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.

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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
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.

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

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

NAVAREA V
COASTAL WARNING 0832/17
EAST OF CABO DE SÃO TOME
CHART 1486
FOUL AREA IN 22 00 46S 040 49 74W
CANCEL THIS WARNING 042218 UTC APR 18.
ST

Broadcast message B2
[312638F70100C055F4E3131ADCE]
11-NOV-2017 14:56:37 150261

NAVAREA V
COASTAL WARNING 0832/17
EAST OF CABO DE SÃO TOME
CHART 1486
FOUL AREA IN 22 00 46S 040 49 74W
CANCEL THIS WARNING 042218 UTC APR 18.
ST

Bulletin Board
Status: 600 bps return link / Operational satellite / In service / Clear / Terrestrial links closed
Services: ALERT (Maritime Distress Alerting) / SafetyNET Traffic / STD & Inmarsat-C Traffic / Store & Forward / FleetNET Traffic / Land Mobile Alerting / Aero C Service / ITA2 supported / DATA supported / Low
Power C NES supported

Signalling Board
Uplink channel: 1641.0750 MHz
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.