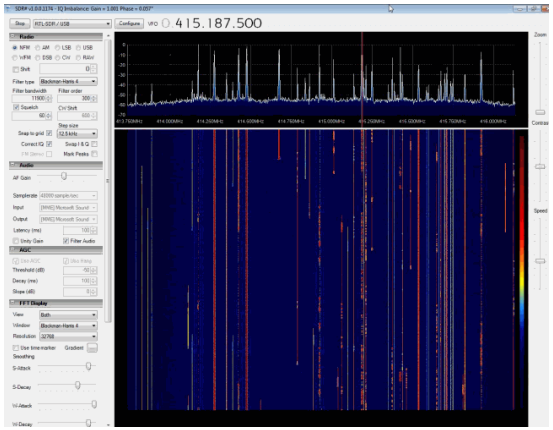
“CHIAVETTE SDR”
Seconda Parte

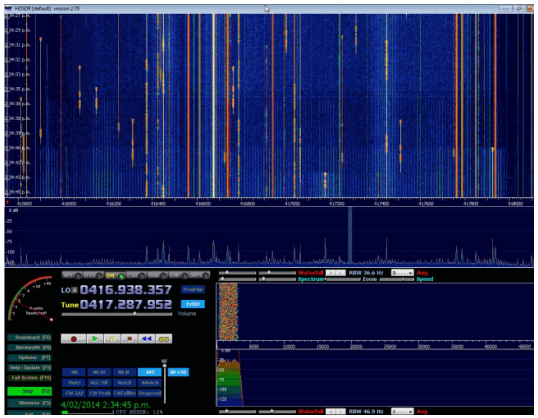
Software & Applicazioni & Idee

Andrea Borgnino IW0HK

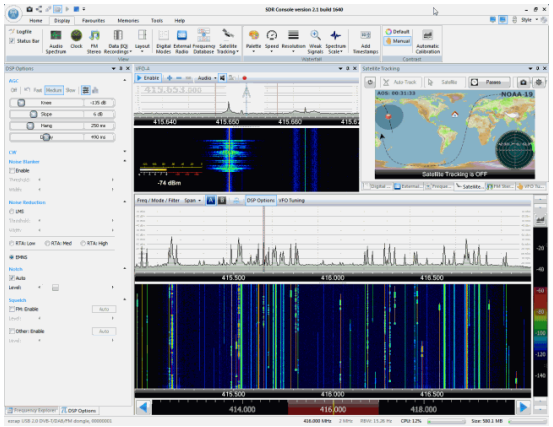
- SDR#



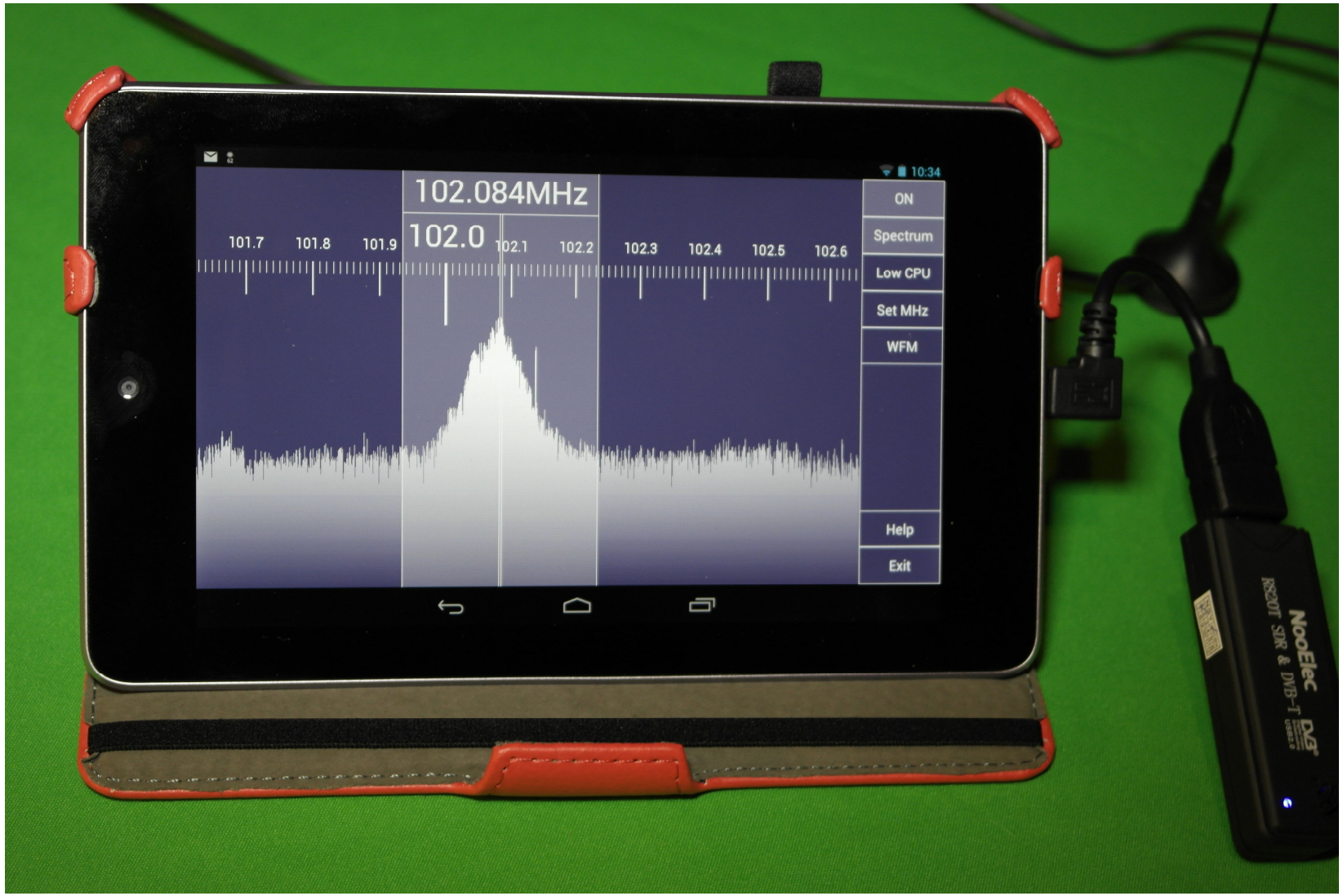
- HDSDR



- SDR RADIO 2.0

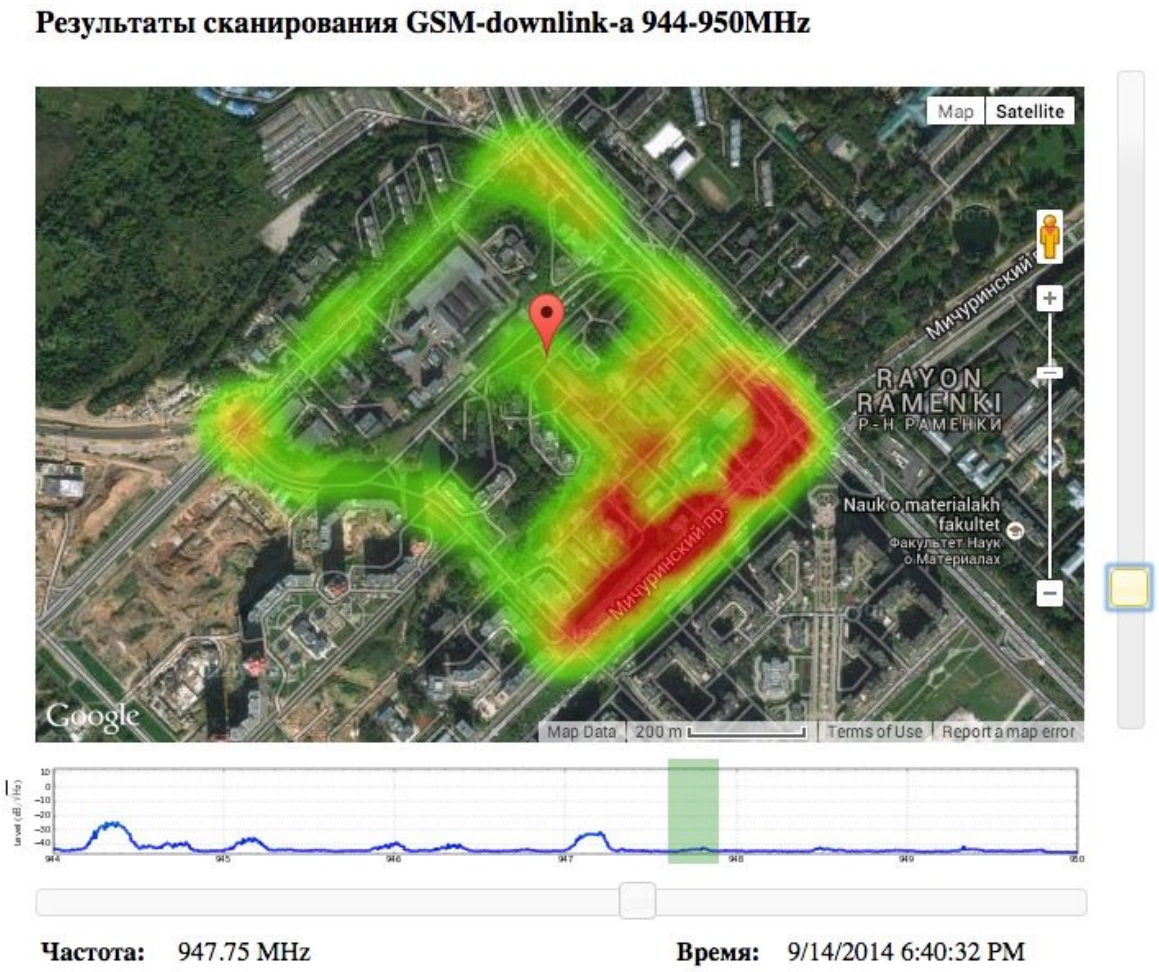


Sdr Touch: Android SDR

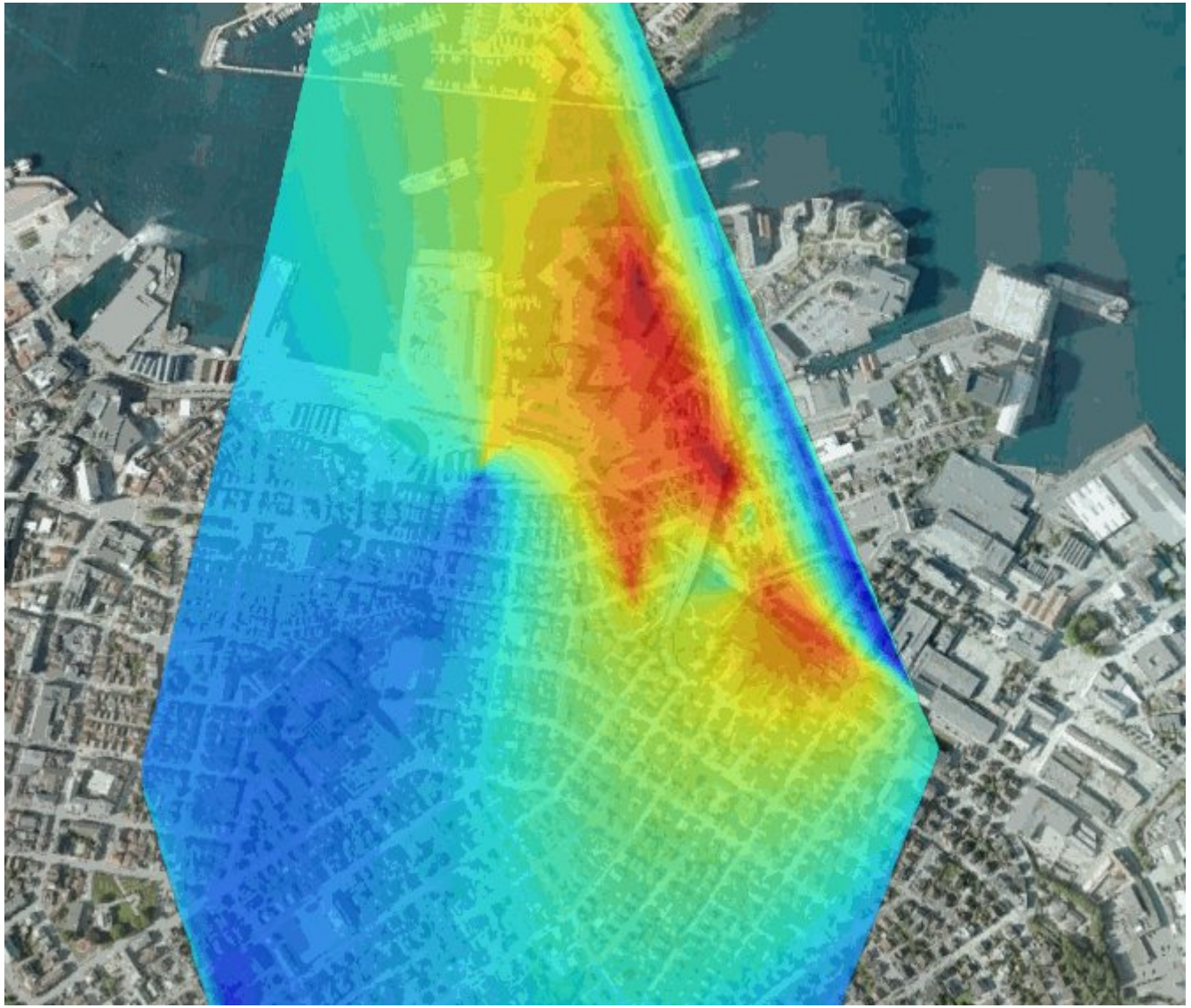


Sdr Touch: Android SDR

Eartoearoak's rtl-sdr scanner create a heatmap of signal strengths

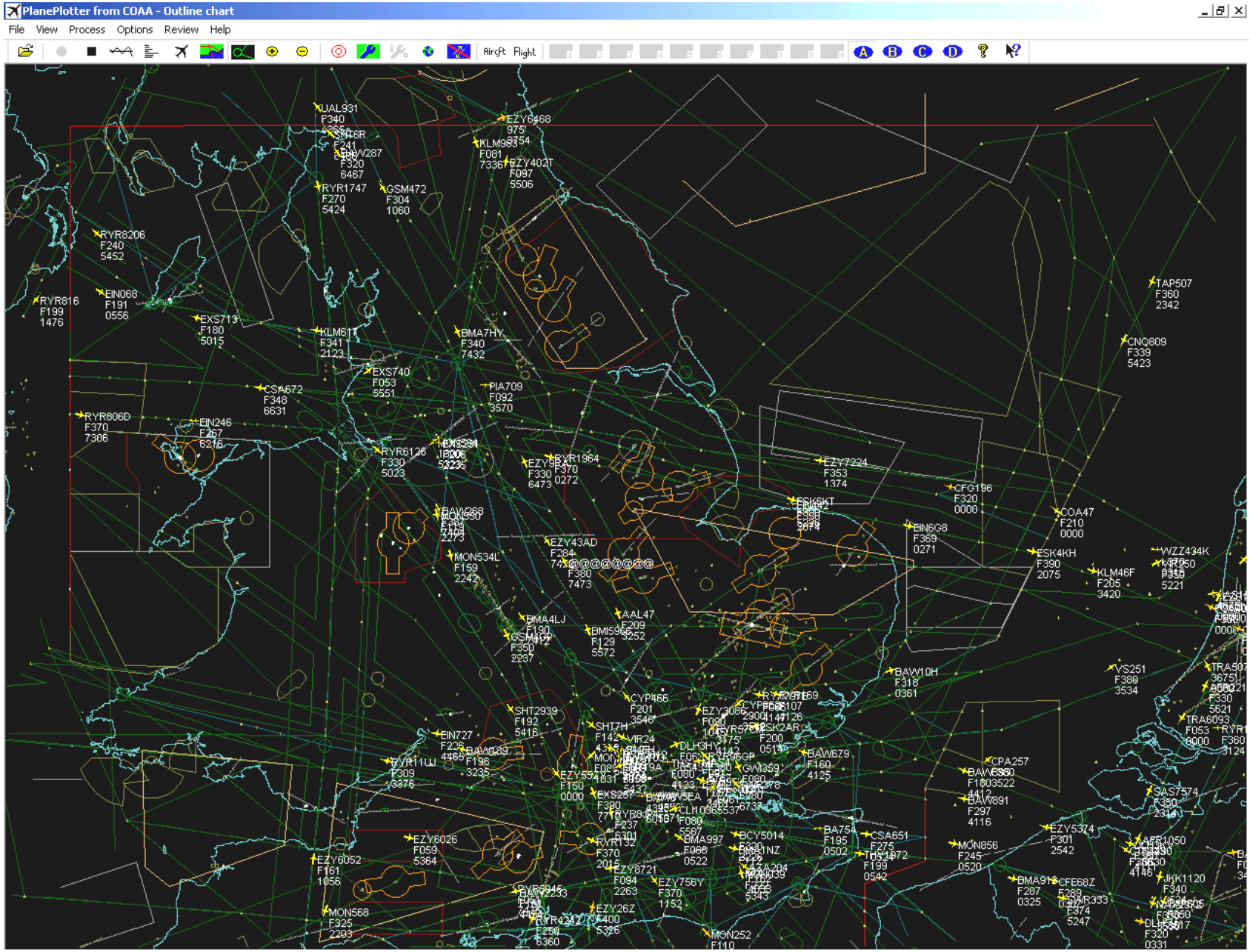


Triangulation of a VHF signal



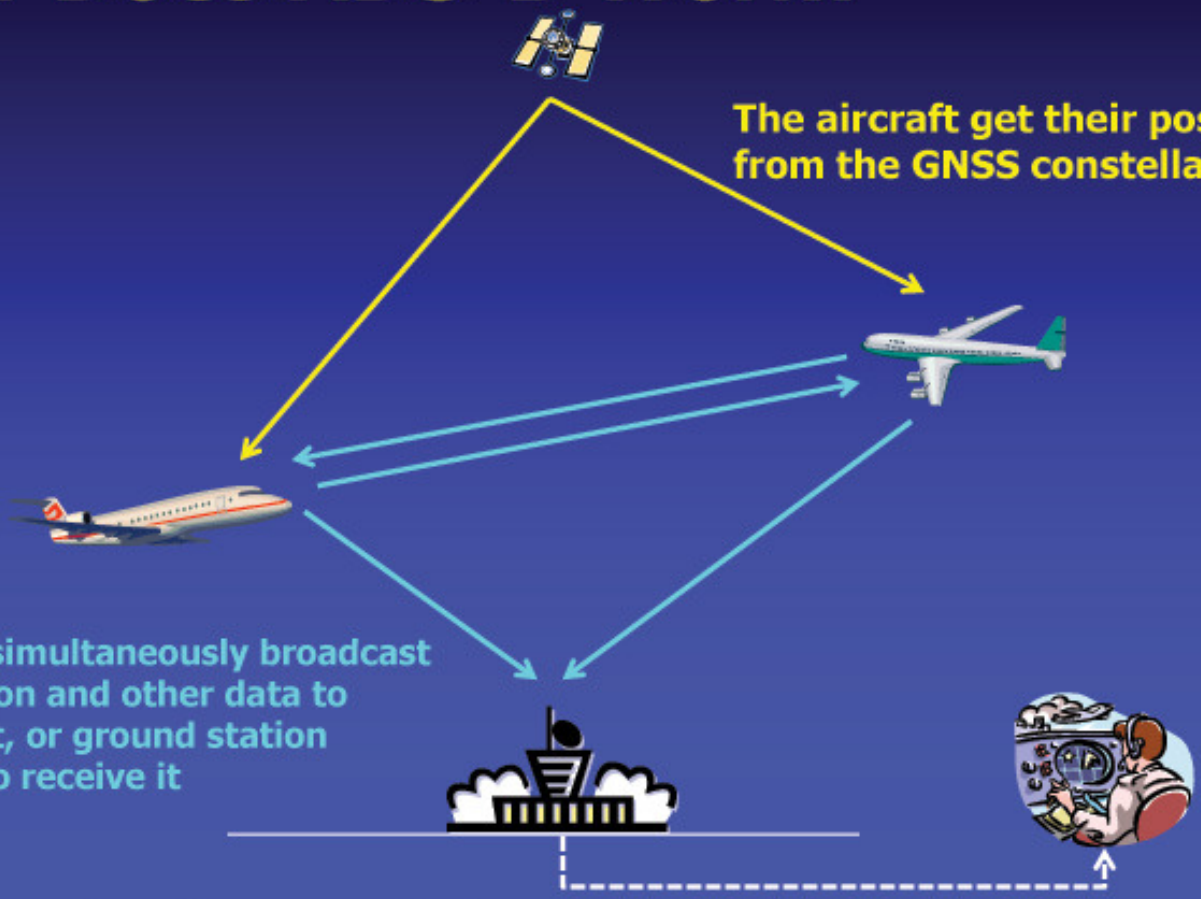
Triangulation of a VHF signal

- RTL-SDR TV dongle (http://sdr.osmocom.org/trac/wiki/rtl-sdr)
- GPS receiver (NMEA or GPSd compatible)
- rtlsdr-scanner (http://eartoearoak.com/software/rtlsdr-scanner)

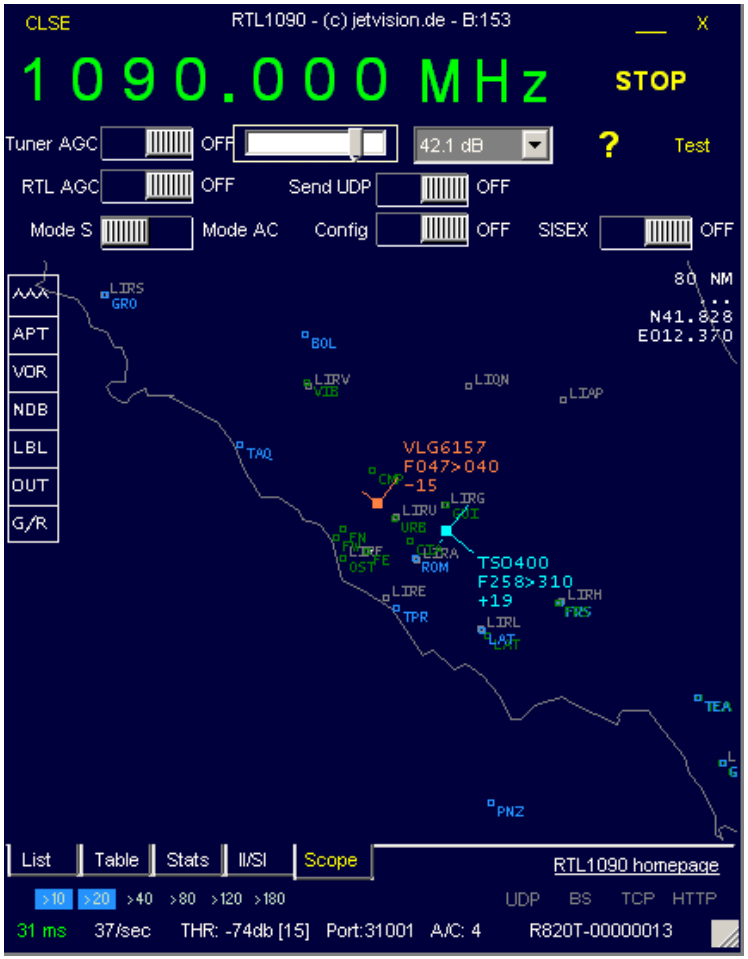

PlanePlotter from COAA - Outline chart
File View Process Options Review Help
Aircft Flight
UAL931 F340
EZY6468 975
KLM963 F081 7336
EZY402T F097 5506
RYR1747 F270 5424
GSM472 F304 1060
RYR8206 F240 5452
RYR816 F199 1476
EIN068 F191 0556
EXS713 F180 5015
KLM617 F341 2123
BMA7HY F340 7432
EXS740 F053 5551
CSA672 F348 6631
PIA709 F092 3570
RYR806D F370 7306
EIN246 F267 6216
RYR6126 F330 5023
RYR1964 F370 0272
EZY7224 F353 1374
CFG196 F320 0000
COA47 F210 0000
EIN6G8 F369 0271
ESK4KH F390 2075
KLM46F F205 3420
WZZ434K
TAP507 F360 2342
CNQ809 F339 5423
MON534L F159 2242
EZY43AD F284 F380 7473
AAL47 F209 3252
BMA4LJ F190
BMI596 F129 5572
BAW10H F318 0361
VS251 F380 3534
CYP466 F201 3546
SHT2939 F192 5416
EIN727
RYR11UJ F309 3376
BAW679 F160 4125
CPA257
BAW891 F297 4116
SAS7574
EZY6026 F059 5364
EZY6052 F161 1056
MON568 F325 2203
BMA997 F066 0522
BCY5014
BA754 F195 0502
CSA651 F275
MON856 F245 0520
EZY5374 F301 2542
JKK1120 F340
EZY8721 F094 2263
EZY756Y F370 1152
EZY26Z
MON252 F110
For Help, press F1
1531/0/13510
14:29:43UTC

ADS-B Technologies

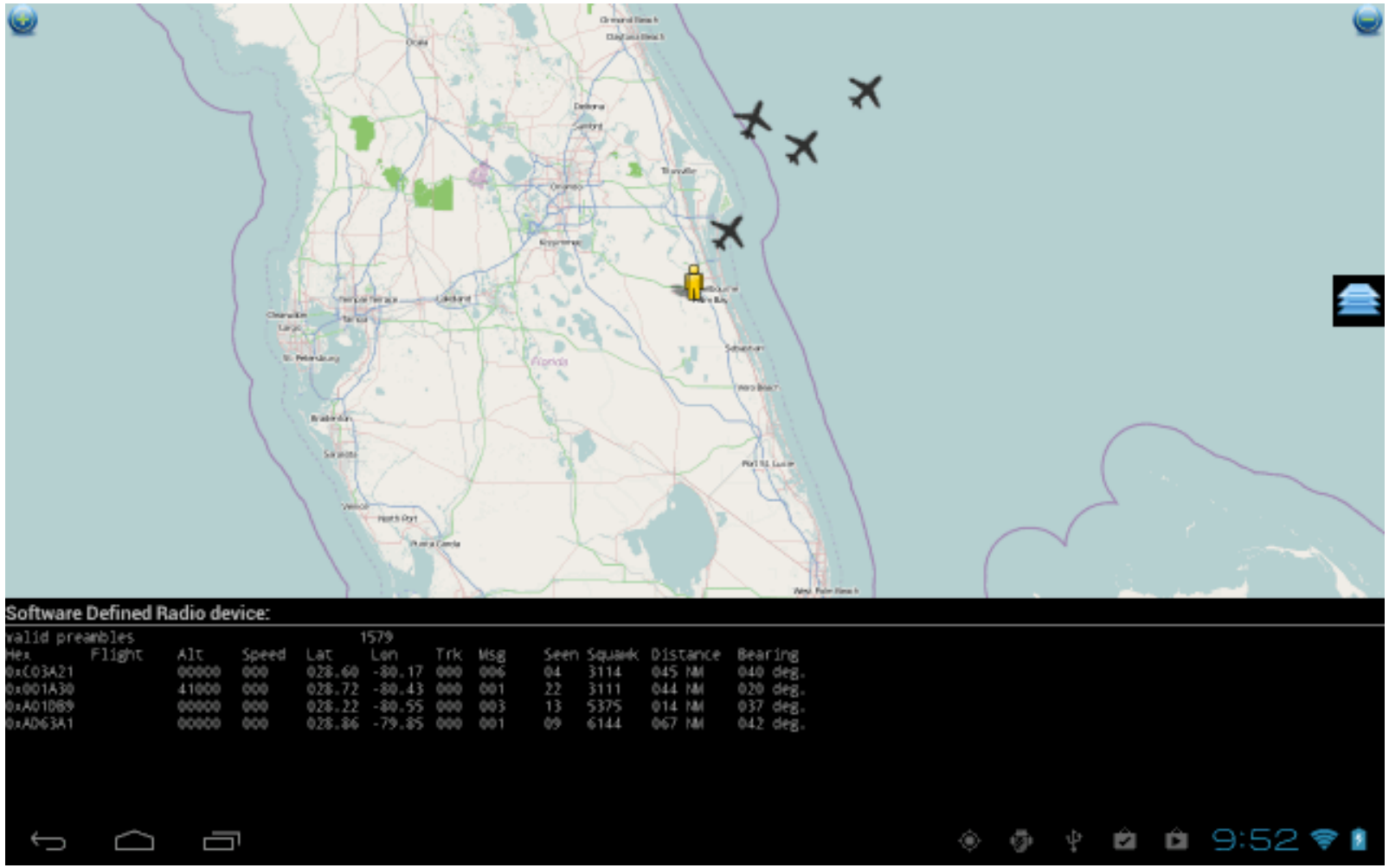
How Does ADS-B Work?

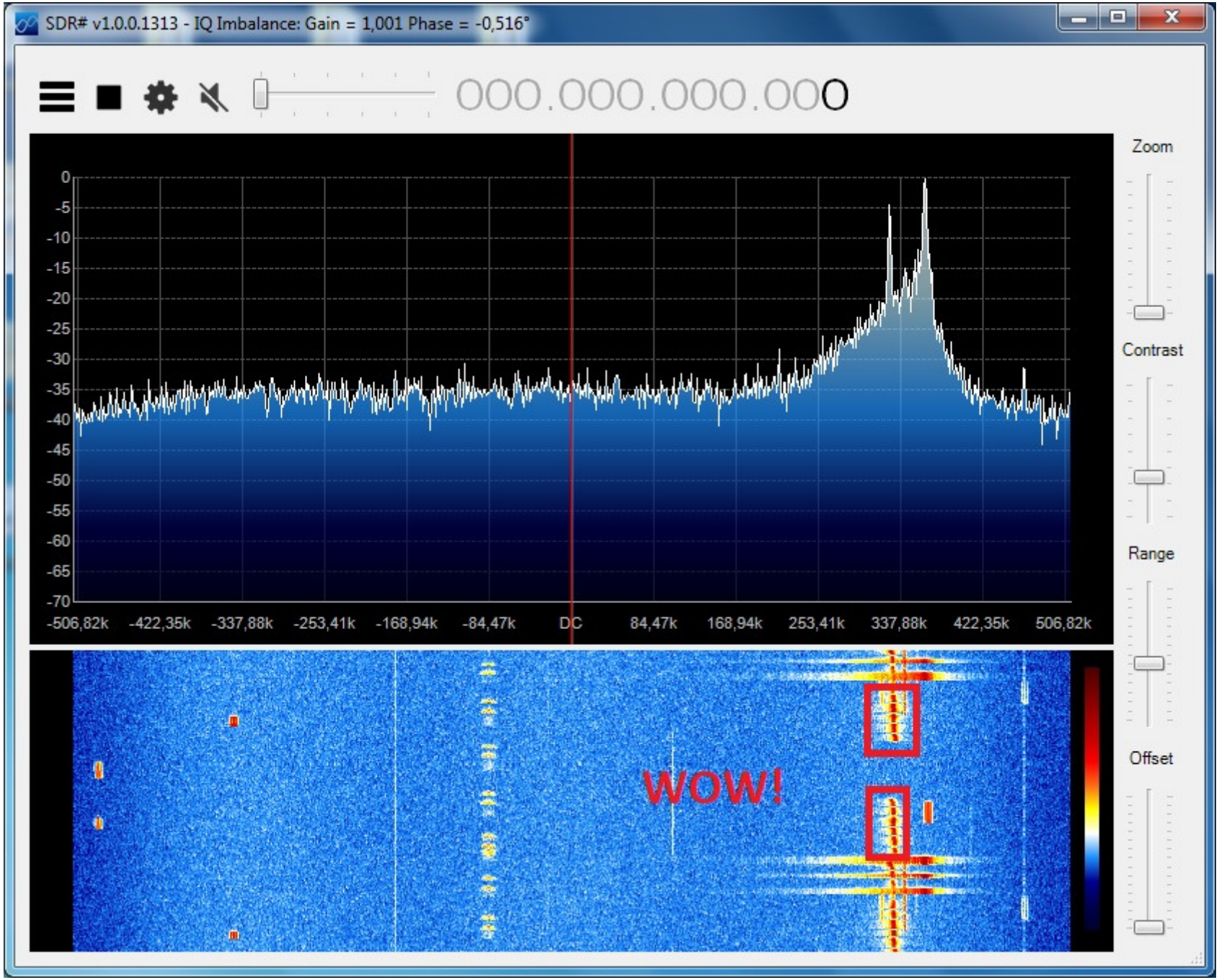


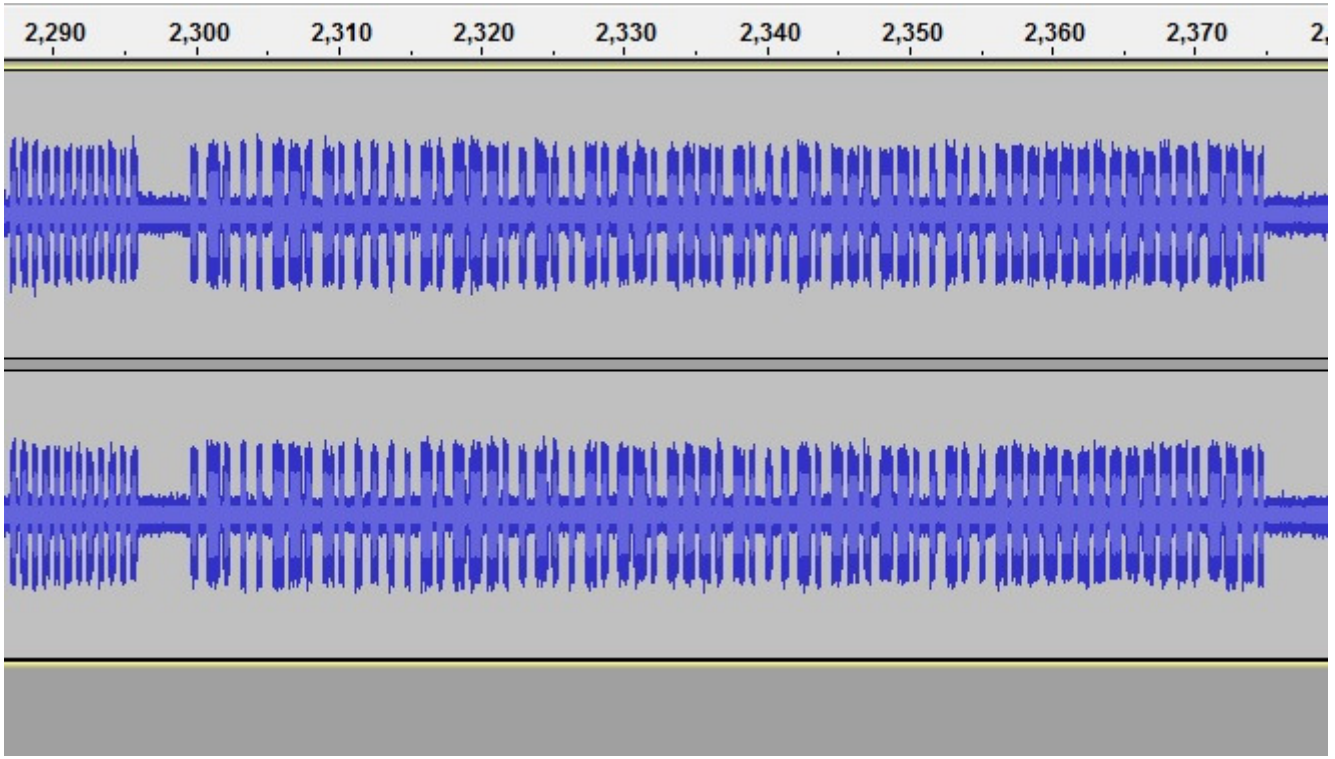
Ads-B minimale

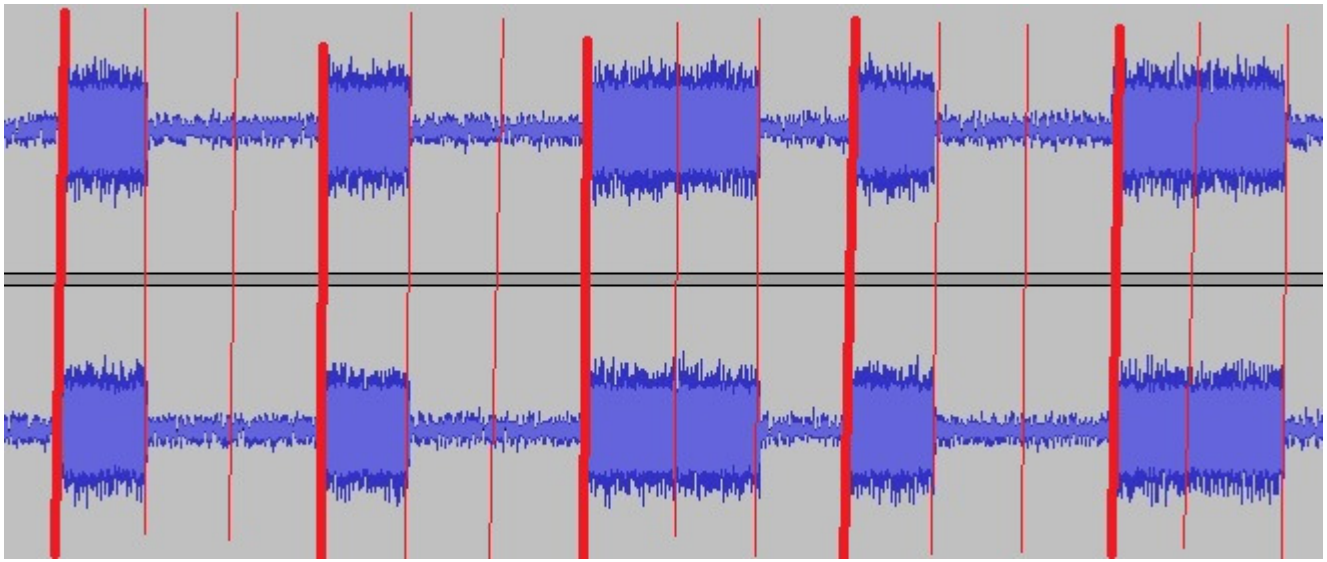


ADS-B Android on USB SDR RTL



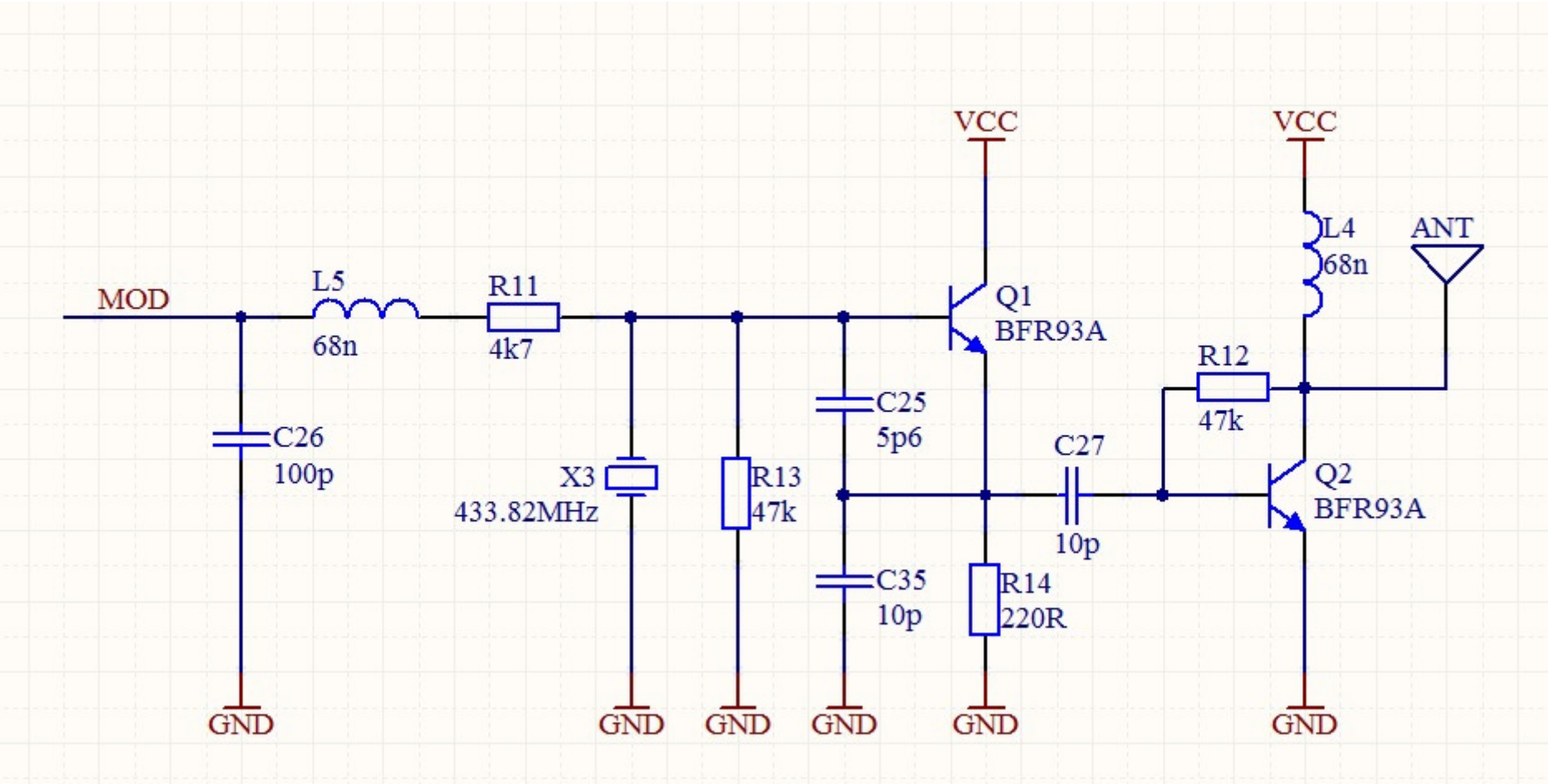

SDR# v1.0.0.1313 - IQ Imbalance: Gain = 1,001 Phase = -0,516°
000.000.000.000
Zoom
Contrast
Range
Offset
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
-506,82k
-422,35k
-337,88k
-253,41k
-168,94k
-84,47k
DC
84,47k
168,94k
253,41k
337,88k
422,35k
506,82k
WOW!

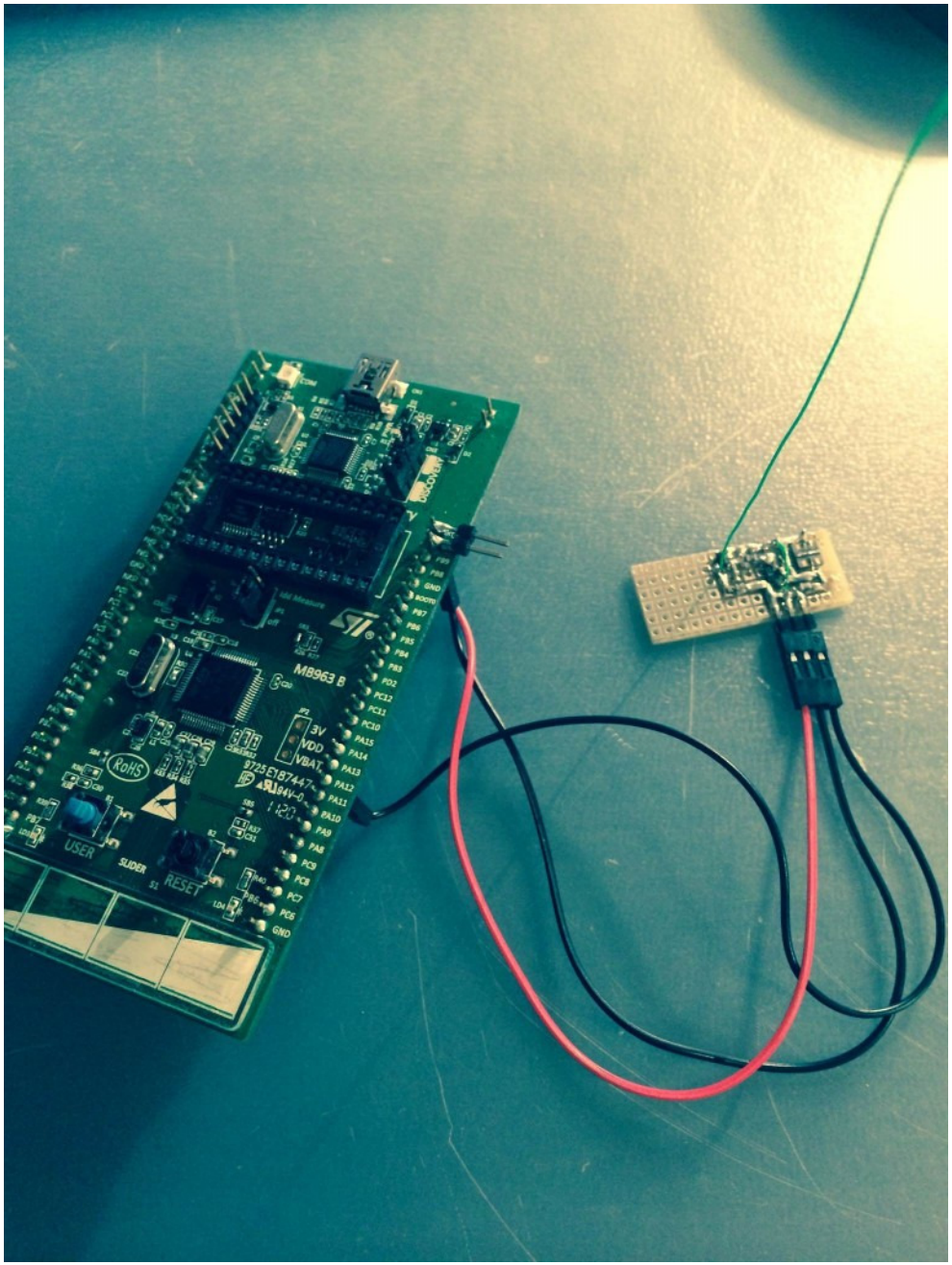

2,290
2,300
2,310
2,320
2,330
2,340
2,350
2,360
2,370



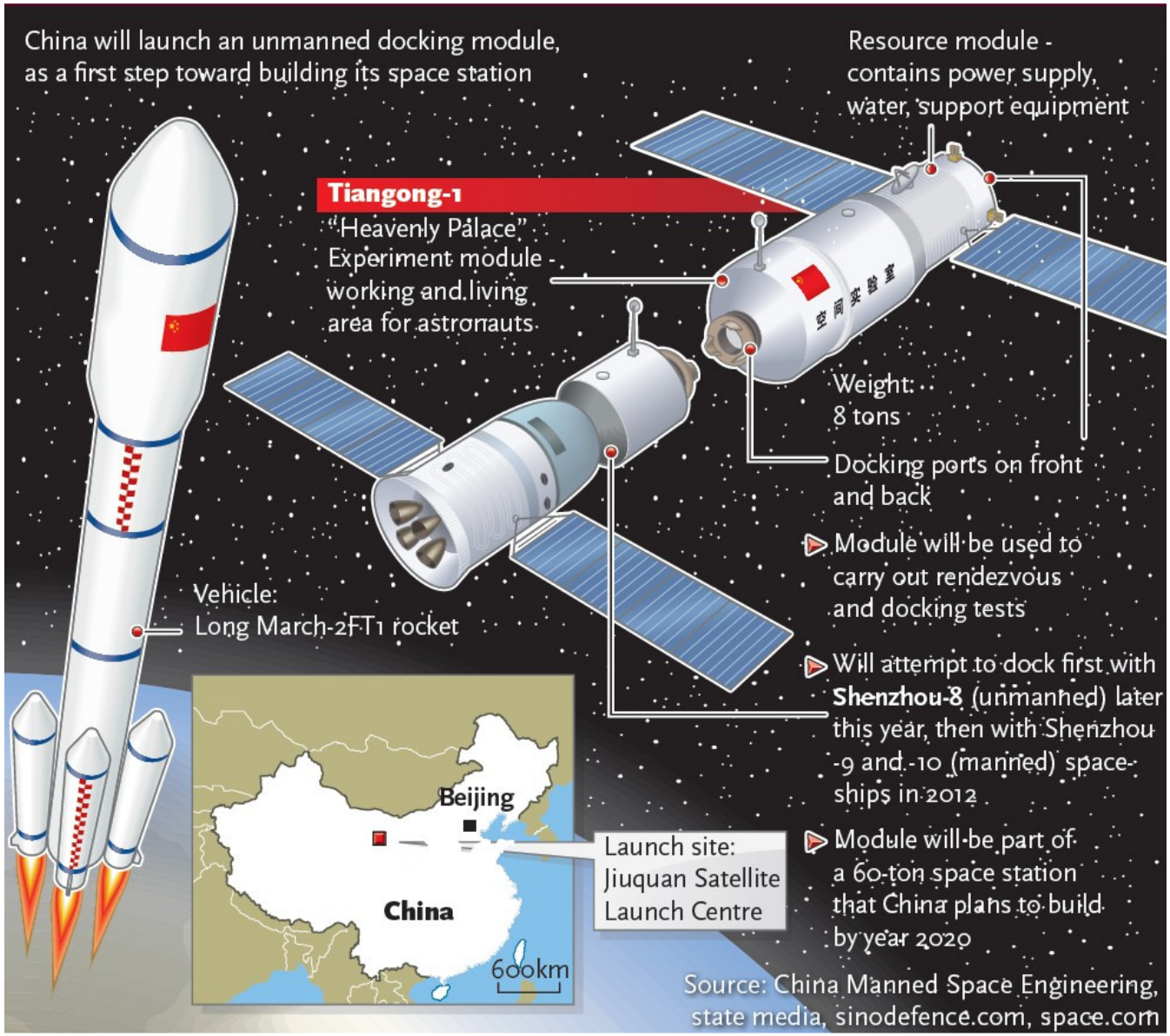
On-off keying modulation

- mportant signal parameters that one should write down:
- bit rate – duration of a single ‘bit’ – 380us
- preamble length – 24 bits (1010101….)
- radio ‘silence’ length – 9 bits (funny number, I know, but there is more funny numbers to come..)
- bit sequence – sequence of dits and dashes…
- interval between emitted frames – 105 ms

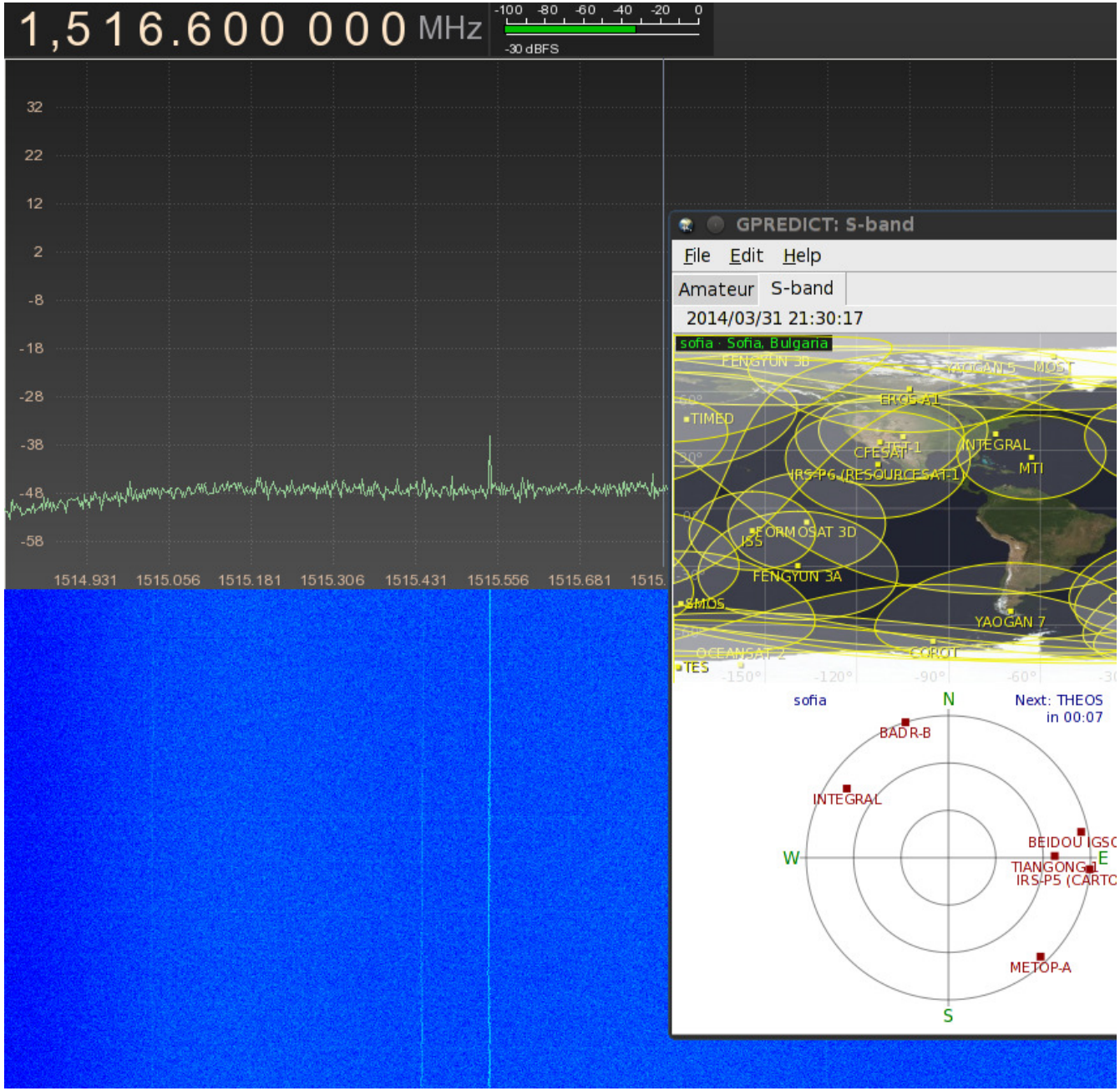

MOD
L5
68n
R11
4k7
C26
100p
X3
433.82MHz
R13
47k
C25
5p6
C35
10p
VCC
Q1
BFR93A
R14
220R
C27
10p
VCC
L4
68n
ANT
R12
47k
Q2
BFR93A
GND
GND
GND
GND
GND
GND


MB963 B
3V
VDD
VBAT
RoHS
USER
SLIDER
RESET

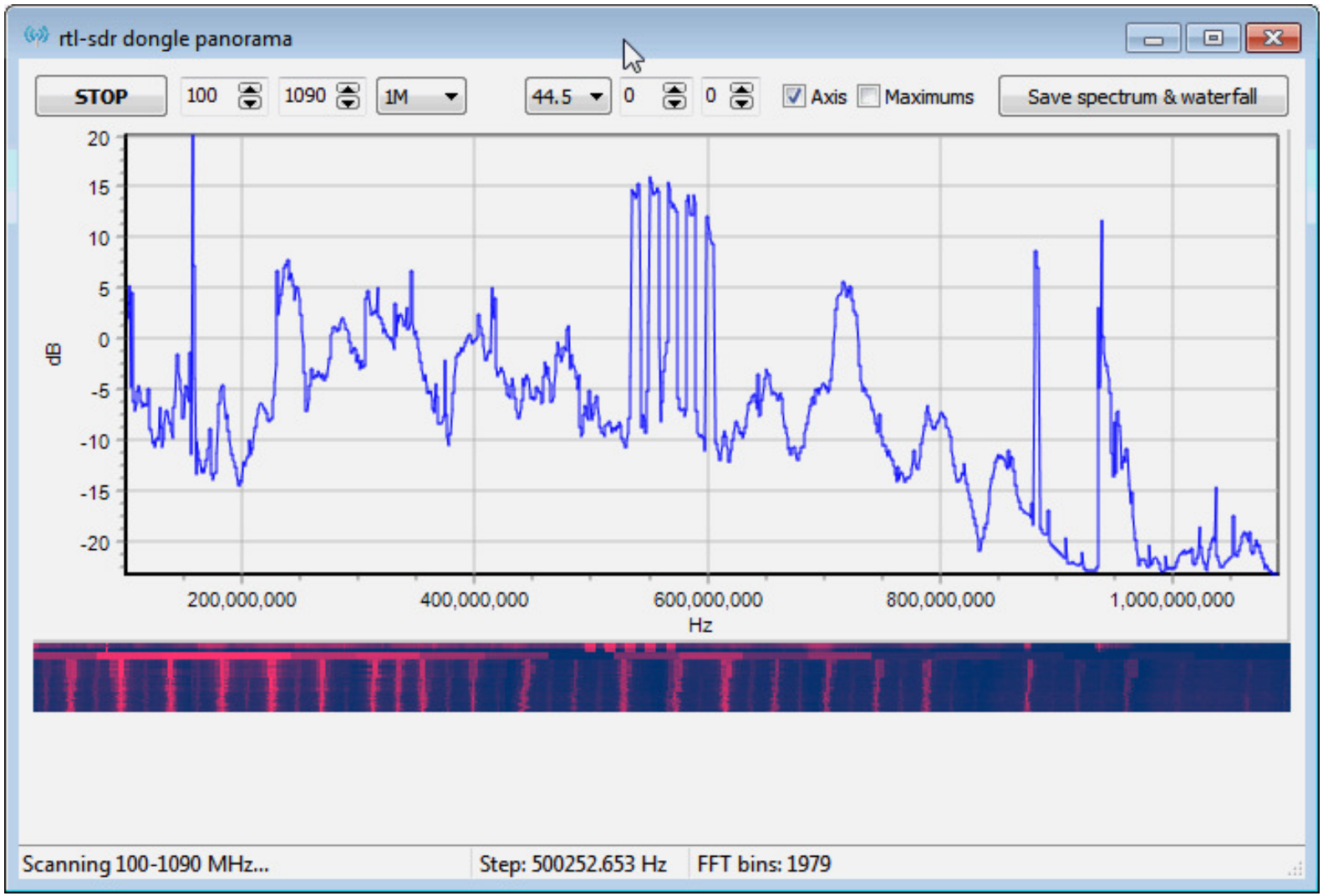
Tiangong-1


China will launch an unmanned docking module, as a first step toward building its space station
Resource module - contains power supply, water, support equipment
Tiangong-1
"Heavenly Palace"
Experiment module - working and living area for astronauts
Weight: 8 tons
Docking ports on front and back
Module will be used to carry out rendezvous and docking tests
Will attempt to dock first with Shenzhou-8 (unmanned) later this year, then with Shenzhou -9 and -10 (manned) space-ships in 2012
Module will be part of a 60-ton space station that China plans to build by year 2020
Vehicle: Long March-2F-T1 rocket
Beijing
China
600km
Launch site: Jiuquan Satellite Launch Centre
Source: China Manned Space Engineering, state media, sinodefence.com, space.com

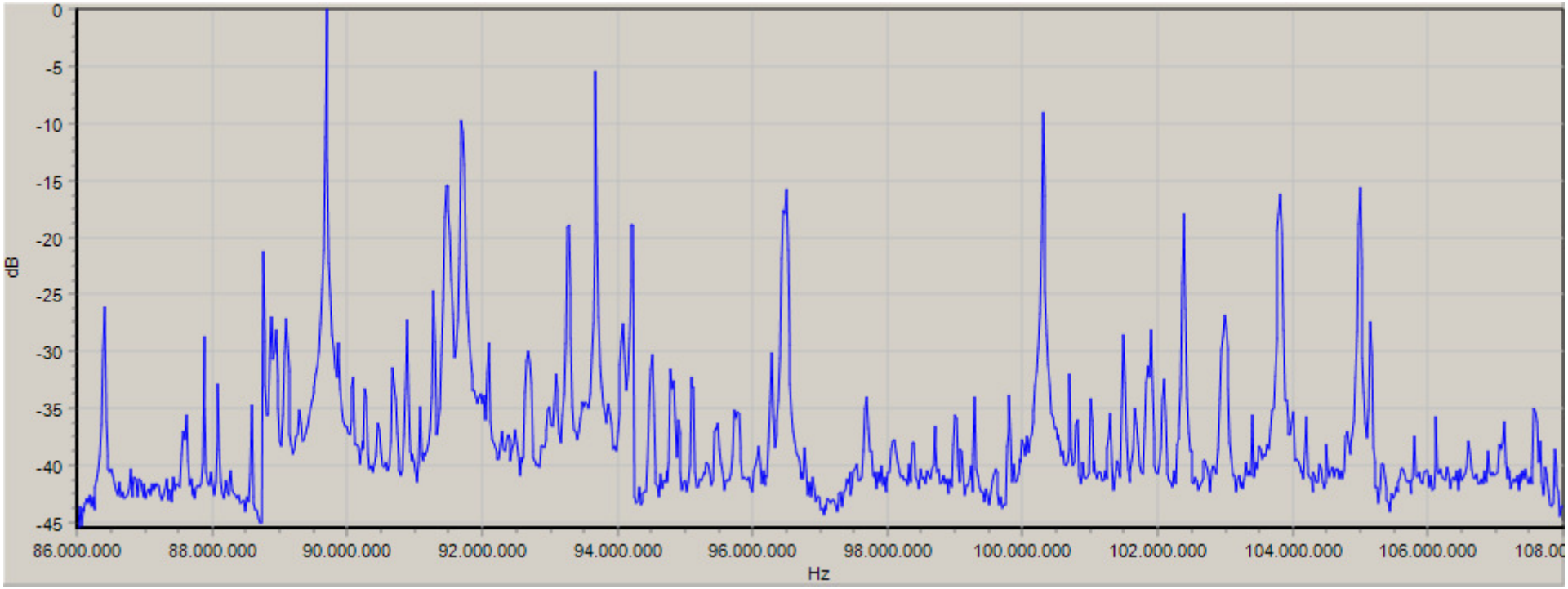
Un beacon a 2232.15 MHz


1,516.600 000 MHz
-100 -80 -60 -40 -20 0
-30 dBFS
32
22
12
2
-8
-18
-28
-38
-48
-58
1514.931 1515.056 1515.181 1515.306 1515.431 1515.556 1515.681 1515.
GPREDICT: S-band
File Edit Help
Amateur S-band
2014/03/31 21:30:17
sofia - Sofia, Bulgaria
FENGYUN 3B
YAOGAN 5
MOST
ERGS-A1
TIMED
CFESAT
TEF-1
INTEGRAL
MTI
IRS-P6 (RESOURCESAT-1)
FORMOSAT 3D
ISS
FENGYUN 3A
SMOS
YAOGAN 7
OCEANSAT-2
COROT
TES
-150° -120° -90° -60°
sofia
Next: THEOS
in 00:07
N
W
E
S
BADR-B
INTEGRAL
BEIDOU IGSC
TIANGONG-1
IRS-P5 (CARTC
METOP-A

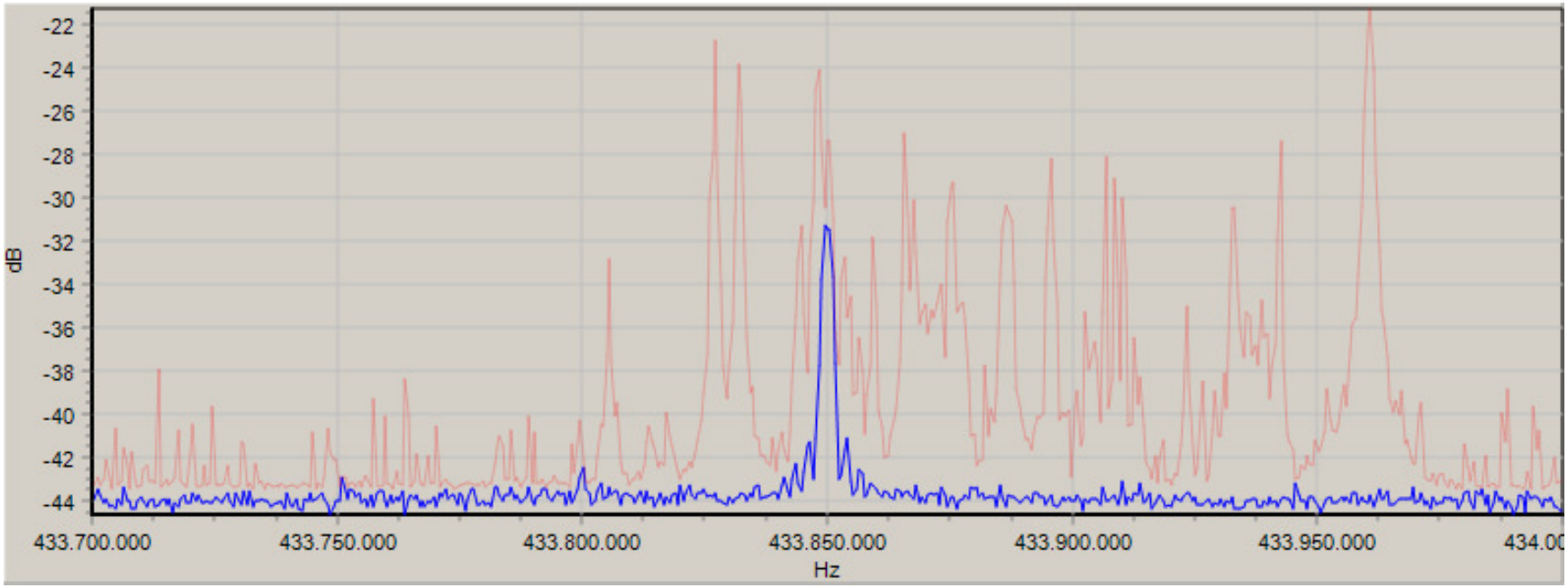
Scanner


rtl-sdr dongle panorama
STOP
100
1090
1M
44.5
0
0
Axis
Maximums
Save spectrum & waterfall
20
15
10
5
0
-5
-10
-15
-20
dB
200,000,000
400,000,000
600,000,000
800,000,000
1,000,000,000
Hz
Scanning 100-1090 MHz...
Step: 500252.653 Hz
FFT bins: 1979

Banda FM


0
-5
-10
-15
-20
-25
-30
-35
-40
-45
dB
86.000.000
88.000.000
90.000.000
92.000.000
94.000.000
96.000.000
98.000.000
100.000.000
102.000.000
104.000.000
106.000.000
Hz

Short Range Devices (SRD)



Tv Sharp

TVSharp
Tuner
Device
E4000
Generic RTL2832U (e.g. hama nano)
SampleRate
1.951047 MSPS ntsc
AGC
Tuner
RTL
Program
Gain
42 dB
Brightnes
Frequency correction
Auto correction
-94
Roughly
Fine
Contrast
Position correction
Auto
X
Y
Sto
p
Frequency
591.250
591.25

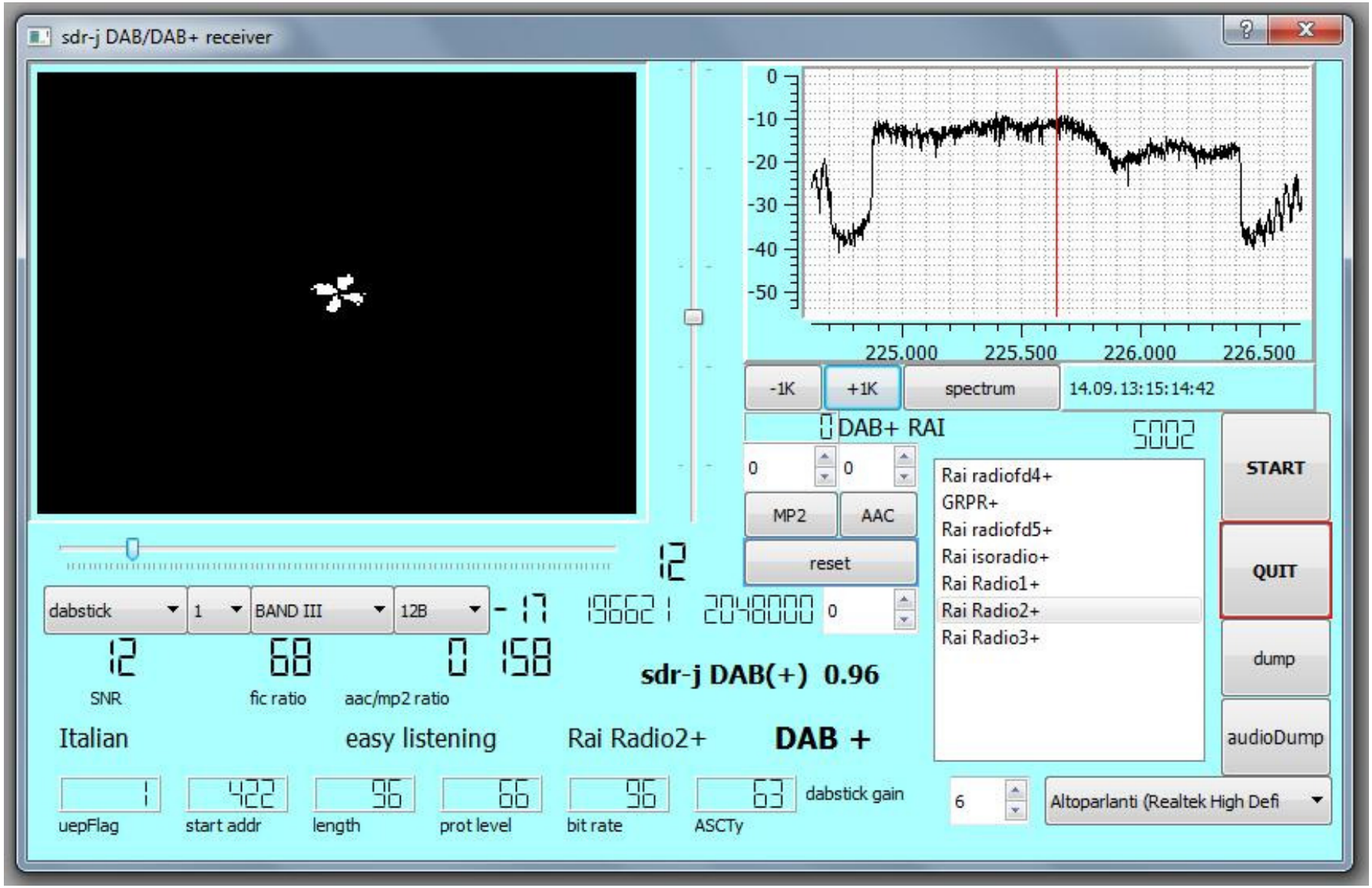
Dab Player

Pegel
Pegel
Min / Max
Anzeige
Linear
Logarithmisch
DAB-Info
Ensemble
FIC
MSC
FIC-Datenrate
FIG-Statistik
Multiplex-Konfiguration
CU-Belegung
FIC-Daten speichern ...
SNR-Info
SNR: 28,2dB
Min.: 26,0dB / ø: 29,3dB / Max.: 31,4dB
Slideshow
Gotye feat. Kimbra
Somebody That I Used To Know
Slideshow-Cache
67.JPG
68.JPG
69.JPG
70.JPG
71.JPG
72.JPG
13 Element(e), 173 KB
ANTENNE BAYERN
Senderspeicher...
Suchlauf...
Popmusik
STEREO
HE-AAC v1
80 kbit/s
EEP 3-A
Signal: OK
SNR: 28,2dB
ANTENNE BAYERN
229,072 MHz
Bayern
Sonntag, 23. März 2014, 11:07
Technische Fragen? hotline@antenne.de
Gotye feat. Kimbra - Somebody That I Used To Know
SMS ins Sendestudio: 8888
Gotye feat. Kimbra - Somebody That I Used To Know
Sie hören ANTENNE BAYERN
Titel: Somebody That I Used To Know
Künstler: Gotye feat. Kimbra
Sender: ANTENNE BAYERN
Homepage: www.antenne.de
SlideShow starten
Journaline starten
0%
100%
Journaline
ANTENNE BAYERN
ANTENNE BAYERN Info News
ABY Journaline Verkehr
ABY Journaline Blitzer
ABY Journaline ADAC Infos

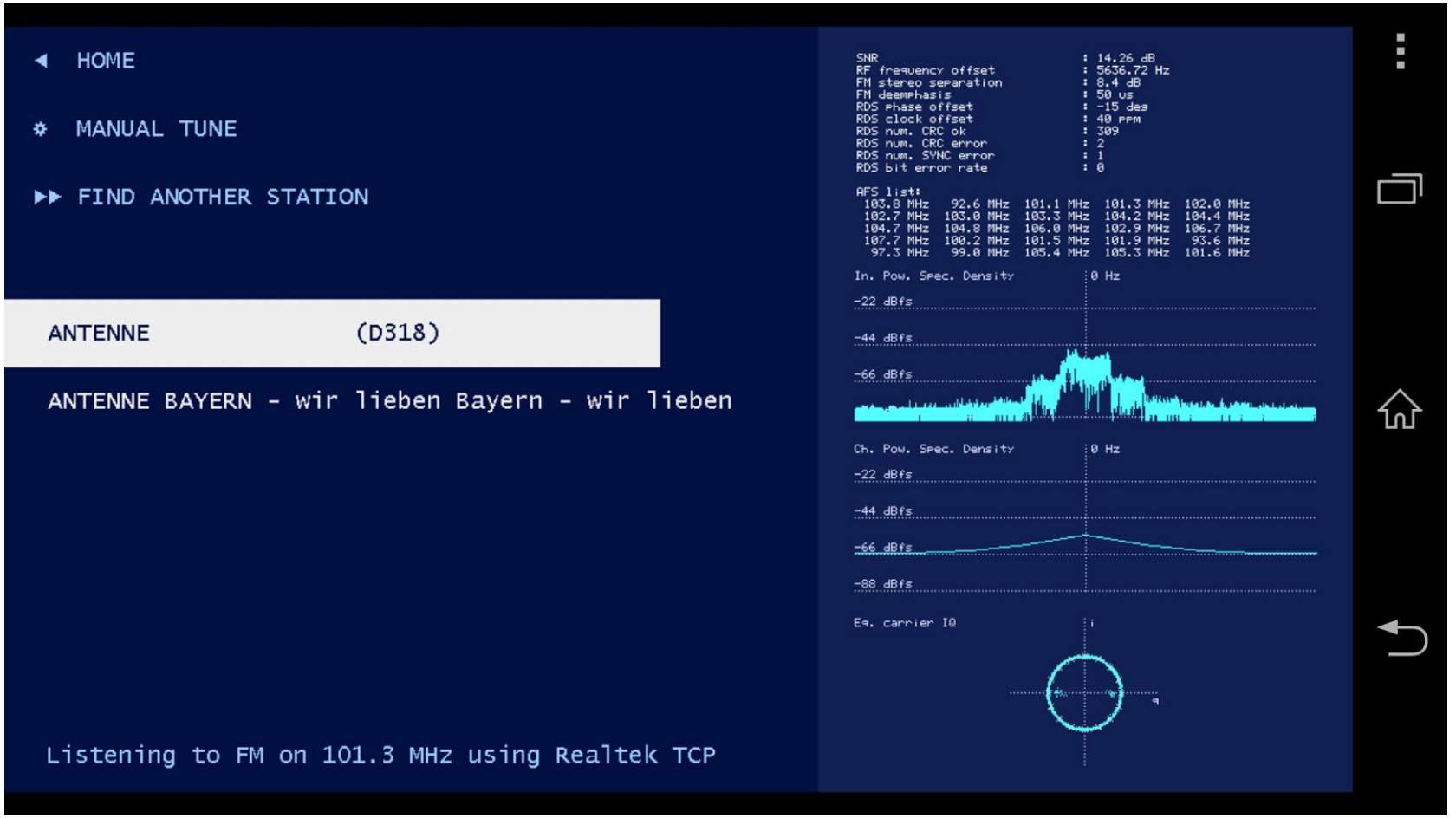
Dab Player

RVaticana Europ
RVaticana Europ
RVaticana Ita +
RVaticana Italia
RVaticana World
RVaticana World
EuroDAB Italia
RTL 102.5 +
RTL 102.5 Cool
RTL 102.5 Rock
RTL Classic
RTL Groove
RTL Guardia Cos
RTL ItalianStyle
RTL ViaRadio
RVaticana Ita +
Radio Italia SMI
Radio Orbital
Radio Padania
DAB+ RAI
GRPR+
Rai Radio1+
Rai Radio2+
Rai Radio2+
Liste des stations ...
Recherche ...
12B
I
STEREO
AAC-LC
96 ko/s
EEP 2-A
Signal: OK
SNR: 28,8dB
Rai Radio2+
225,648 MHz
DAB+ RAI
samedi 19 avril 2014, 16:05
16:05:39 In Siria. Liberati 4 giornalisti francesi. Il capo di al Quaeda: "Fronte comune con
16:05:25 ...Stasera la veglia a San Pietro. E il Papa prega per le vittime del naufragio in
16:05:07 Crocifissi dalla crisi. Un teologo e un economista commentano la Via Crucis del
DynamicLabel+ indisponible.
Démarrer SlideShow
0%
100%
DAB Player v1.0.2.65
Slideshow
Rai radio2
DAB-Info
Ensemble
FIC
MSC
Bloc: 12B
Fréquence: 225,648 MHz
Mode DAB: I
Ensemble: DAB+ RAI
Ensemble-ID: 0x5002
ECC: 0xE0
SNR: 28,8dB
33dB
0dB
Sauvegarder les données baseband
Twitter / H
Downloads
Bookmarks
History
Add-ons
Sync

Sdr-J DAB

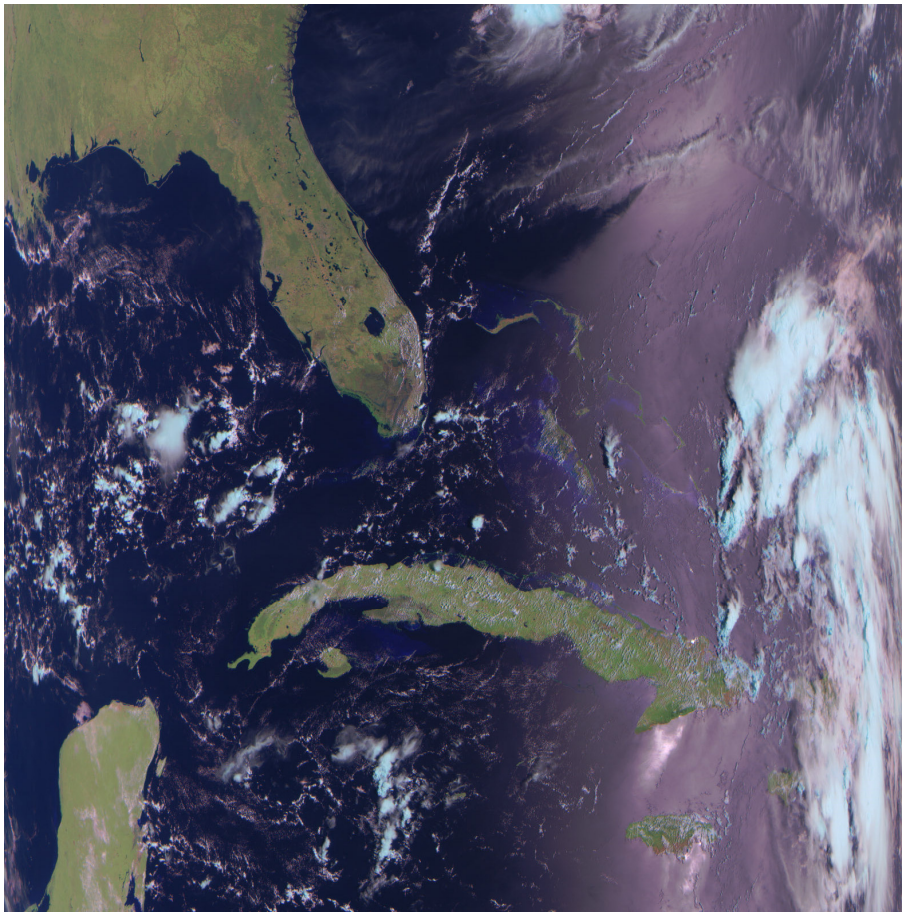

sdr-j DAB/DAB+ receiver
0
-10
-20
-30
-40
-50
225.000
225.500
226.000
226.500
-1K
+1K
spectrum
14.09.13:15:14:42
DAB+ RAI
5002
MP2
AAC
reset
Rai radiofd4+
GRPR+
Rai radiofd5+
Rai isoradio+
Rai Radio1+
Rai Radio2+
Rai Radio3+
START
QUIT
dump
audioDump
dabstick
BAND III
12B
SNR
fic ratio
aac/mp2 ratio
sdr-j DAB(+) 0.96
Italian
easy listening
Rai Radio2+
DAB +
uepFlag
start addr
length
prot level
bit rate
ASCTy
dabstick gain
Altoparlanti (Realtek High Defi

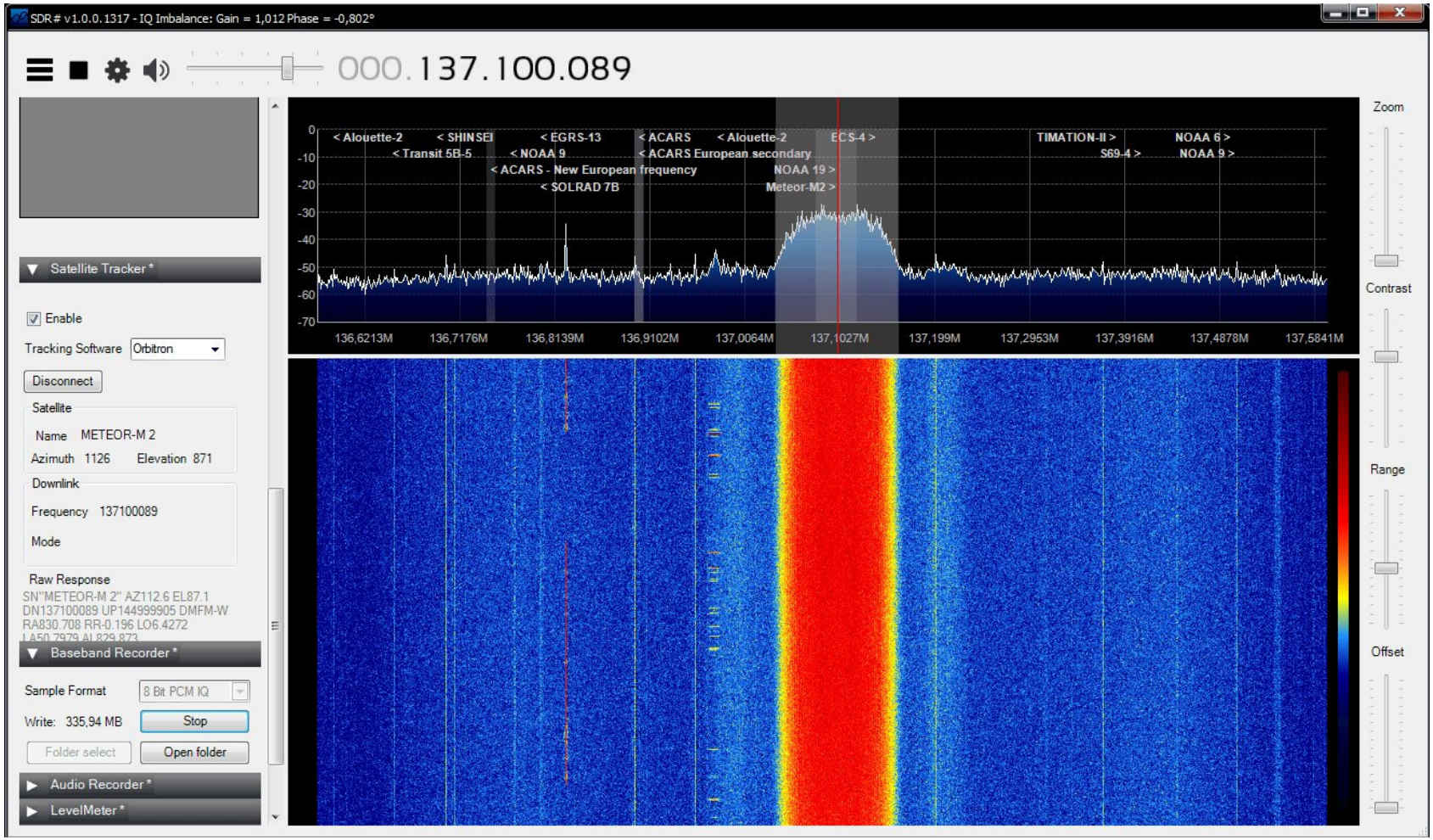
Wavesink Plus DAB/FM/DRM+

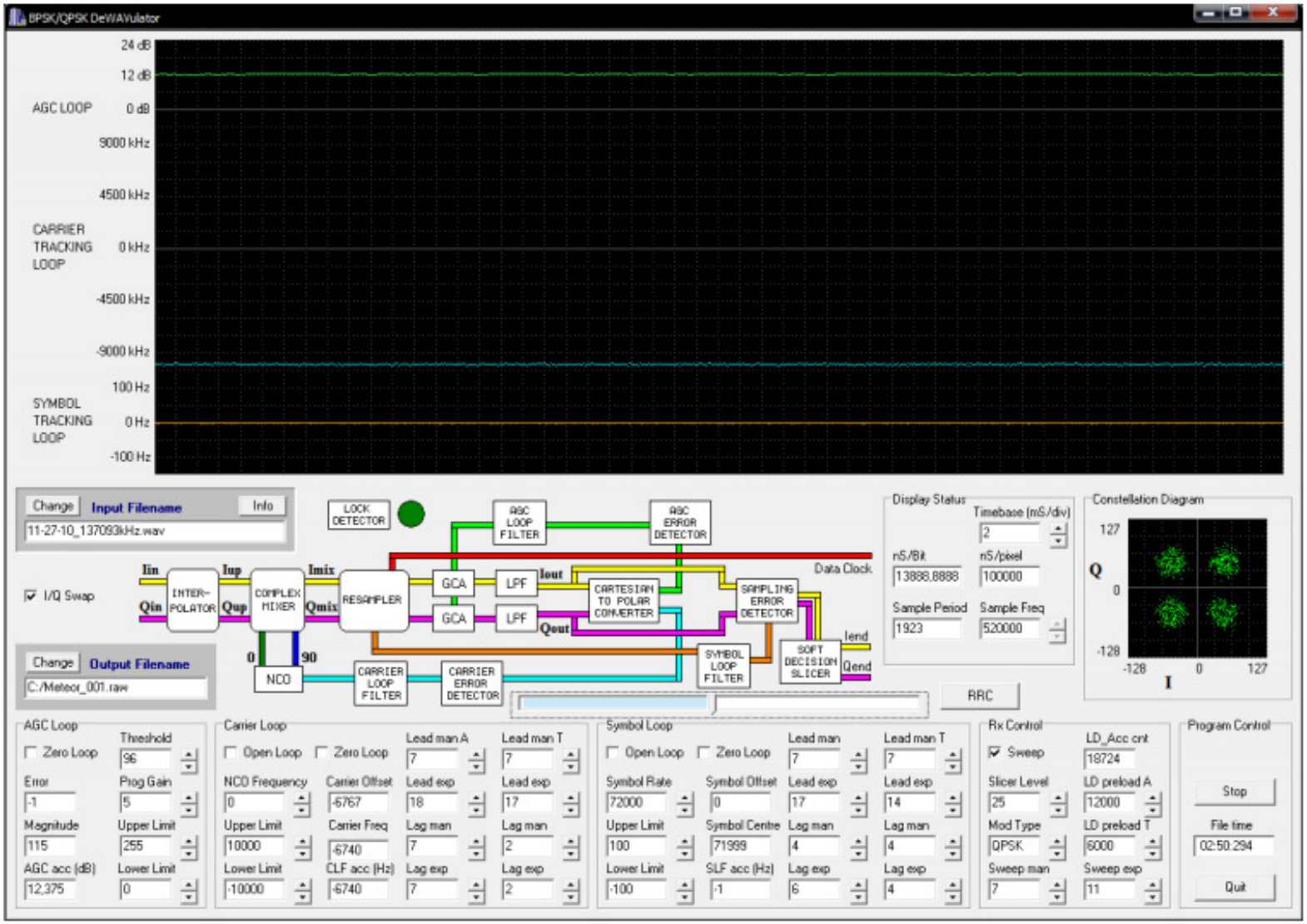


Meteor N2

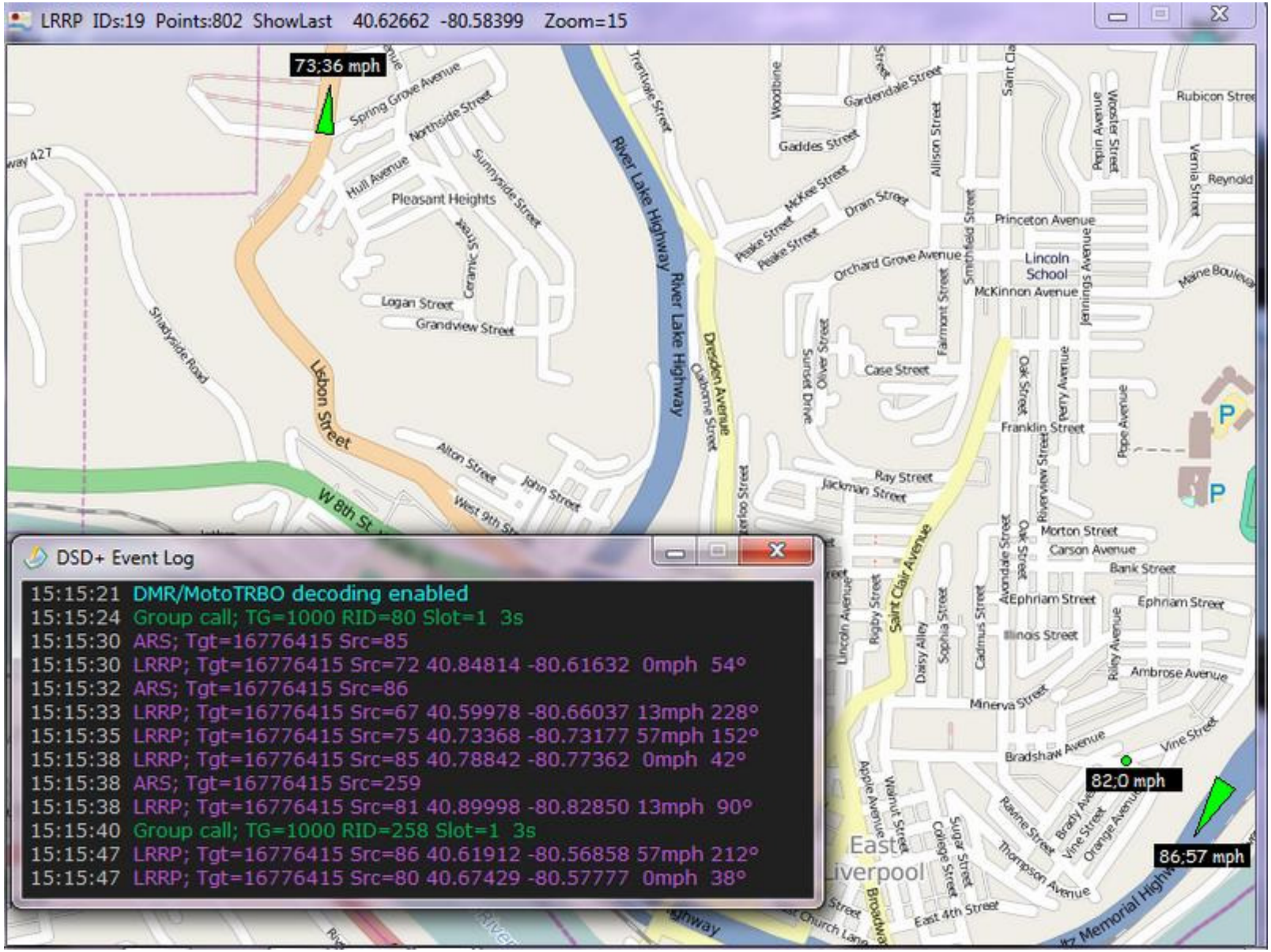
Low Resolution Picture Transmission (LRPT)




SDR# v1.0.0.1317 - IQ Imbalance: Gain = 1,012 Phase = -0,802°
000.137.100.089
< Alouette-2
< SHINSEI
< EGRS-13
< ACARS
< Alouette-2
ECS-4 >
TIMATION-II >
NOAA 6 >
< Transit 5B-5
< NOAA 9
< ACARS European secondary
S69-4 >
NOAA 9 >
< ACARS - New European frequency
NOAA 19 >
< SOLRAD 7B
Meteor-M2 >
0
-10
-20
-30
-40
-50
-60
-70
136,6213M
136,7176M
136,8139M
136,9102M
137,0064M
137,1027M
137,199M
137,2953M
137,3916M
137,4878M
137,5841M
Zoom
Contrast
Range
Offset
Satellite Tracker *
Enable
Tracking Software
Orbitron
Disconnect
Satellite
Name METEOR-M 2
Azimuth 1126
Elevation 871
Downlink
Frequency 137100089
Mode
Raw Response
SN"METEOR-M 2" AZ112.6 EL87.1
DN137100089 UP144999905 DMFM-W
RA830.708 RR-0.196 LO6.4272
Baseband Recorder *
Sample Format
8 Bit PCM IQ
Write: 335,94 MB
Stop
Folder select
Open folder
Audio Recorder *
LevelMeter *


BPSK/QPSK DeWAVulator
24 dB
12 dB
AGC LOOP
0 dB
9000 kHz
4500 kHz
CARRIER TRACKING LOOP
0 kHz
-4500 kHz
-9000 kHz
100 Hz
SYMBOL TRACKING LOOP
0 Hz
-100 Hz
Change
Input Filename
Info
11-27-10_137093kHz.wav
I/Q Swap
Change
Output Filename
C:/Meteor_001.raw
LOCK DETECTOR
AGC LOOP FILTER
AGC ERROR DETECTOR
Iin
Qin
INTER-POLATOR
Iup
Qup
COMPLEX MIXER
Imix
Qmix
RESAMPLER
GCA
GCA
LPF
LPF
Iout
Qout
CARTESIAN TO POLAR CONVERTER
SAMPLING ERROR DETECTOR
Data Clock
Iend
Qend
SOFT DECISION SLICER
SYMBOL LOOP FILTER
0
90
NCO
CARRIER LOOP FILTER
CARRIER ERROR DETECTOR
RRC
Display Status
Timebase (mS/div)
2
nS/Bit
13888.8888
nS/pixel
100000
Sample Period
1923
Sample Freq
520000
Constellation Diagram
127
Q
0
-128
-128
0
127
I
AGC Loop
Zero Loop
Threshold
96
Error
-1
Prog Gain
5
Magnitude
115
Upper Limit
255
AGC acc (dB)
12.375
Lower Limit
0
Carrier Loop
Open Loop
Zero Loop
Lead man A
7
Lead man T
7
NCO Frequency
0
Carrier Offset
-6767
Lead exp
18
Lead exp
17
Upper Limit
10000
Carrier Freq
-6740
Lag man
7
Lag man
2
Lower Limit
-10000
CLF acc (Hz)
-6740
Lag exp
7
Lag exp
2
Symbol Loop
Open Loop
Zero Loop
Lead man
7
Lead man T
7
Symbol Rate
72000
Symbol Offset
0
Lead exp
17
Lead exp
14
Upper Limit
100
Symbol Centre
71999
Lag man
4
Lag man
4
Lower Limit
-100
SLF acc (Hz)
-1
Lag exp
6
Lag exp
4
Rx Control
Sweep
LD_Acc cnt
18724
Slicer Level
25
LD preload A
12000
Mod Type
QPSK
LD preload T
6000
Sweep man
7
Sweep exp
11
Program Control
Stop
File time
02:50:294
Quit

Digital Speech Decoder Plus DSD+



Digital Speech Decoder Plus (DSD+)

- D-STAR
- NXDN4800
- NXDN9600
- DMR/MotoTRBO
- P25 Phase 1
- X2-TDMA
- ProVoice