

Iniciándose en microondas y DATV con el QO-100

Jaume Planas – EA3NE

Aitor Echeandia – EB2AT



Merca Ham 2019



437 MHz 32 APSK 170 KHz SRI25

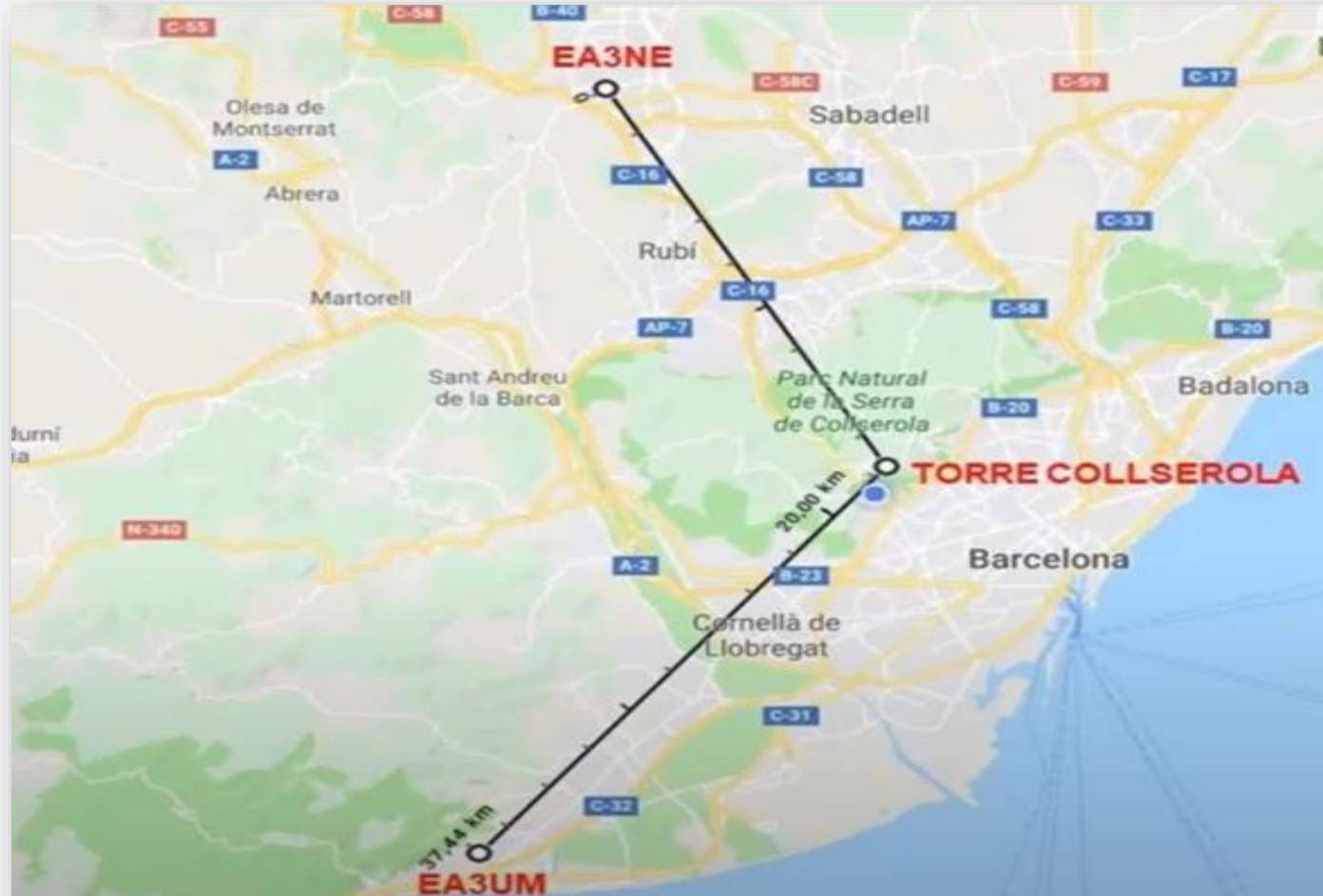


Perfil EA3CNO (Motnjuic) - EA3NE



EA3UM – EA3NE QSO DATV

70 cm SR333 15W Rebote Tibidabo



MI SETUP PARA QO-100 SSB



Parábola



LNB



SDR Rx



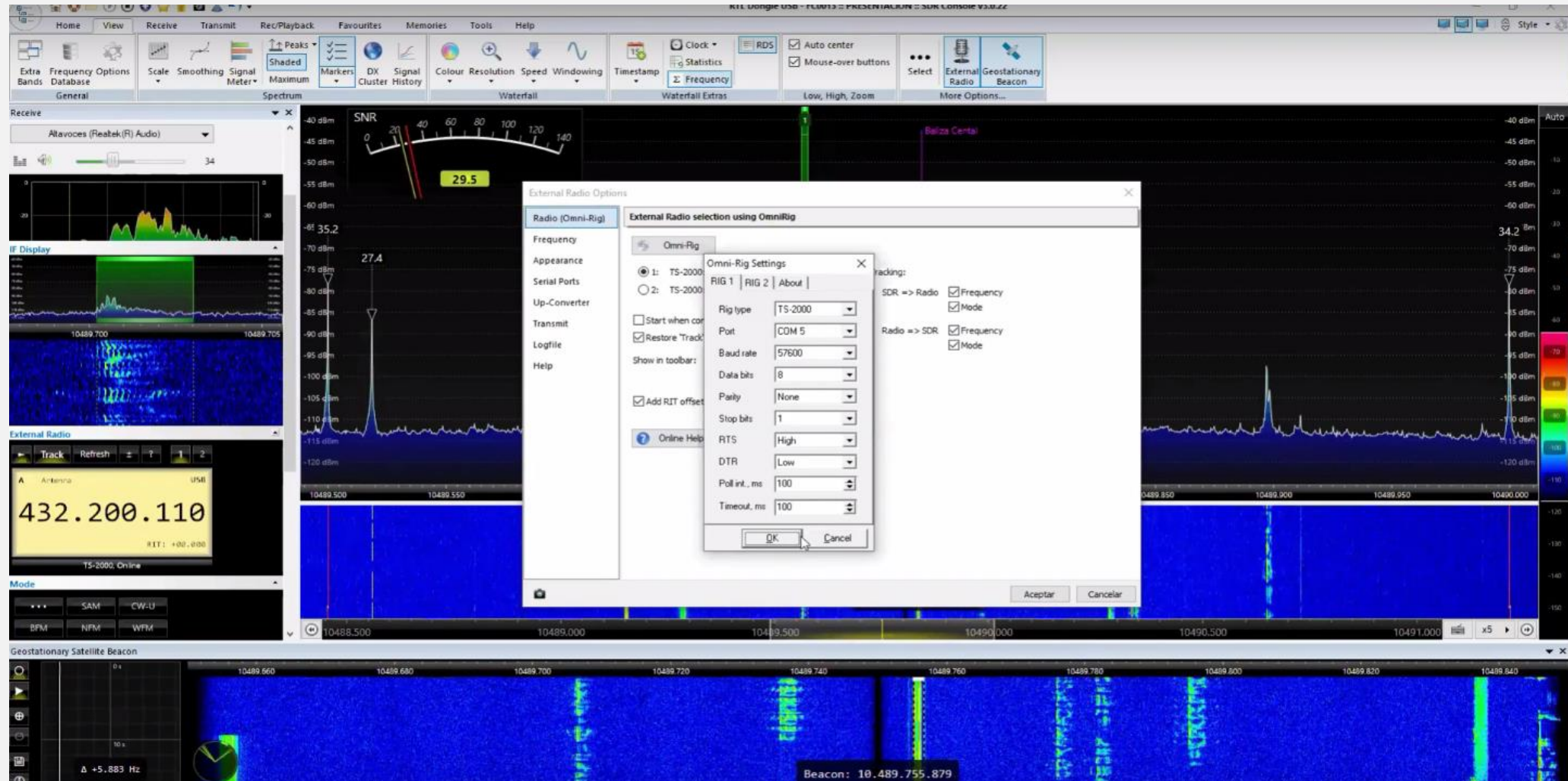
PC



Transverter 432-2400



External Radio y Baliza QO-100



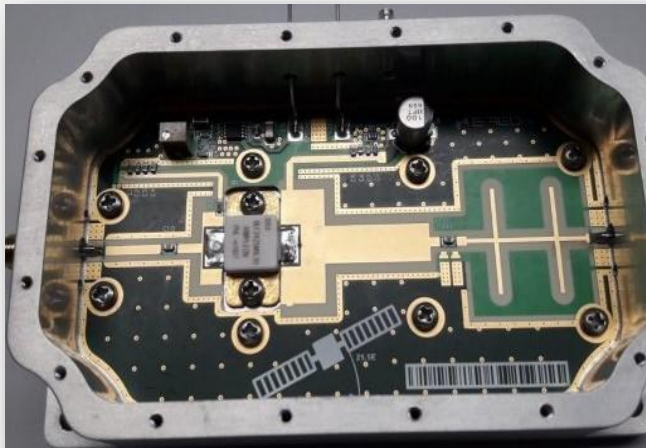
OTRO SETUP PARA QO-100 SSB



Parábola



LNB



POWER AMPLIFIER

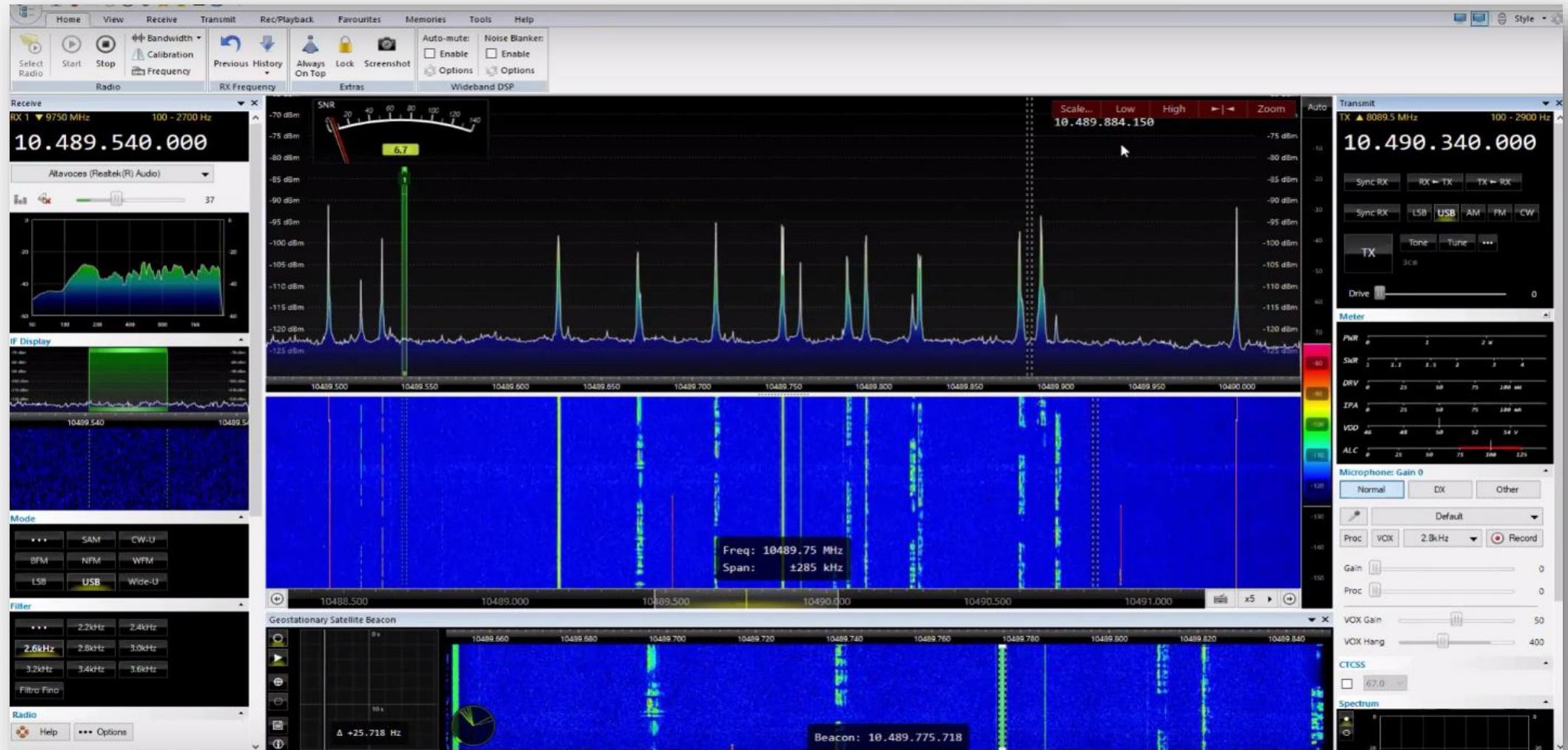


SDR Tx/Rx



PC

SDR y Baliza QO-100



MI SETUP PARA QO-100 SSB



Transverter 432-2400



Parabólica



Hélice

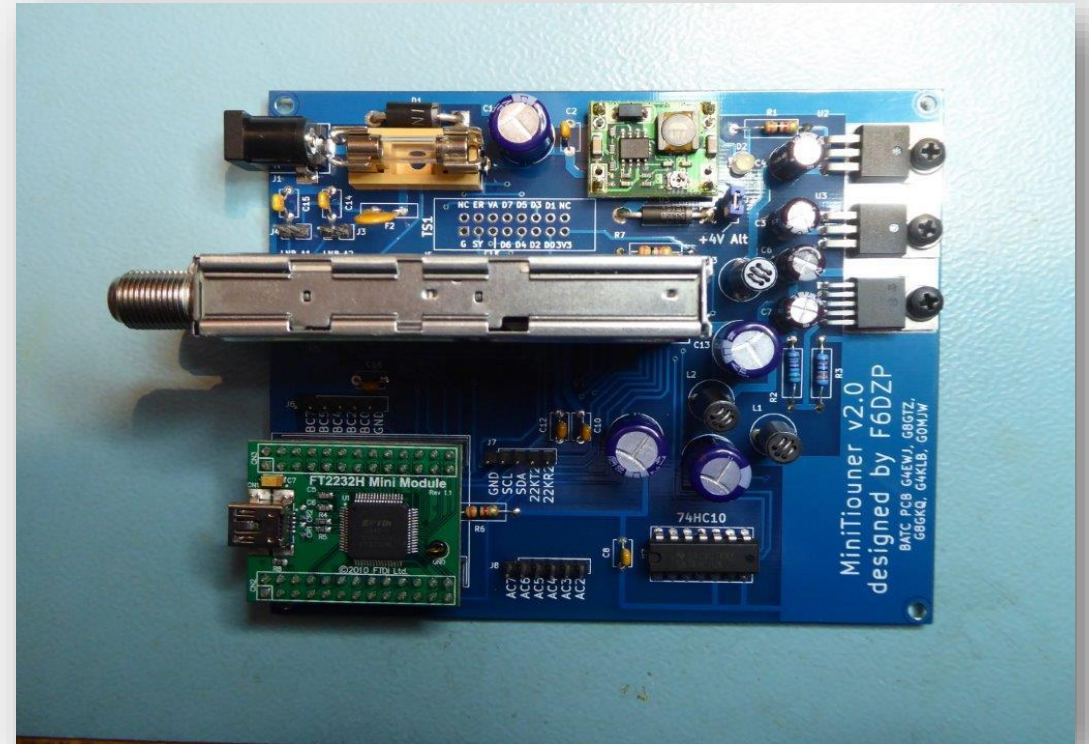
RECEPTOR DATV OCTAGON SF8008



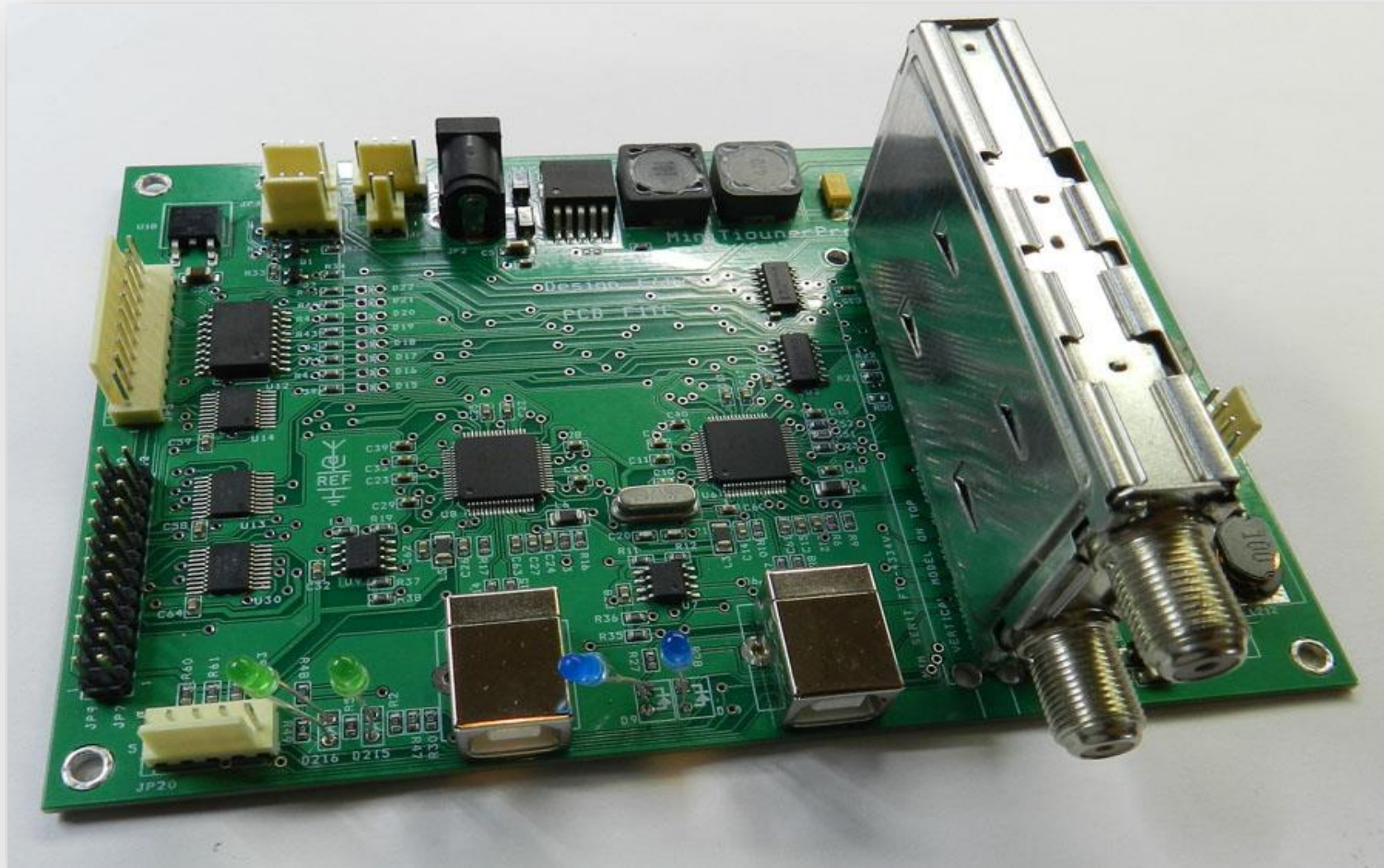
E-TIOUNER de ELAD



MiniTiouner de BATC



MiniTiouner Pro V2



MiniTiouner Pro V2



MiniTioune de BATC

MINITIOUNE v1.0.1.0r - Receiver/Analyser DVB-S/S2 144 MHz to 2450 MHz - SRmini=25 kS/s - for MiniTouner/MiniTouner-Pro

MiniTouner V2
NIM : Serit FTS-4334L
ppm calibr 23,00 (i)

SR (kS) Freq (kHz)
00333 10497250
OSCAR-100

DEROTATOR
Symbolrate mode: fixed scan
SR set: 333017S
Deviation: 14S
SR → 333 kS/s
Carrier Width: 450 KHz
TV mode: DVB-S2

Frequency
Freq asked: 10497250kHz
Freq → 10497170 kHz 747253kHz
IF 747253kHz
doppler

TS from
16USB
8USB
2USB
Demod

TS bitrate
620 max
500
490,908kb/s
495,329kb/s
min 380
reset TS

Noise
I: 140 Q: 123

Payload Diagram ok1ipv
Video 71,5 %
Overhead 7,4 %
Null Packet 13,8 %
Audio 7,4 %

TS stat
BCH errors 0
LDPC 4% 280
FEC QPSK 3/4_L35
C/N needed: 4,0 dB
D4
TS 0
lock time: 2.909 ms refresh:205ms
Null Packets: 13,8%
Video: 358kb/s 71,5%
Audio: 37kb/s 7,4%
data rcvd: 497,534kb/s
TSbitrate: 500,756kb/s

Carrier Lock
Carrier SR Full RF Pw -44dBm C/N MER 8,3dB Constellations

PIDs
Pid from .ini
ok1ipv Auto PID
F6DZP-Mpeg VIDEO
HDlowSR PID 00256
France24 V_H264
QRZ DX AUDIO
RaspberryP PID 00257
AAC

Program
ok1ipv
Provider
0303_Petr

Renderer
Graph
VLCdll
TS IP: 230.0.0.12:10000
Width: 768
Height: 432
photo
A_decoder: LAV Audio Decoder
V_decoder: Microsoft DTV-DVD
Format: 4/3 Zoom: adapt
16/9 x1
1/1 maxi
auto Format: 16/9
Info
Audio level mute

Beep Dsave UDP Record
Quit

Windows taskbar: Escribe aquí para buscar, ESD-ISO (F:), Minitioune_v1_0_1..., Escritorio, 21°C, 19:55 01/03/2022

MiniTioune versión actual

MINITIOUNE v1.0.1.0r - Receiver/Analyser DVB-S/S2 144 MHz to 2450 MHz - SRmini=25 kS/s - for MiniTouner/MiniTouner-Pro

SR (kS) Freq (kHz)

00333 10497250

OSCAR-100

SR	Freq
1500	1 000
1000	2 125
500	3 250
333	4 375
250	5 500
125	6 625
66	7 750
35	8 875
25	9 000

M1 M2 M3 M4

☒ Low SR ☐ Wide scan

DVB mode: ☐ DVB-S ☒ DVB-S2 ☐ Auto

FEC mode: ☒ Auto ☐ Manual

Fplug: ☒ A ☐ B LNB volt: ☐ 0 ☐ 13(V) ☐ 18(H) 22kHz: ☐ OFF ☐ ON ☐ TS

Store into Memory

M1 M2 M3 M4

OK1IPV

PIDs

Pid from .ini

ok1pv Auto PID

F6DZP-Mpeg VIDEO

HDlowSR PID 00256

France24 V_H264

QRZ DX AUDIO

RaspberryP PID 00257

AAC

Program ok1pv

Provider 0303 Petr

Renderer

☒ Graph ☐ VLCdll

Reset

TS IP: 230.0.0.12:10000

Width: 768

Height: 432

photo

A_decoder: LAV Audio Decode

V_decoder: Microsoft DTV-DV

Format: ☐ 4/3 ☒ 16/9 ☐ 1/1 ☐ auto

Zoom: ☐ adapt ☒ x1 ☐ maxi

Format 16/9

Info

Audio level

☐ mute

LNA gain: 13,0dB

Carrier Lock

SR Lock

RF Pw -44dBm

C/N MER 8,2dB

Constellations

BCH errors 0

LDPC 4% 281

FEC QPSK 3/4_L35

C/N needed: 4,0 dB

TS 0

lock time: 2.909 ms refresh: 203ms

TS stat

Null Packets: 13,9%

Video: 356kb/s 71,6%

Audio: 37kb/s 7,4%

data rcvd: 499,497kb/s

TSbitrate: 496,954kb/s

Beep Dsave UDP Record

Quit

Expert Web

Escribe aquí para buscar

ESD-ISO (F:)

Minitioune_v1_0_1...

Escritorio

21°C

19:56

01/03/2022

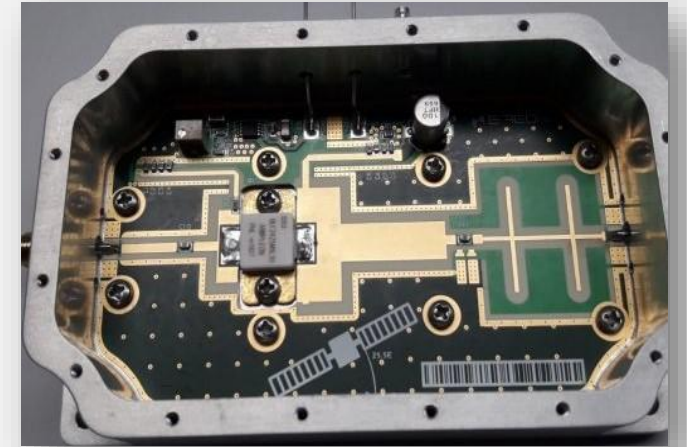
Como Transmitir DATV via QO100



PC & EASY DATV



PLUTO & Firm. F50E0



POWER AMPLIFIER

Como Transmitir DATV via QO100



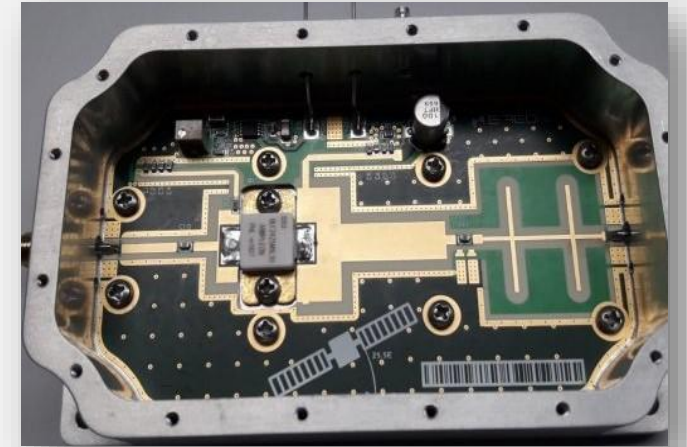
PC & EASY DATV



Conexión por RED



PLUTO & Firm. F50E0



POWER AMPLIFIER

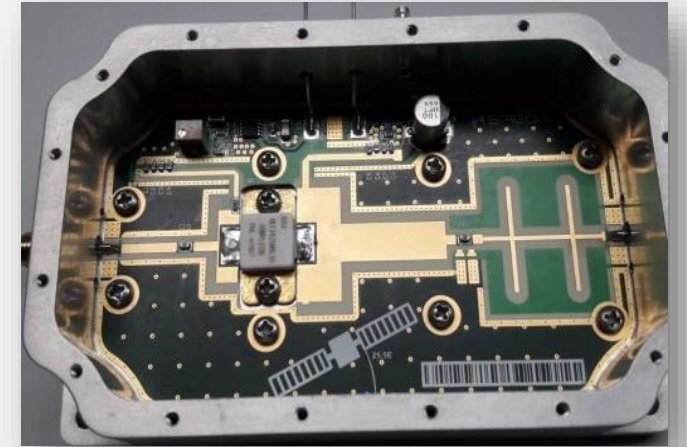
Como Transmitir DATV via QO100



PC & EASY DATV

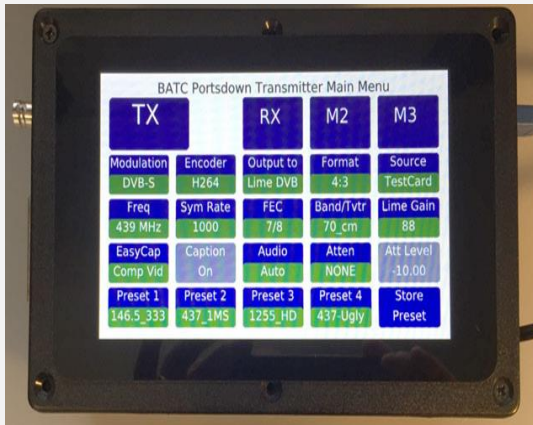


LIME SDR



POWER AMPLIFIER

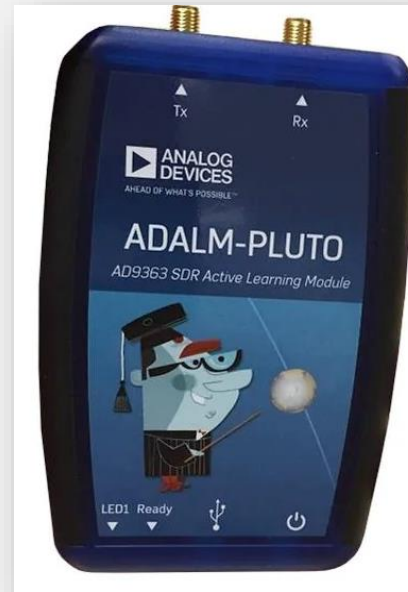
Como Transmitir DATV via QO100



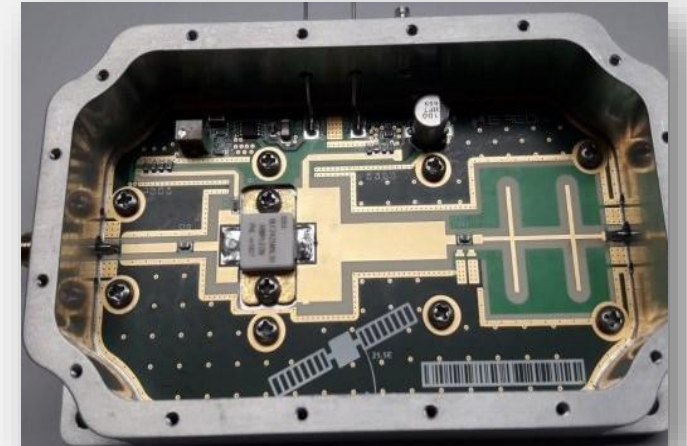
**RASPBERRY PI
+
PORSTDOWN**



Conexión por RED

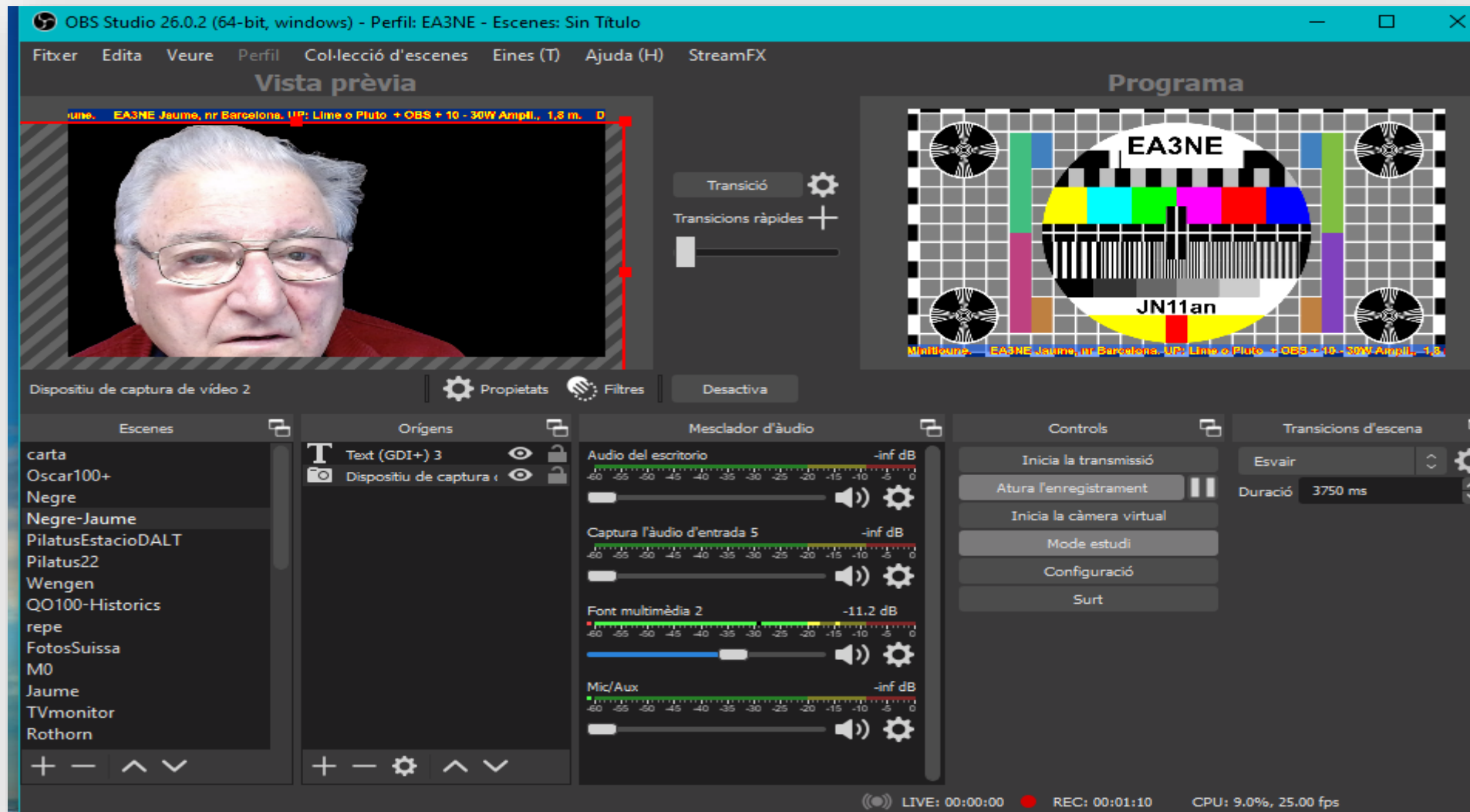


PLUTO & Firm. F50E0



POWER AMPLIFIER

OBS



vMix



Micromeet 2023

Codificadores HEVC H.265



Microprocesador



Tarjeta gráfica



Caja externa

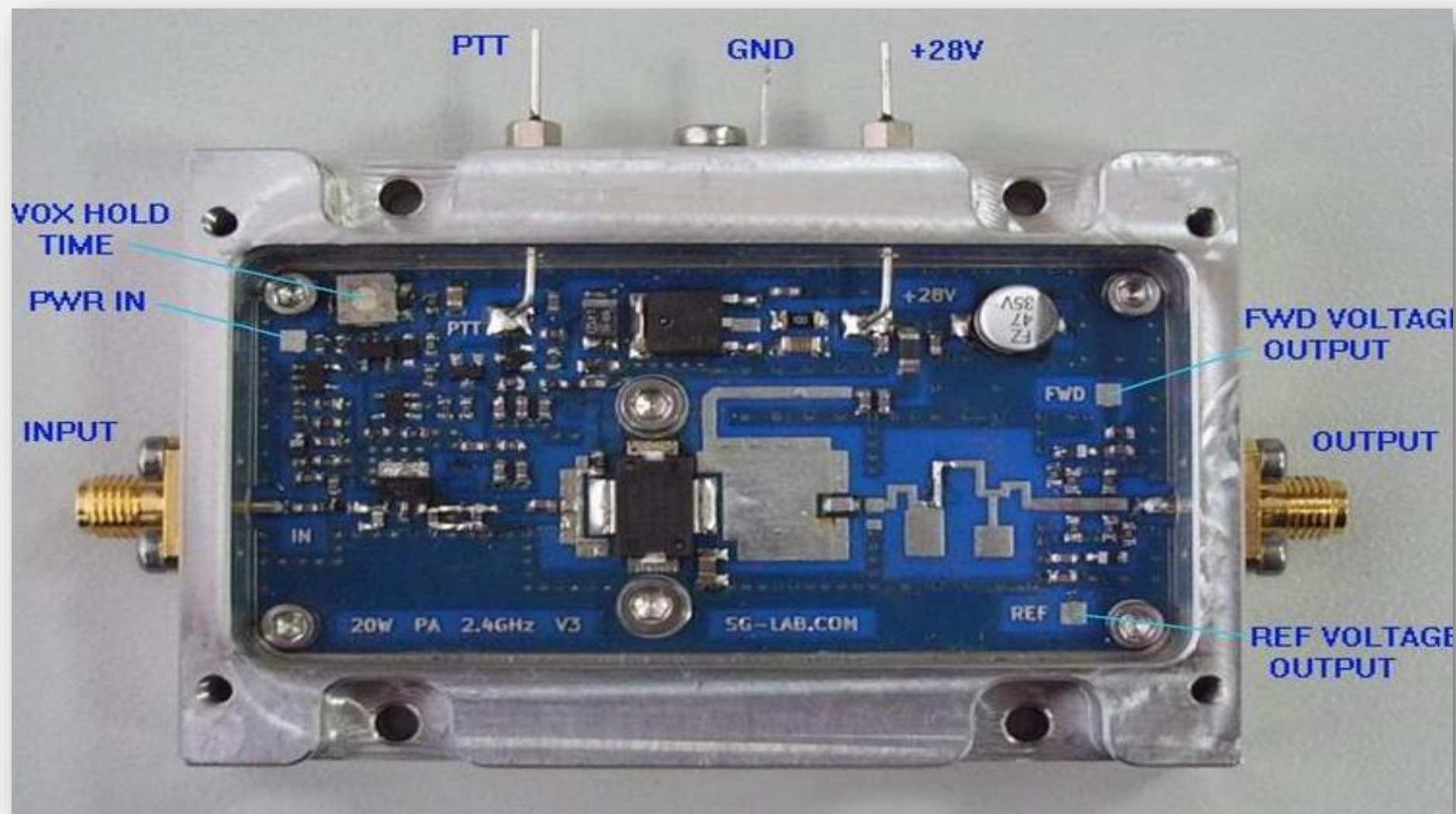
Publicación básica DATV: BATC

Dish Diameter	Power Required
2.4m	7.5W
2.0m	11W
1.8m	13W
1.5m	19W
1.2m	30W
1m	43W
90cm	53W
80cm	67W
60cm	120W

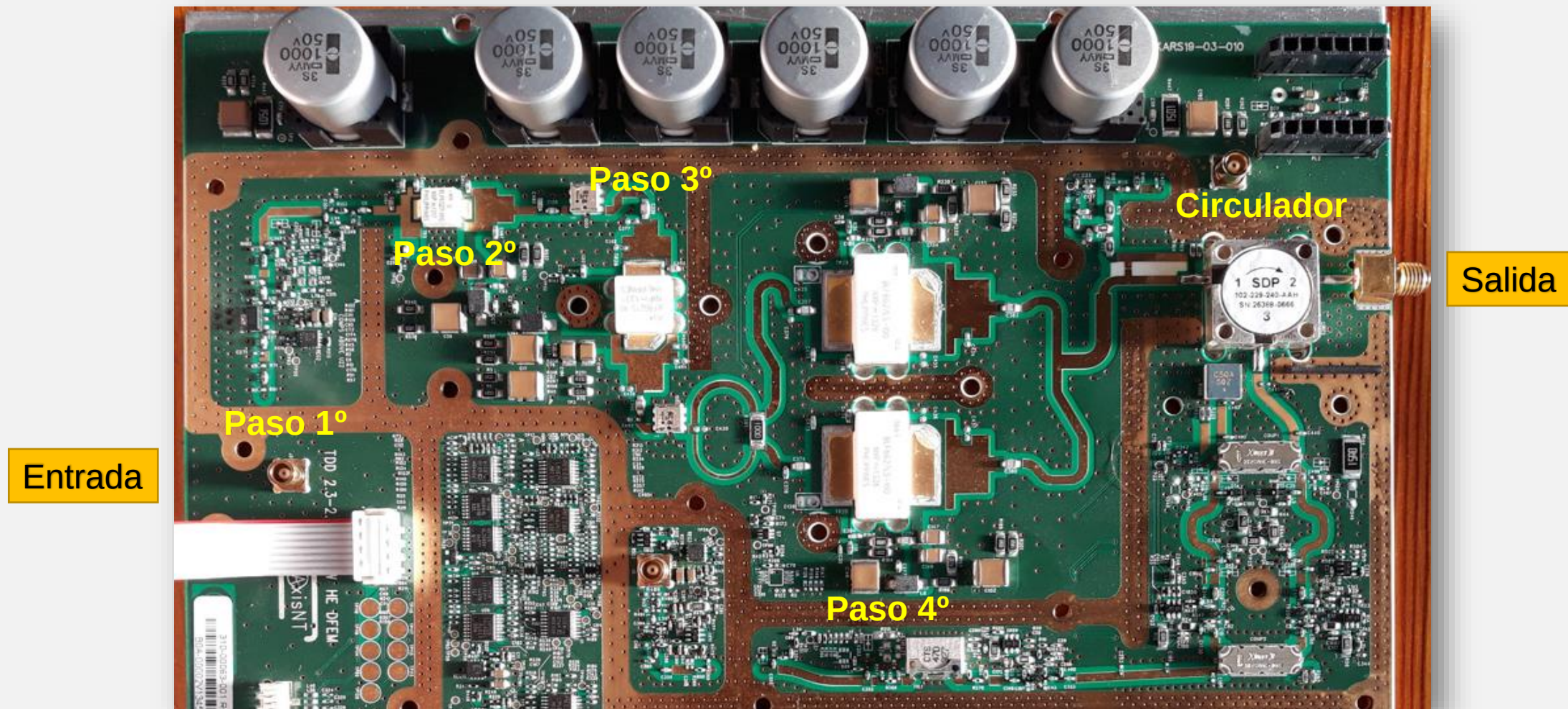


SR	Factor
66 KS	0.26
125 KS	0.5
250 KS	1.0
333 KS	1.33
500 KS	2.0
1000 KS	4.0
1500 KS	6.0

Amplificador SG Labs 2,4 GHz 20W



Amplificador 2,4 GHz



CONFIGURACIÓN EASY V2.15

F1EJP DATV-Easy V2.15

DVB / MPEG-TS Configuration DVB Tables PTT / Monitoring

Equipment
LimeSDR mini

Tx Gain %
9

Max %
100

Adalm Pluto SDR IP
192 . 168 . 2 . 1

Port
8282

N°
1

Input / Entrée
OBS + VirtualCam

Port
230 . 0 . 0 . 11

Port
20000

Encoder
INTEL

Default FPS
25

Audio sync +/- ms
250

Audio SR
48000

Add Windows / Fenêtre Monitoring ☐

Frequency MHz
2405.250

Easy

10494.75

OSCAR-100

Transmission ☒ ☒

1487 kb/s

0 20 40 60 80 100

START +

STOP

PTT

EXIT

>> Datv-Easy << OBS / vMIX / IP > H262 / H264 / H.265 DVB Transmission

CONFIGURACIÓN DVB/MPEG-TS

F1EJP DATV-Easy V2.15

DVB / MPEG-TS Configuration DVB Tables PTT / Monitoring

Target bitrate
1487.47 kb/s

Video bitrate
1196 kb/s

Frequency MHz
2405.250

MODE
DVB
DVB-S2 QPSK

VIDEO / AUDIO
Codec
H265

Symbol Rate
1000

Image Size 16/9
1920x1080

FEC
3/4

Fps
25

FEC Frame
64800

Audio Codec
AAC +

Roll-off
0.15

Audio kb/s
96

☐ Pilot Symbols

☒ All Automatic

Easy
10494.75
OSCAR-100

Transmission ■ ■

1487 kb/s

0 20 40 60 80 100

START + **PTT**

STOP **EXIT**

>> Datv-Easy << OBS / vMIX / IP > H262 / H264 / H.265 DVB Transmission

Cobertura del QO-I00



Pioneros de DATV en el QO-100



¿IP en QO-100?



[AMSAT-DL HOME](#) [DASHBOARD](#) [FORUM 8](#) [LEXICON](#) [WIKI](#)

[AMSAT-DL Forum](#) / [Forum](#) / [QO-100 / Es'hail-2 / P4-A](#) / [WB Transponder](#)



NPR-VSAT : IP ACCESS OVER QO-100 WB

 F4HDK  Sunday, 3:46 pm



Online

F4HDK

Sunday, 3:46 pm

**I have developed the protocol /solution : NPR-VSAT.
It allows low datarate IPv4 access over the QO-100 WB transponder.
It could be used for low-datarate Hamnet access.**

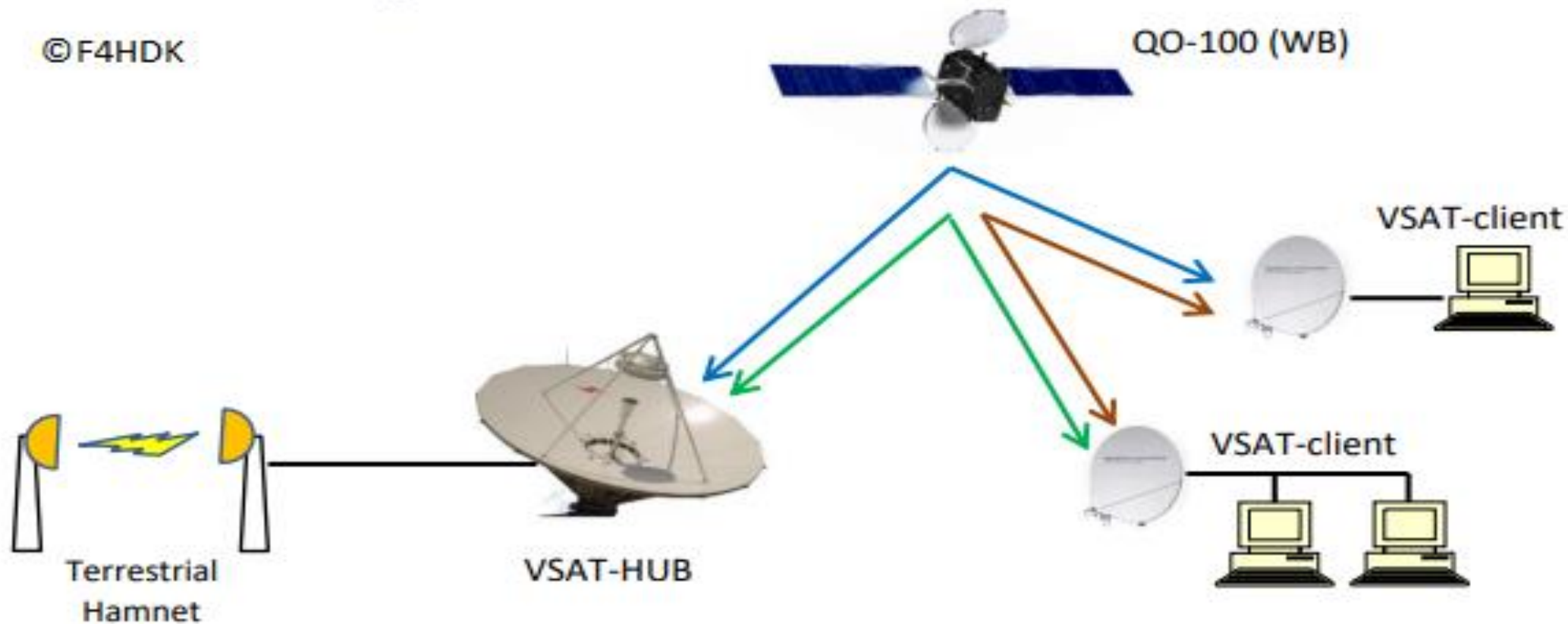
[Documentation](#), [source code](#), [binary](#):

http://f4hdk.free.fr/NPR_VSAT/

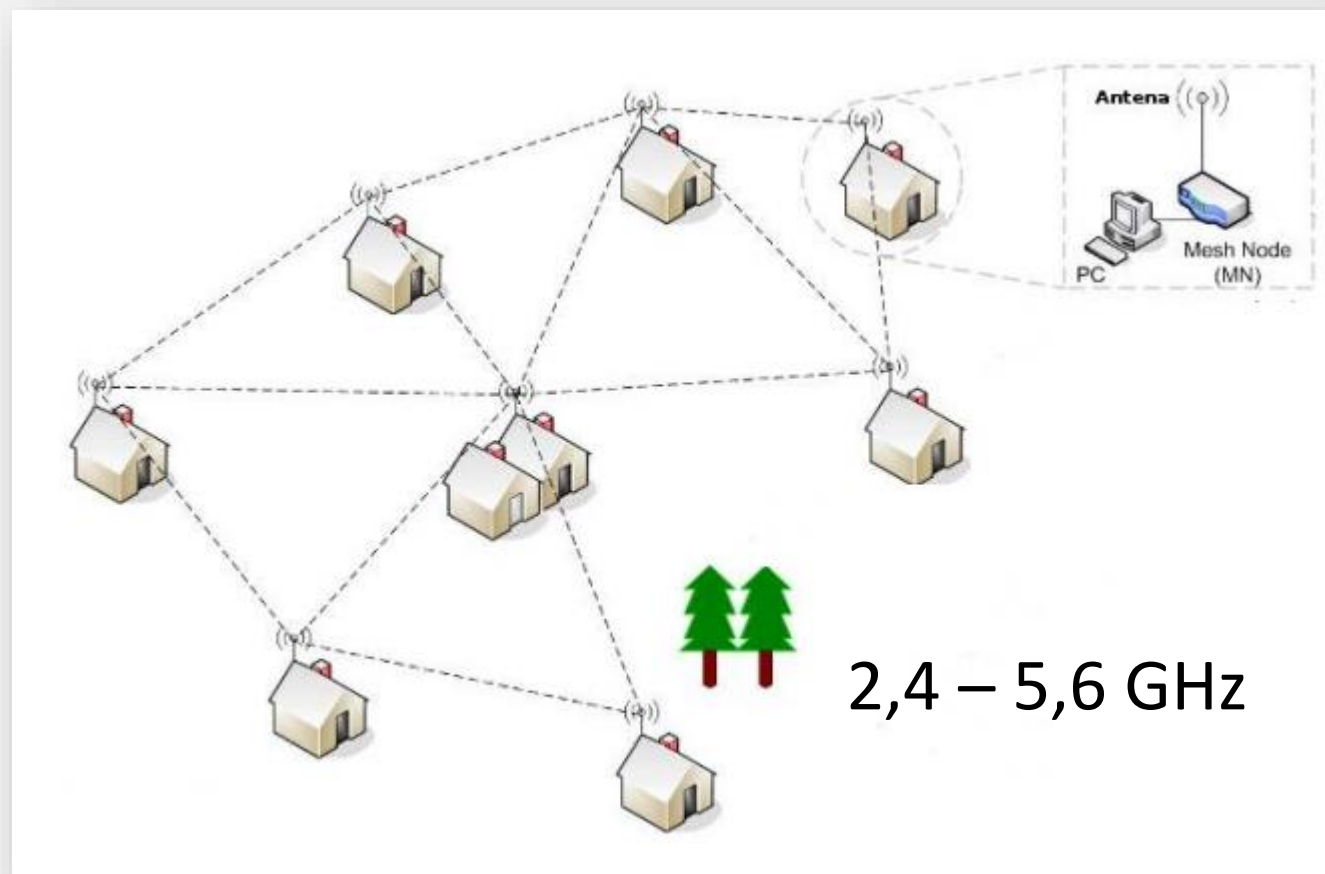
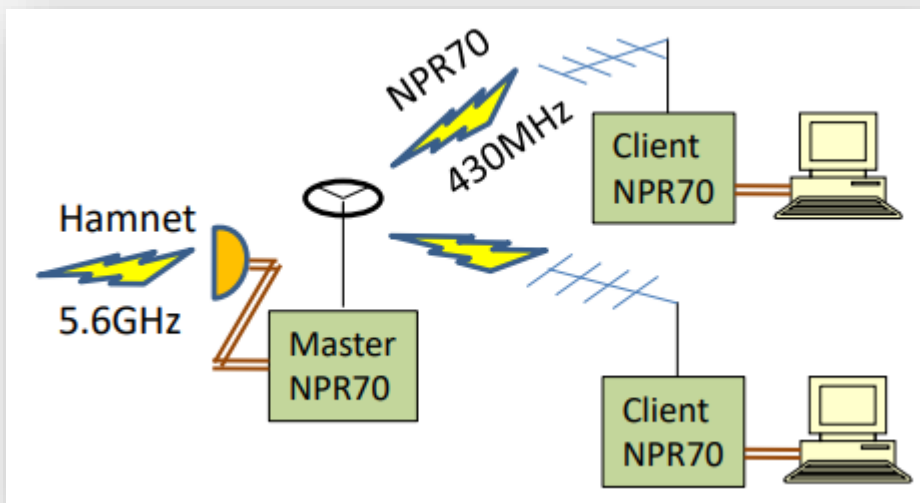
<https://forum.amsat-dl.org/index.php?thread/4306-npr-vsats-ip-access-over-qo-100-wb/>

¿HAMNET en QO-100?

© F4HDK

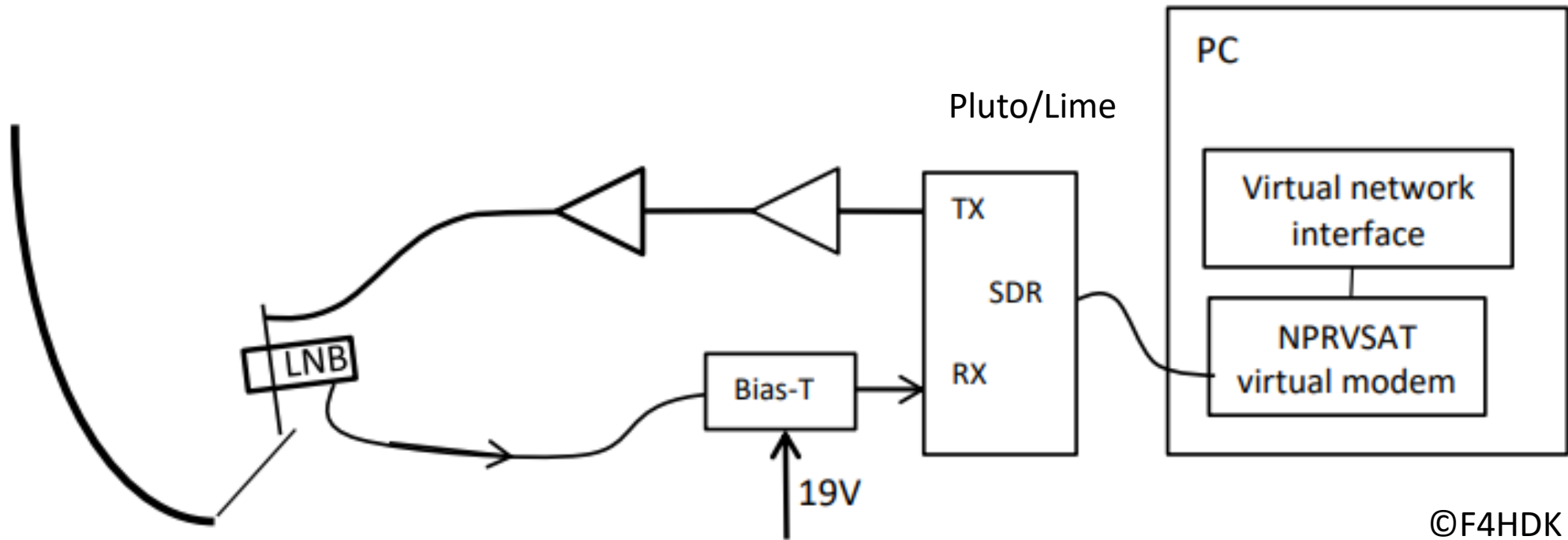


¿NPR70 HAMNET?

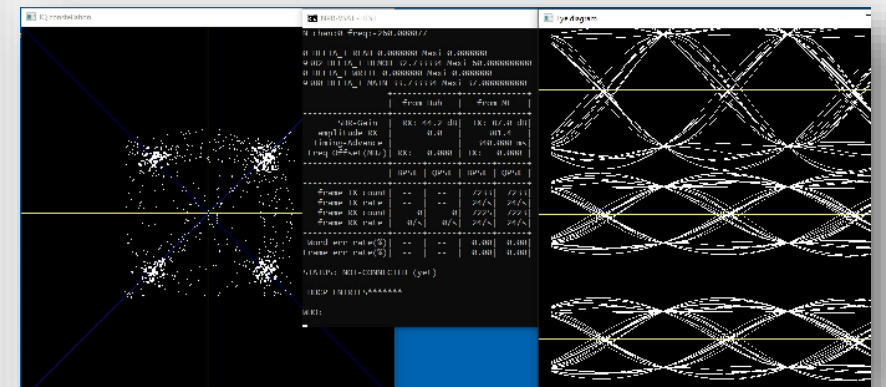
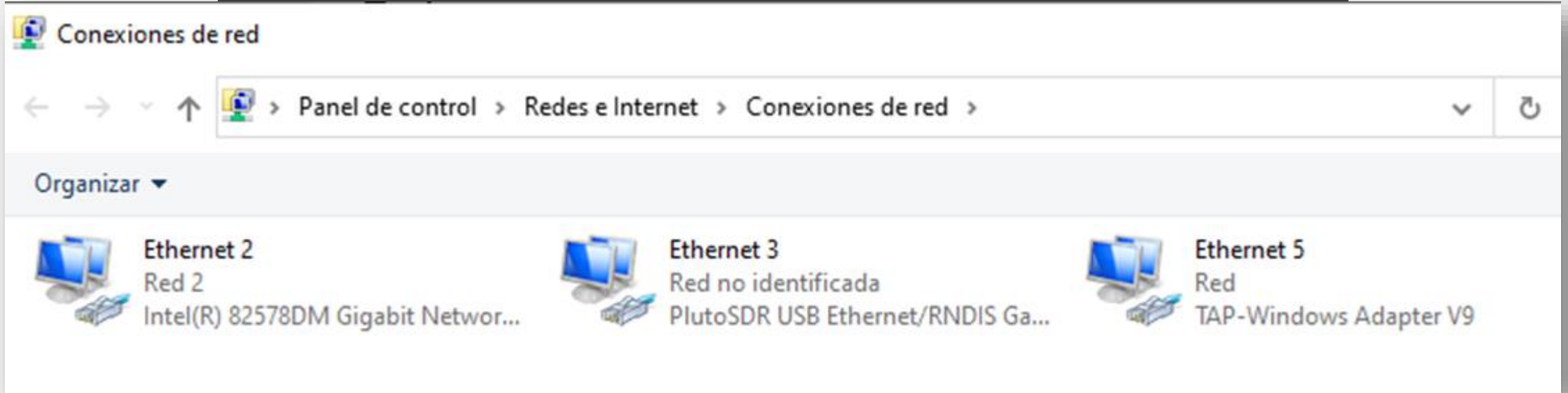


Estación de cliente.

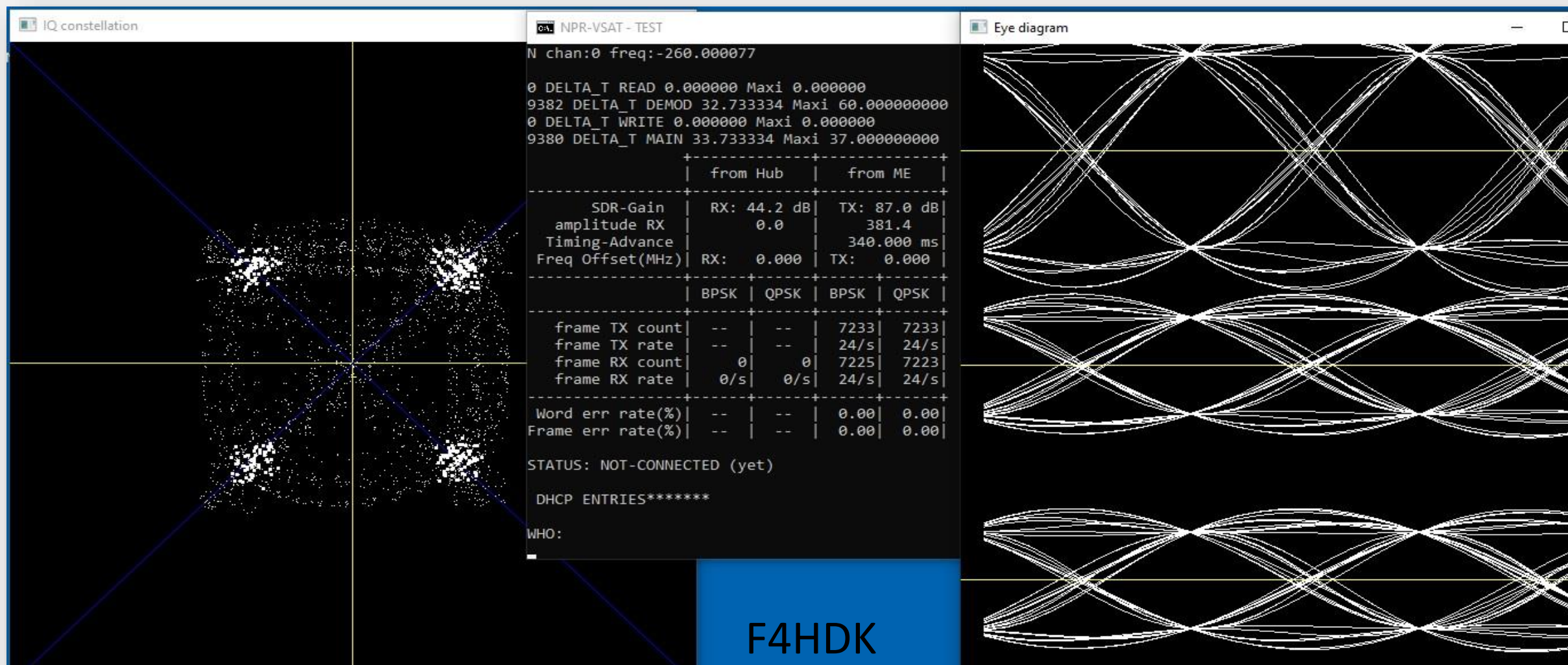
2 A typical client station



Instalación.



Test en bucle local.



Trama TDMA

2.1 MF-TDMA general description

The radiofrequency resource allocated to NPR-VSAT is split in a 2D matrix made of

- Several channels, each having its own frequency, and its own symbol rate. The symbol-rate can vary from one channel to another.
 - 50kS/s
 - 100kS/s
 - 200kS/s
- Timeslots inside each channel.

The timeslot duration is 23800 microseconds; it corresponds to a 1-frame QPSK burst with 100kS/s and with the maximum frame length, plus a slot-margin.

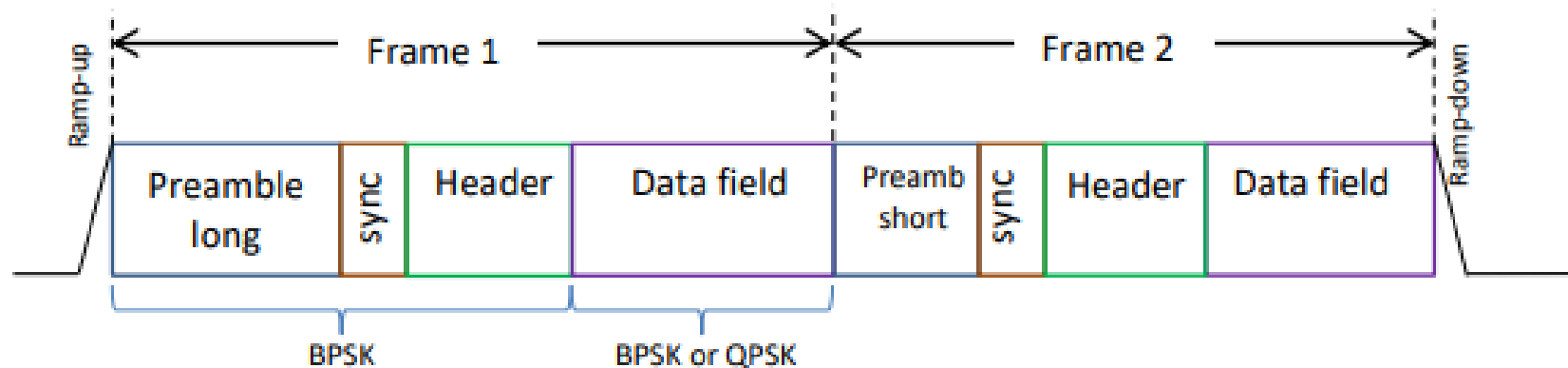
	TDMA frame 1					TDMA frame 2					TDMA frame 3			
Time-Slot counter	1	2	3	...	16	17	18	19	...	32	33	34	..	48
Channel 1 (100kS/s)	Hub				4	Hub			Client 2		Hub			
Channel 2 (100kS/s)	Client 1		Client 3			Client 1		Client 2			Discovery slot			
Channel 3 (100kS/s)	Client 2							Client 3		4	1	3	4	2

Ráfaga de datos.

2.2 Transmission burst

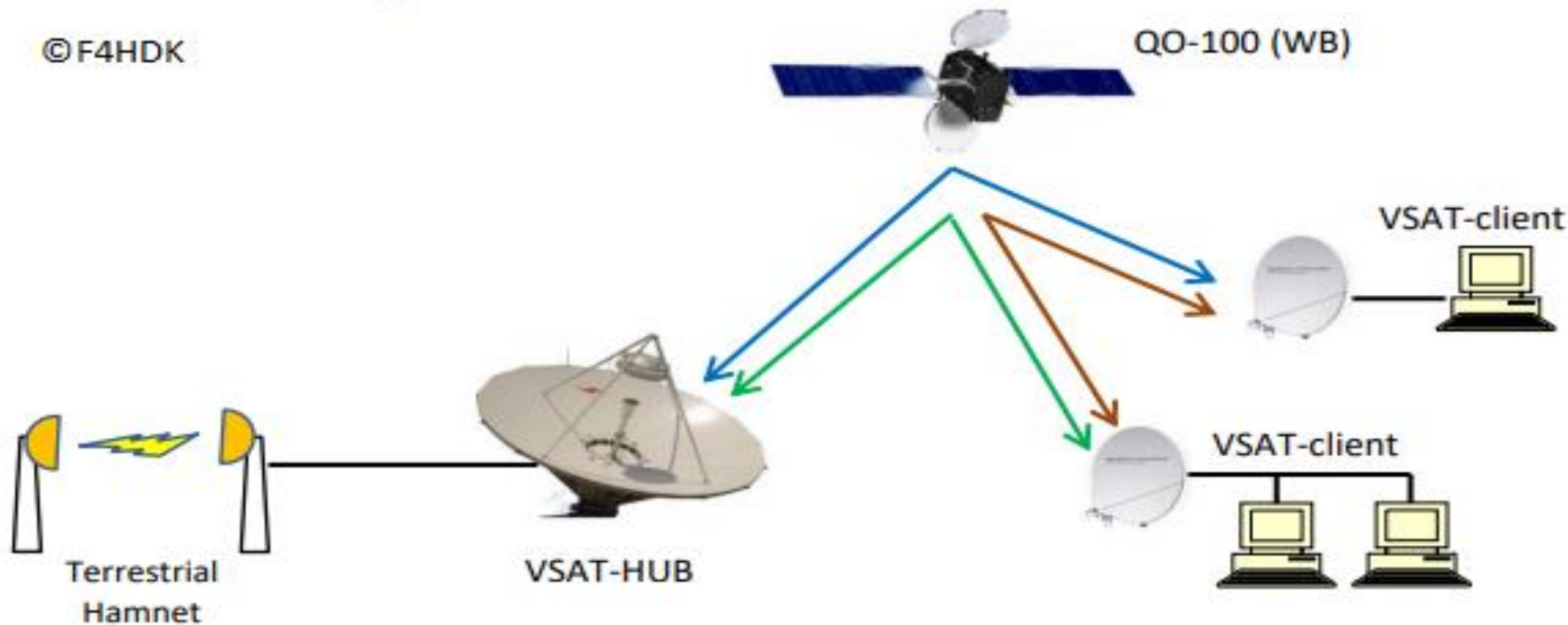
A transmission burst is made of

- Ramp-up: duration 320 microseconds
- One or several frames, each one containing
 - A Preamble
 - A sync word
 - A header
 - Data field
- Ramp down : duration 320 microseconds



HAMNET en QO-100

© F4HDK





Micromeet 2023

LARGA VIDA, MICROMEET

