

EGC EASY WITH MULTIPSK (Version 4.33)

Introduction

In this document (revision A), it will be found a small guide about :

- the equipment to use for monitoring EGC transmissions,
- the way to decode the EGC transmissions, this with snapshots of the Multipsk screen.

Notes about the help in Multipsk:

- for the contextual help, click on the right button of the mouse, with the focus over the « EGC » button,
- use also the button hints. For this, wait a fraction of second with the mouse focus over the button.

Contents

- EGC mode presentation
- Necessary equipment to monitor EGC transmissions
- How to decode EGC transmissions with Multipsk (V. 4.33)

EGC mode presentation

The **EGC** (Enhanced Group Calls) service of Inmarsat C satellites uses a BPSK modulation at 1200 bauds to send broadcast messages either to all ships or to ships located on a given area, from a NCSC (Network Control Station Channel). The geostationary Inmarsat satellites 3F2 and 3F4 use respectively the frequencies 1541.450 and 1537.70 MHz, for these transmissions.

Example of message received:

**** Message number: 247 <26/11/17 09:17:26>

NL BURUM LES
11-NOV-2017 14:56:37 150261

NAVAREA V
COASTAL WARNING E 0832/17
EAST OF CABO DE SAO TOME
CHART 1406
FOUL AREA IN 22-00.46S 040-49.74W
CANCEL THIS WARNING 042218 UTC APR 18.
ST

Necessary equipment to monitor EGC transmissions

Receiver and LNA

For these UHF frequencies, a stable receiver not having too much shift is advised, as, for example, the "RTL-SDR.COM V3" key which permits, moreover, to directly supply the LNA in 4.5 V.

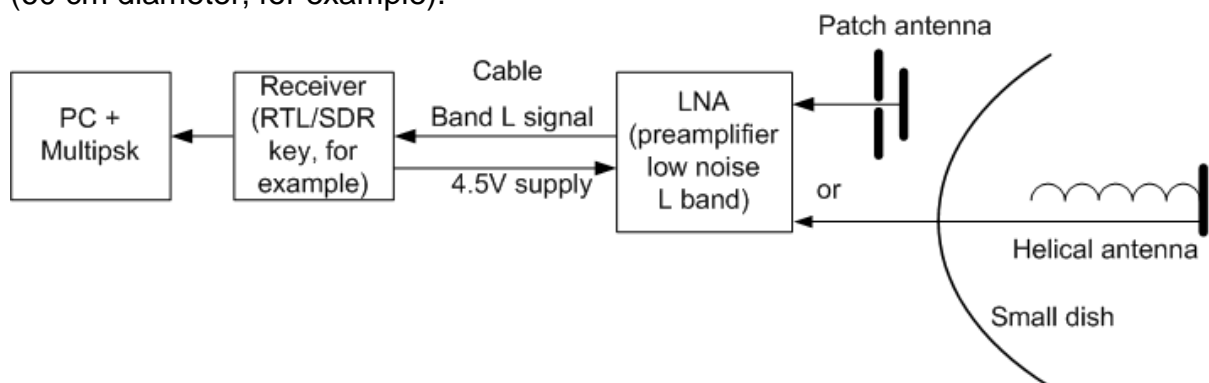
Note : if your receiver is neither a RTL/SDR key nor a FUNcube (equipments directly interfaced by Multipsk), you will need to install a VAC link (48 KHz, IQ signal 16 bits, in base band) between the SDR program associated to your receiver and Multipsk (in SdR interface).

It is necessary to have at one's disposal a LNA ("Low Noise Amplifier") as, for example, the « Outernet/Inmarsat L-band Amplifier – LNA » which can be supplied by the "RTL-SDR.COM V3" key. The LNA must be placed at the antenna output. A LNA specific to band L is advised.

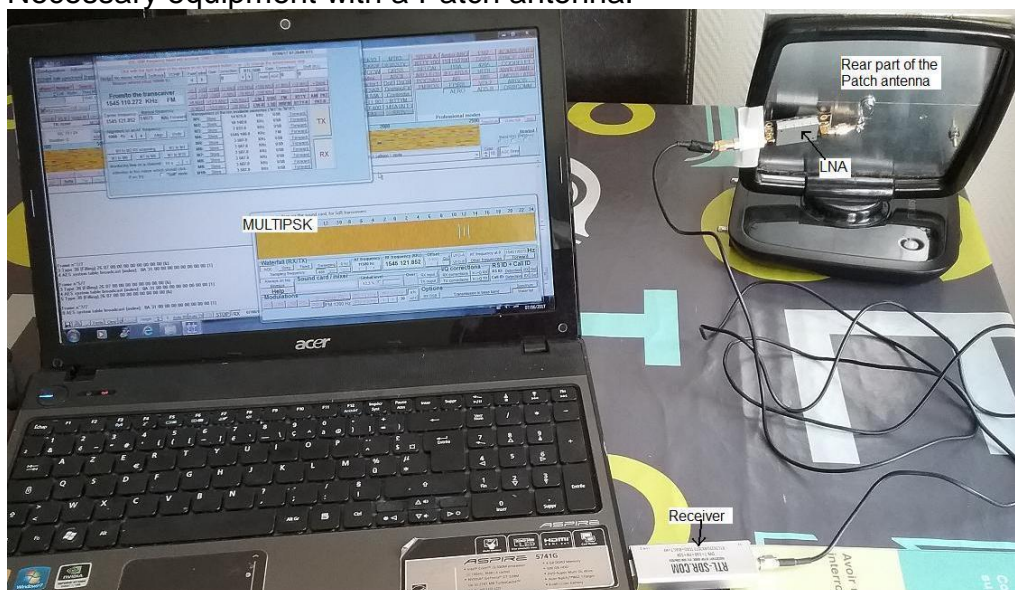
The cable between the LNA and the receiver must not introduce too many losses, so either use a cable with weak losses or a short cable.

Antenna

The antenna can be either a Patch antenna or a helical one installed on a small dish (60 cm diameter, for example).



Necessary equipment with a Patch antenna:



About these antennas :

- The Patch one : not very directional but quick to install.
To build a Patch antenna, see : <http://www.rtl-sdr.com/building-and-testing-an-l-band-patch-antenna-for-inmarsat-c-reception/>

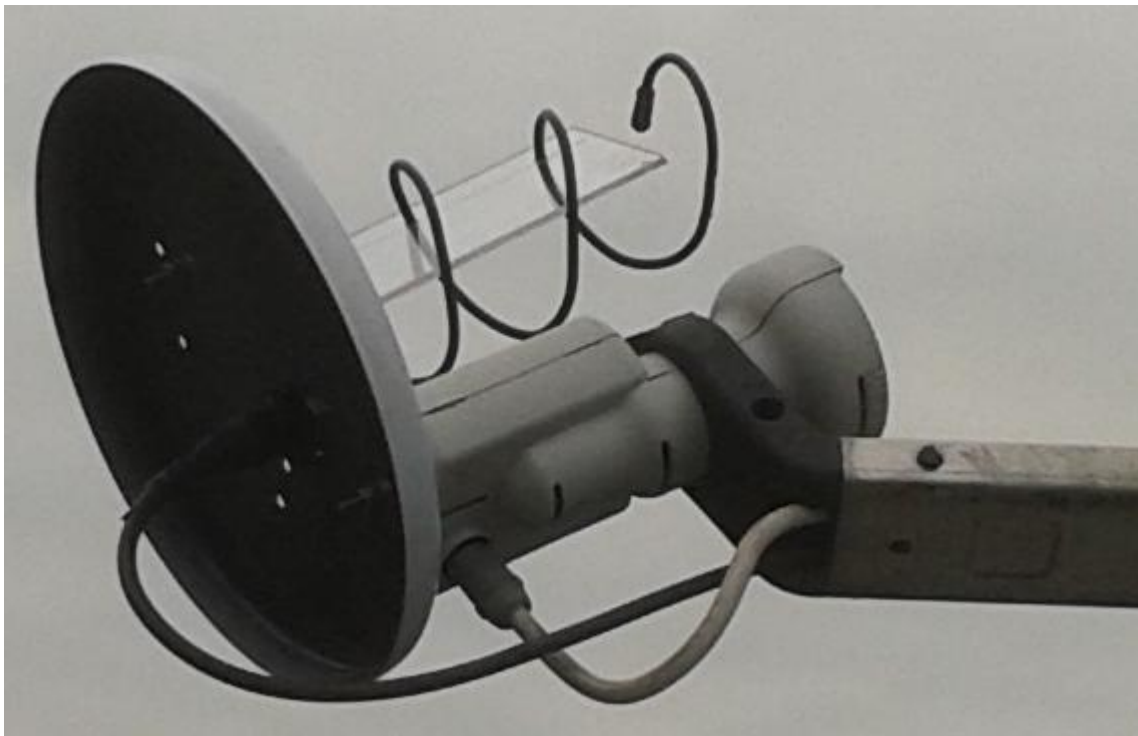
- The helical one installed on a small dish : more directional but more complicated to install.

For the helical antenna, see an example here : <http://www.uhf-satcom.com/lband/>

To calculate a helical antenna :

http://www.f1afz.fr/montages/calcul_helice/calcul_helice.html

Attention, the EGC polarization is right-hand circular, but the « dish » reversing the polarization, antenna turns must be wound to the left, as shown below:



How to decode EGC transmissions with Multipsk (V. 4.33)

It will be found, below, several snapshots which will show you how to configure Multipsk for the EGC mode.

One finishes with a snapshot of the « Satellites » window to help for antenna pointing.

It is reminded that the geostationary satellites 3F2 (for Europe, Africa and part of Asia) and 3F4 (rather for Americas) use respectively as frequencies 1541.450 and 1537.70 MHz for these transmissions

Note: for technical questions, Multipsk users can ask them to the Multipsk Yahoo group (in English).

Reception of the EGC transmission

MULTIPSK V. 4.33 RX/TX screen Patrick LINDECKER (F6CTE) 4, avenue du Square BURES-SUR-YVETTE 91440 FRANCE

Configuration Adjustments Options Tools PSKReporter Satellites Panoramic Help

TCP/IP SdR spectrum Transceiver Country/Loc World QSO Mail Tune Beacon ID CPU 1 %

Where? Number? Search Look-up DXK DXView Pathfinder Where? -> PSKReporter Options are in the logbook

8 Call Name Freq Mhz Mode Ur RST My RST R S Locator QTH Notes Clear Logbook QSO->Log

1541.453 EGC 599 599 Cluster L A DXKeeper Conf F

MESSAGE ID TX Text OK

Call ID RS ID Video ID QRGs RX RS ID RX Call ID Packets selection: Messages Information Unknown

TX: none MODE RX: EGC

RX: 9 3117 Hz Slow PC Satellites

AFC Time display

200 500 1000 1500 2000 2500 3000 3500 4000

Spectrum Waterfall

Rewind Band KHz (P450=+) 2.5 3.3 4.3 Color 10 AGC Grey

I/Q direct interface via the sound card, for SdR transceivers

-24 -22 -20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24

Waterfall (RX/TX)

AGC Grey Fixed Sweeping 0 Hz AF frequency 3120 Hz HF frequency (KHz) 1541 453.120 Offset 0 KHz VFO-A HF frequency at 0 1541450000 Hz

Sampling frequency: 48K 96K 192K VFO-B Other frequencies Forward

Always on top Sound card / mixer Global level 16.7 % Over RX input TX output I/Q corrections RX corrections TX corrections RS ID + Call ID RS ID: Detection RX Go! Call ID: Detection RX Go!

Help Modulations AM USB LSB PSK PPM FM 10 KHz FM x KHz afc Options RX DSB Re-reading of the .WAV sound file Spectrum Waterfall

Broadcast FM FM 5 KHz FM 5 KHz 33 AFC

Bulletin Board

Network version: : 132 / Frame number: 6751 / Signalling channel: 1 / Count: 0 / Ch<annel type: 1 / Satellite: AOR-E / LES: NCS

Status: 600 bps return link / Operational satellite / In service / Clear / Terrestrial links closed

Services: ALERT (Maritime Distress Alerting / SafetyNET Traffic / STD-C (Inmarsat-C Traffic) / Store & Forward / FleetNET Traffic / Land Mobile Alerting / Aero-C Service / ITA2 supported / DATA supported / Low Power C MES supported

Signalling Board

Uplink channel: 1641.0750 MHz

Bulletin Board

Network version: : 132 / Frame number: 6752 / Signalling channel: 1 / Count: 0 / Ch<annel type: 1 / Satellite: AOR-E / LES: NCS

Status: 600 bps return link / Operational satellite / In service / Clear / Terrestrial links closed

Services: ALERT (Maritime Distress Alerting / SafetyNET Traffic / STD-C (Inmarsat-C Traffic) / Store & Forward / FleetNET Traffic / Land Mobile Alerting / Aero-C Service / ITA2 supported / DATA supported / Low Power C MES supported

Signalling Board

Uplink channel: 1641.0750 MHz

STOP RX 25/11/17 23:25:00 UTC SpotC. Off Commander

Example of reception of a broadcast message.

Once the last packet relative to this message, received, it is displayed, in red, the re-formed broadcast message.

**** Message number: 247 <25/11/17 23:20:45>

NL BURUM LES
11-NOV-2017 14:56:37 150261

NAVAREA V
COASTAL WARNING E 0832/17
EAST OF CABO DE SAO TOME
CHART 1406
FOUL AREA IN 22-00.46S 040-49.74W
CANCEL THIS WARNING 042218 UTC APR 18.
ST

Broadcast message B2
[31283BF701004C055F4E3131ADCE]
11-NOV-2017 14:56:37 150261

NAVAREA V
COASTAL WARNING E 0832/17
EAST OF CABO DE SAO TOME
CHART 1406
FOUL AREA IN 22-00.46S 040-49.74W
CANCEL THIS WARNING 042218 UTC APR 18.
ST

Bulletin Board

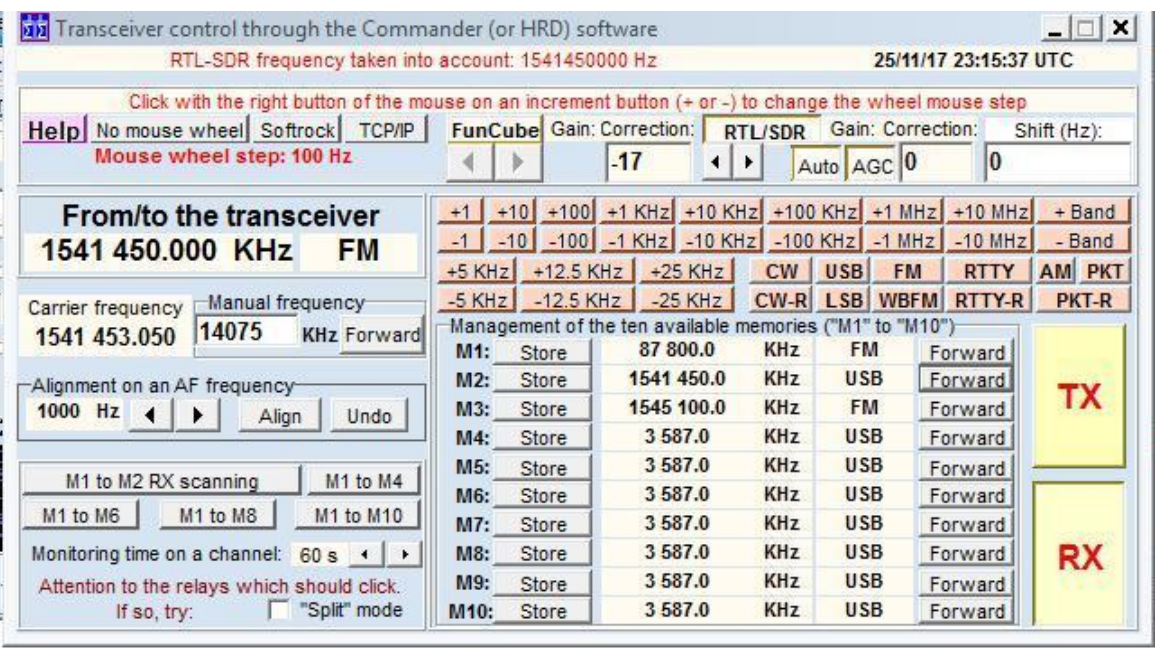
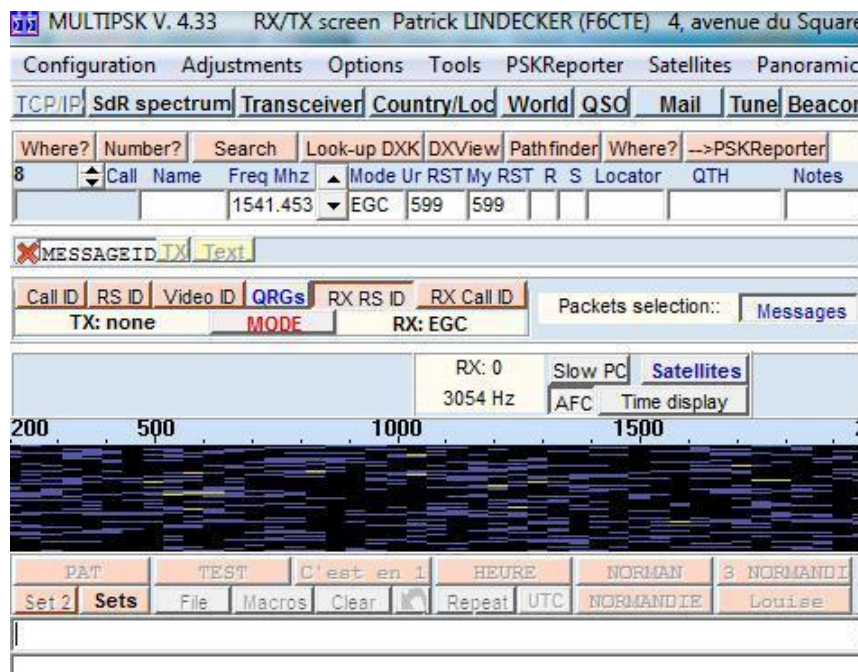
Network version: : 132 / Frame number: 6229 / Signalling channel: 1 / Count: 0 / Channel type: 1 / Satellite: AOR-E / LES: NCS
Status: 600 bps return link / Operational satellite / In service / Clear / Terrestrial links closed
Services: ALERT (Maritime Distress Alerting / SafetyNET Traffic / STD-C (Inmarsat-C Traffic) / Store & Forward / FleetNET Traffic / Land Mobile Alerting / Aero-C Service / ITA2 supported / DATA supported / Low Power C MES supported

Signalling Board

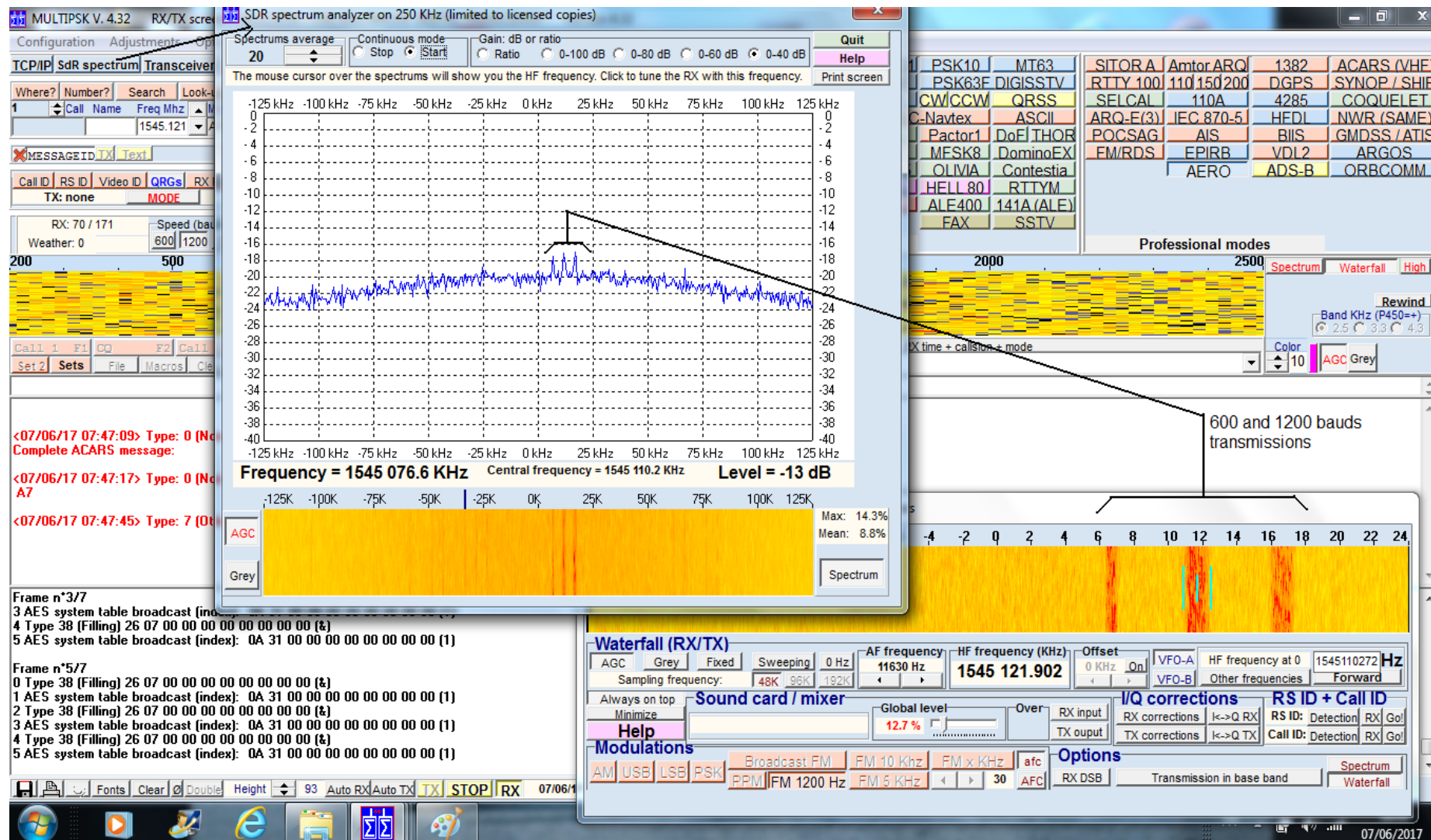
Uplink channel: 1641.0750 MHz

Fonts Clear Double Height 0 Auto RX Auto TX STOP RX 25/11/17 23:21:07 UTC SpotC. Off Commander

The Transceiver control window permits to control the RTL/SDR key or the FunCube frequency.



The « SdR spectrum » window permits to display a 250 KHz bandwidth and to control the RTL/SDR key frequency. Here with an example of AERO transmissions. The peaks height on the SdR spectrum makes easier the antenna pointing.



For the antenna pointing (azimuth and elevation), use the "Satellites" function.


Satellites tracking (positions and frequencies)

Automatic determination of the satellite position and its frequency taking into account the Doppler shift
Multipsk, with this frequency, will automatically control the receiver (configured in "Transceiver")

Help

Maps

World
Europe
North America
South America
Asia
Oceania
Africa



10:08:14: 3-F2 1541.449994 MHz Map: World_physical_small.jpg

Options

Your position is known **Personal** Ring Always on top

Export of the sole frequency proposed when the satellite appears **Fr. control** **Minimum elevation**
HF AF No < > 0°

Controls File

Frequencies 3-F2
1541.4500

Satellites
Orbcomm Argos 3 / EPIRB
Aero/EGC Fax APT Amateur
ISS Your choice

Only one track
Satellite name-nom
Tracked

Reset
Offset
0 Hz 0 Hz

2 satellites Oldest prediction: 260.3 days It's time to download new data

List of the satellites positions (from the closest to the farrest) Stop display

| | | | | | | | |
|------|-----------|---------|--------|---------|----------|---------------|---------|
| 3-F2 | 136150 Km | Az=201° | El=35° | 02.22°N | 013.30°W | F=1541.4500 M | D=-6 Hz |
| 3-F4 | 136593 Km | Az=244° | El=13° | 00.01°S | 054.91°W | F=1537.7000 M | D=0 Hz |

Pass predictions Save/Open