

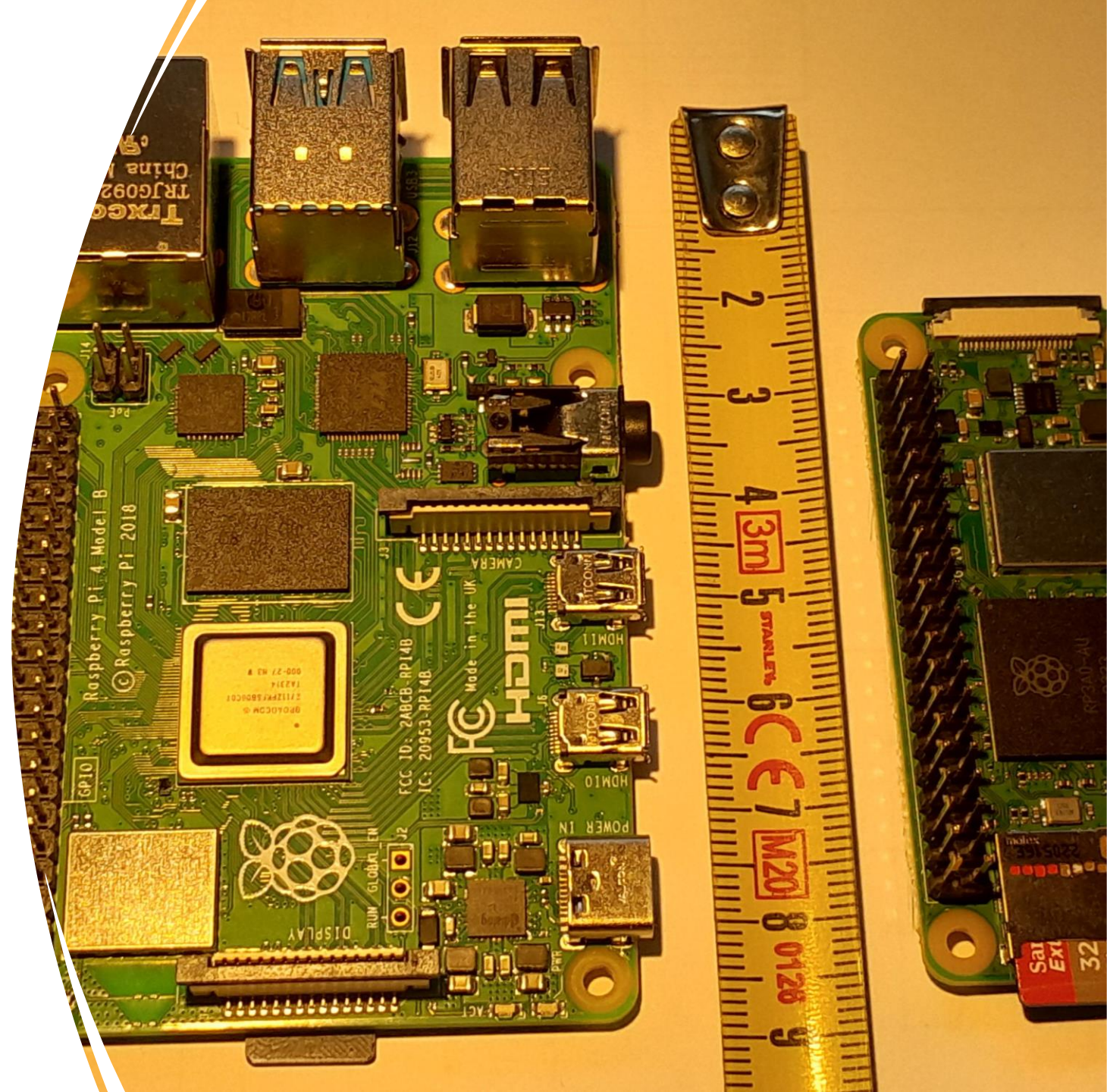
Radio med RPI

Låt en Raspberry PI styra din radiotillämpning

Tilman D. Thulesius – SM0JZT

SSA – QTC 20+ år
<http://radio.thulesius.se>

ver Apr 25 2024





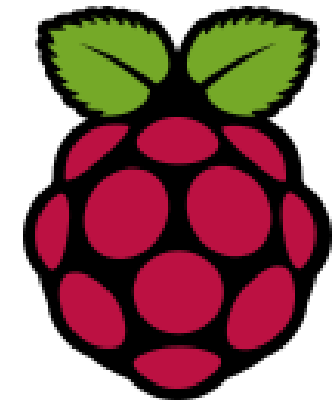
Nyare teknik kompletterar gammal

Technical Advances That Have Killed Amateur Radio by Making It Too Easy

1. Amplitude Modulation (AM): 1900
2. Semi-automatic CW Keys (Bugs): 1902
3. Vacuum Tubes: 1906
4. Single Sideband (SSB): 1915
5. Radio Teletype (RTTY): 1922
6. Repeaters: 1935
7. Electronic CW Keyers: 1945
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9. Electronic digital programmable computers: 1948
10. Antenna Rotators: 1950
11. Integrated Circuits: 1958
12. Digital Signal Processing: 1960
13. Microprocessors: 1971
14. the Internet: 1972
15. CW Decoding Software: 1975
16. Automatic Link Establishment (ALE): 1978
17. Packet Radio: 1980
18. DX Clusters: 1989
19. Pactor: 1991
20. PSK: 1998
21. FT8: 2017
22. Raspberry Pi 2012...

RASPBERRY PI

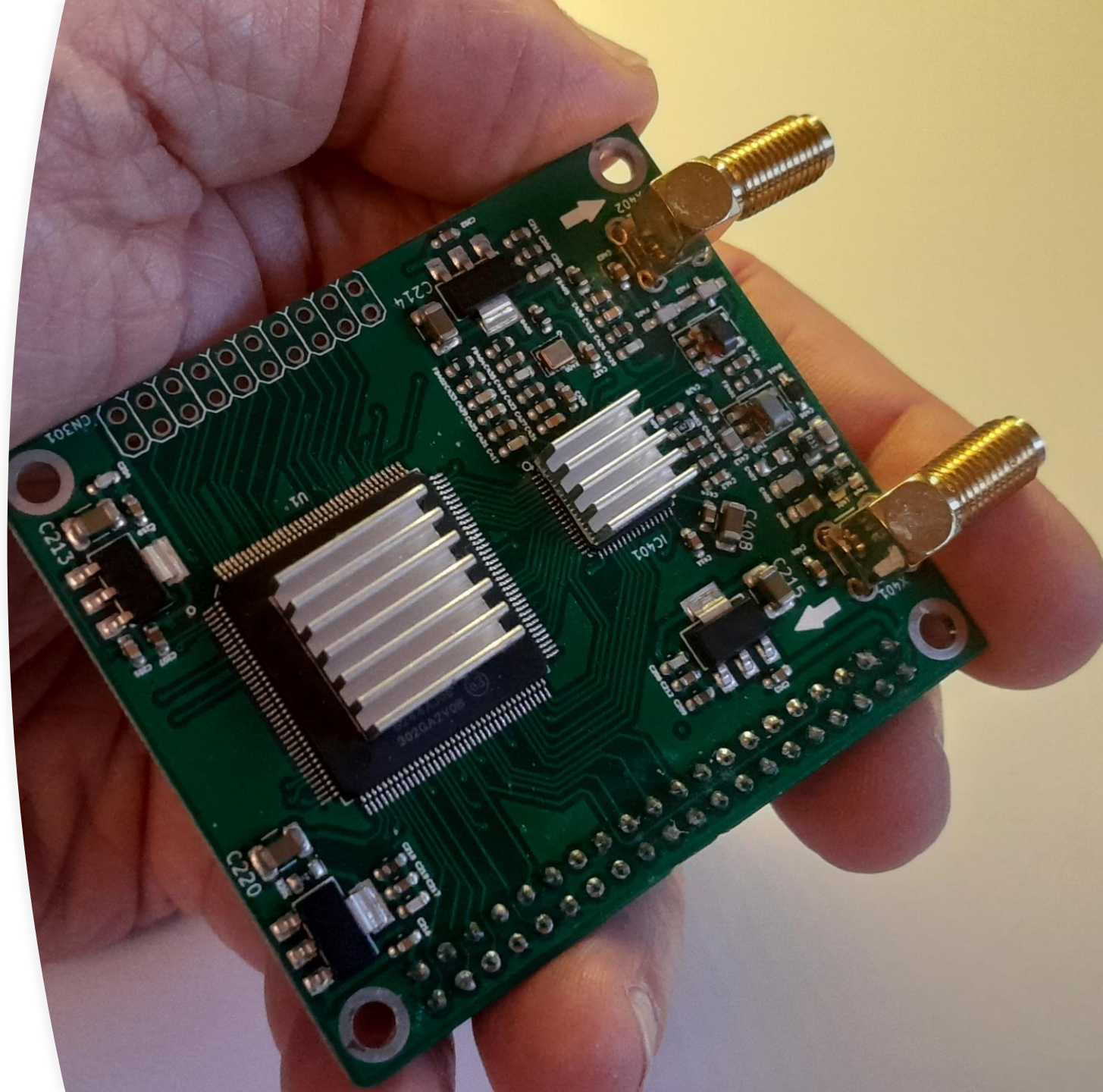
- Made in the UK
- 2012
- Eben Upton
- Datorvetenskap i skolan
- Raspberry Pi Foundation
- Broadcom
- HDMI, USB, Ethernet, SD-card, WiFi
- RPI 1, 2, 3, 4, 5
- 32 – 64 bitar 2.4 GHz QUAD Core
- LINUX



Radioberry



- QTC Feb 2024
- PA3GSB Johan
- AD9866 12 modemchip
- Cyclone FPGA
- Hjälp!!
 - <https://www.pa3gsb.nl>
 - <https://github.com/pa3gsb/RadioBerry>
 - <https://groups.google.com/g/radioberry>



- Hat finns på AMAZON

- Analog Devices AD9866 & 10CL025

- Kompletterande komponenter

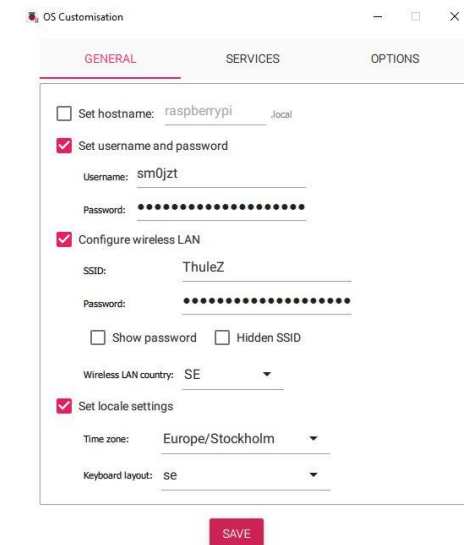
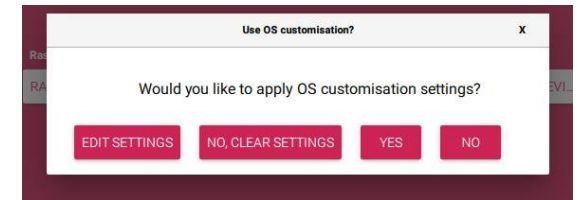
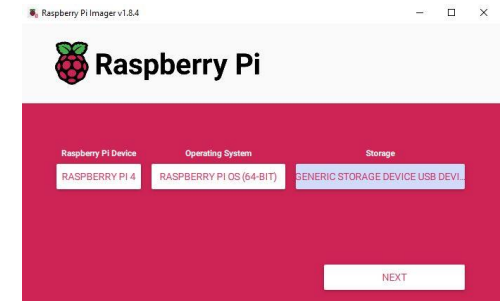
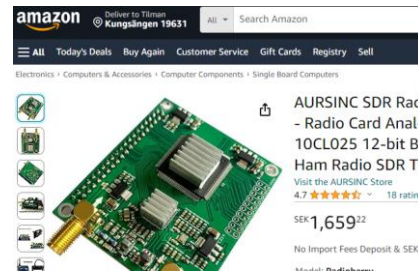
- LPI, BPF, 10W PA
 - QRP-labs
- PA3GSB preamp

- Bygga SD-kort....

- Raspberry PI Imager
 - RaspOS
- Starta RPI
 - Hitta IP
- Logga in med ssh med Putty
- github.com/pa3gsb/Radioberry-2.x
 - Följ "Building"

- Operatörspanel/programvara i PC

- Thetis
- SDRConsole (Hermes-light)



VFO A

7.200 000

40M SSB TX

VFO Sync Tune Step: - 500Hz +

VFO Lock: A B 7.000000 Band Stack 4 5

Rx Ant Save Restore < V >

VFO B

14.144 000

TX 20M CW

RX1 Meter TX Meter

-101 dBm

MON TUN

MOX 2TON

DUP PS-A

● ▶

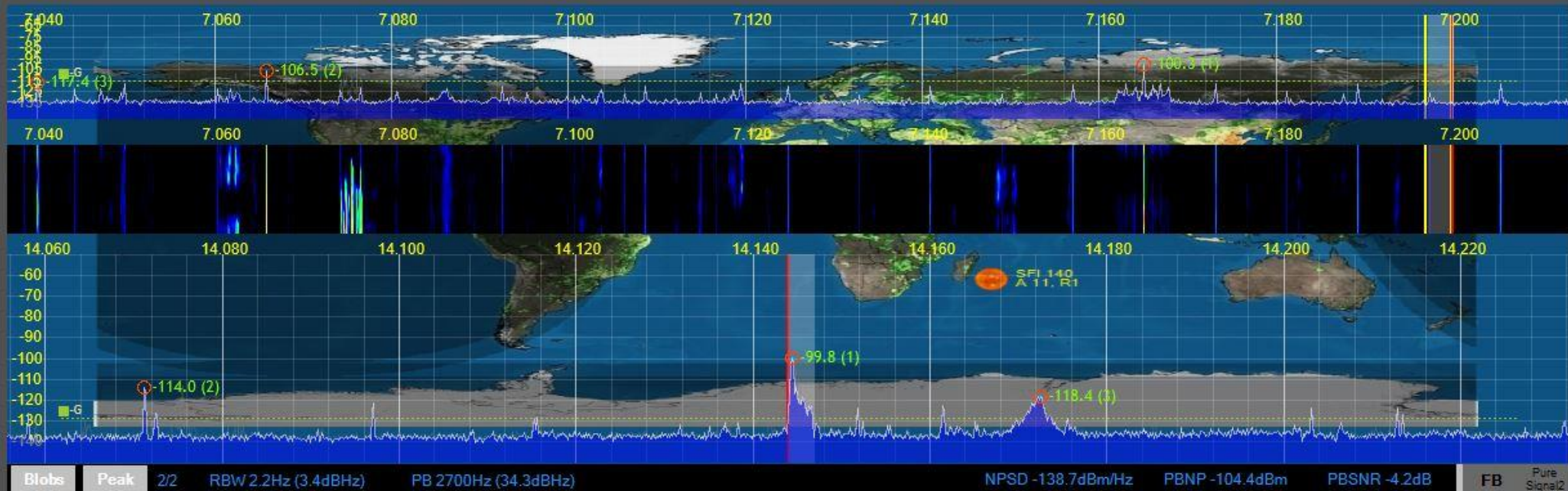
Master AF: 100

RX1 AF: 92

RX2 AF: 20

AGC Gain: 71

Drive: 100



Signal Fwd Pwr

160 80 60

40 30 20

17 15 12

10 6 LFMF

VHF+ WWV SWL

LSB USB DSB

CWL CWU FM

AM SAM SPEC

DIGL DIGU DRM

AGC ATT

Med 0dB

SQL: -106

SPLT A > B

0 Beat A < B

IF->V A <> B

RIT 0 XIT 0

NR ANF Panafall

NB SNB AVG Peak

MUT BIN CTUN

MNF +MNF

MIC 25 dB Transmit Profile

COMP 2 dB Default DX

VOX -40 Low High

DEXP 200 3100

5.0k 4.4k 3.8k

3.3k 2.9k 2.7k

2.4k 2.1k 1.8k

1.0k Var 1 Var 2

Thetis - github.com/ramdor/Thetis

VFO B Band

20m

ATT

0dB

AGC Gain: 85

SQL: 0

NR ANF Panadarter

NB SNB AVG Peak

MUT BIN CTUN

AGC: Med

LSB USB DSB

5.0k 4.4k 3.8k

3.3k 2.9k 2.7k

2.4k Var 1 Var 2

Low 100 High 3000

RX2 Meter

-79 dBm

Openwbrx+

Experimentplattform för
multipla SDR-mottagaren

QTC Mar 2024

- RPI 4
- SDRPlay
- RTL-SDR
- AirSpy
- ++





41m Broadcast

FAX

FSK

STANAG

database: stored

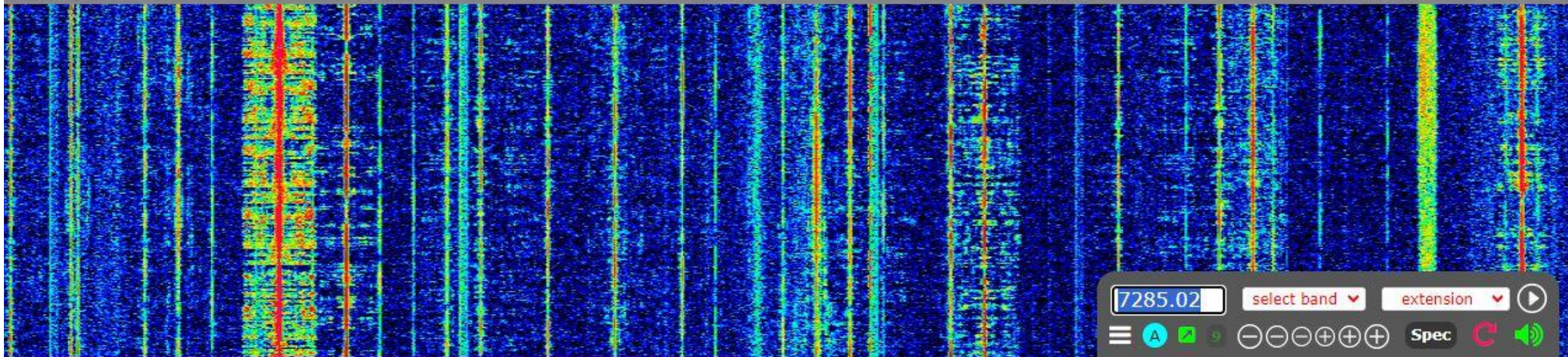
7.25 MHz

7.30 MHz

7.35 MHz

7.40 MHz

7.45 MHz



Welcome!

Project website: kiwisdr.com Here are some tips:

- Windows: Firefox, Chrome & Edge work; IE does not work.
- Mac & Linux: Safari, Firefox, Chrome & Opera should work fine.
- Open and close the panels by using the circled arrows at the top right corner.
- You can click and/or drag almost anywhere on the page to change settings.
- Enter a numeric frequency in the box marked "kHz" at right.
- Or use the "select band" menu to jump to a pre-defined band.
- Use the zoom icons to control the waterfall span.
- Tune by clicking on the waterfall, spectrum or the cyan/red-colored station labels.
- Control-shift or alt-shift click in the waterfall to lookup frequency in online databases.
- Control or alt click to page spectrum down and up in frequency.
- Adjust the "WF min" slider for best waterfall colors or use the "Auto Scale" button.
- Type 'h' or '?' to see the list of keyboard shortcuts.

7285.02 select band extension

AM SAM DRM LSB USB CW NBFM IQ Spec

RF WF7 Audio AGC User Stat Off

RX0 "(no identity)" (Central, Hong Kong)

4182.00 kHz iq z0 0:02:11 0:29:46 act

RX1 "(no identity)" (Haninge, Sweden)

7285.02 kHz sam z7 0:02:09 0:29:46 act

RX2

RX3

Your name or callsign:



JSB S SSTV Rockp... Radio ... HCJE Vari H F Radio R HLL2 -... Chann... V Kazan..

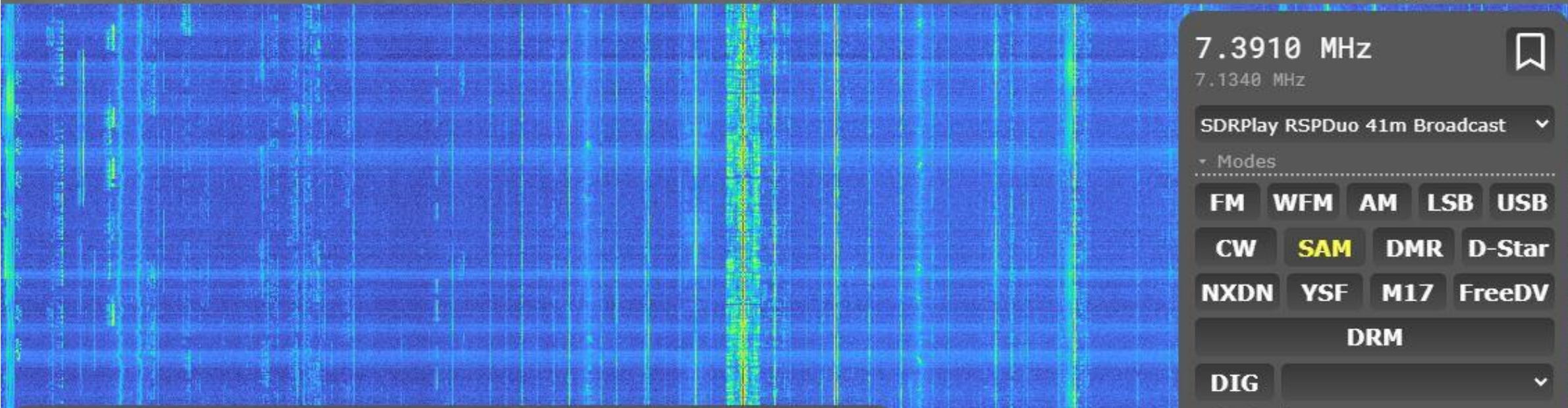
7.1 MHz

7.2 MHz

7.3 MHz

7.4 MHz

7.5 MHz



7.3910 MHz

7.1340 MHz

SDRPlay RSPDuo 41m Broadcast

Modes

DRM

DIG

Controls

1kHz

Settings

Display

13:02 UTC -57.4 dB

OpenWebRX+ message log

Author: [Marat Fayzullin](#) | [OpenWebRX documentation and support](#)

Web Audio API succesfully initialized, using ScriptProcessorNode API, sample rate: 48000 Hz

WebSocket opened to ws://10.4.15.164/ws/

Server acknowledged WebSocket connection, OpenWebRX+ version: v1.2.46

Audio stream is compressed.

FFT stream is compressed.

Name | Message | Send

Audio buffer [0 ms] Audio output [48.2 kbps] Audio stream [49 kbps]

kbps] Server CPU [14%/65°C] Clients [1]

<https://www.openwebrx.de>

Map

Satellite



OpenWebRX



Filter by frequency or band...



SDR device settings

Websnitt för konfig

- Bygg SD-kort
 - Hämta image - <https://luarvique.github.io/ppa>
- ssh – Putty
 - sudo apt update
 - sudo apt upgrade
 - sudo openwebrx admin adduser
 - sudo openwebrx admin listuser
 - sudo openwebrx -h
- Hjälp !!!
 - fms.komkon.org/OWRX
 - groups.io/g/openwebrx
- Registrera RX (receiverbook)
 - www.openwebrx.de
 - Registrera konto
 - “My receivers”
 - Receiver key -> General settings

The screenshot displays the OpenWebRX web interface. At the top, there are three SDR device entries:

- Play RSPDuo**: 7 profile(s), Current profile: 40m, Clients: INACTIVE: 3, USER: 3, Connections: 1
- Play RSPdx**: 11 profile(s), Current profile: 41m Broadcast, Clients: INACTIVE: 3, Connections: 0
- RTL-SDR 1 v4**: 3 profile(s), Current profile: 41m Broadcast, Clients: INACTIVE: 3, Connections: 0

Below the device list, the state of the RTL-SDR 1 v4 device is shown as "State: Stopped".

The "Settings" menu is visible, containing the following options:

- General settings
- SDR devices and profiles
- Bookmark editor
- Modulation and decoding
- Background decoding
- Spotting and reporting
- Report

New device settings

Device name

Device type

Airspy R2 or Mini

Airspy R2 or Mini

Airspy HF+ or Discovery

Blade RF

FunCube Dongle Pro+

FiFi SDR

HackRF

HPSSDR devices (Hermes / Hermes Lite 2 / Red Pitaya)

LimeSDR device

Perseus SDR

PlutoSDR

RadioBerry

RTL-SDR device

RTL-SDR device (via SoapySDR)

RTL-SDR device (via rtl_tcp)

R&S device using EB200 or Ammos protocol

SDRPlay device (RSP1, RSP2, RSPDuo, RSPDx)

Device connected to a SoapyRemote server

Ettus Research USRP device

Settings / SDR device settings /

Apply and save

Summerring.....

- Raspberry PI – en mycket kompetent UNIX/LINUXdator till billig peng.
- Kan användas till bland annat
 - Radioberry (RPI-Hat)
 - SändTagare (Kortvåg)
 - openwebrx+
 - SDR-mottagaren (en eller flera) tillgängliga på nätet
- Välkommen till utställningen för frågor / demo

QTC - radio.thulesius.se

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