

## A new Callisto solar radio burst station has been set into operation in Germany

Christian Monstein

### 1. Introduction

In May 2010 an article about the building of a Callisto solar radio spectrometer was published in the German journal *Funkamateurl* (radio amateur journal). About 40 kits were sold to radio amateurs but, unfortunately, only a few finally managed to get their Callisto operational. One of them was Jochen Plessmann (DO1JPA). Within a very short time he received nice solar radio bursts that are now archived at the solar radio burst archive in Switzerland (<http://soleil.i4ds.ch/solarradio/callistoQuicklooks/>).



Figure 1 ~ The biconical antenna and the responsible engineer Hannes during installation



Figure 2 ~ The biconical antenna (called "Fliegenfischfänger" in German language, because it looks like a trap for flying fishes) mounted to a tree. The antennas directional sensitivity should follow the sun, so no tracking system is needed.

### 2. Startup

During spring 2012 the radio astronomy group at the Walter Hohmann Sternwarte in Essen, Germany began to build and set up the equipment for the e-Callisto system (figure 3). Guided by the article from *Funkamateurl* magazine and the expertise of Karl-Heinz Gansel, they succeeded. The group initially used a commercial log-periodic DVB-T antenna but the results were rather poor. Looking for a simple, low frequency substitute they set up a biconical antenna (figure 1). To avoid the complications of a Sun tracking system, the antenna was oriented vertically and tilted (figure 2). At this site the CALLISTO software is running on a Linux computer with a Windows emulator (figure 4). This setup still has some quirks to solve, but the system has been online since October 25, 2013 (figure 5) and better than ever! The station coordinates are longitude 6.9790° east, latitude 51.3938° north and elevation is 120 m above sea level. Homepage: <http://www.sternwarte-essen.de>

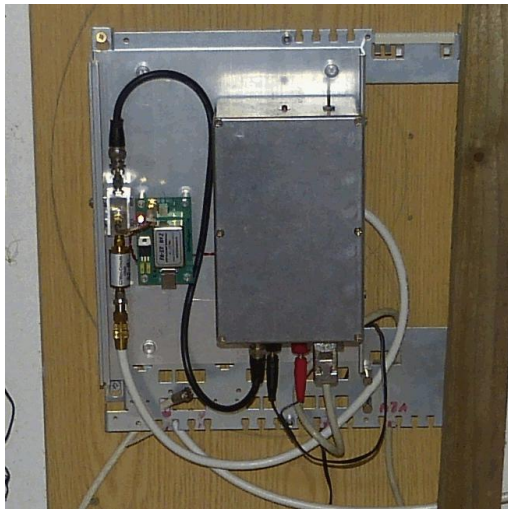


Figure 3 ~ Opened, wall mounted receiver-box. An up-converter is shown left, and the CALLISTO is shown middle. A surge arrester is mounted between the antenna plug and the low pass input filter to protect the electronics.



Figure 4 ~ Computer box containing a small low-power computer board, disk, switch and power supply.

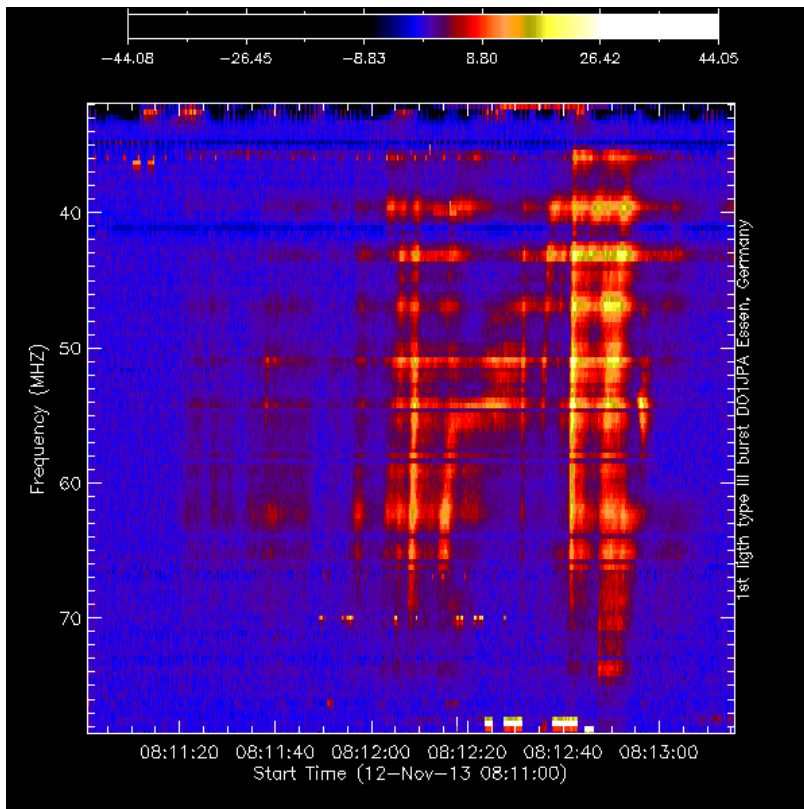


Figure 5 ~ 1st light of Callisto at Walter Hohmann Sternwarte in Germany – a small group of type III radio bursts at low frequency observed at Essen observatory.

The radio astronomy group plans to use additional Callisto stations setup to observe at low frequencies (with a heterodyne up-converter) to conduct a measurement campaign. They will use identical frequency programs to allow the results to be easily correlated and to significantly improve the signal-to-noise ratio (SNR).

### 3. Conclusions

It was demonstrated that interested and motivated amateurs are able to set up a radio astronomical instrument to conduct solar radio burst observations at low cost.

### 4. References and further reading

Photos taken by Jochen Plessmann, and burst plot created by Christian Monstein with RAPPVIEW under SSW-IDL

[Funkamateur] <http://www.funkamateur.de/>

e-Callisto data access and technical information can be found here: <http://www.e-callisto.org/>