

## **IOTA and Lighthouse expedition to the island of Graciosa, CU4, Azores**

Our 2005 target was the small island of Graciosa, CU4, EU175. Our plan was to participate into the IOTA contest and to activate in parallel a lighthouse. Our selection was the lighthouse Carapacho located on the Southern tip of the island at 39°00,85N;27°57,35W, at the slope of the volcano "Enxofre" (sulfur) on a plateau 191 m above sea level. Around the lighthouse there is lot of flat ground which we fully used for our antenna farm and until the last bit of coax cable was in use! Graciosa, like all of the 9 Azores islands is of volcanic origin. The island is scattered with volcano craters and the largest one is the "Caldeira Enxofre". This crater measures some km in diameter and a road goes down to the base of the crater. A path leads down to the interior of the volcano where one can visit an enormous cave. Hot steam comes out of the ground and mud is bubbling. The CO<sub>2</sub> concentration is being monitored all the time and sometimes the cave is closed when the concentration of CO<sub>2</sub> is too high. Graciosa is a green island like all Azores islands and is reminiscent of Ireland.

The participants came from 4 countries: Luis CT1AGF, Arlindo CT1EGW, Antonio CT1EPV, Juergen DJ2VO, Franz DF6QV, Derek G3KHZ, Rolf HB9CNU, Rudi HB9CQL, Toni HB9EBV and Hermann HB9CRV/CT3FN. For Rudi and Rolf it was their first expedition ever! In Portugal the license authority ANACOM issues special 2X1 call signs valid only for 3 days. That was the reason why we showed up under 5 different call signs: CU4T, CU4M in the IOTA Contest, CU4/CT1EGW, CU4/HB9EBV, CU4/CT3FN. Organization of this event started back in November 2004. In May 2005 Antonio and Luis travelled to Graciosa to check the suitability of the lighthouse and accommodation, apply for the permit to install our stations inside the lighthouse and operate from the lighthouse at the harbour authorities and clear logistic problems like material shipment.

Being close to the sunspot minimum we expected poor propagation conditions. Therefore, we decided to build special light weight wire antennas: 4squares for 20m + 40m were built. Particularly, the 20m hybrid coupler was difficult to build and finally I replaced the 180° phase toroid transformer by a  $\lambda/2$  RG59 coax cable[1]. For 80m (and outside of the contests) also for 160m a 20m height ground plane with hat capacitor was built and tested at the CQ160m CW contest at the end of January 2005. Further antennas were 1 Spider Beam 10/15/20m, 80m SuperLoop antenna, HF9V GP, 10m high aperiodic GP, K9AY RX loop and 4 el. 6m Beam.

On 22.7. the advance crew met on Graciosa and by 27.7. all the remaining operators had arrived. Unfortunately, twelve glass fiber tubes of 3m length for the 80m ground plane were missing from the freight that consisted of 17 crates and 2 pipes. The transport company found these pipes 1 week later, but we had already engineered an alternative solution: Antonio, CT1EPV bought a 15m high aluminum ladder, which we extended by an aluminum pipe to 17m. On top we fixed 25m wire to form a lazy L antenna. This wire was rolled up for 80m operation to approx. half length and moved towards the ladder, until the SWR was correct. The antenna erections went smoothly with one exception: At the first day a big storm blow my entire documents for the 4square antennas down in the sea.

On 24.7. the 1st station went on the air: The 6m beacon under CU4/CT3FN. As of 27.7. all antennas and stations were QRV using the callsign CU4T: FT900 (digital modes), Alinco DX-70TH (for 6m), FT1000MP, FT847, IC706MKII and occasionally 1 Elecraft K2/100. For amplifiers we used 1xSB220, 1xExplorer, 2xFET Pa (designed by DJ9YN). Altogether 3 Shacks were installed in the lighthouse. The network setup using wirtelog gave as many problems. What worked well at home in my shack didn't work on CU4. After 2 days of "trial and error" with 4 different laptops (Windows 98, Millenium and XP) the hard disk of the Millenium laptop has been formatted and Windows 98 installed. Finally, the Ethernet network worked with a second "98er" laptop.

Another problem was the 230 AC mains line which had only 1 single phase with 14 Ampere feeding the house of the lighthouse keeper, the lighthouse itself and our 2 SW stations with 1kW Pa Explorer and 800 Watts Pa SB220. We were lucky as the fuse blew only twice, even with 2 PA's transmitting simultaneously. As a "side effect" the lighthouse keeper's family learnt CW, because all lights, TV etc. suffered CW-flicker.

In the IOTA Contest a total of 1692 QSOs were made giving a final score of 3`339`684 points. The propagation was moderate, but better than 2004. 10m provided propagation (for us) only 1h before the contest ended. Here is the result:

Band	QSOs	Points	Multipliers	QSOs	Points	Multipliers
80	67	489	13	53	675	30
40	175	1161	27	121	1095	34
20	432	2208	38	455	3429	71
15	173	1107	30	105	795	28
10	20	108	3	91	487	15

The 6m operation was a great experience. OM Peter, HB9RUZ asked me to set up a 6m station as he still needed a 6m QSO with the Azores. The 6m beacon operating under the call CU4/CT3FN was controlled by a CWK tiny. 50 Watts rf went via Aircel7 Coax into a 4el. beam 5m up. As one can see on the picture 7 propagation was only blocked in the northerly direction.

First QSO with EI5FK was on 24.7. followed by G's, GW's, GD and EA1. Next opening was on 27.7 and again the majority of the QSOs were with G and F. After the IOTA contest a large opening occurred, which lasted from 17.47 to 20.55UT. During the first hour the signals were accompanied by a strong hum and were difficult to read. Probably, the tropo propagation was mixed with Aurora or TV carrier. After 1h the hum disappeared. During this opening 97 QSOs with 15 different DXCC countries were logged working alternatively in CW and SSB. Particularly it was pleasing that also 4 Swiss amateurs came into the log. However, HB9RUZ was not successful - sorry Peter perhaps next year?

On 1.8. 6m opened for a short time prior to 11.00UT and around 18.55 again. By 21.26 UT 63 QSOs were made. For the first time there was propagation to US east coast and we contacted K1TOL. Thereafter WX deteriorated and up to the end of the activity we had only short openings in the direction of G and GW. A total of 186 QSOs into 28 DXCC entities were made.

At the end of our operation 9594 QSOs were in our log:

Band	CW	SSB	RTTY	PSK31	total
80m	75	296	-	-	371
40m	524	255	-	-	779
30m	407	-	-	-	407
20m	1062	3679	40	148	4929
17m	1085	1	33	32	1151
15m	1108	480	-	6	1594
10m	20	157	-	-	177
6m	80	106	-	-	186
Total	4361	4974	73	186	9594

On 160m not one single QSO could be made and our efforts to erect the shortened ground plane and the K9AY RX loop didn't pay off. Our "secret weapon" the ladder antenna worked relatively well, suffering however from the bad ground conductivity and the fact that we had only 9 radials of 42m length at our disposal.

We were happy to learn that the 20m 4square worked very well: The antenna has been erected and tested for the first time!! Most of the 3679 20m SSB QSO's were made with this antenna! We observed a front to back ratio of 2 – 4 S units. And switching from NE (Europe) to NW (the USA) looked like switching off the mains power to the whole of Europe. The 40m 4square worked also very well and pileups developed within minutes and were enormous. Most of the 80m QSOs were made during the IOTA Contest and by the majority on the SuperLoop antenna, which was tuned for the SSB portion of the 80m band. We appreciated very much the hospitality and the support of the lighthouse keeper Paulo Medeiros and his family, Sr. Contra-almirante José Conde Baguinho, Gabinete do Chefe de Estado Maior de Armada, Sr. Tenente Santos, Capitania de Santa Cruz de Graciosa, SDXF, DF4SA and VA2AM. Thank you to all, who contributed to the success of the expedition. In memory of our colleague CT1EEN - Samuel Pimenta, silent key at the 29/07/05. He was a GPDX member.

[1] John Devoldere, ON4UN, low band Dxing, page II-72: The Collins method.

Picture 1: Crew CT1AGF, HB9CQL, Sr. Paulo Medeiros, HB9EBV, CT1EPV, CT1EGW, DJ2VO, Silvia XYL of HB9CQL, HB9CRV/CT3FN, G3KHZ, DF6QV, Bea XYL of HB9EBV, HB9CNU.



Picture 2: Lighthouse with 20m 4square, 40m 4square and spider beam:



Picture 3 View from the Caldeira Enxofre down to the lighthouse:



Picture 4: Outlook from the lighthouse down to the small village Carapacho and Luz.



Picture 5: Lighthouse Carapacho by night



Picture 6: Outlook from the lighthouse to the neighbor islands Sao Jorge, CU5 and Pico, CU6.



Picture 7: View from the lighthouse in direction North.



QSL card



**CU4M**  
**CU4T**  
**CU4/CT3FN**

**Graciosa Island, Azores**

CQ 14 • ITU 36 • EU 175  
Locator HM69aa • WLOTA 0113  
DIP AZ004 • FAZ04 • ARLHS AZ0006

QSL CU4M / CU4T via CT1GFK  
CU4/CT3FN via HB9CRV

confirming QSO's with

Date	UTC	MHz	2-way	RST

PSE / TNX QSL 73's

Our 2005 IOTA and lighthouse expedition brought us to Graciosa Island, Azores. It is the smallest island of the central group of the Azores consisting of CU3, 4, 5, 6 and CU7. Our QTH was the 14 m high lighthouse of Carapacho situated at 39° 00' 85" N; 27° 57' 35" W, 191 m asl, range of sight 15 miles. The team was CT1AGF, CT1EGW, CT1EPV, CT3FN/HB9CRV, DJ2VO, DF6QV, G3KHZ, HB9CNU, HB9CQL, HB9EBV. We are grateful to the lighthouse keeper Paulo Medeiros and his wife Teresa for their great hospitality and to our sponsors SDXF, DF4SA and VA2AM. We dedicate this expedition to Samuel, CT1EEN, sk 1 day before the IOTA contest. He was a GPDX member.



Picture by G3KHZ

