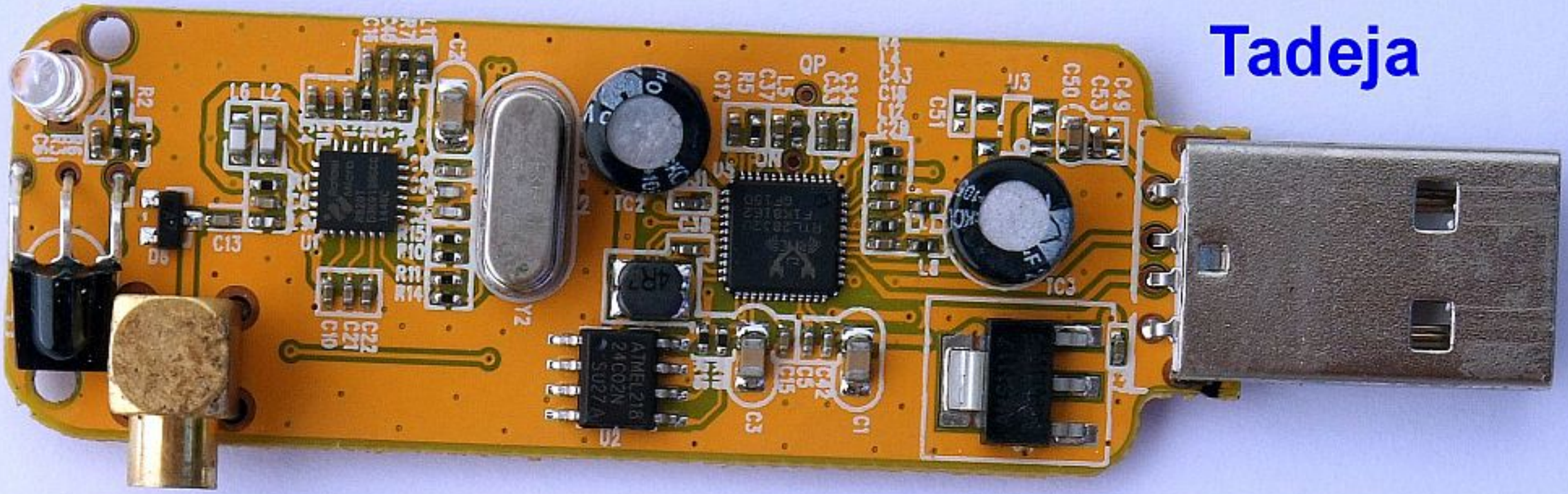
Amaterska radioastronomija

9 – DVBT ključ

Laboratorij za sevanje in optiko

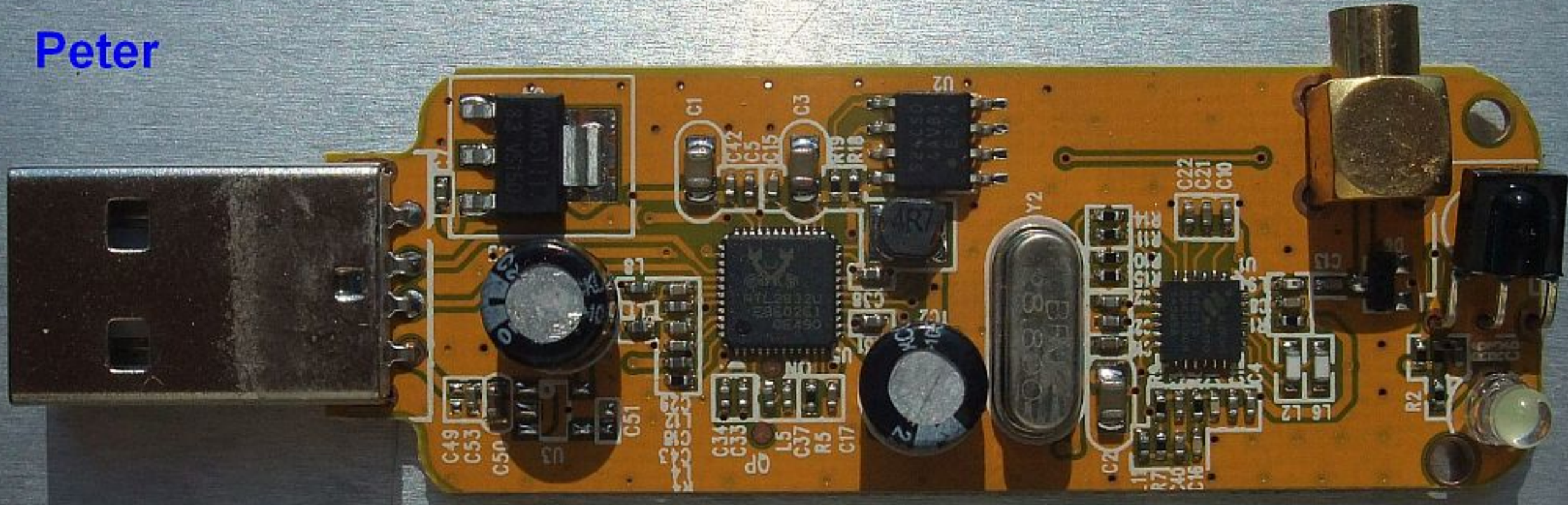
Tadeja Saje, S56ZSA
&
Matjaž Vidmar, S53MV

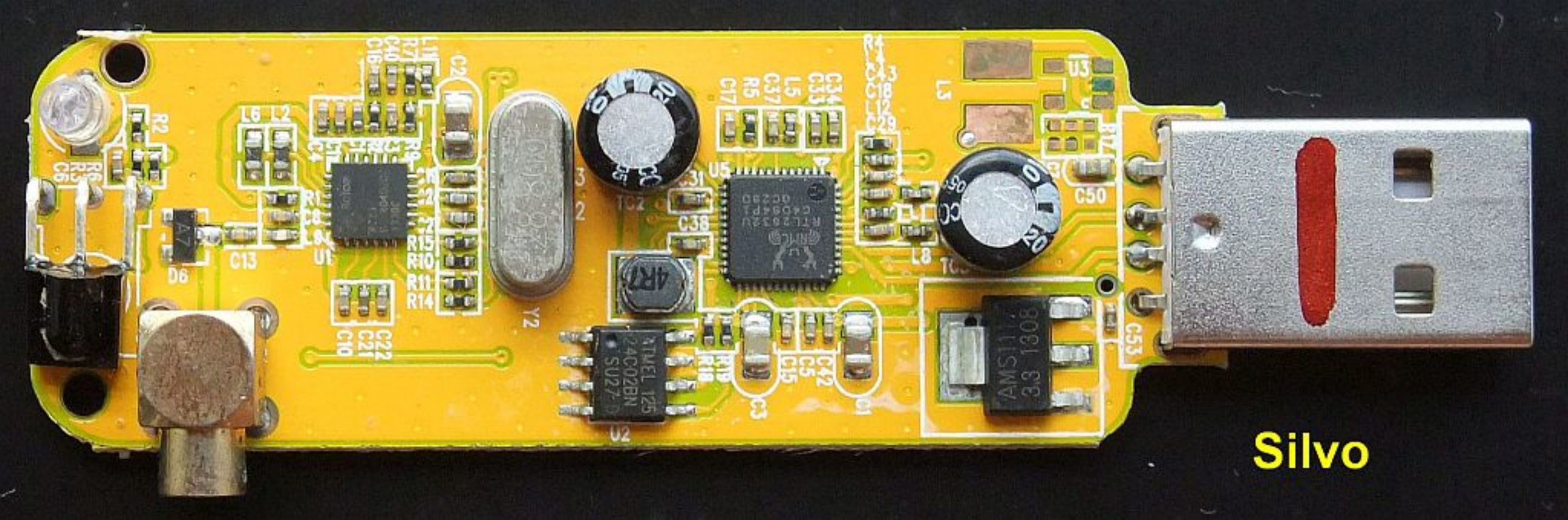
Tadeja

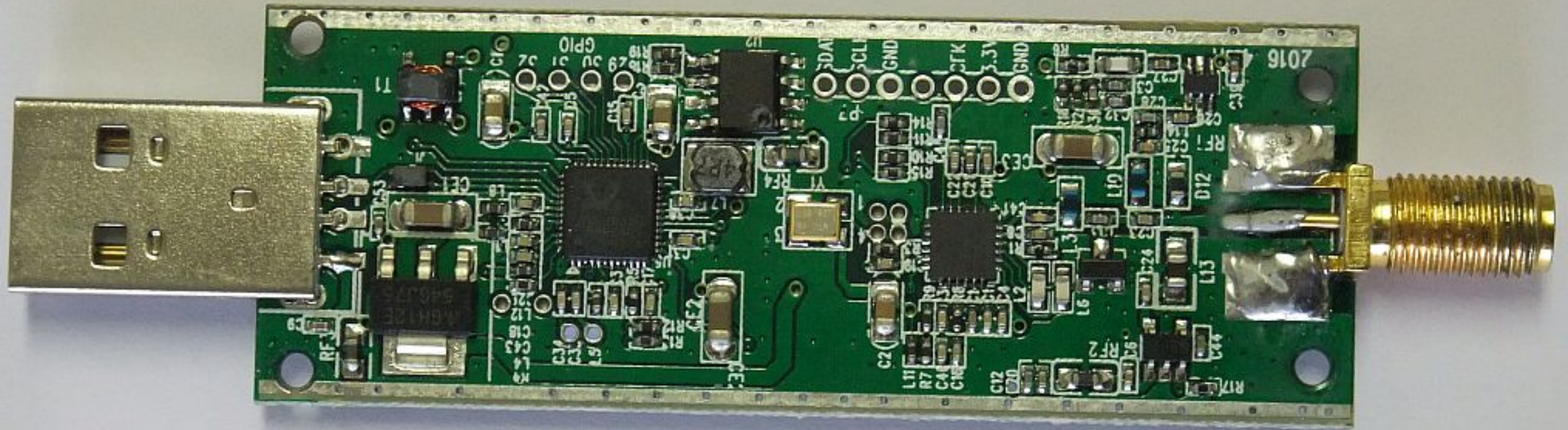


Andrej

Peter




Silvo


GPIO
SDA
SCL
GND
CLK
3.3V
GND
2016

RTL-SDR.COM
QUICKSTART SETUP GUIDE: RTL-SDR.COM/QSG
DVB-T+DAB+FM+SDR
RTL2832U R820T2 TCXO+BIAS T+HF
V.3
2
GPIO
2016

SDR# v1.0.0.1337 - IQ Imbalance: Gain = 1.000 Phase = 0.000°

RTL-SDR Controller

Device R820T

Generic RTL2832U OEM

Sample Rate

2.048 MSPS

Sampling Mode

Quadrature sampling

Offset Tuning

RTL AGC

Tuner AGC

RF Gain 20.7 dB

Frequency correction (ppm) 0

Close

1.420.400.000

OS [F2CD]

1.419 600G 1.419 900G 1.420 200G 1.420 500G 1.420 800G 1.421 100G 1.421 400G

Zoom

Contrast

Range

Offset

S-Attack

S-Decay

W-Attack

W-Decay

Spectrum

Speed

Zoom FFT *

Noise Blanker *

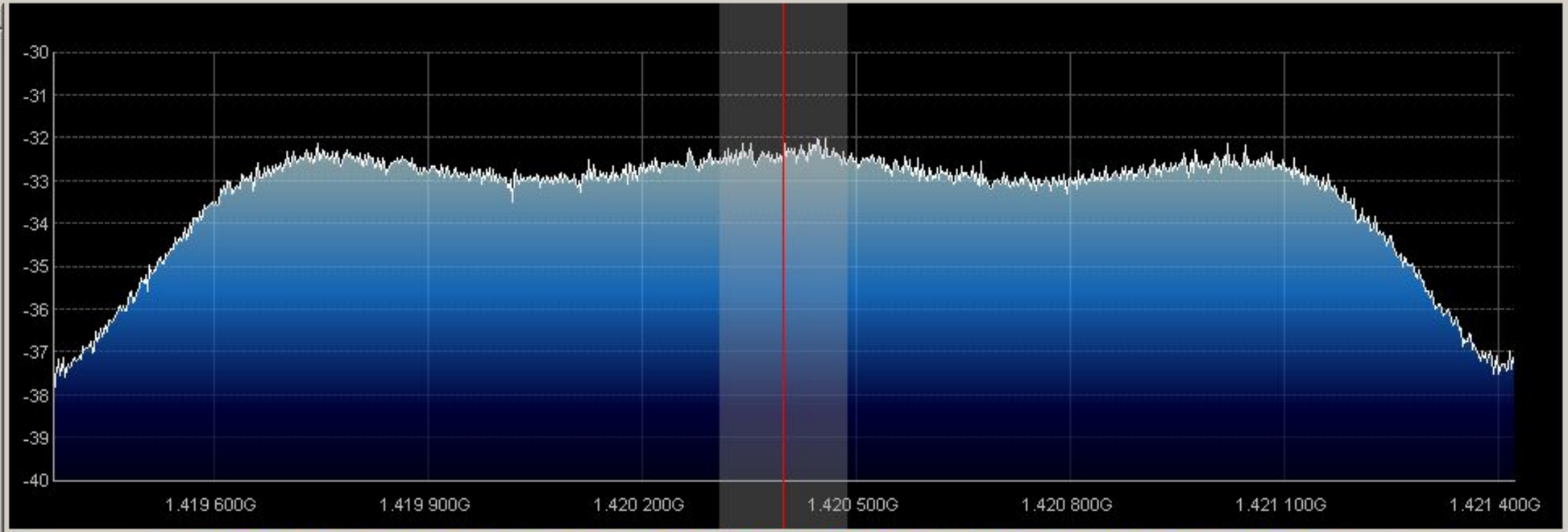
Digital Noise Reduction *

Start SDR# v1.0.0.1337 - I... 7:08 AM

SDR# v1.0.0.1337 - IQ Imbalance: Gain = 1.000 Phase = 0.000°

1.420.400.000

- Source
  - RTL-SDR / USB
- Radio
- Audio
- AGC
- FFT Display
  - View: Both
  - Window: Blackman-Harris 4
  - Resolution: 65536
  - Time markers
  - Gradient ...
  - Mark Peaks
  - Smoothing
    - S-Attack
    - S-Decay
    - W-Attack
    - W-Decay
  - Spectrum
    - Speed
- Zoom FFT *
- Noise Blanker *
- Digital Noise Reduction *



Zoom
Contrast
Range
Offset

Start | SDR# v1.0.0.1337 - I... | 7:16 AM

SDR# v1.0.0.1457 - RTL-SDR (USB)

001.420.400.000

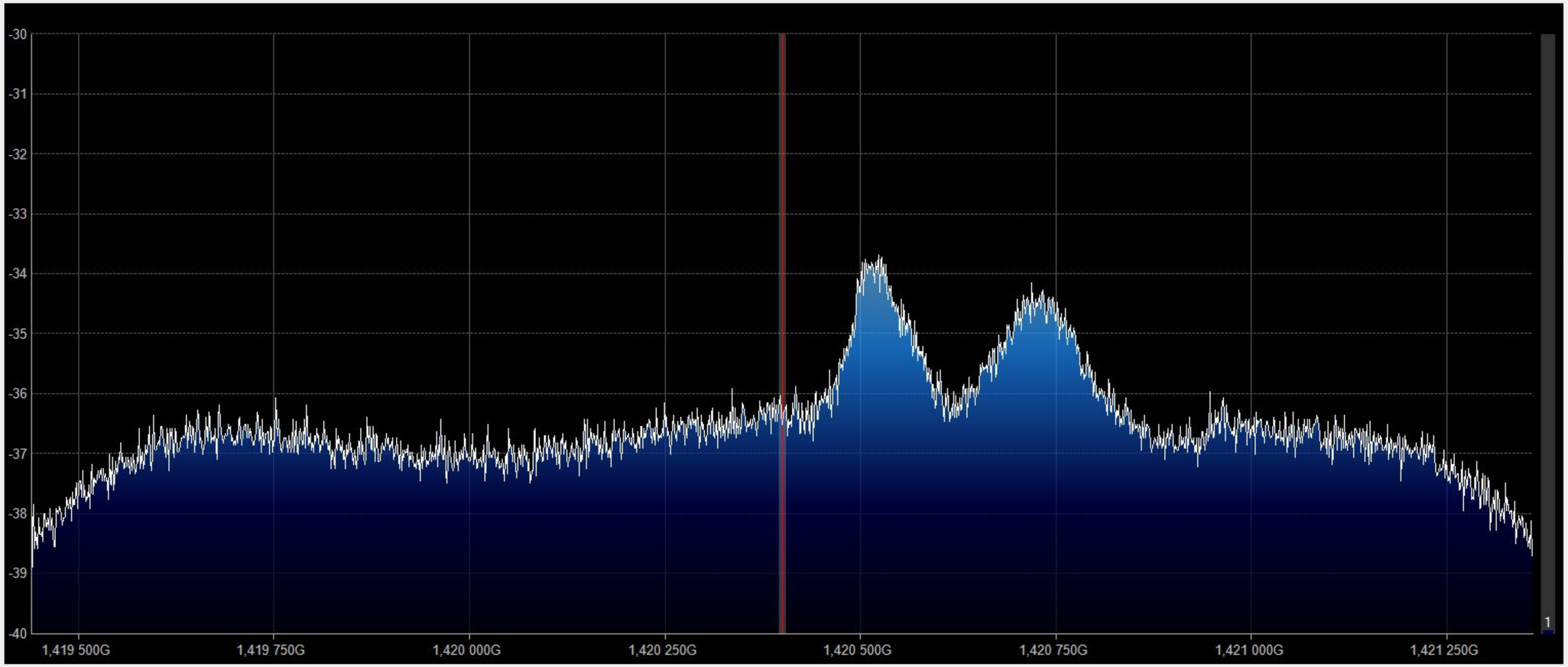
- Source: RTL-SDR (USB)
- Radio
- Audio
- AGC
- FFT Display

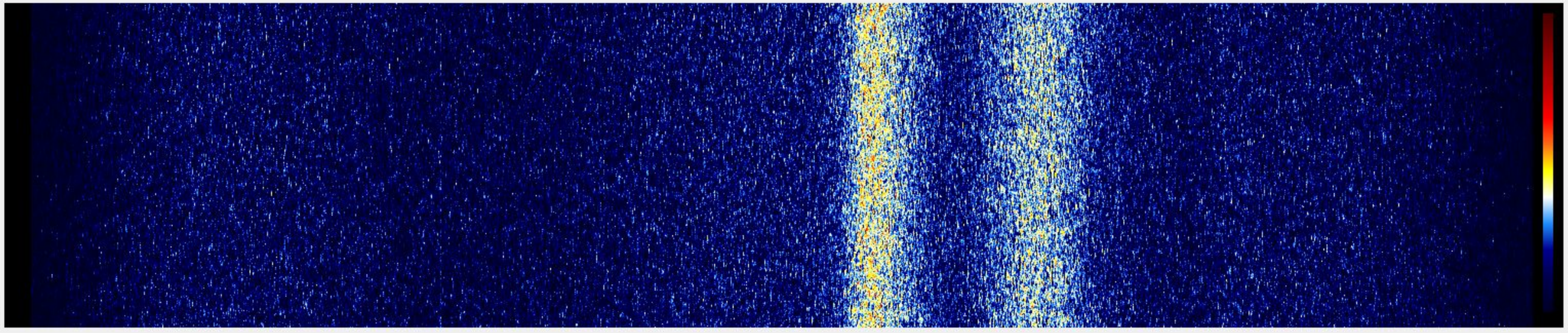
View: Both
Window: Blackman-Harris 4
Resolution: 32768
Spectrum Style: Static Gradient
Time Markers
Gradient ...
Mark Peaks

Smoothing
S-Attack
S-Decay
W-Attack
W-Decay

Spectrum
Speed

- Audio Noise Reduction *
- IF Noise Reduction *
- Baseband Noise Blanker *
- Demodulator Noise Blanker *
- Recording *
- Zoom FFT *
- Frequency Manager *





Zoom
Contrast
Range
Offset

HDSDR [default] version 2.70

10:19:37 AM
10:19:45 AM
10:19:52 AM
10:20:00 AM
10:20:08 AM
10:20:16 AM
10:20:24 AM
10:20:32 AM
10:20:40 AM
10:20:48 AM
10:20:55 AM
10:21:03 AM
10:21:11 AM
10:21:19 AM
10:21:27 AM
10:21:35 AM
10:21:43 AM
10:21:51 AM
10:21:58 AM
10:22:06 AM
10:22:14 AM
10:22:22 AM
10:22:30 AM
10:22:38 AM
10:22:45 AM
10:22:53 AM
10:23:01 AM

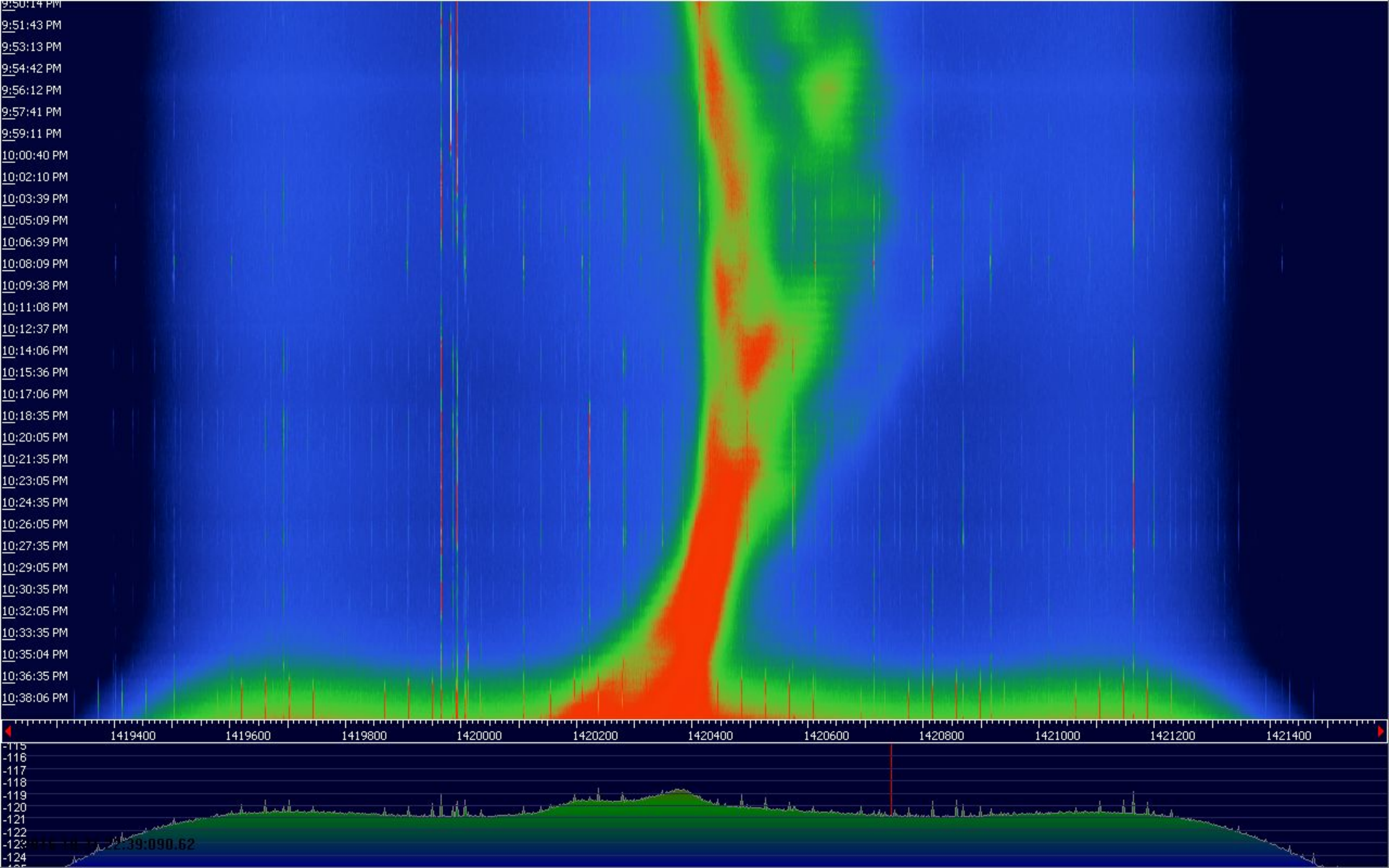
1419200 1419400 1419600 1419800 1420000 1420200 1420400 1420600 1420800 1421000 1421200 1421400

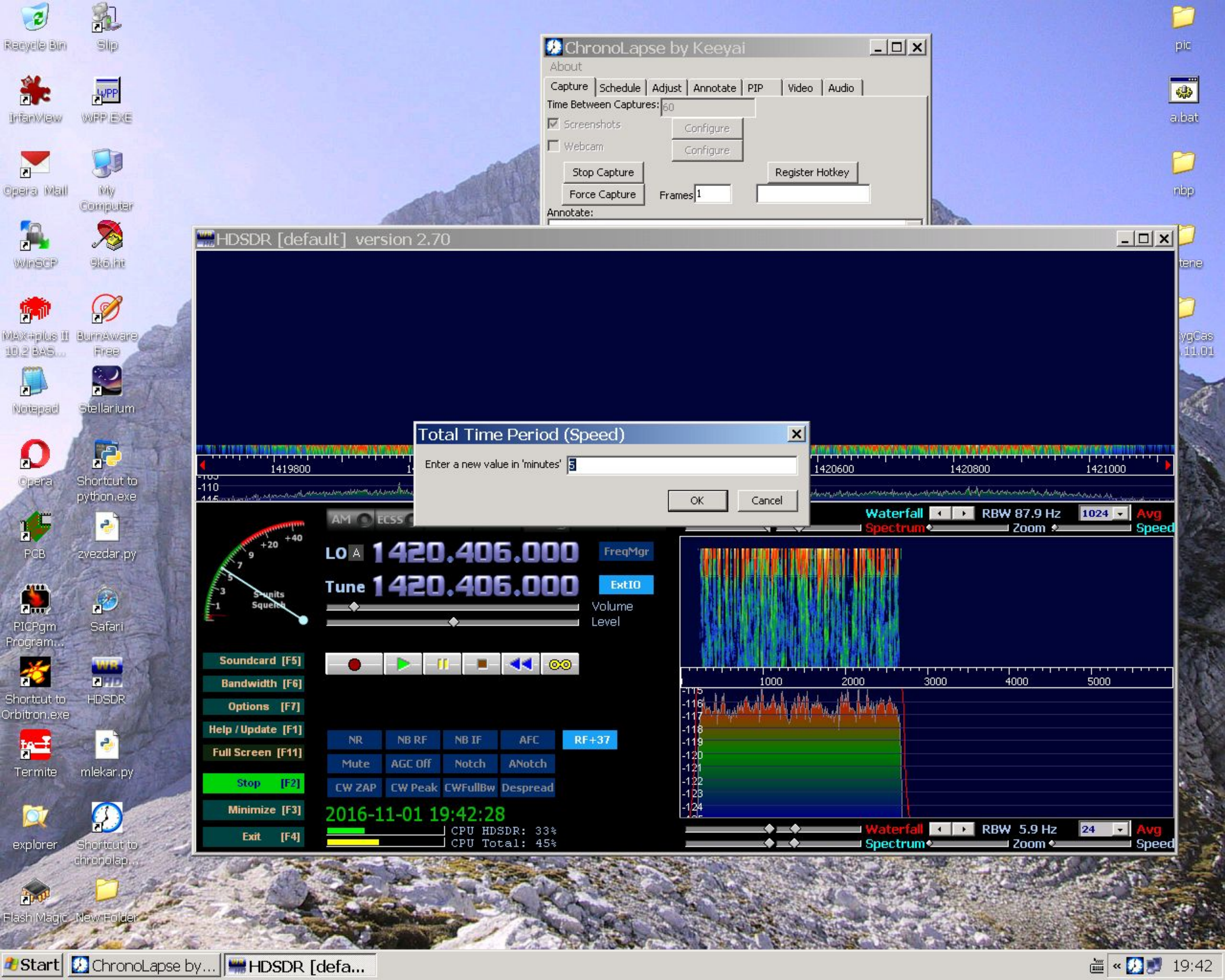
-114
-115
-116
-117
-118
-119
-120
-121
-122
-123

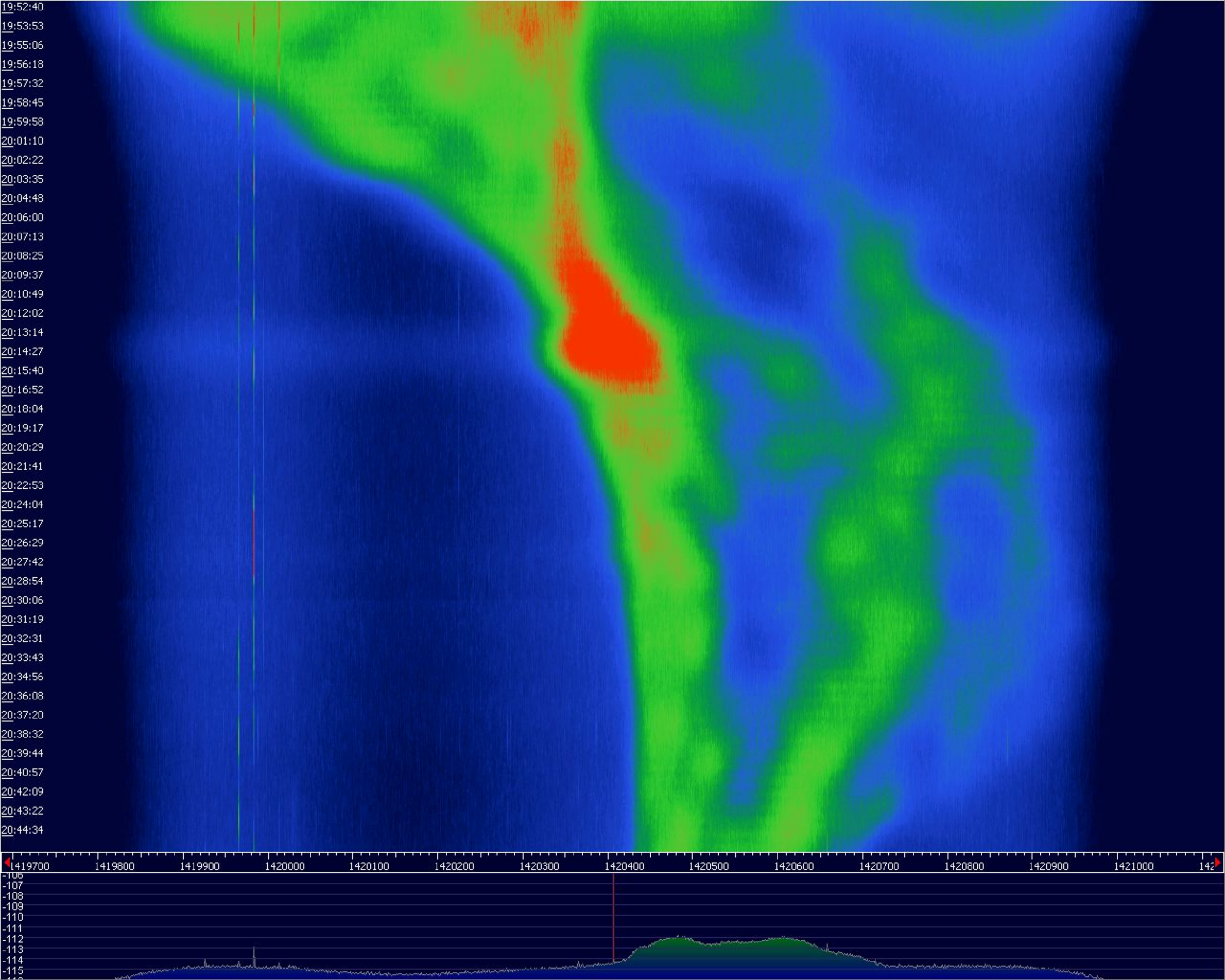
1,420,388,947 Hz
-115.9 dB

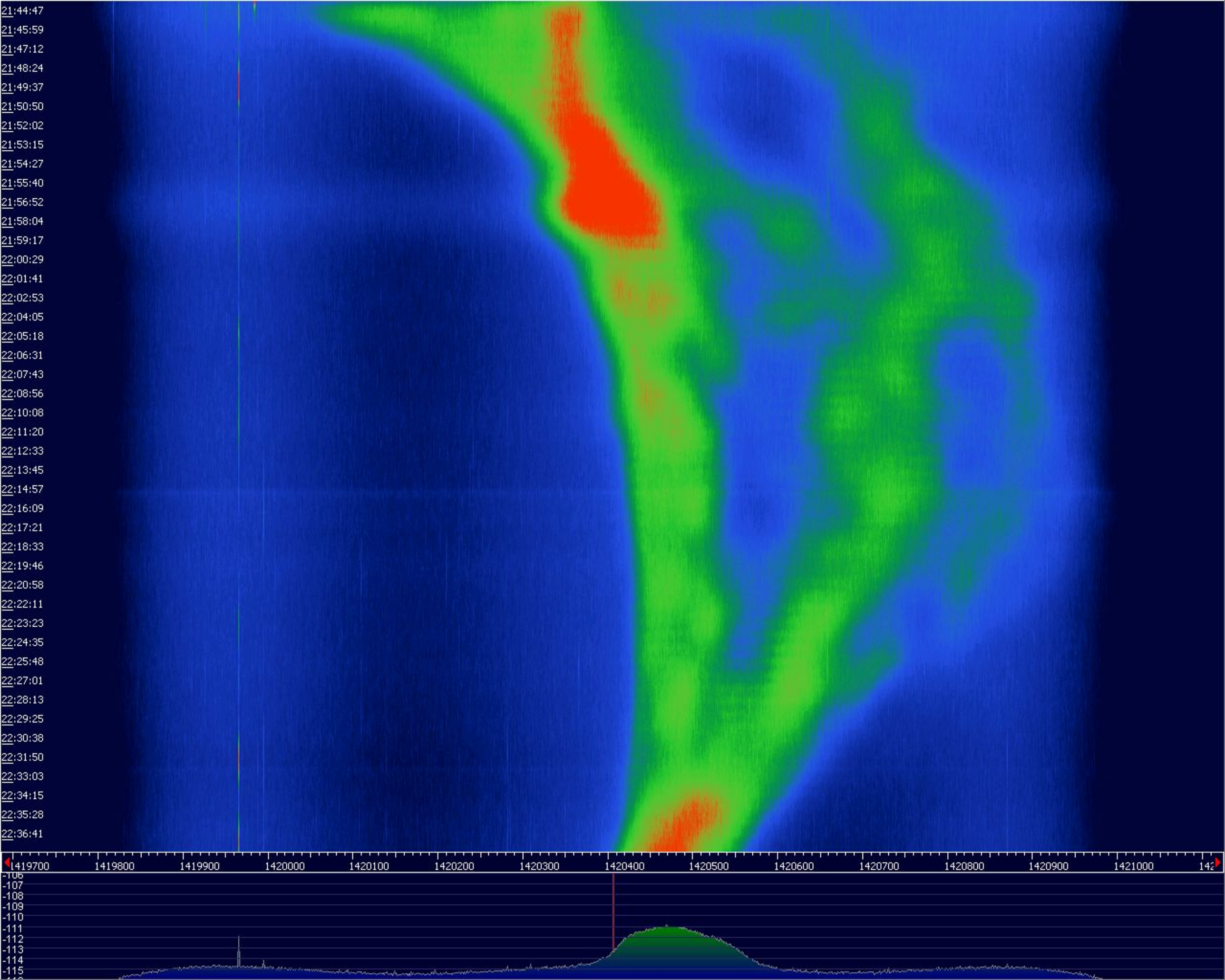
Start | HDSDR [default] vers... | « 10:23 AM

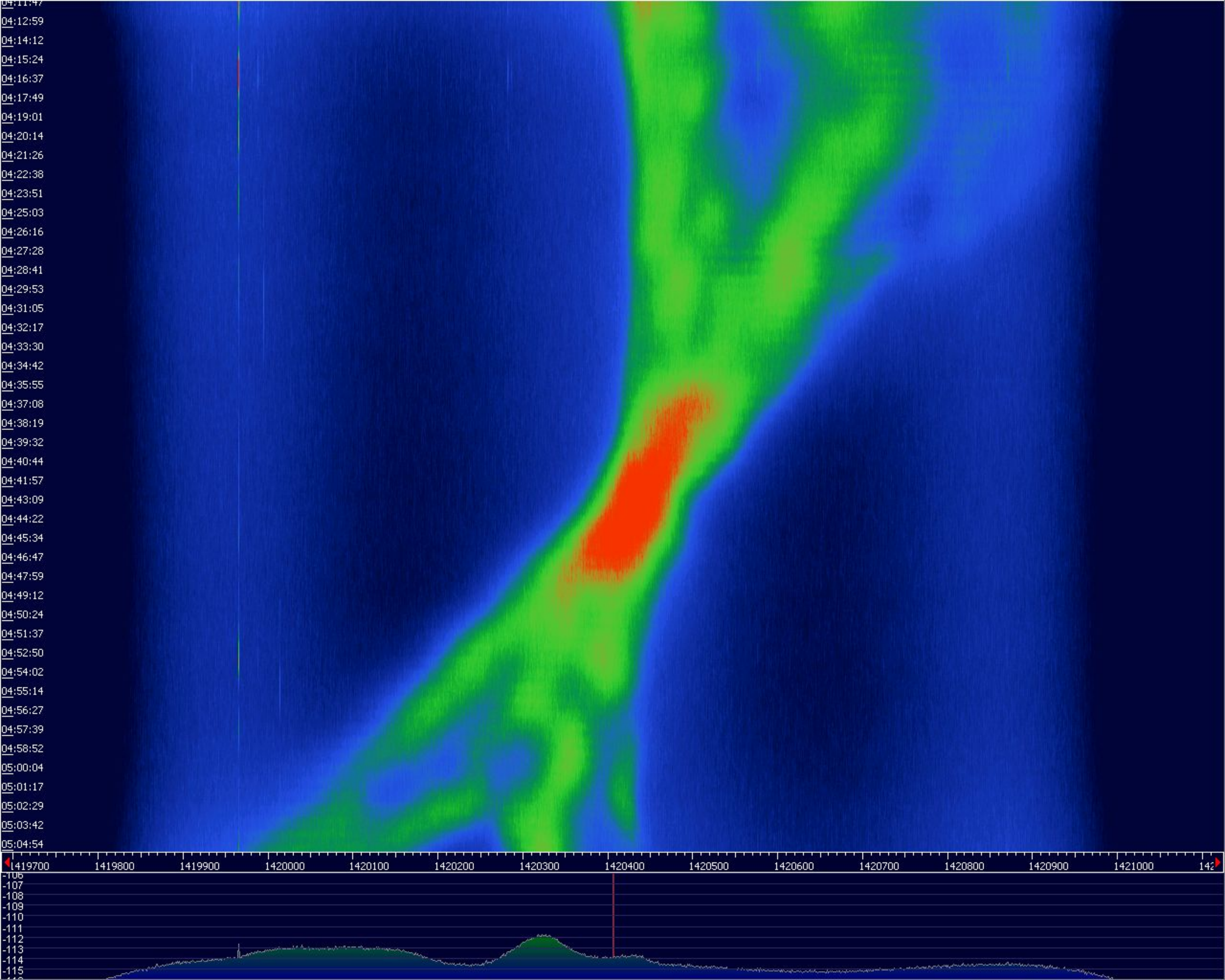
Griotte desert
1R0
1R2
1R5
1R8
2R2
2R7
3R3
3R9
4R7
5R6
6R8
8R2
10R
12R


9:50:14 PM
9:51:43 PM
9:53:13 PM
9:54:42 PM
9:56:12 PM
9:57:41 PM
9:59:11 PM
10:00:40 PM
10:02:10 PM
10:03:39 PM
10:05:09 PM
10:06:39 PM
10:08:09 PM
10:09:38 PM
10:11:08 PM
10:12:37 PM
10:14:06 PM
10:15:36 PM
10:17:06 PM
10:18:35 PM
10:20:05 PM
10:21:35 PM
10:23:05 PM
10:24:35 PM
10:26:05 PM
10:27:35 PM
10:29:05 PM
10:30:35 PM
10:32:05 PM
10:33:35 PM
10:35:04 PM
10:36:35 PM
10:38:06 PM
1419400
1419600
1419800
1420000
1420200
1420400
1420600
1420800
1421000
1421200
1421400
-115
-116
-117
-118
-119
-120
-121
-122
-123
-124


Recycle Bin
Slip
IrfanView
WPP EXE
Opera Mail
My Computer
WinSCP
9k6.ht
MAX+plus II 10.2 BAS...
BurnAware Free
Notepad
Stellarium
Opera
Shortcut to python.exe
PCB
zvezdar.py
PICPgm Program...
Safari
Shortcut to Orbitron.exe
HDSDR
Termite
mlekar.py
explorer
Shortcut to chronolap...
Flash Magic
New Folder
pic
a.bat
nbp
tene
ygCas .11.01
ChronoLapse by Keeyai
About
Capture
Schedule
Adjust
Annotate
PIP
Video
Audio
Time Between Captures: 60
Screenshots
Configure
Webcam
Configure
Stop Capture
Force Capture
Frames 1
Register Hotkey
Annotate:
HDSDR [default] version 2.70
Total Time Period (Speed)
Enter a new value in 'minutes' 5
OK
Cancel
1419800
1420600
1420800
1421000
-110
AM
ECSS
LO A 1420.406.000
Tune 1420.406.000
FreqMgr
ExtIO
Volume
Level
S-units Squelch
Soundcard [F5]
Bandwidth [F6]
Options [F7]
Help / Update [F1]
Full Screen [F11]
Stop [F2]
Minimize [F3]
Exit [F4]
NR
NB RF
NB IF
AFC
RF+37
Mute
AGC Off
Notch
ANotch
CW ZAP
CW Peak
CWFullBw
Despread
2016-11-01 19:42:28
CPU HDSDR: 33%
CPU Total: 45%
Waterfall
RBW 87.9 Hz
1024
Avg
Spectrum
Zoom
Speed
1000
2000
3000
4000
5000
-116
-117
-118
-119
-120
-121
-122
-123
-124
Waterfall
RBW 5.9 Hz
24
Avg
Spectrum
Zoom
Speed
Start
ChronoLapse by...
HDSDR [defa...
19:42


19:52:40
19:53:53
19:55:06
19:56:18
19:57:32
19:58:45
19:59:58
20:01:10
20:02:22
20:03:35
20:04:48
20:06:00
20:07:13
20:08:25
20:09:37
20:10:49
20:12:02
20:13:14
20:14:27
20:15:40
20:16:52
20:18:04
20:19:17
20:20:29
20:21:41
20:22:53
20:24:04
20:25:17
20:26:29
20:27:42
20:28:54
20:30:06
20:31:19
20:32:31
20:33:43
20:34:56
20:36:08
20:37:20
20:38:32
20:39:44
20:40:57
20:42:09
20:43:22
20:44:34
1419700
1419800
1419900
1420000
1420100
1420200
1420300
1420400
1420500
1420600
1420700
1420800
1420900
1421000
-107
-108
-109
-110
-111
-112
-113
-114
-115


21:44:47
21:45:59
21:47:12
21:48:24
21:49:37
21:50:50
21:52:02
21:53:15
21:54:27
21:55:40
21:56:52
21:58:04
21:59:17
22:00:29
22:01:41
22:02:53
22:04:05
22:05:18
22:06:31
22:07:43
22:08:56
22:10:08
22:11:20
22:12:33
22:13:45
22:14:57
22:16:09
22:17:21
22:18:33
22:19:46
22:20:58
22:22:11
22:23:23
22:24:35
22:25:48
22:27:01
22:28:13
22:29:25
22:30:38
22:31:50
22:33:03
22:34:15
22:35:28
22:36:41
1419700
1419800
1419900
1420000
1420100
1420200
1420300
1420400
1420500
1420600
1420700
1420800
1420900
1421000
-106
-107
-108
-109
-110
-111
-112
-113
-114
-115


04:11:47
04:12:59
04:14:12
04:15:24
04:16:37
04:17:49
04:19:01
04:20:14
04:21:26
04:22:38
04:23:51
04:25:03
04:26:16
04:27:28
04:28:41
04:29:53
04:31:05
04:32:17
04:33:30
04:34:42
04:35:55
04:37:08
04:38:19
04:39:32
04:40:44
04:41:57
04:43:09
04:44:22
04:45:34
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04:51:37
04:52:50
04:54:02
04:55:14
04:56:27
04:57:39
04:58:52
05:00:04
05:01:17
05:02:29
05:03:42
05:04:54
1419700
1419800
1419900
1420000
1420100
1420200
1420300
1420400
1420500
1420600
1420700
1420800
1420900
1421000
-106
-107
-108
-109
-110
-111
-112
-113
-114
-115

ChronoLapse by Keeyai

About

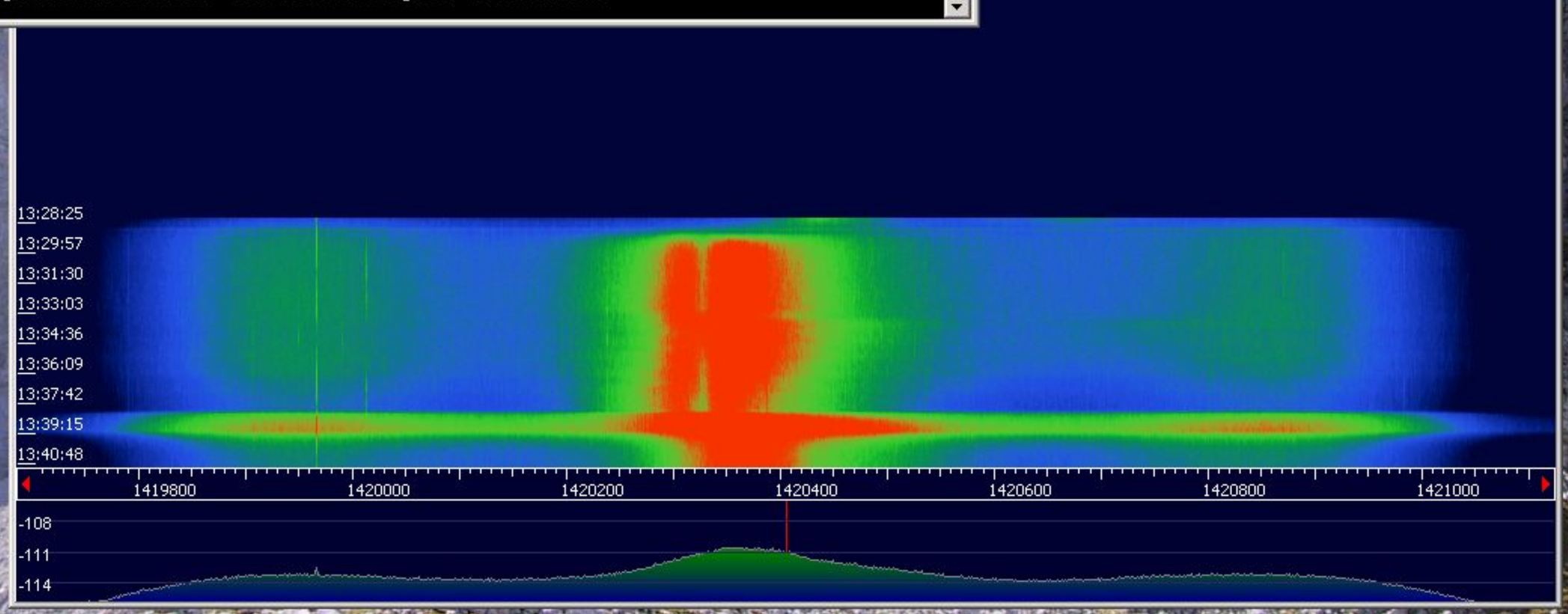
Capture | Schedule | Adjust | Annotate | PIP | Video | Audio

Time Between Captures: 60

Screenshots Configure

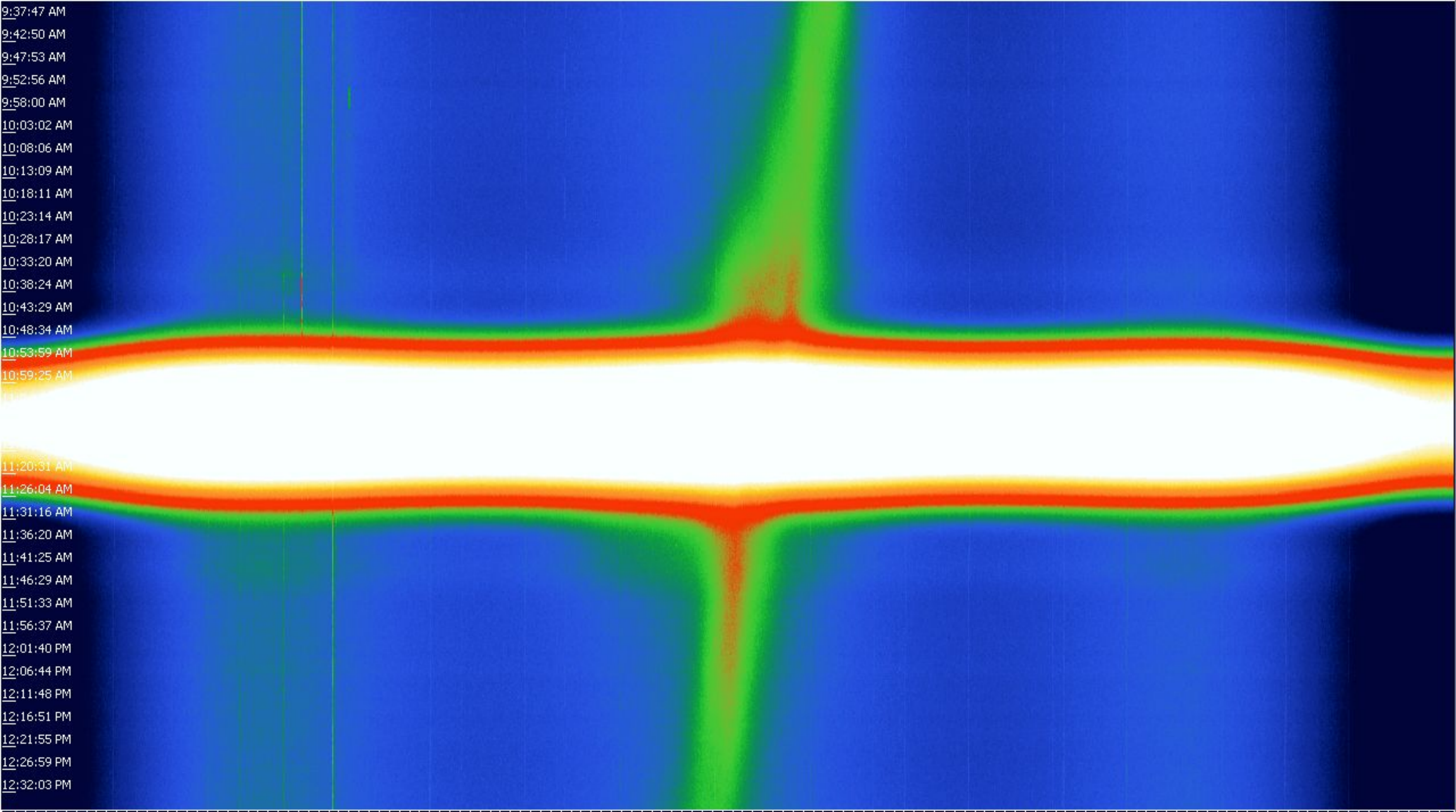
C:\Anaconda2\python.exe

```
8 Deneb  72.6/55.9
9 Sadr  83.5/57.2
10 Scutum 158.3/33.4
11 Polaris   0.6/45.4
12 Arcturus 250.9/43.3
13 Spica 239.6/12.0
14 Vega 111.1/74.6
15 Altair 127.6/41.3
16 Regulus 291.6/-3.9
17 Mizar 305.9/52.1
18 Procyon 319.5/-30.5
19 Eta Puppis 293.0/-54.0
20 Mirphak  18.7/ 9.2
21 Sagittarius A 175.8/15.1
22 Cygnus A  86.3/61.4
23 Cassiopeia A  41.0/37.9
24 Crab Nebula 124.2/55.8
25 3C400 131.4/49.7
26 Nebula Orion A 355.5/-49.4
Izberi zvezdo: 21
2016-11-2 13:40:24 Sagittarius A 175.8/15.1 Vrtiljak
Popravki 175.5/15.0> 6.7 Ukaz vrtiljaku: &*EL=006.72
2016-11-2 13:40:49 Sagittarius A 175.9/15.1 Vrtiljak
Popravki 175.6/15.0> 6.7 Ukaz vrtiljaku: &*AZ=175.60
```



Recycle Bin
Slip
IrfanView
WPP EXE
Opera Mail
My Computer
WinSCP
9k6.ht
MAX+plus II 10.2 BAS...
BurnAware Free
Notepad
Stellarium
Opera
Shortcut to python.exe
PCB
zvezdar.py
PICPgm Program...
Safari
Shortcut to Orbitron.exe
HDSDR
Termite
mlekar.py
explorer
Shortcut to chronolap...
Flash Magic
New Folder
pic
a.bat
nbp
tene
ygCas .11.01

Start | HDSDR [default... | ChronoLapse by... | C:\Anaconda... | EN | « | 13:40


9:37:47 AM
9:42:50 AM
9:47:53 AM
9:52:56 AM
9:58:00 AM
10:03:02 AM
10:08:06 AM
10:13:09 AM
10:18:11 AM
10:23:14 AM
10:28:17 AM
10:33:20 AM
10:38:24 AM
10:43:29 AM
10:48:34 AM
10:53:59 AM
10:59:25 AM
11:20:31 AM
11:26:04 AM
11:31:16 AM
11:36:20 AM
11:41:25 AM
11:46:29 AM
11:51:33 AM
11:56:37 AM
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12:06:44 PM
12:11:48 PM
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12:21:55 PM
12:26:59 PM
12:32:03 PM
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1419800
1419900
1420000
1420100
1420200
1420300
1420400
1420500
1420600
1420700
1420800
1420900
1421000
-108
-111
-114
-117

SDR# v1.0.0.1337 - IQ Imbalance: Gain = 1.000 Phase = 0.000°

1.420.400.000

Source

RTL-SDR / USB

Radio

Audio

AGC

FFT Display

View: Both

Window: Blackman-Harris 4

Resolution: 65536

Time markers

Gradient ...

Mark Peaks

Smoothing

S-Attack

S-Decay

W-Attack

W-Decay

Spectrum

Speed

Zoom FFT *

Noise Blanker *

Digital Noise Reduction *

VJ [0760]

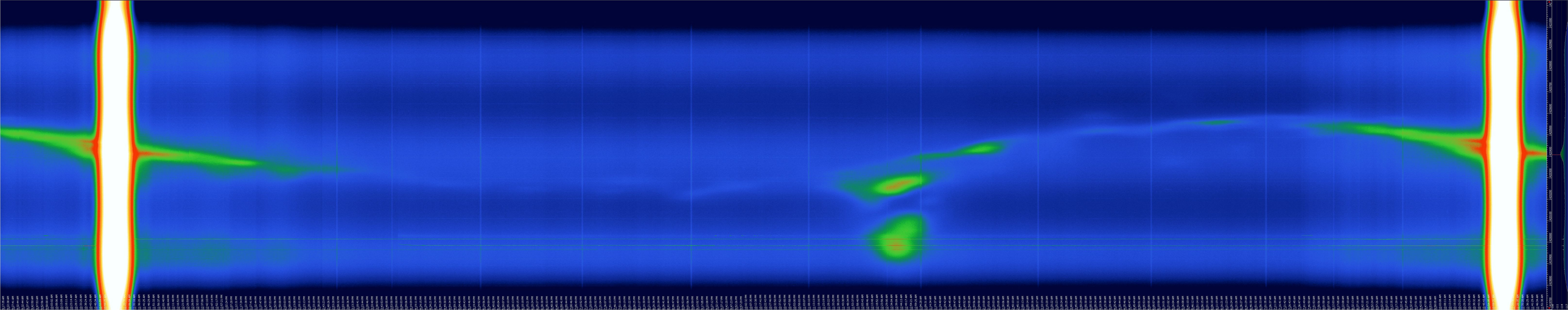
-30 -31 -32 -33 -34 -35 -36 -37 -38 -39 -40

1.419 600G 1.419 900G 1.420 200G 1.420 500G 1.420 800G 1.421 100G 1.421 400G

Zoom

Contrast

Range

Offset

Start SDR# v1.0.0.1337 - I... 6:58 AM