

Argos Performance in Europe

As our European customers are well aware, the performance of the Argos system in that region of the world is less than optimal. For many years we have observed a significant difference in the real life performance of a PTT transmitting in the USA and the same PTT operating in Europe. In the late 1990's when our Pop-up tags were first deployed in the Mediterranean (and when they were being tested on land before deployment) it was observed that the data returned from them through the system was significantly less than that from similar tags elsewhere in the world. Often less than 10% of the expected data was received.

These results were the first inkling that the problem was worse in the Mediterranean than in northern Europe, and therefore, might be caused by a source of radio "noise" somewhere nearer the Mediterranean.

Over the last 12 months in cooperation with CLS/Argos we have been carrying out tests and analyzing the raw data from PTTs in and around Europe. Initially we did tests with a special frequency-hopping PTT to see if the problem could be circumvented by taking advantage of the new Argos II wide bandwidth receivers and moving to an interference free part of the band. However, it soon became obvious the problem was equally affecting the whole Argos II band, so there was little advantage in operating on any frequency relative to another to avoid this presumed interfering signal. (Moving away from the Argos I center frequency generally improves performance in all parts of the world but this is a separate phenomenon).

Analysis of the number of messages received from a PTT during a satellite pass from a given location has proven to give valuable insight into the problem. We have been able to start plotting a map (Fig. 1), of the affected area using test data from PTTs*.

Although the map is far from complete it seems to show that the affected area is roughly the size of the

satellite footprint, the area of the earth that the satellite is in view of at any given moment. This area seems to be centered in the Mediterranean in the region of southern Italy/Sicily. The closer a PTT is to the center of this area the worse is its apparent performance.

Closer analysis of the message data and the exact positions of the satellites when messages are received, show that when messages from PTTs in this area are successfully received, the footprint of the satellite does not usually include southern Italy/Sicily.

Looking at this in reverse, whenever the satellite can "see" southern Italy/Sicily, messages from anywhere else in its footprint (which can be just about anywhere in Europe) are much less likely to be received.

These two separate observations lead us to the conclusion that the cause of the problem is probably a wideband transmission from somewhere geographically near the center of the observed affected area on or near the Argos frequency of 401.650MHz.

We have presented these findings to Service Argos here in the USA, who together with CLS in France are now implementing an investigation. This includes global satellite based measurement of the noise floor at the Argos frequencies and global analysis of received power levels from the Argos platforms. We hope that by the time we write the next newsletter we will be closer to solving this problem that denies European users the full benefits of the Argos system enjoyed by researchers everywhere else on earth.

*If you have any data from birds within this area or especially ones migrating through it and would like us to use it in our analysis please contact us.

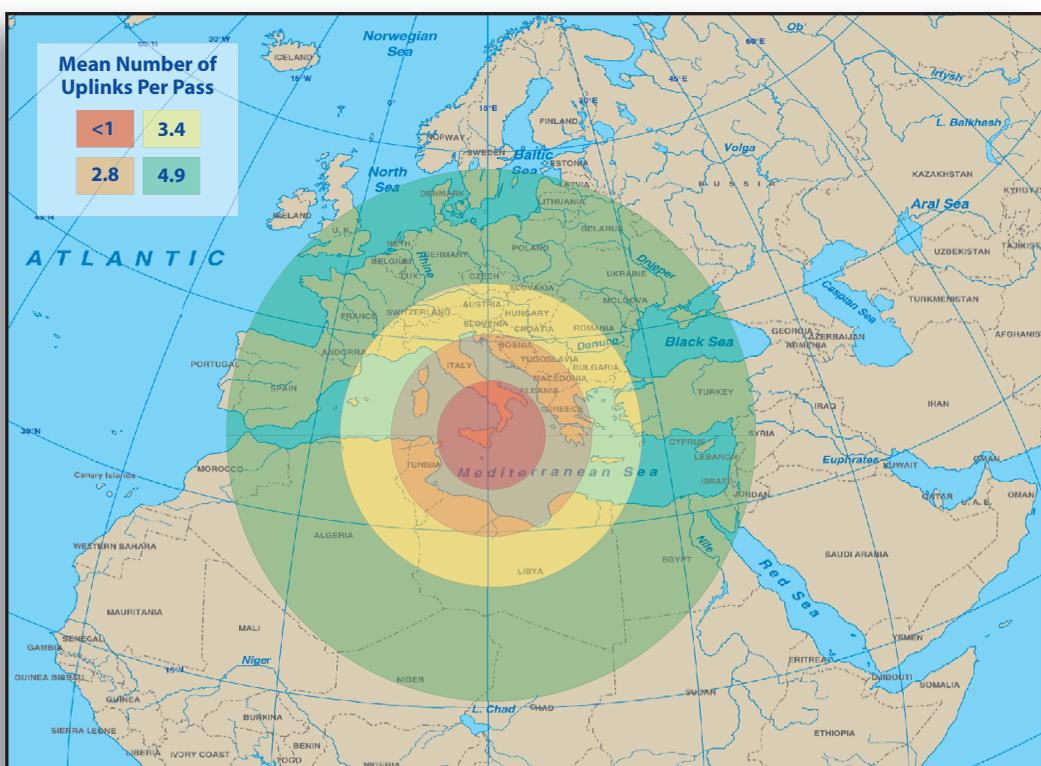


Figure 1. Depiction of the mean number of uplinks received from various PTTs throughout the shown area per satellite pass. Data from 2005 with PTT repetition rate of 60 seconds.