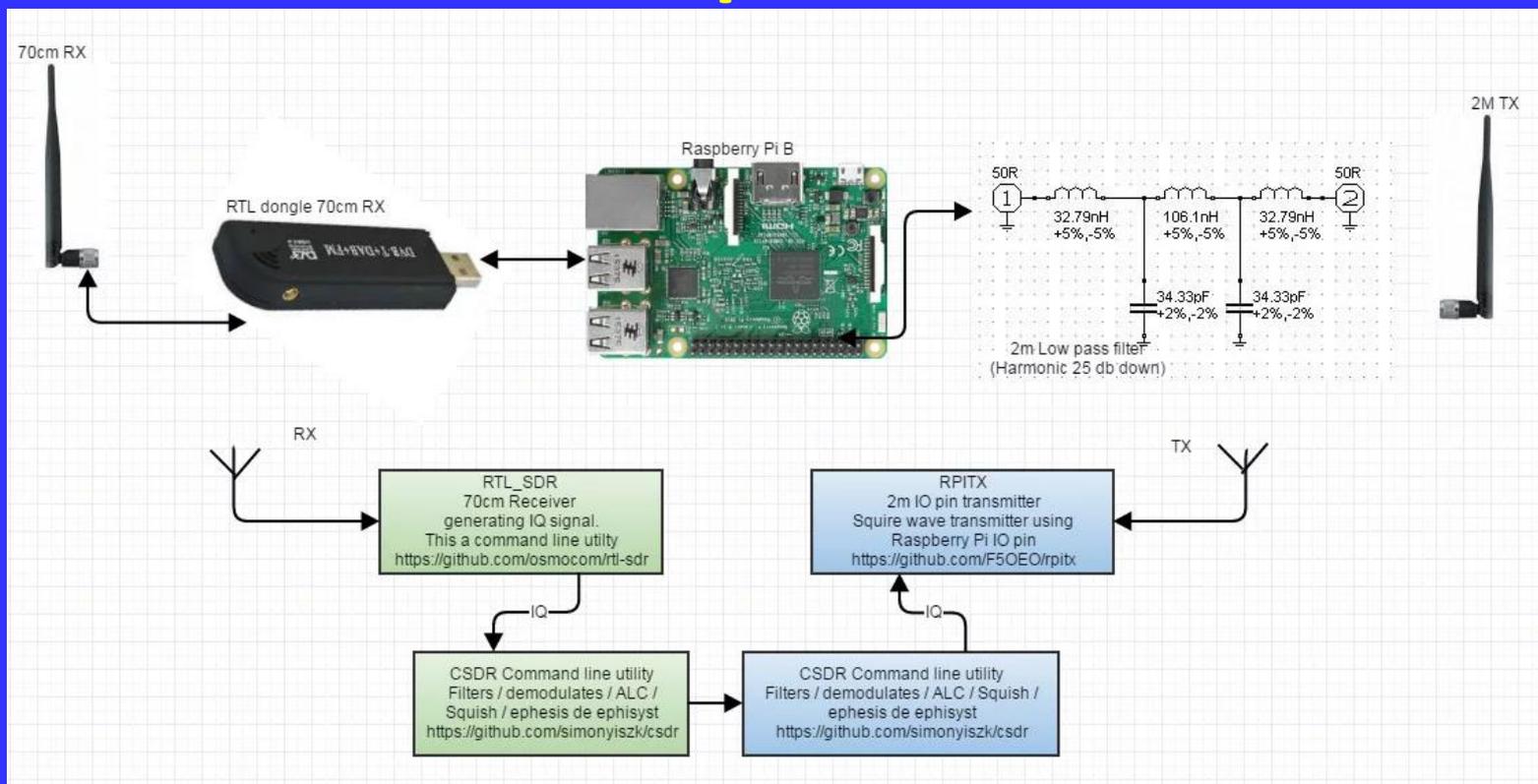
Emission directe
Sur un port GPIO
Du Raspberry Pi

- Porteuse
- FM
- BLU
- POCSAG
- SSTV
- FreeDV
- ...



Le Raspberry Pi et les OM

Un mini relais avec rpiTx



Le Raspberry Pi et les OM

Une balise WSPR Weak Signal Propagation Reporter *hb9fgk*

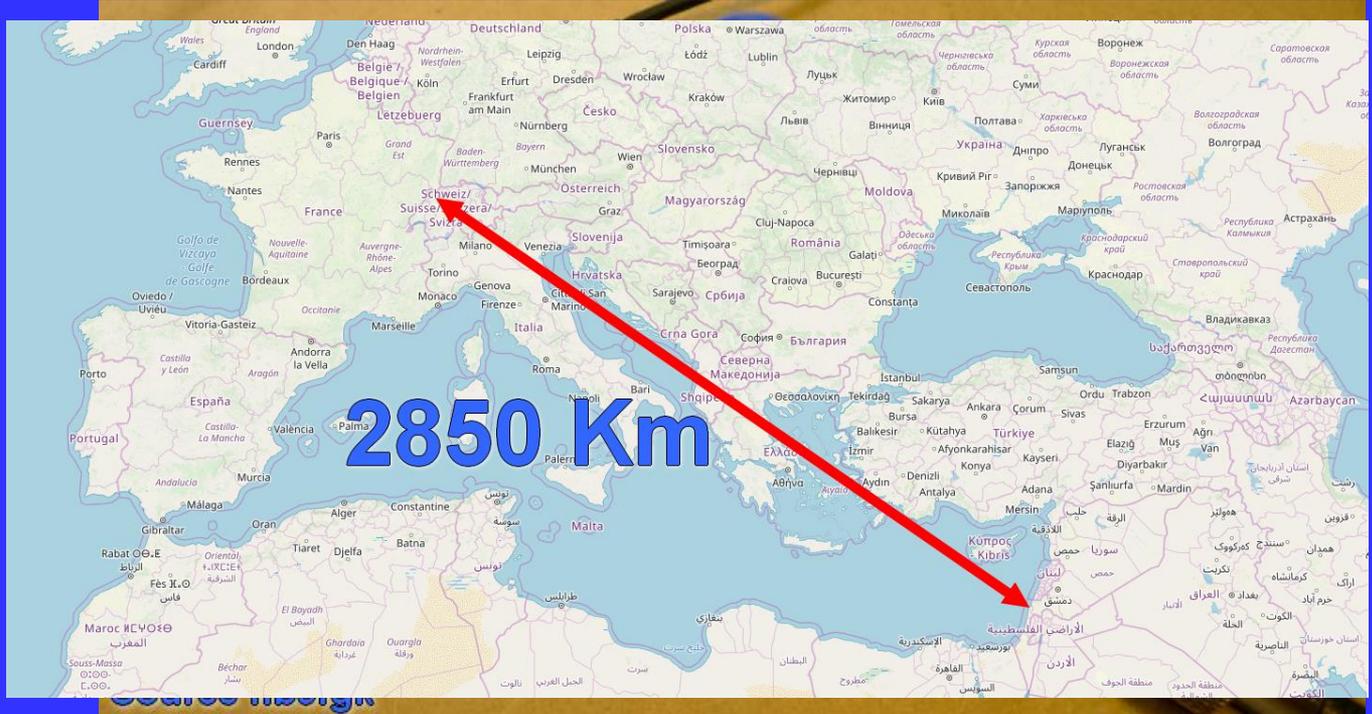
Sur un port GPIO
Du Raspberry Pi

Filtre de bande

30m – 10,14 MHz

10 dBm – 10 mW

2850 Km

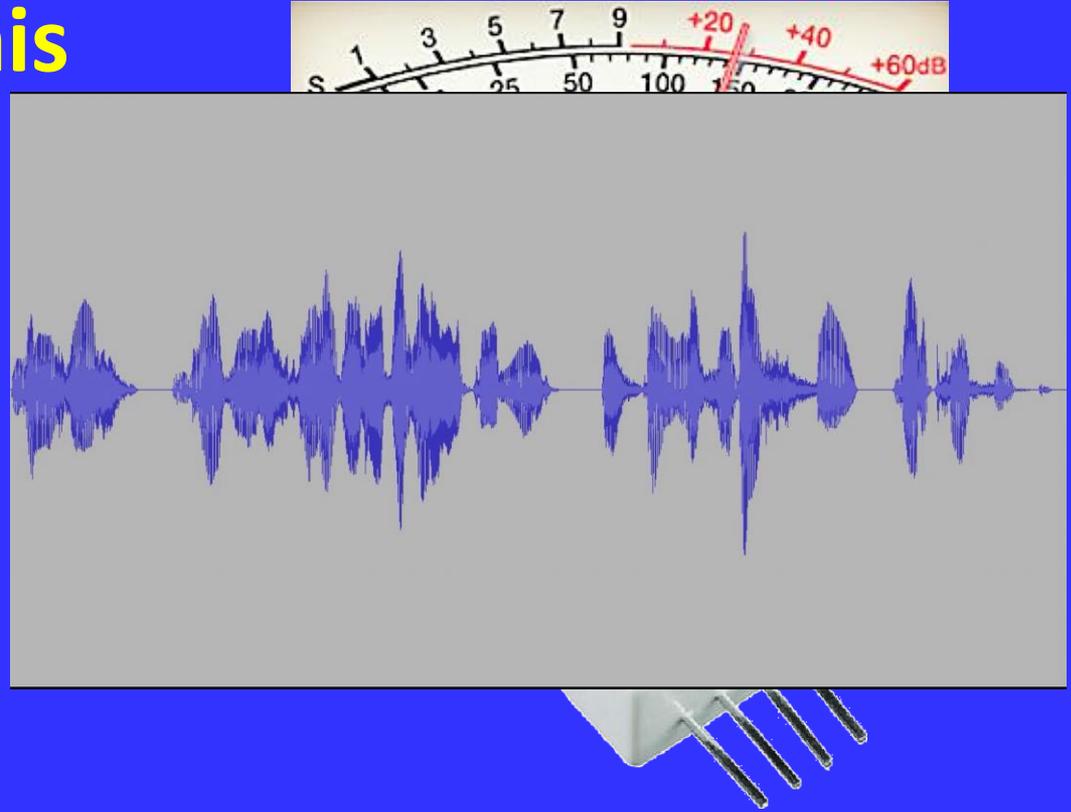


Le Raspberry Pi et les OM

Faire parler un relais

Synthèse vocale

- **Accueil / Indicatif**
- **Valeur Smètre**
- **Température**
- **Humidité**
- **Pression**
- ...

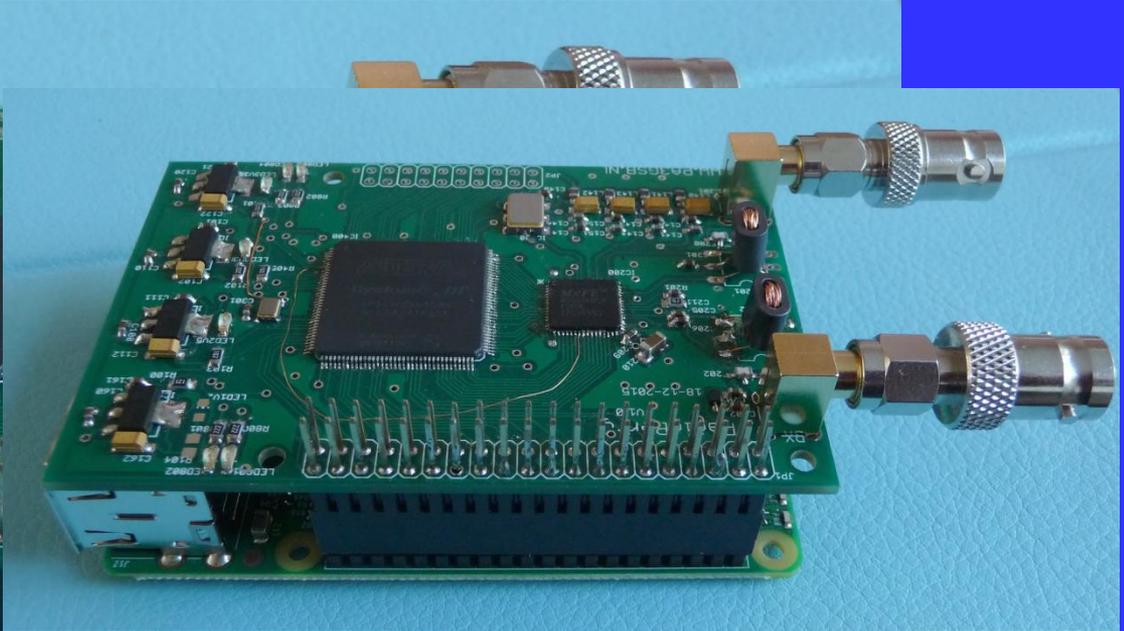


Le Raspberry Pi et les OM

RadioBerry de *pa3gsb*

Emetteur/Recepteur

- Analog Devices AD9866 modem 12-bit large bande
- Couvre de 0 à 30 MHz
- Utilise un FPGA Intel Cyclone firmware chargé via le Pi



Le Raspberry Pi et les OM

RadioBerry de *pa3gsb*

The screenshot displays the PowerSDR™ OpenHPSDR mRX PS v3.3.6 (11/16/15) interface. The main window features a world map with a frequency grid. The VFO A is set to 3,630,000 Hz (75M Extra SSB) and VFO B is set to 7,000,000 Hz (40M Extra CW). The RX1 Meter shows a signal strength of -86 dBm. The interface includes various control panels for power, tuning, and reception, as well as a transmit section with a microphone and various filters. The bottom right corner shows a frequency display of 4303.3Hz and -95.6dBm, and a transmit profile of Default.

PowerSDR™ OpenHPSDR mRX PS v3.3.6 (11/16/15)

Setup Memory Wave Equalizer XVTRs CWX Diversity Collapse Linearity RA

POWER RX2

MON TUN
MOX TX
DUP
REC PLAY

Master AF: 59
RX1 AF: 61
RX2 AF: 0
AGC Gain: 94
Drive: 50
AGC S-ATT

Slow 0

SQL: -150

16-3-2016
LOC 17:21:17
CPU% 10

VFO A: 3,630 000
75M Extra SSB TX
VFO Sync Tune Step: -25Hz
VFO Lock 3,633000 Save Restore

VFO B: 7,000 000
TX 40M Extra CW

RX1 Meter TX Meter
Signal Fwd Pwr
-86 dBm

1 3 5 9 +20 +40 +60

160 80 60
40 30 20
17 15 12
10 6 LFMF
VHF+ WwV GEN

LSB USB DSB
CWL CWU FM
AM SAM SPEC
DIGL DIGU DRM

5.0k 4.4k 3.8k
3.3k 2.9k 2.7k
2.4k 2.1k 1.8k
1.0k Var 1 Var 2

Width: |
Shift: | Reset
Low -2850 High 150

Center Zoom: 0.5x 1x 2x 4x

4303.3Hz -95.6dBm 3,634 303 MHz

Pan: |

SPLIT A > B
0 Beat A < B
IF->V A <> B
XIT 0 RIT 0
-20 -10
VAC1 VAC2

NR ANF
NB SNB
MUT BIN
MNF

Panadapter
AVG Peak
CTUN

MIC 6 dB
COMP 1 dB
VOX 100
DEXP -40

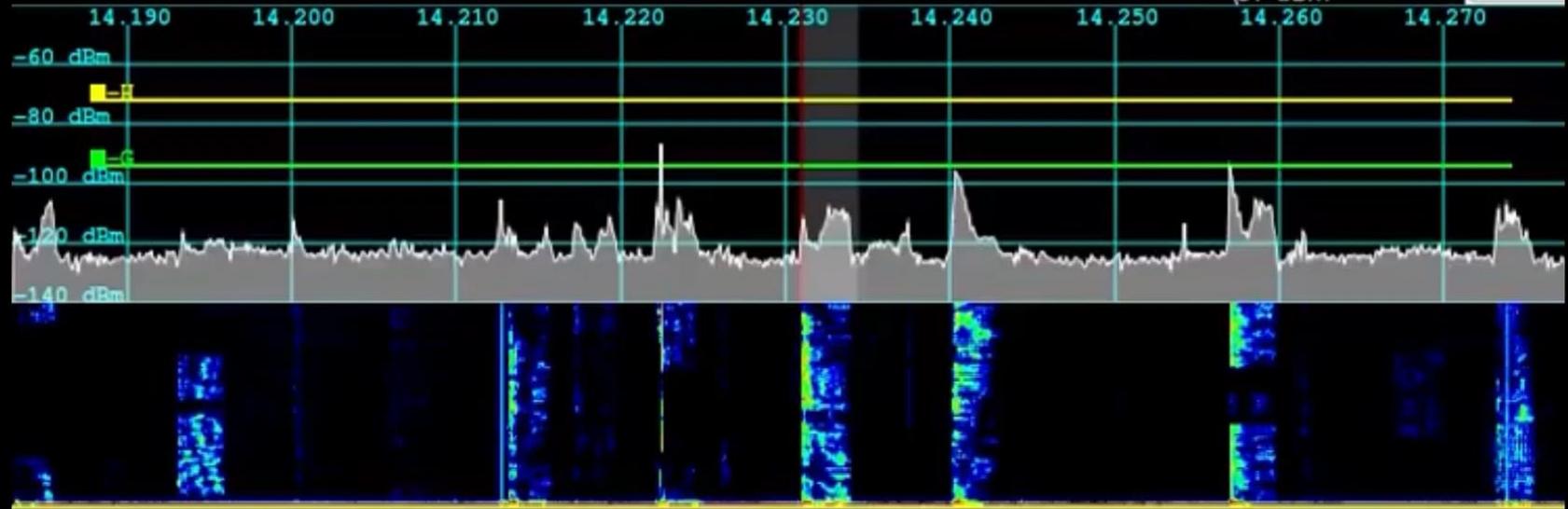
Transmit Profile: Default
RX EQ TX EQ
TX FL

Vol Pan Vol
MultiRX
Swap

USB 3.3k RIT: 0 Hz Step 1kHz CTUN CAT VOX
VFO A: 14.231000 VFO B: 14.010000
Locked Split NB NB2 NR NR2 ANF SNB AGC SLOW



Hide
Menu



AF: AGC: RX-GAIN:
Mic (dB): Drive: Squelch:
Mox Band BStack Mode Filter Noise AGC Function

Le Raspberry Pi Pour l'IoT



Sigfox



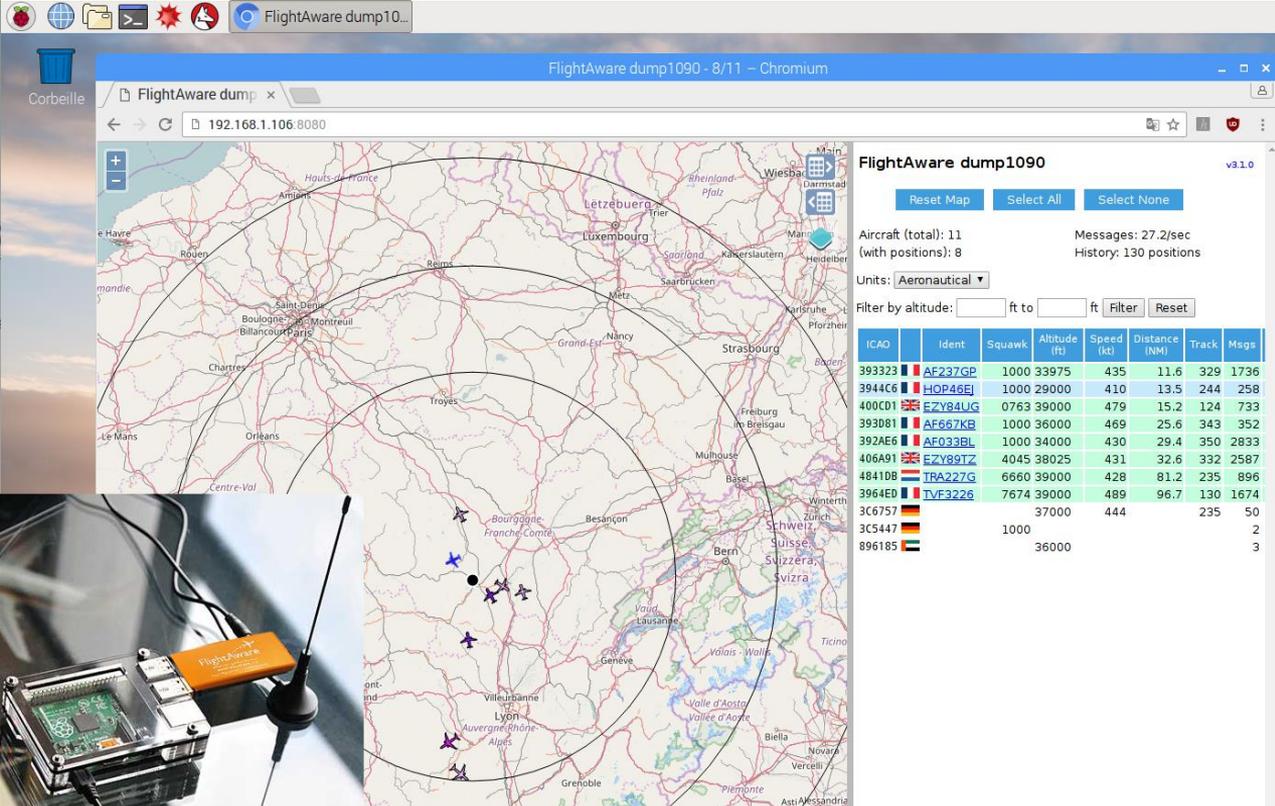
Lora

LoraWan



Le Raspberry Pi et les OM

Localiser les avions



FlightAware dump1090 - 8/11 - Chromium

192.168.1.106:8080

FlightAware dump1090 v3.1.0

Reset Map Select All Select None

Aircraft (total): 11
(with positions): 8

Messages: 27.2/sec
History: 130 positions

Units: Aeronautical

Filter by altitude: ft to ft Filter Reset

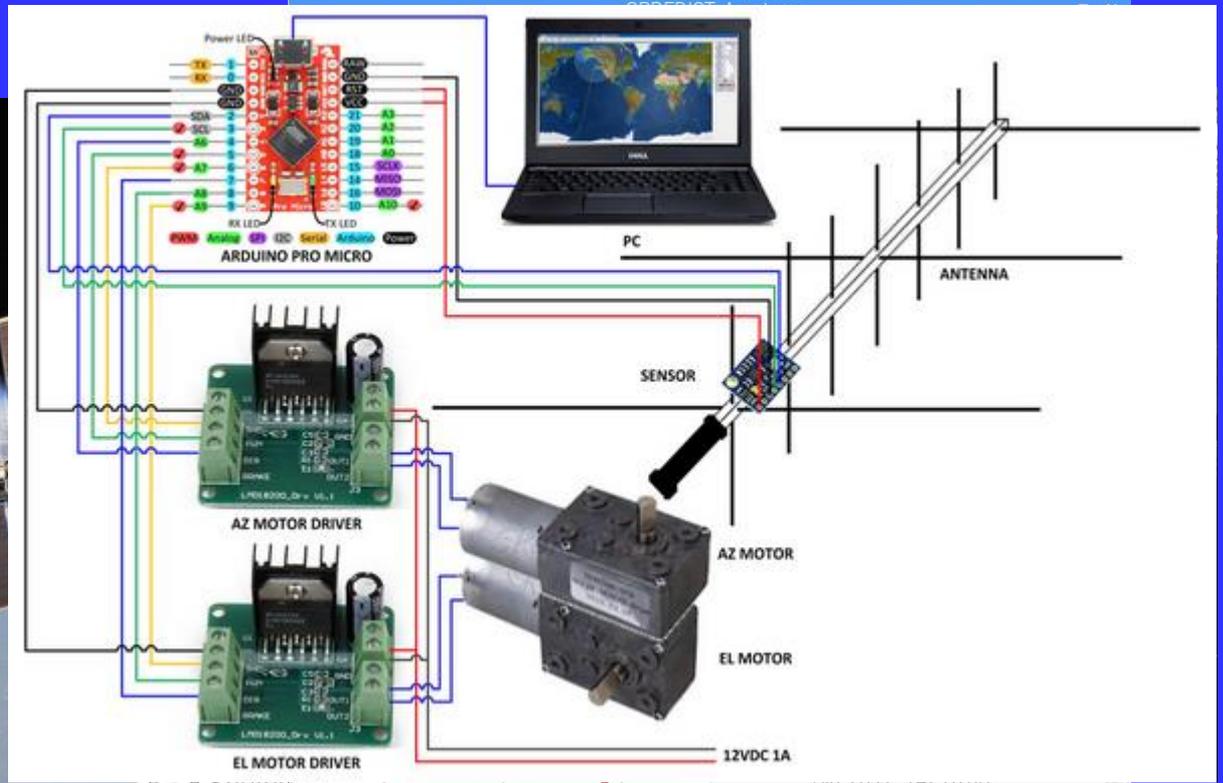
ICAO	Ident	Squawk	Altitude (ft)	Speed (kt)	Distance (NM)	Track	Msgs
393323	AF237GP	1000	33975	435	11.6	329	1736
3944C6	HOP46E	1000	29000	410	13.5	244	258
400CD1	EZY84UG	0763	39000	479	15.2	124	733
393D81	AF667KB	1000	36000	469	25.6	343	352
392AE6	AF033BL	1000	34000	430	29.4	350	2833
406A91	EZY89TZ	4045	38025	431	32.6	332	2587
484108	TRA227G	6660	39000	428	81.2	235	896
3964E0	TVF3226	7674	39000	489	96.7	130	1674
3C6757			37000	444		235	50
3C5447			1000				2
896185			36000				3



Le Raspberry Pi et les OM

Localiser l'ISS

Installer gPredict
Satellites OM
Prévisions ISS
Positionner les
antennes

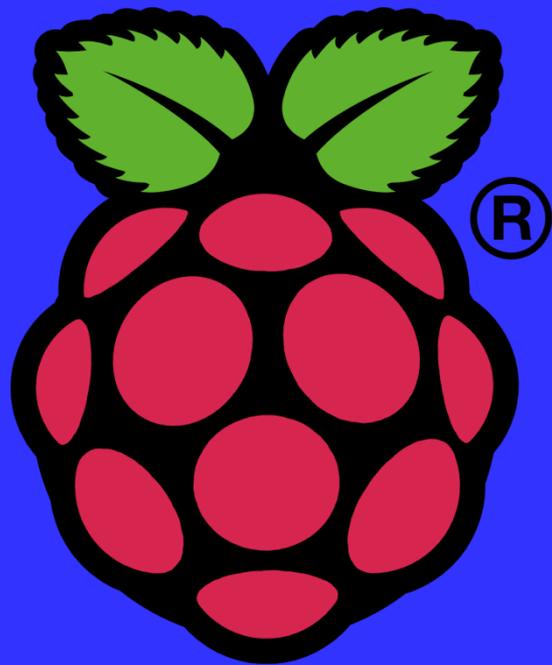


Deux Raspberry Pi dans l'ISS



Voilà...

**Je pense que je vous ai tout dit
Enfin... Non !**

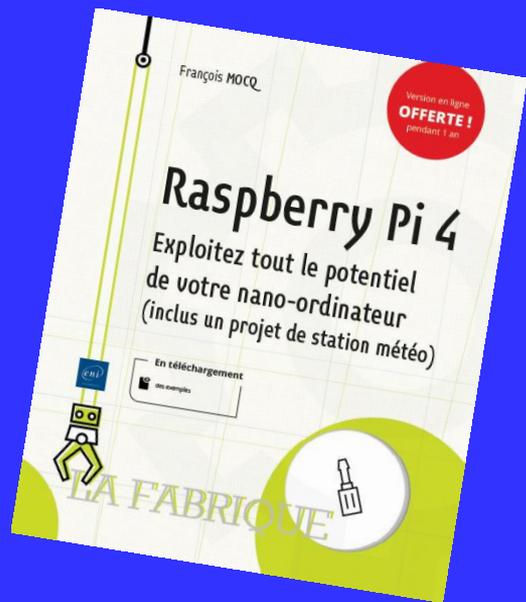
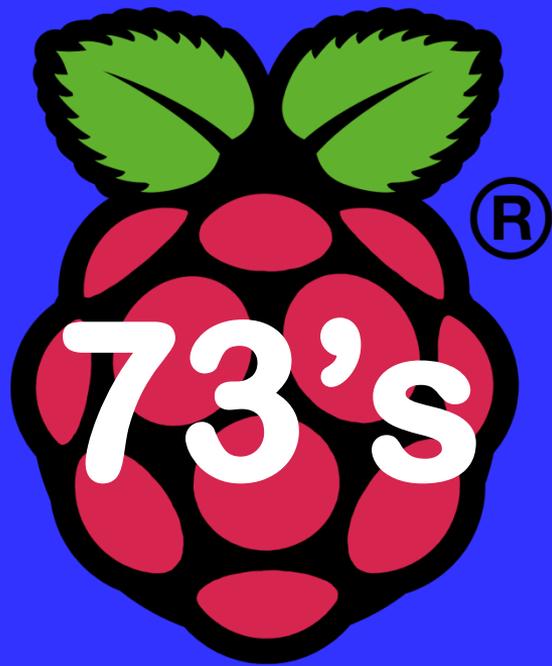


®

Il y a une limite
à l'utilisation
du
Raspberry Pi !

VOTRE
IMAGINATION





Merci de votre
attention



à bientôt sur
www.framboise314.fr