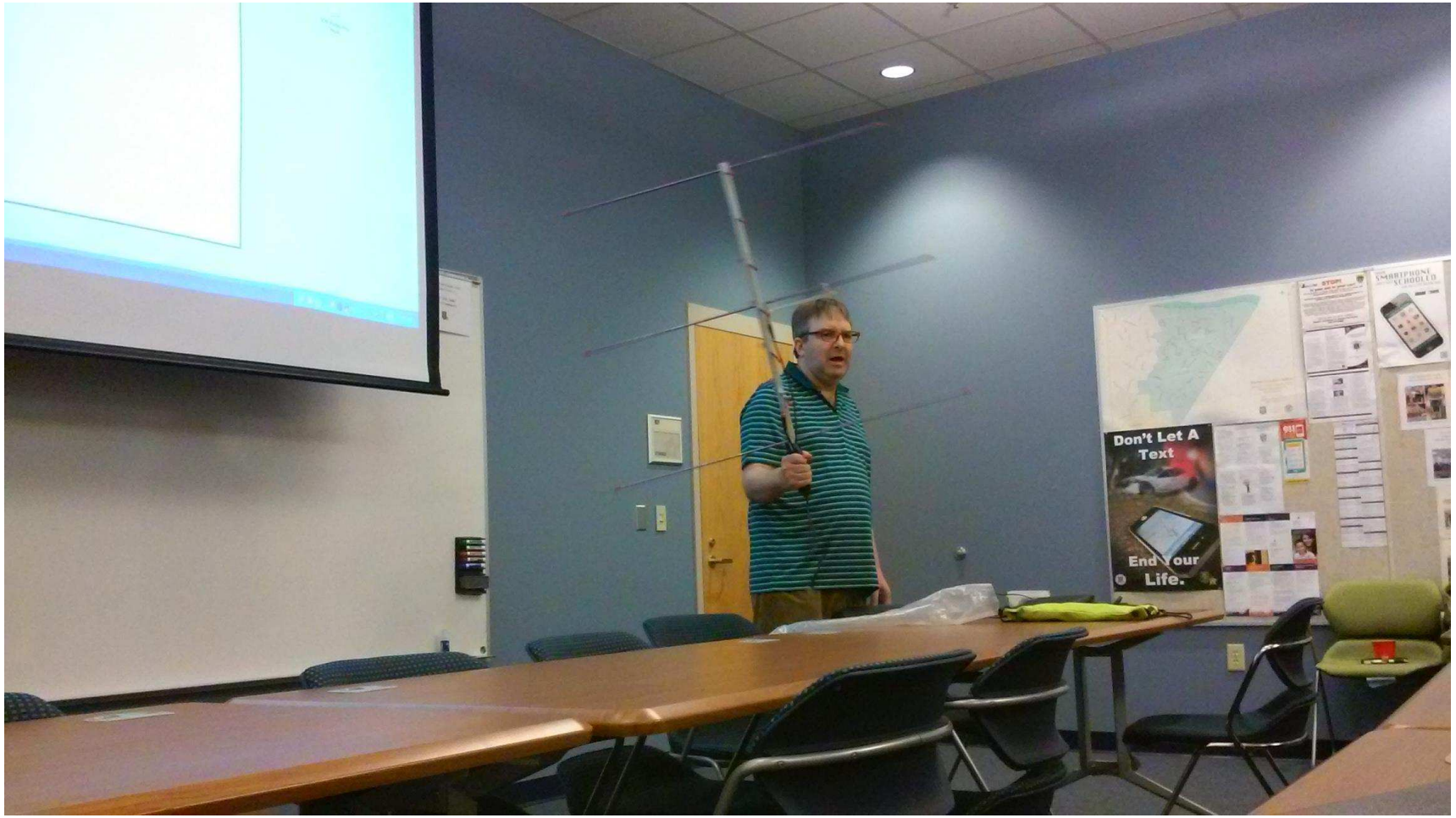


Eric, AJ4LN, demonstrating his directional antenna during his presentation on Software Defined Radio use in Direction Finding with a focus on using apps on a cell phone.

SDR Radio Direction finding (Fox Hunting)

Eric Carlson, AL4LN, 3/7/2018

NOTE: The product photos are from the Internet/product manufacturers.

SDR = Software Defined Radio

Items used:

Android phone with OTG and adequate OTG power

SDRTouch software

- Manual gain control: AGC (Automatic Gain Control) off, adjust as needed

RTL-SDR driver software

USB extension cable

Ferrite filter for USB cable

USB OTG cable/adapter

Velcro ties

RTL-SDR USB stick

Antenna adapter, MCX to BNC

Directional antenna, dual band, with duplexer

Methods: Directional signal strength, Triangulation

https://www.rtl-sdr.com/

RTL-SDR Blog R820T2 RTL2832U 1PPM TCXO SMA Software Defined Radio with Dipole Antenna Kit = $27 ($20 without accessories)

SMA connector

Metal case

<1 PPM temperature compensated oscillator (TCXO)

Experimental: HF Direct Sampling Mode

Stratux RTL-SDR (Low Power RTL-SDR) (Limited Stock, $17)

https://www.nooelec.com/store/

NooElec NESDR SMArt Bundle - Premium RTL-SDR w/ Aluminum Enclosure, 0.5PPM TCXO, SMA Input & 3 Antennas. RTL2832U & R820T2-Based. ($26, $21 alone)

Smaller case, fits better with other USB devices plugged in. Slightly better TXCO, no HD experimental mode. 2 year warrancy.

Adapter cable set $19-20, or individual cable for under $10.

TYPE N F

PAL/BELLING LEE F

UHF F

SMA MALE
(OTHER END)

TYPE F F

BNC F

SMA M

TYPE N F

SMA M

PAL/BELLING LEE F

UHF F

MCX MALE
(OTHER END)

TYPE F F

BNC F

SMA F

Windows software (free):

SDR#

HDSDR

SDR-RADIO.COM V2 and the newer V3 (AKA SDR Console)

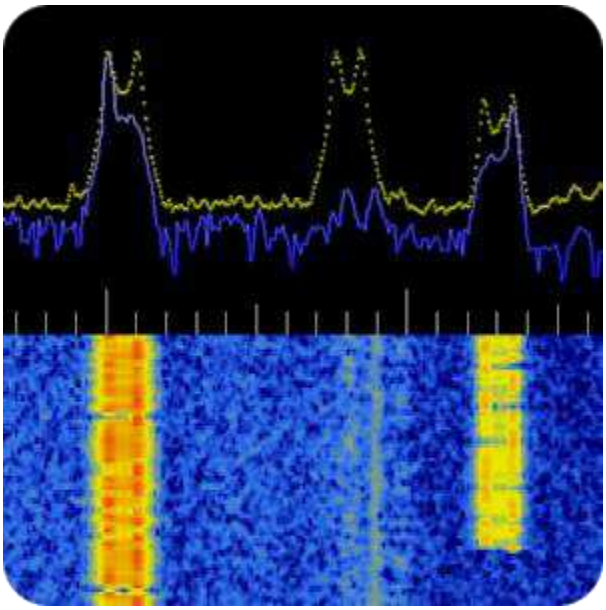
And several others, and software for MAC and Linux, including Raspberry Pi compatible software

Android software:

Requires a device that supports USB OTG (On The Go) with enough power to dun the SDR stick, and a USB OTG cable.

RF Analyzer by Dennis Mantz, $1.01

https://play.google.com/store/apps/details?id=com.mantz_it.rfanalyzer



SDRoid by hOne, free, Forked from RF Analyzer, Not yet tested by me

https://play.google.com/store/apps/details?id=com.sdr_labs.sdroid

SDR Touch - Live offline radio by Martin Marinov, Free evaluation, with limited features

SDR Touch Key by Martin Marinov, $10, unlocks all features

http://sdrtouch.com/

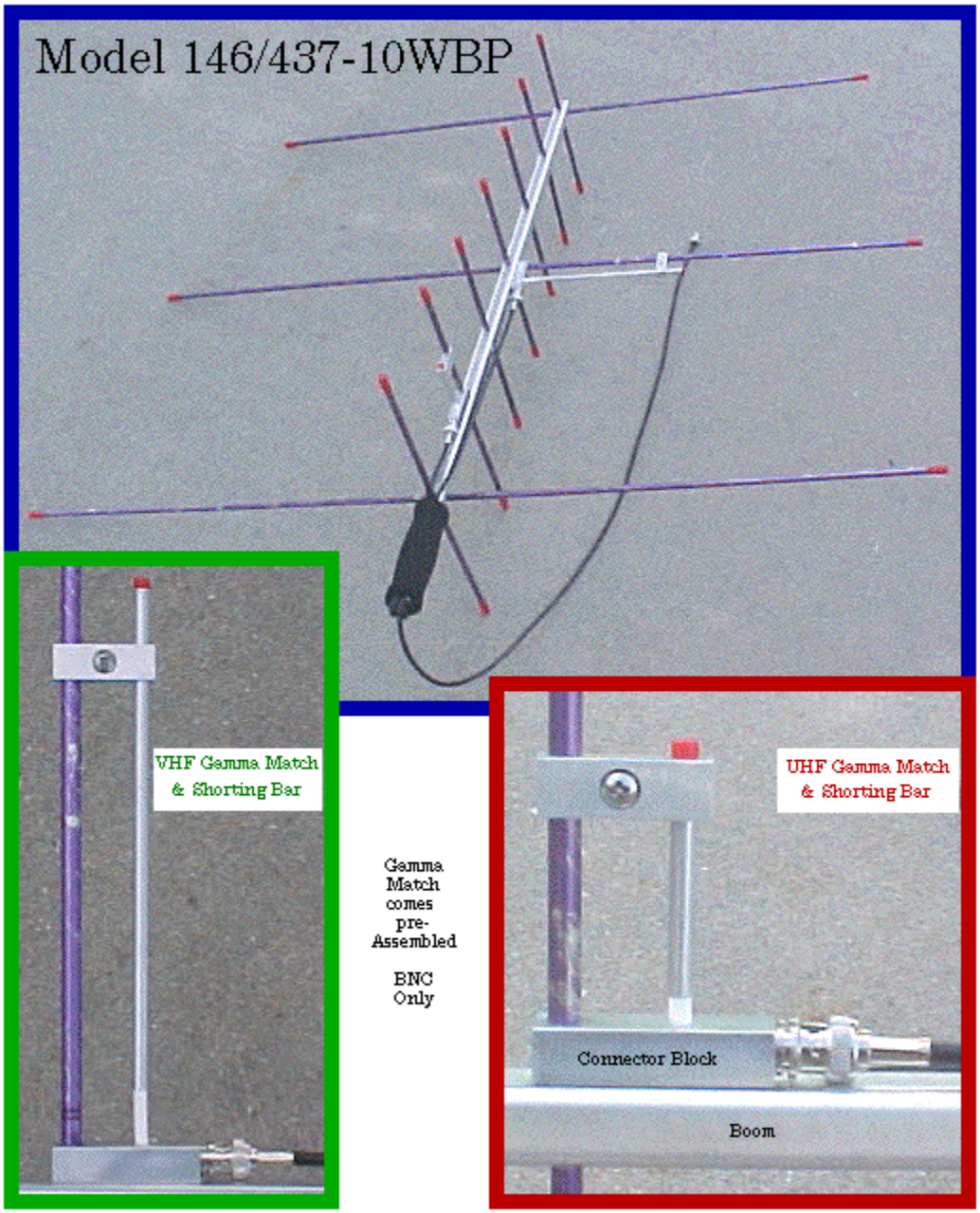
https://play.google.com/store/apps/details?id=marto.androsdr2

RTL2832U driver by Martin Marinov, Free, required for any of the above Android software to work

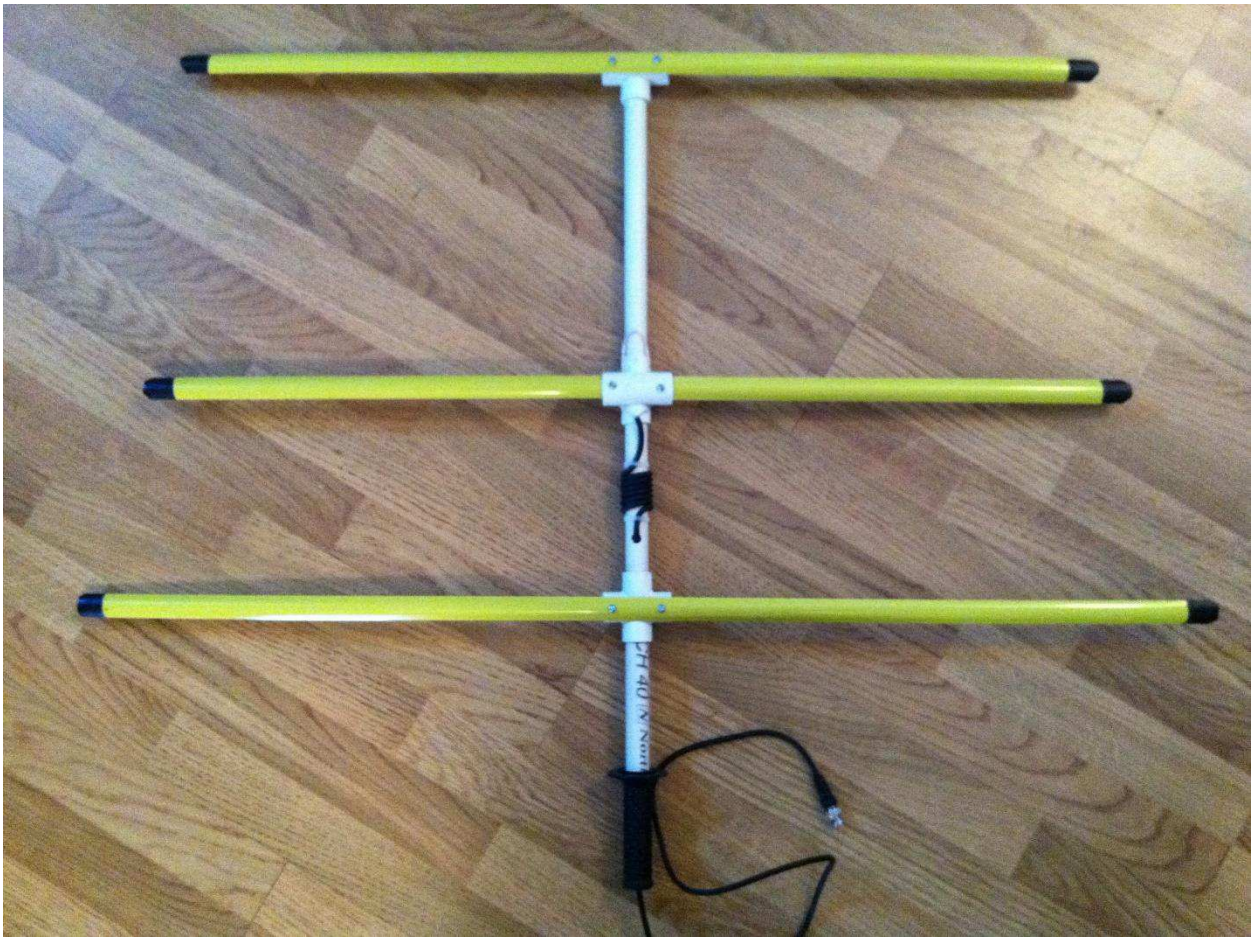
https://play.google.com/store/apps/details?id=marto.rtl_tcp_andro

Antennas

Arrow II: 146/437-10WBP Split boom with duplexer. $150



Tape Measure antenna



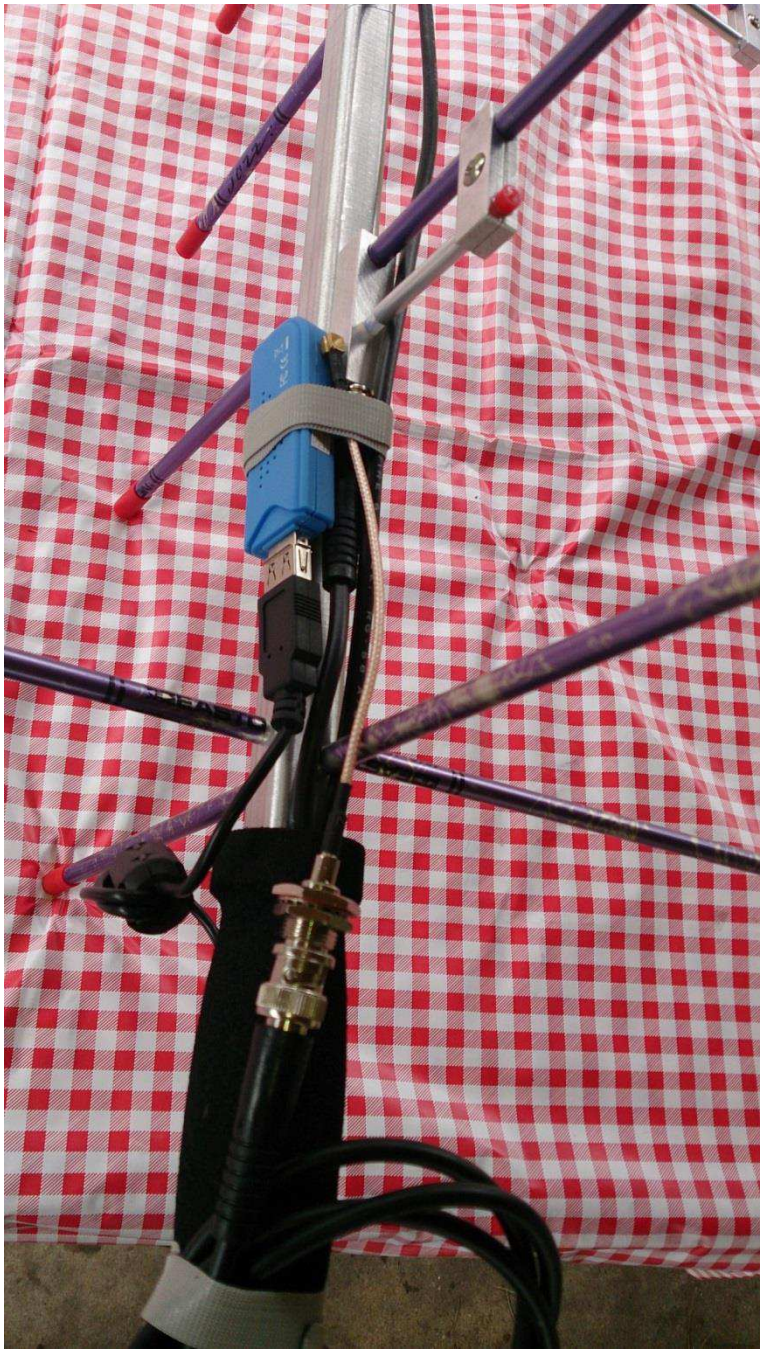
Log Periodic

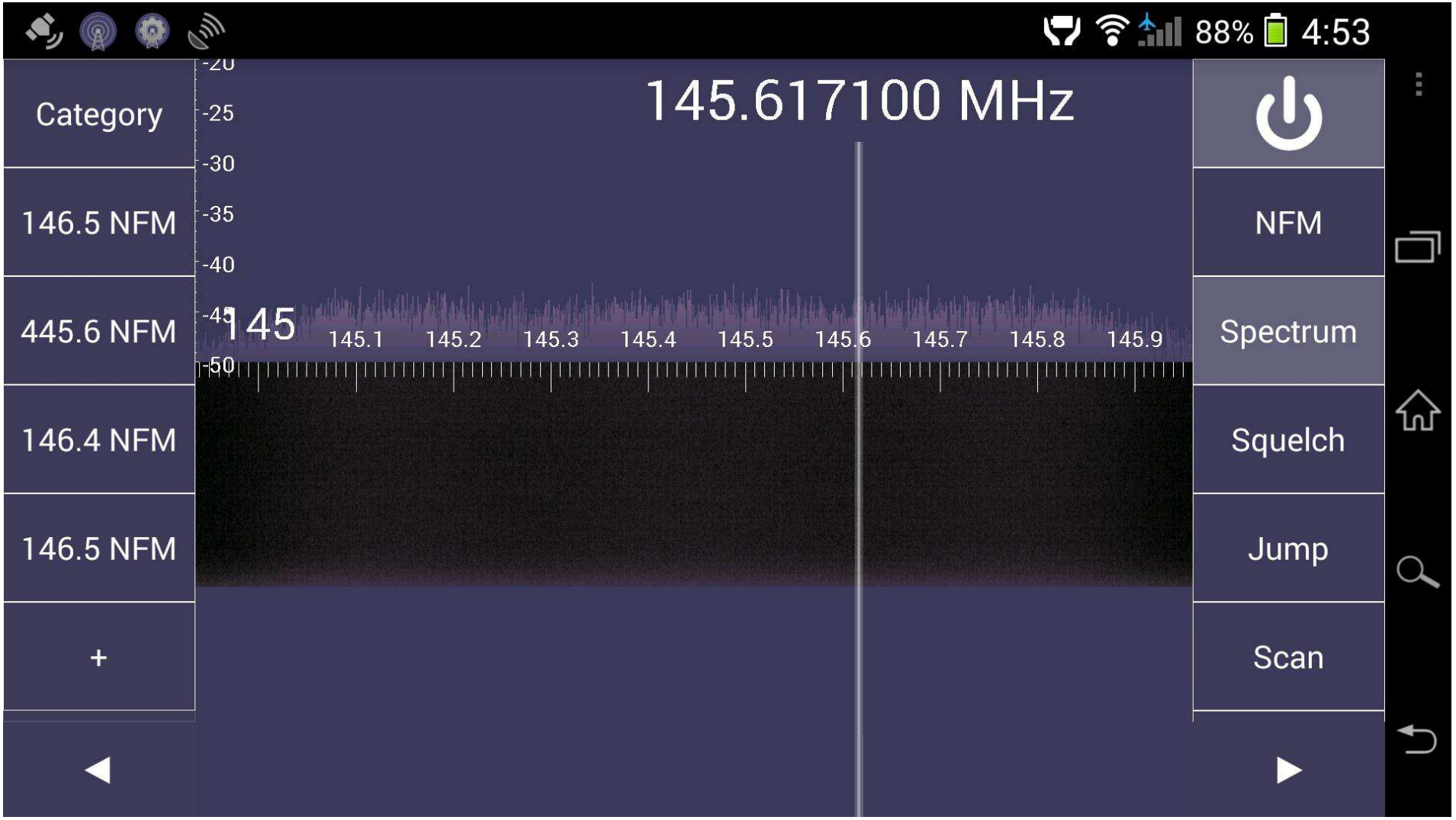
Simple dipole (bi-directional, so requires extra effort to determine which of the 2 directions is correct)

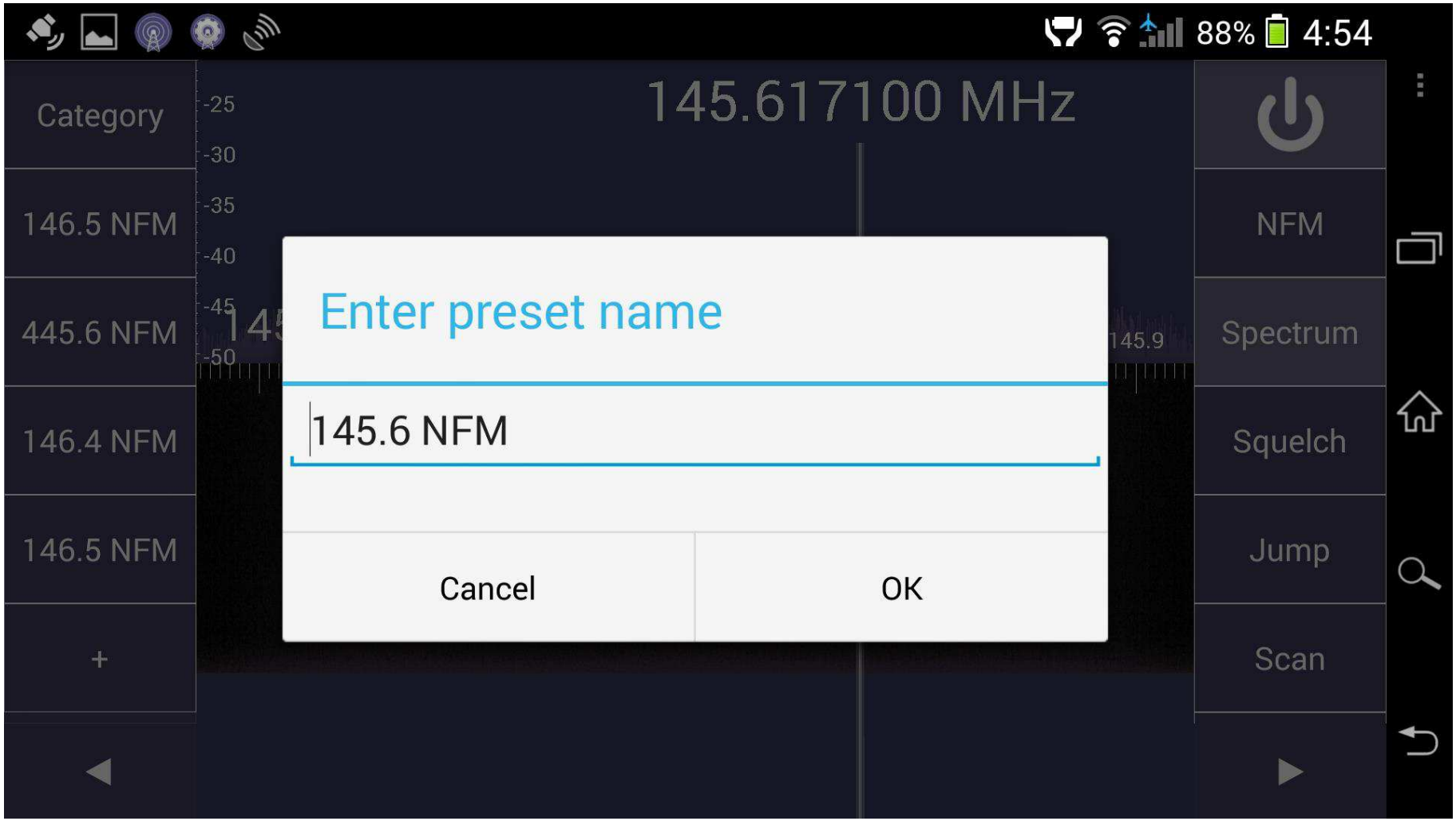
Rubber duck, using body fade

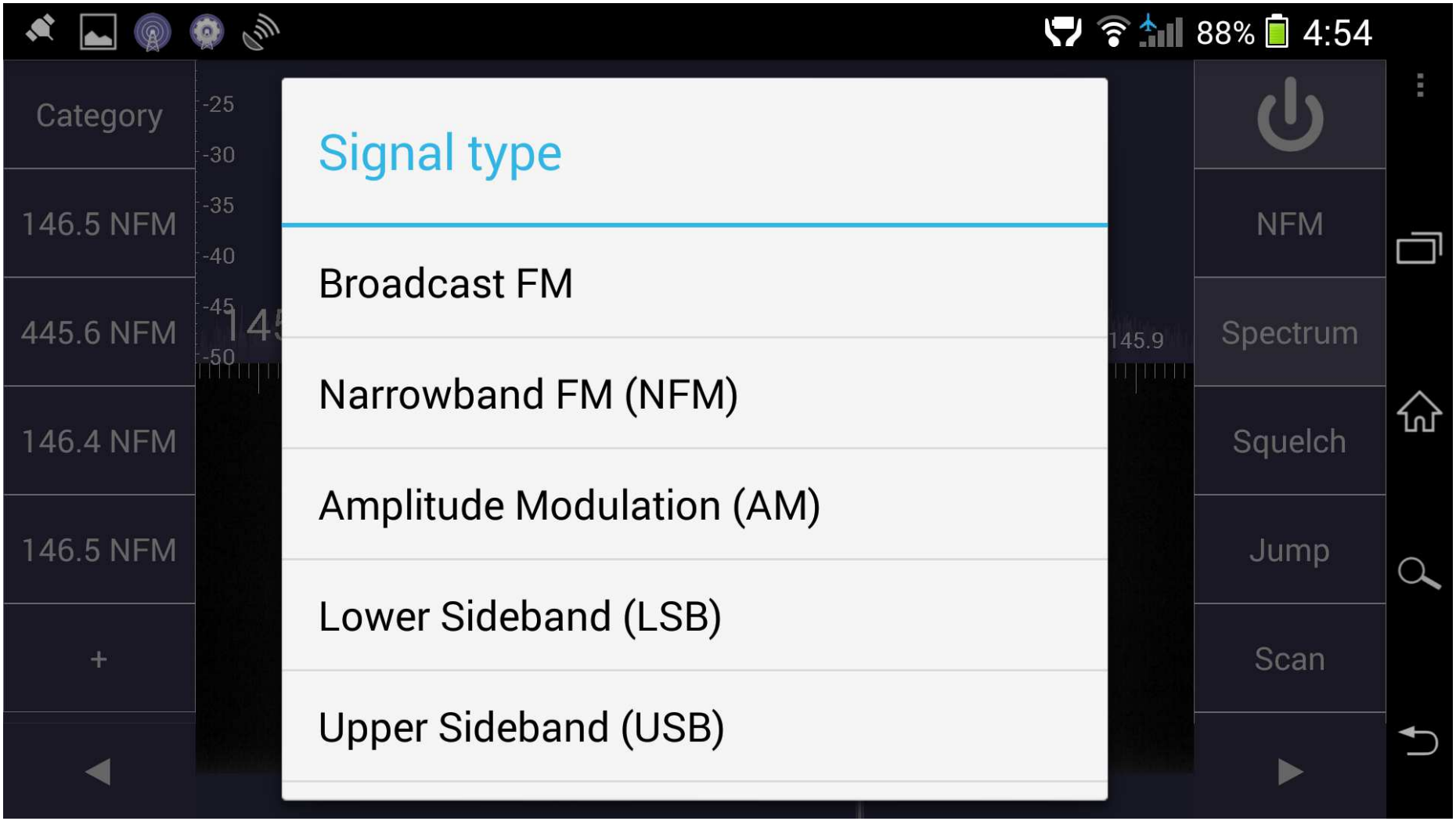
Several other directional designs

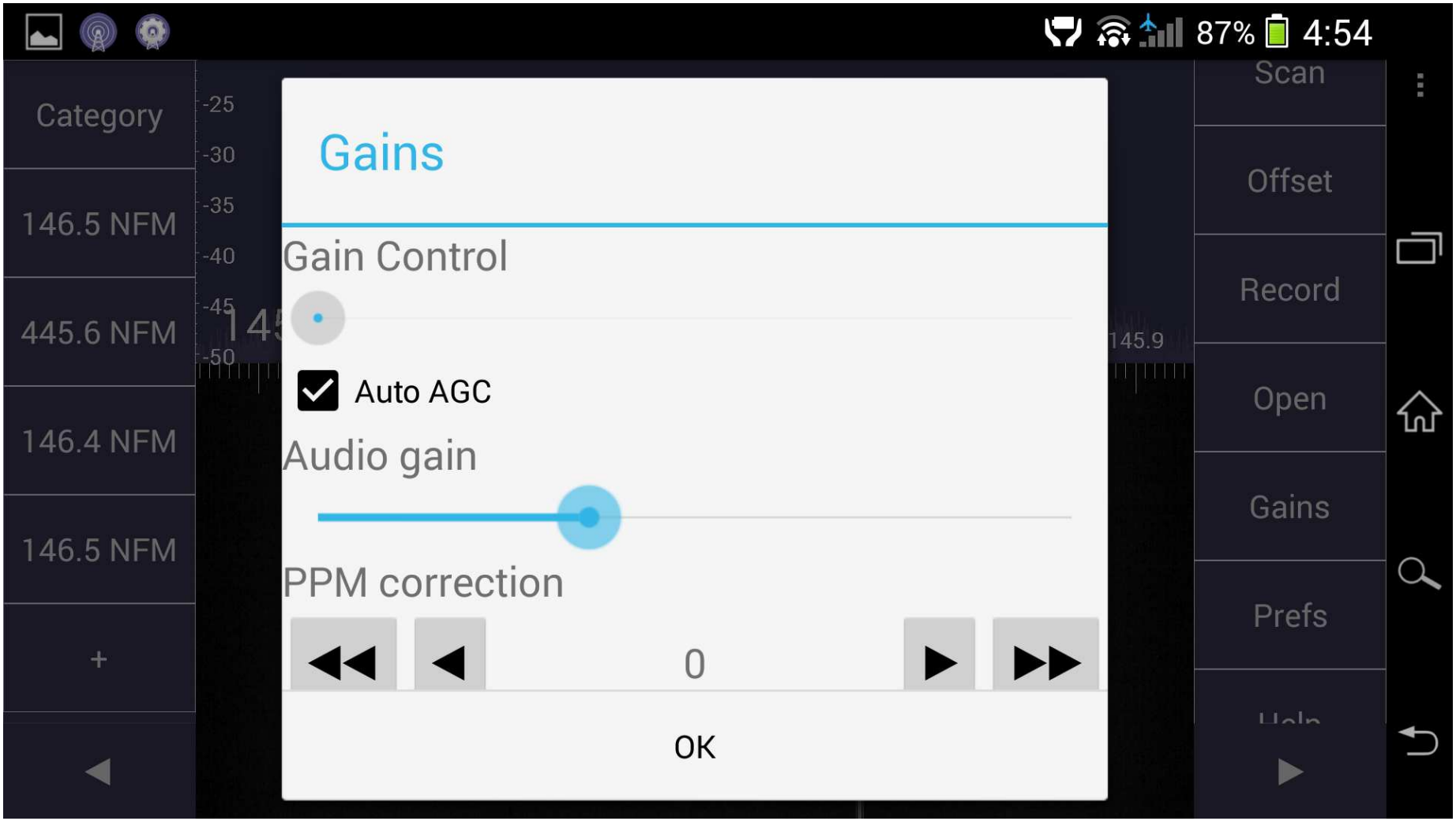

BOSCH

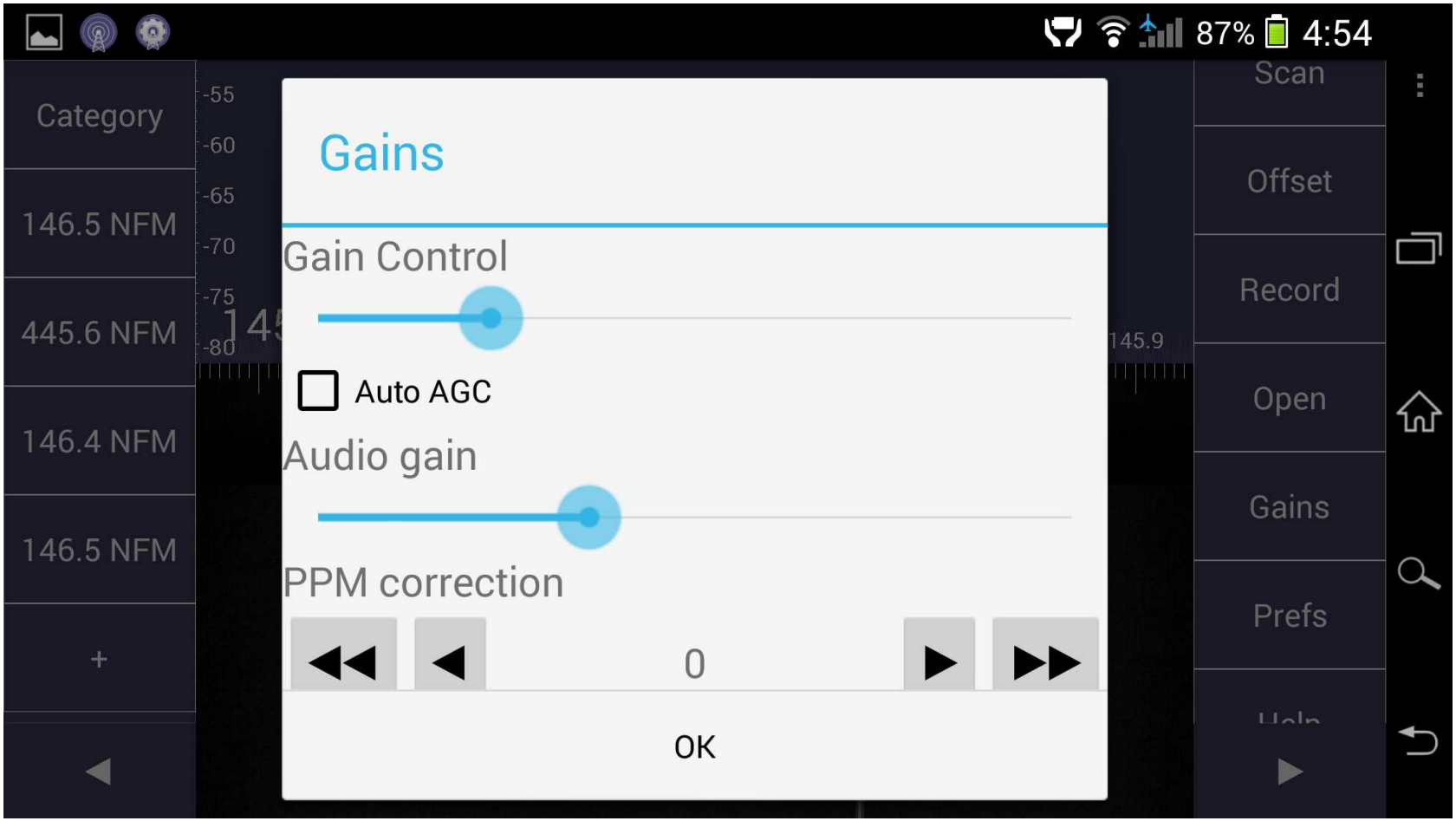


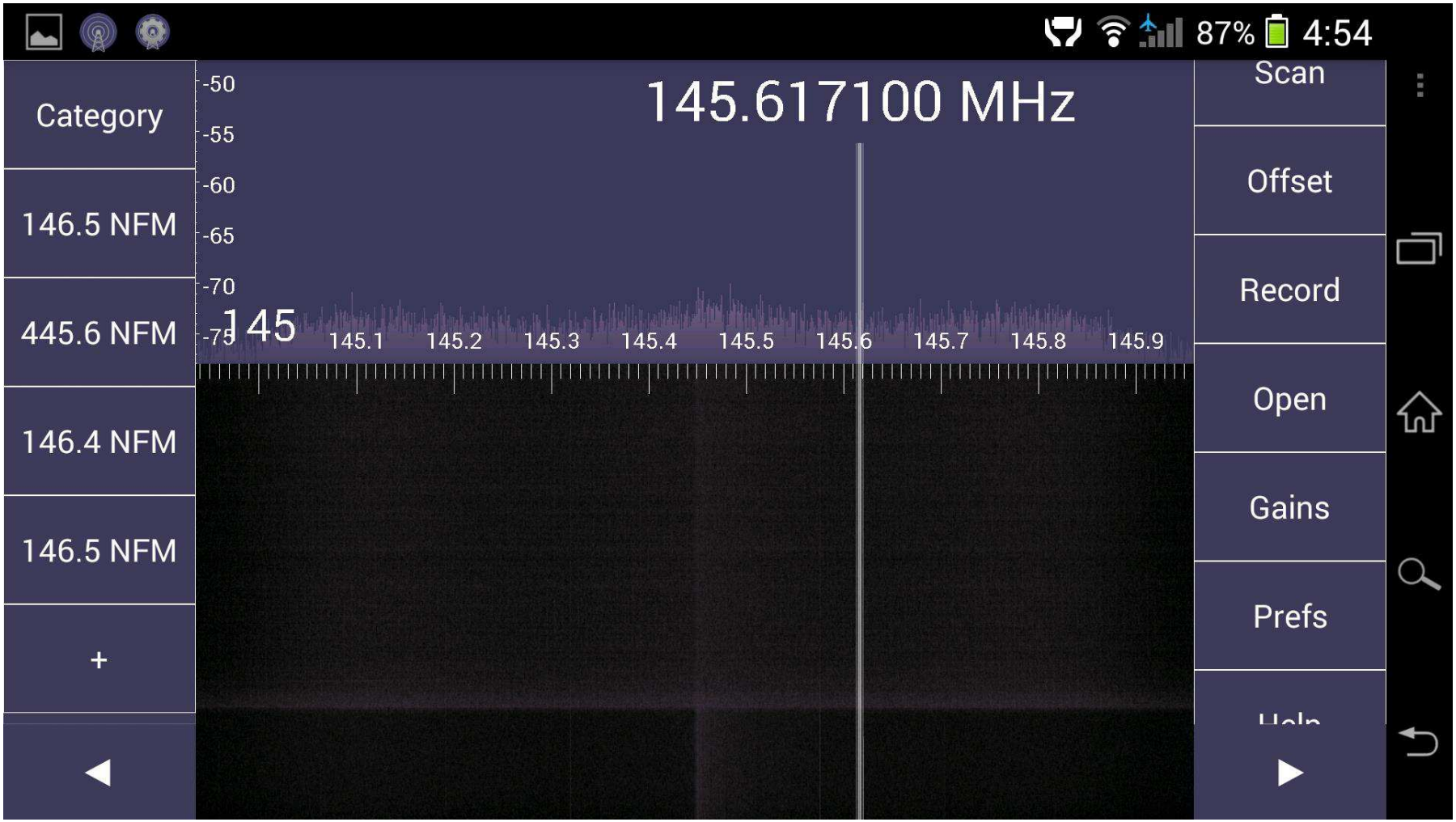

88% 4:53
145.617100 MHz
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
NFM
Spectrum
Squelch
Jump
Scan
-20
-25
-30
-35
-40
-45
-50
145
145.1
145.2
145.3
145.4
145.5
145.6
145.7
145.8
145.9

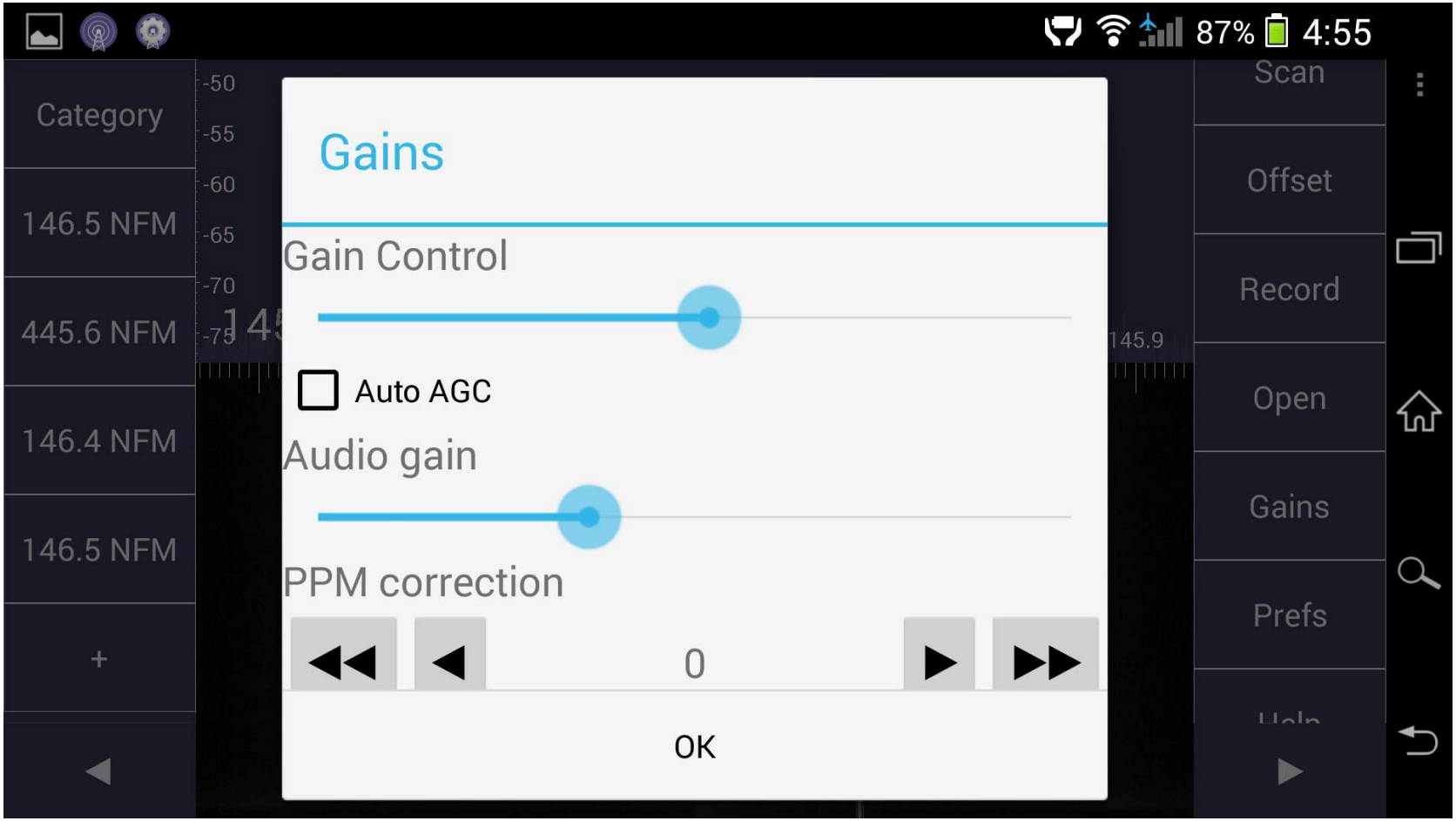

88% 4:54
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
145.617100 MHz
-25
-30
-35
-40
-45
-50
145.9
NFM
Spectrum
Squelch
Jump
Scan
Enter preset name
145.6 NFM
Cancel
OK

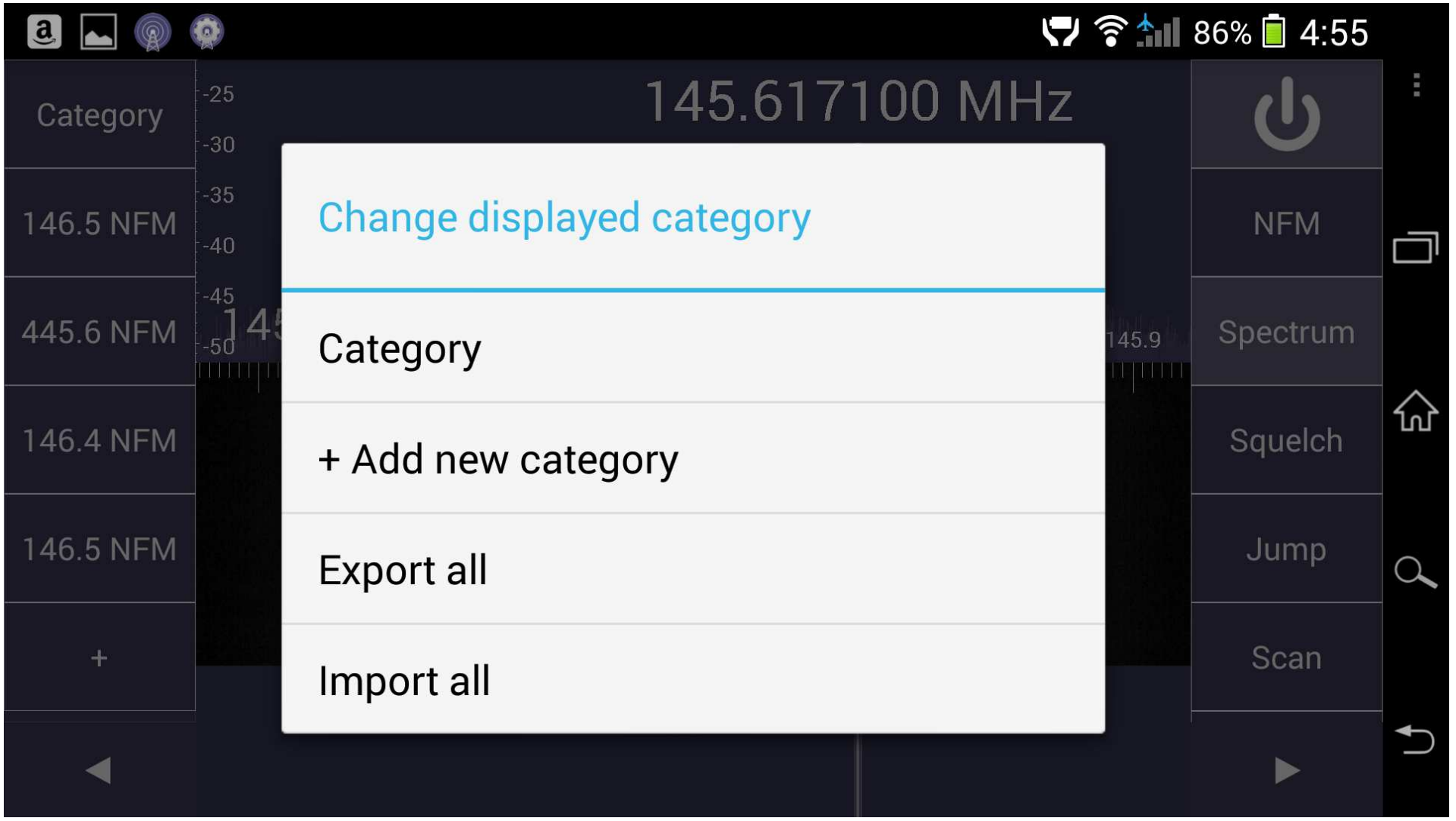

88% 4:54
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
-25
-30
-35
-40
-45
-50
145.9
NFM
Spectrum
Squelch
Jump
Scan
Signal type
Broadcast FM
Narrowband FM (NFM)
Amplitude Modulation (AM)
Lower Sideband (LSB)
Upper Sideband (USB)

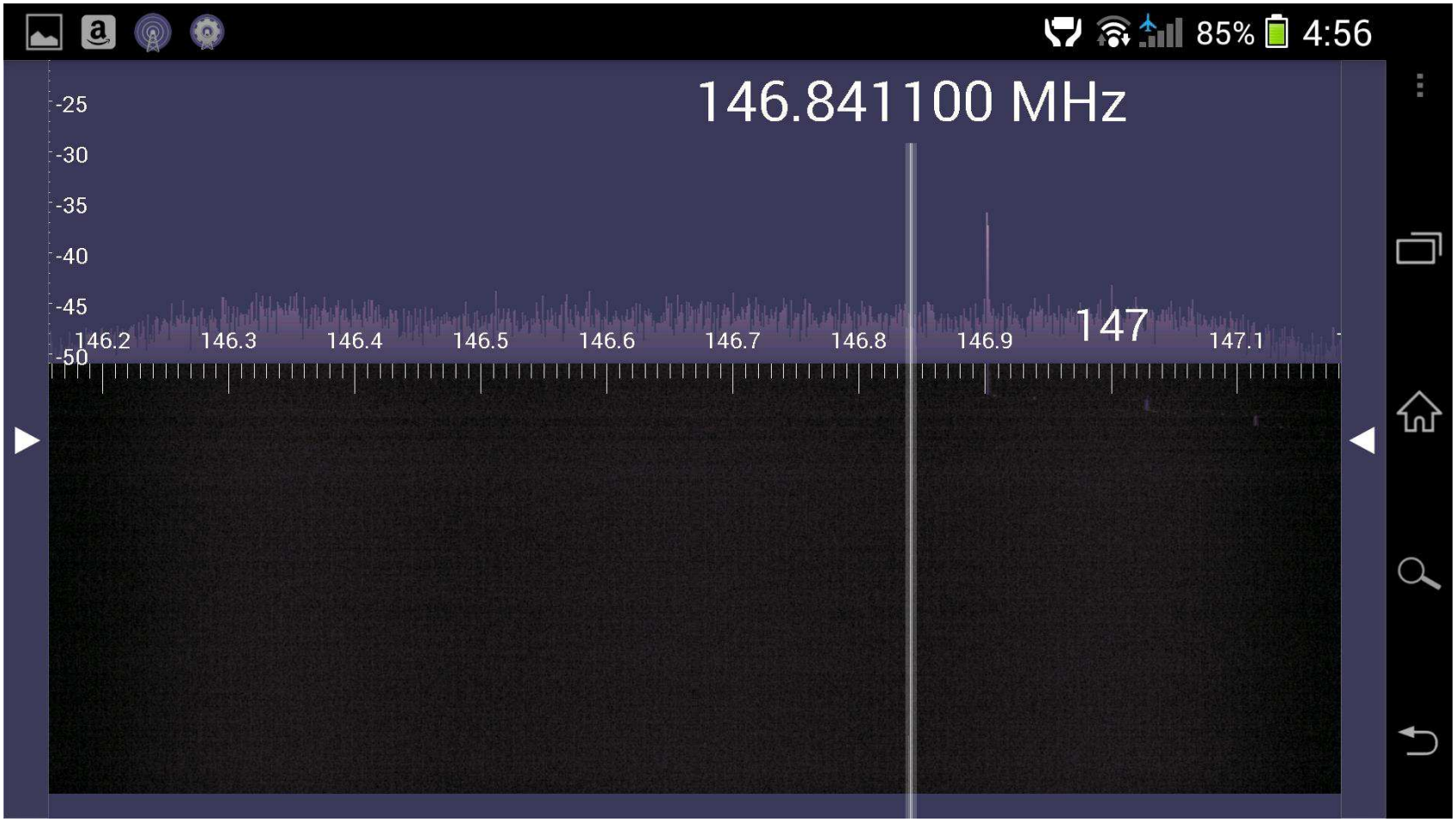

87% 4:54
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
-25
-30
-35
-40
-45
-50
145.9
Scan
Offset
Record
Open
Gains
Prefs
Gains
Gain Control
Auto AGC
Audio gain
PPM correction
0
OK

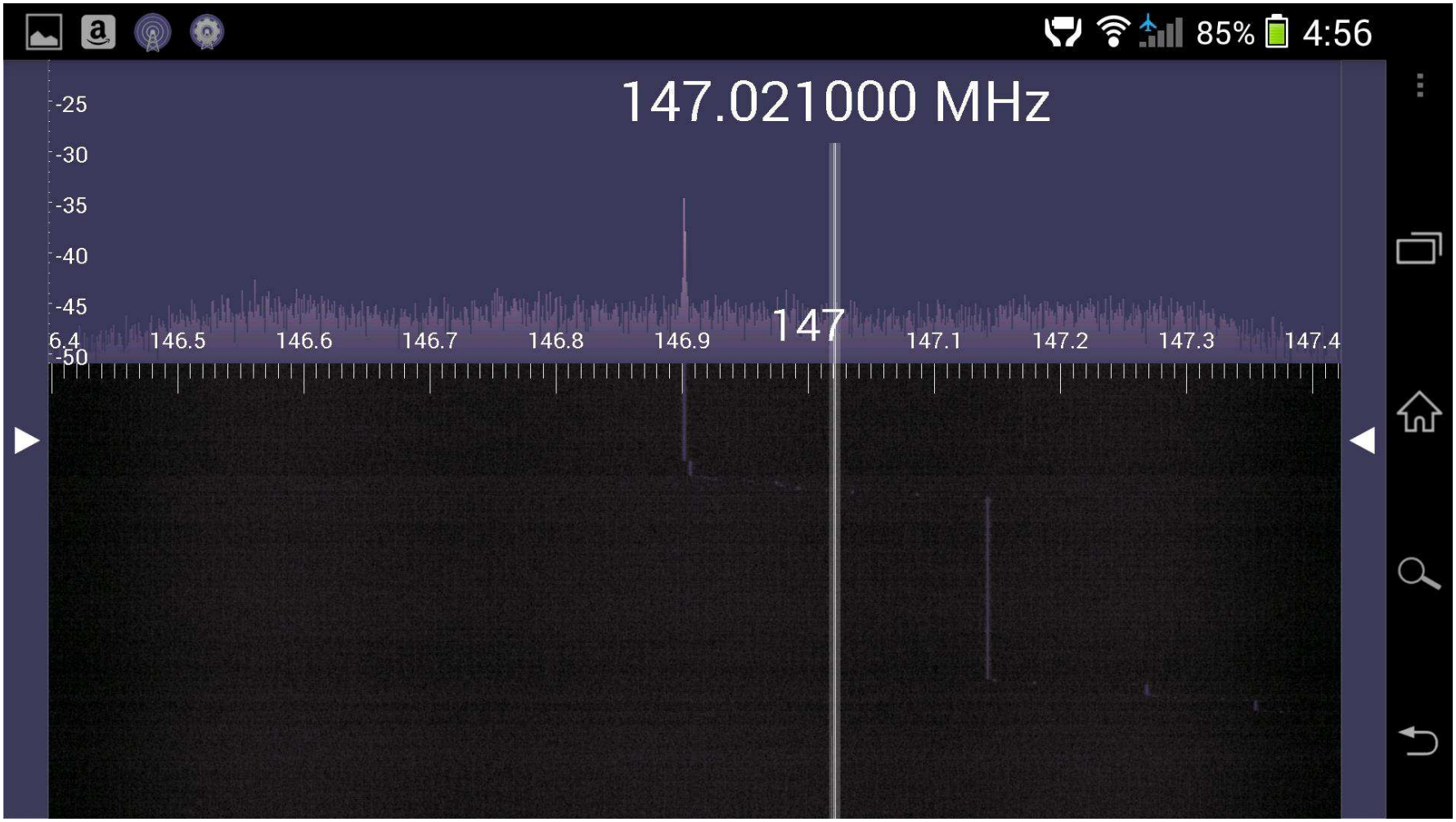

87% 4:54
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
-55
-60
-65
-70
-75
-80
145.9
Scan
Offset
Record
Open
Gains
Prefs
Gains
Gain Control
Auto AGC
Audio gain
PPM correction
0
OK


87% 4:54
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
145.617100 MHz
-50
-55
-60
-65
-70
-75
145
145.1
145.2
145.3
145.4
145.5
145.6
145.7
145.8
145.9
Scan
Offset
Record
Open
Gains
Prefs


87% 4:55
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
-50
-55
-60
-65
-70
-75
145.9
Scan
Offset
Record
Open
Gains
Prefs
Gains
Gain Control
Auto AGC
Audio gain
PPM correction
0
OK


86% 4:55
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5 NFM
+
145.617100 MHz
-25
-30
-35
-40
-45
-50
145.9
NFM
Spectrum
Squelch
Jump
Scan
Change displayed category
Category
+ Add new category
Export all
Import all


85%
4:56
146.841100 MHz
-25
-30
-35
-40
-45
-50
146.2
146.3
146.4
146.5
146.6
146.7
146.8
146.9
147
147.1


85% 4:56
147.021000 MHz
-25
-30
-35
-40
-45
-50
6.4
146.5
146.6
146.7
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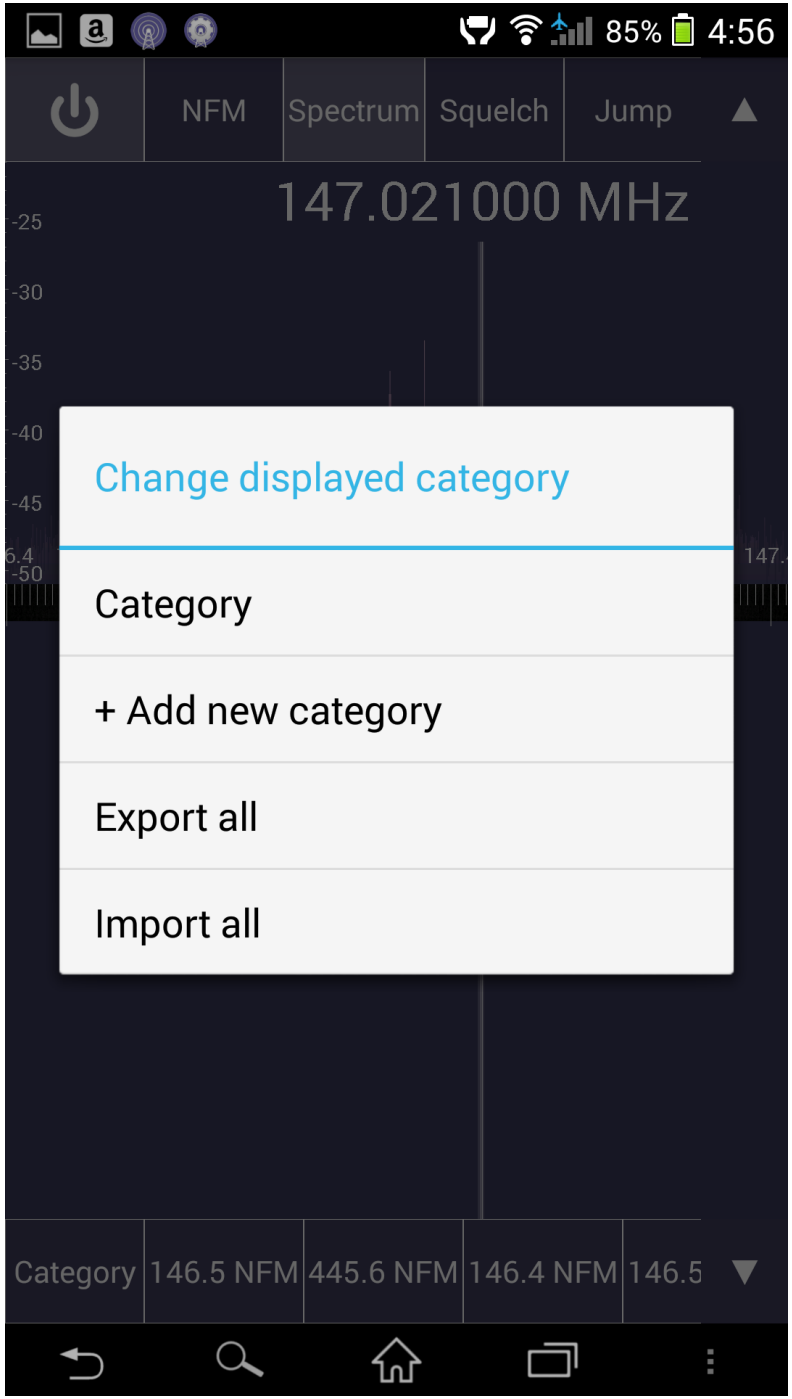
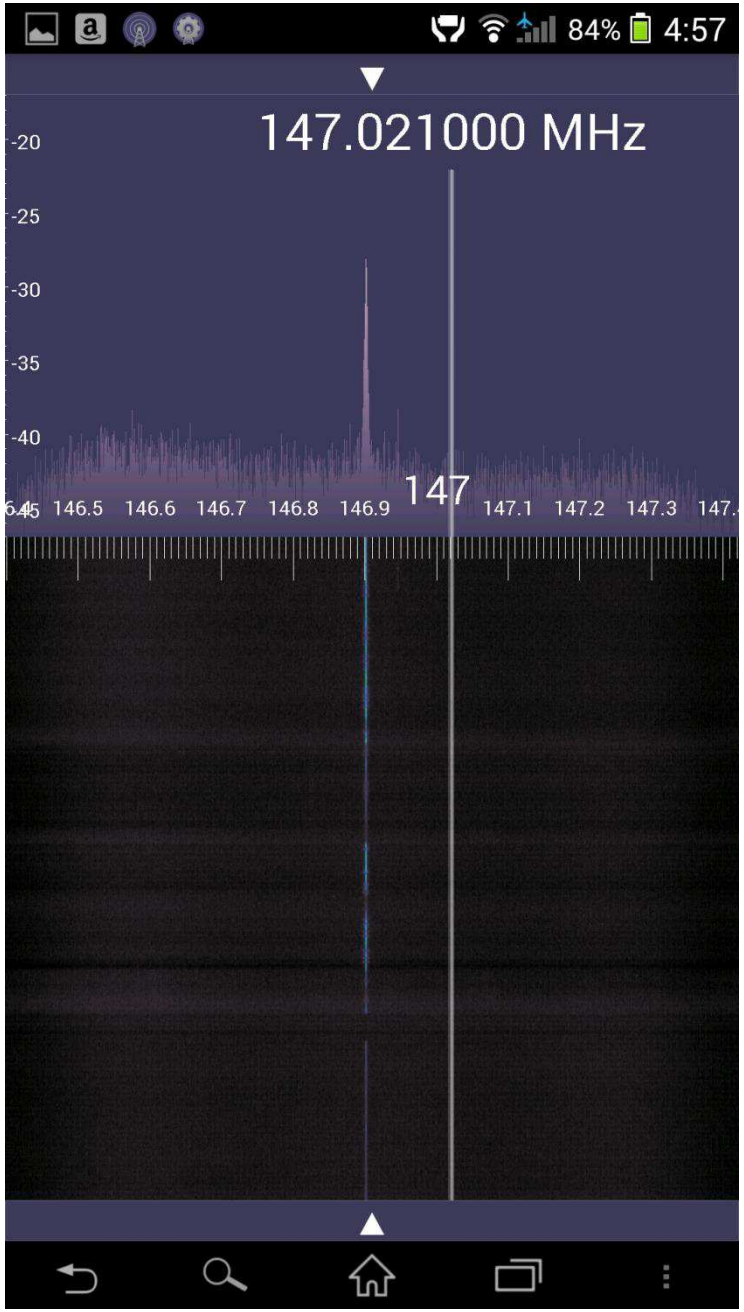
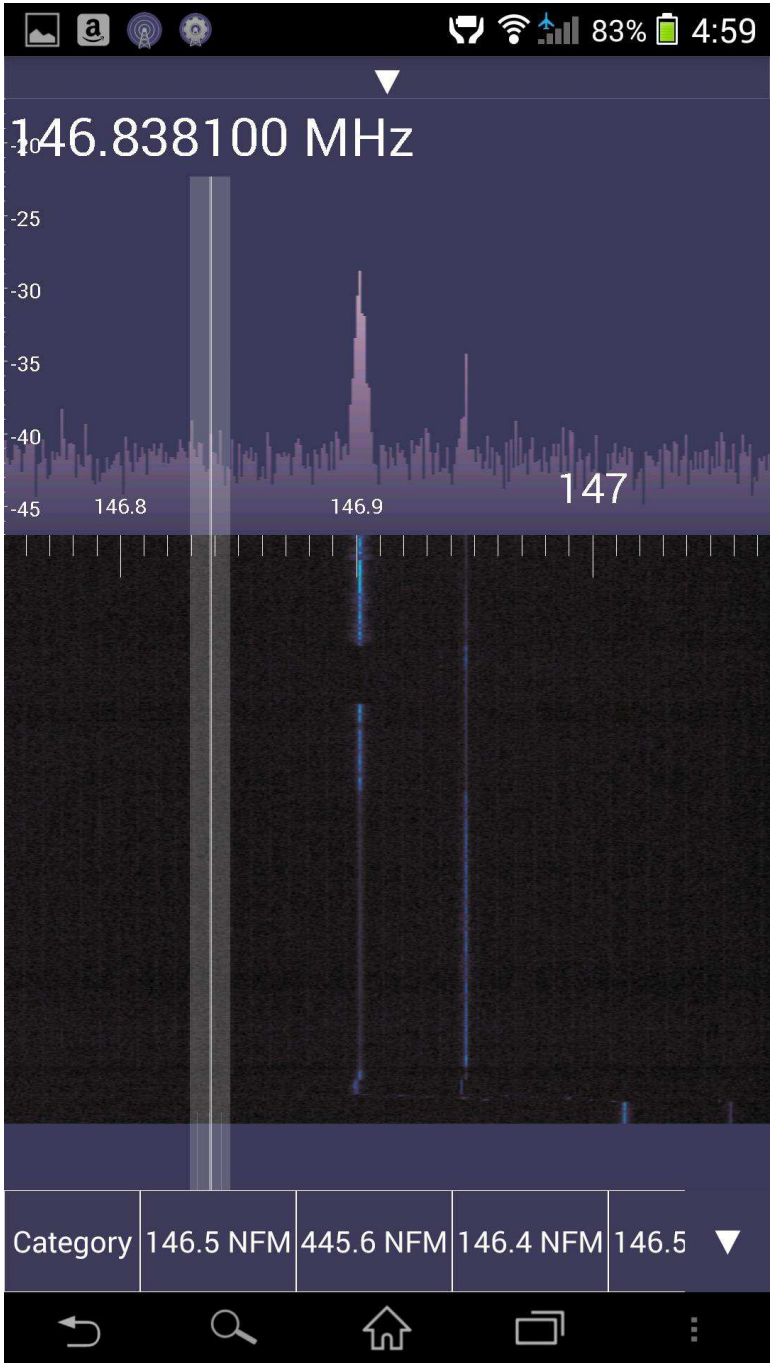
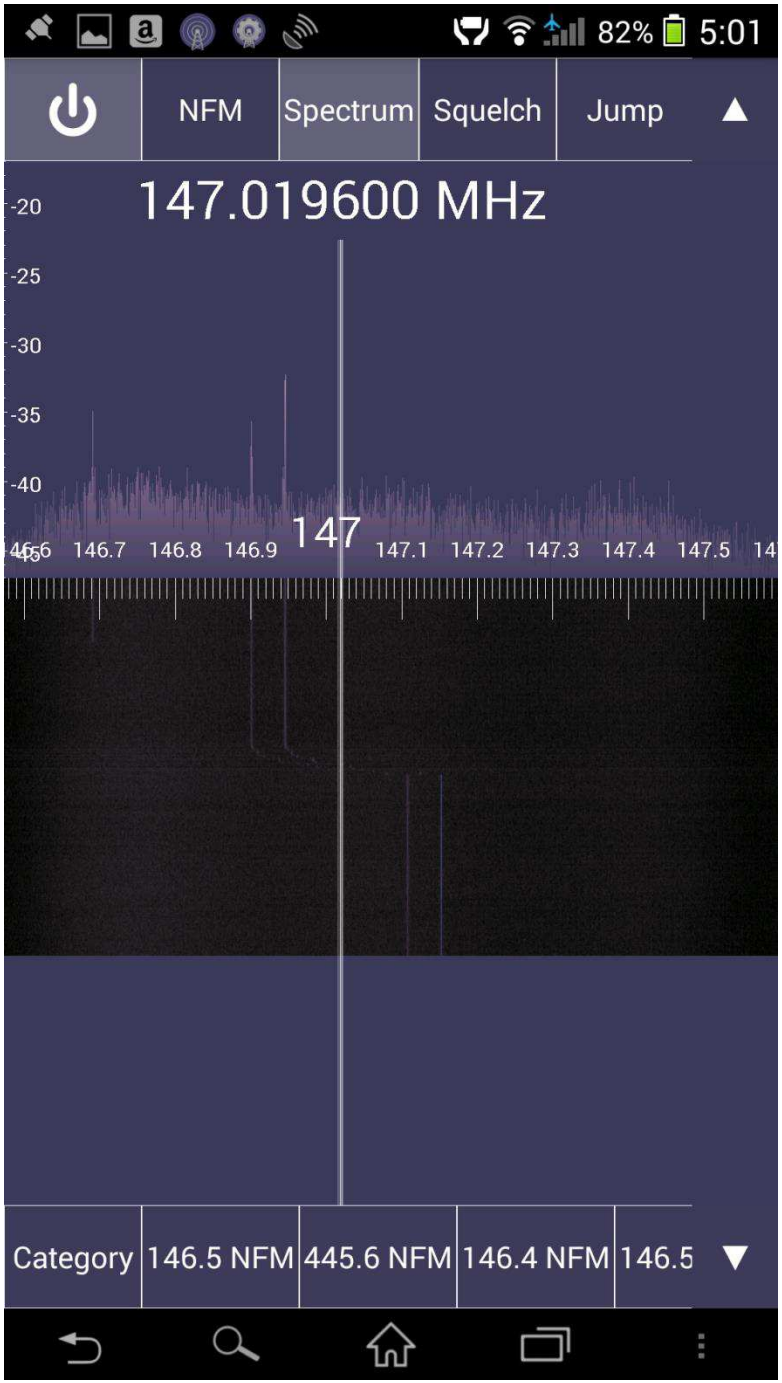
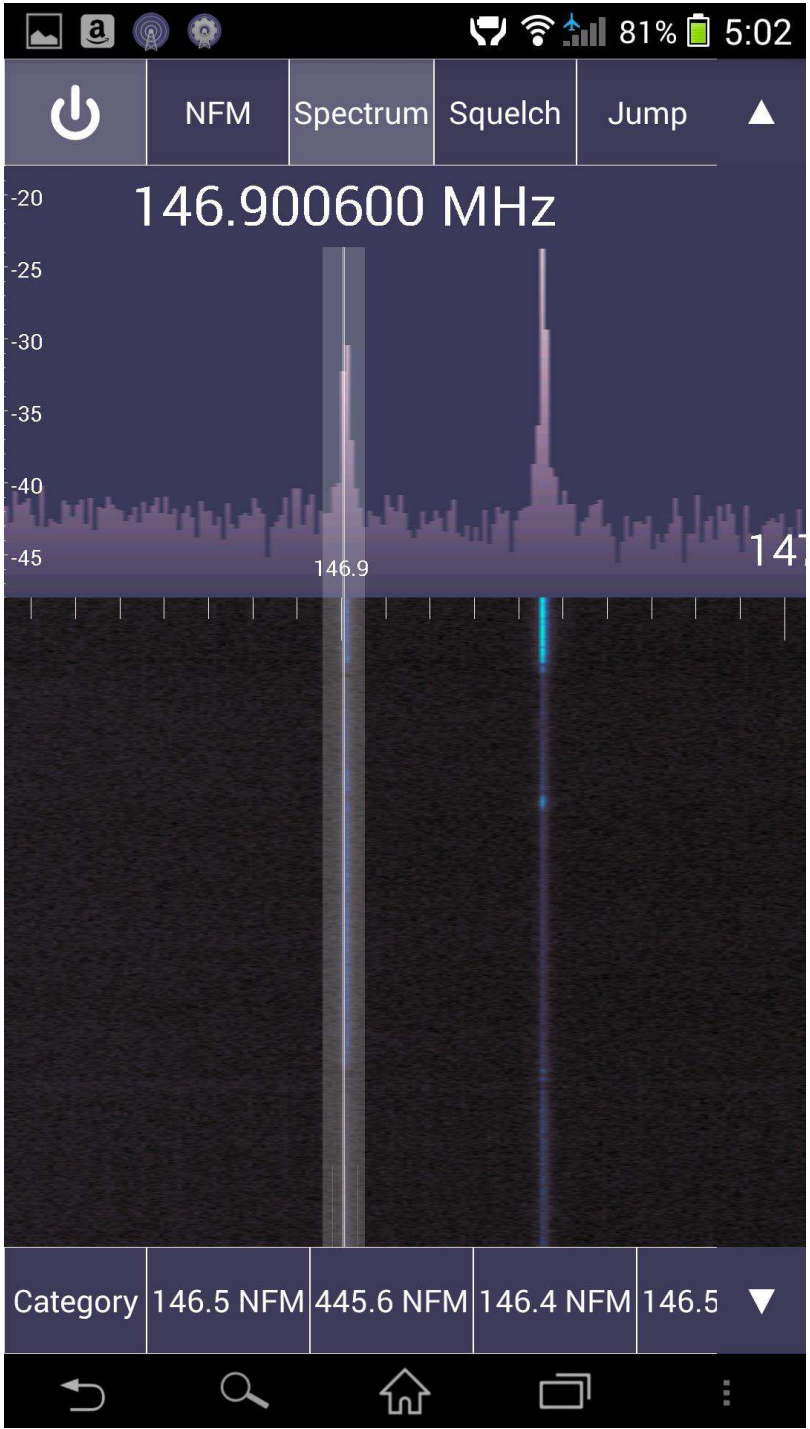
146.9
147
147.1
147.2
147.3
147.4

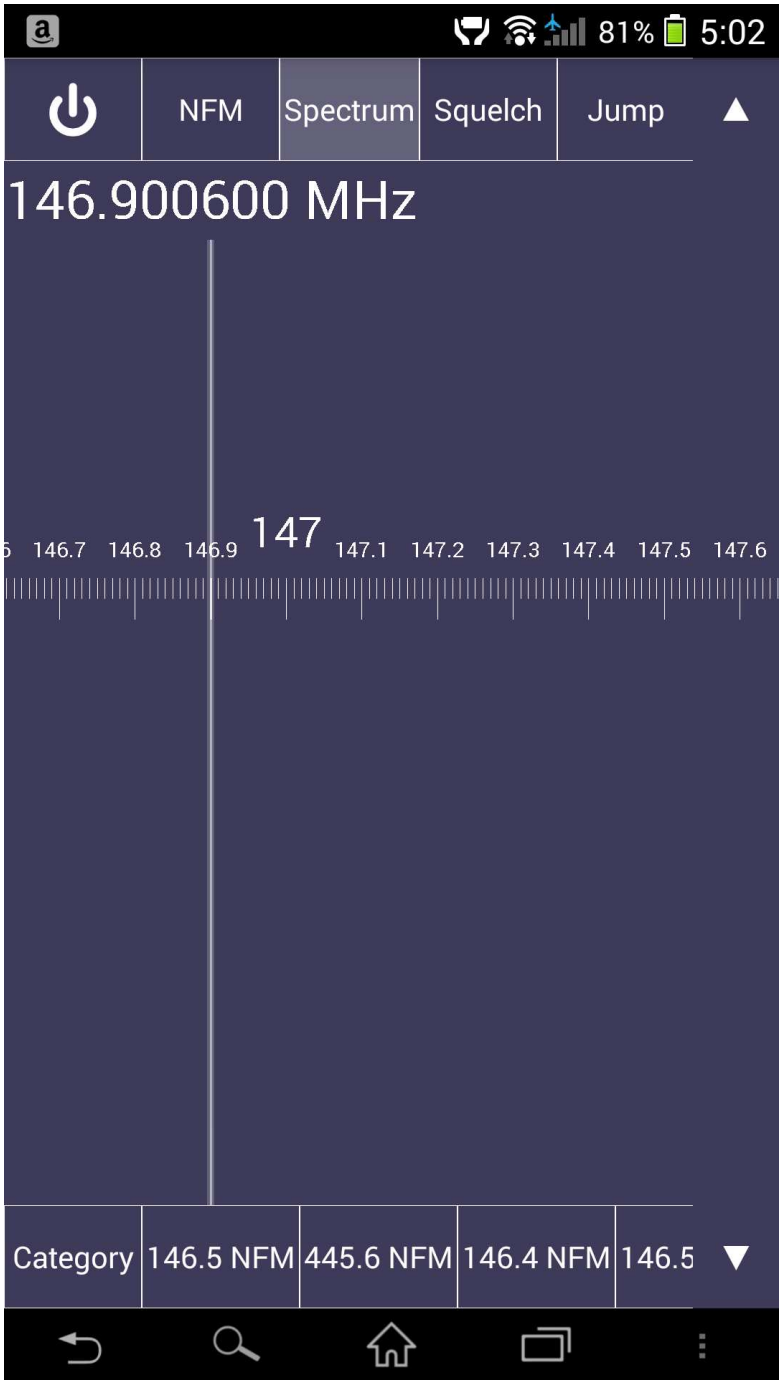

85% 4:56
NFM
Spectrum
Squelch
Jump
147.021000 MHz
-25
-30
-35
-40
-45
-50
Change displayed category
Category
+ Add new category
Export all
Import all
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5


84% 4:57
147.021000 MHz
-20
-25
-30
-35
-40
146.5
146.6
146.7
146.8
146.9
147
147.1
147.2
147.3


83% 4:59
146.838100 MHz
-20
-25
-30
-35
-40
-45
146.8
146.9
147
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5


82% 5:01
NFM
Spectrum
Squelch
Jump
147.019600 MHz
-20
-25
-30
-35
-40
146.6
146.7
146.8
146.9
147
147.1
147.2
147.3
147.4
147.5
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5


81% 5:02
NFM
Spectrum
Squelch
Jump
146.900600 MHz
-20
-25
-30
-35
-40
-45
146.9
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5


81% 5:02
NFM
Spectrum
Squelch
Jump
146.900600 MHz
146.7 146.8 146.9 147 147.1 147.2 147.3 147.4 147.5 147.6
Category
146.5 NFM
445.6 NFM
146.4 NFM
146.5