

CT3 <> ON Tropo path on 144 MHz

On August 19th, 2021, I had the surprise to see “CT3KN” (IM12MT) on my screen in FT8 on 144 MHz at 10:56 UTC. Unfortunately, we couldn’t make a 2 ways QSO over that 2614 km path, 2-3 dB were missing to achieve it ! In 2011 and 2019, I already worked the Azores Islands (CU8) on 144 MHz in Tropo. Nevertheless, I never thought the path to CT3 (Madeira Island) would ever been possible. Indeed, if the sea propagation seems sometimes without “limits” (see the QSO’s on 144 MHz between D4 and EA8 and the Caribbean Islands), when there is land in between, that is another story. If on the path to the Azores the amount of land is very limited, on the path to Madeira, there is about 750 km of land to cross, with as many opportunities to have the tropo sea duct being interrupted.

Nevertheless, knowing that G stations as close to me as J001/02 made their way to the Ricardo (CT3KN)’s log on August 18th evening, I called “CQ” from time to time with the antennas heading to the Azores on the 19th. And it paid ! Below a screenshot taken at my station :

The screenshot shows a radio software interface with two main log windows. The left window, titled "Band Activity", shows a list of received signals with columns for UTC, dB, DT, Freq, and Message. The right window, titled "Rx Frequency", shows a list of transmitted signals with columns for UTC, dB, DT, Freq, and Message. Below the logs are various control buttons and a frequency display.

Band Activity					Rx Frequency				
UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
105530	-2	0.3	2269	~ CQ F8PRC IN99	105515	Tx	1766	~	CQ DX ON4KHG JO10
105600	-2	0.2	2266	~ CQ F8PRC IN99	105545	Tx	1766	~	CQ DX ON4KHG JO10
105600	-19	-0.9	1301	~ ON4KHG CT3KN IM12 a2	105600	-19	-0.9	1301	~ ON4KHG CT3KN IM12 a2
105630	-8	0.2	2264	~ CQ F8PRC IN99	105615	Tx	1766	~	CQ DX ON4KHG JO10
105630	-21	-0.9	1297	~ ON4KHG CT3KN IM12 a3	105630	-21	-0.9	1297	~ ON4KHG CT3KN IM12 a3
105700	-8	0.2	2263	~ CQ F8PRC IN99	105645	Tx	1766	~	CT3KN ON4KHG -19
105730	-7	0.3	2262	~ G8HGN F8PRC +01	105715	Tx	1766	~	CT3KN ON4KHG -19
105800	-4	0.3	2261	~ G8HGN F8PRC RR73	105745	Tx	1766	~	CT3KN ON4KHG -19

Control buttons: CQ only, Log QSO, Stop, Monitor, Erase, Decode, Enable Tx, Halt Tx, Tune, Menus

Frequency display: 2m, 144,174 000

DX Call: CT3KN, DX Grid: IM12NP, Az: 229, 2626 km

Generate Std Msgs: CT3KN ON4KHG JO10, CT3KN ON4KHG -19, CT3KN ON4KHG R-19, CT3KN ON4KHG RR73, CT3KN ON4KHG 73, CQ DX ON4KHG JO10

Bottom status bar: Receiving, FT8, FT8, Last Tx: CQ DX ON4KHG JO10, 0, 0/15, WD:11m

And here is the screen at Ricardo’ side at the same time :

WSJT-X v2.4.0 by K1JT, G4WJS, K9AN, and IV3NWW

File Configurations View Mode Decode Save Tools Help

Band Activity

UTC	dB	DT	Freq	Message	
105315	-2	1.0	1407	~ CQ EA7FDW IM76	EA
105330	15	1.1	1734	~ CQ EA8JK IL18	EA8
105330	-14	1.0	1366	~ CQ EA8CXN IL18	EA8
105445	9	0.9	1489	~ CT3KN EA4GDA -07	
105515	11	0.9	1492	~ CT3KN EA4GDA -07	
105515	-21	1.0	1975	~ CQ DX ON4KHG JO10	ON
105545	-20	1.0	1977	~ CQ DX ON4KHG JO10	ON
105545	14	1.0	1493	~ CT3KN EA4GDA -07	
105545	-10	1.0	1398	~ CQ EA7FDW IM76	EA
105615	-11	1.1	1976	~ CQ DX ON4KHG JO10	ON
105615	8	1.0	1495	~ CT3KN EA4GDA -07	
105645	13	1.0	1498	~ CT3KN EA4GDA -07	
105645	-13	1.1	1979	~ CT3KN ON4KHG -19	
105715	-15	1.0	1980	~ CT3KN ON4KHG -19	
105745	-18	1.0	1979	~ CT3KN ON4KHG -19	
105815	-18	1.0	1979	~ CT3KN ON4KHG -19	
105845	-19	1.1	1982	~ CT3KN ON4KHG -19	
105915	-18	1.1	1982	~ CT3KN ON4KHG -19	
105945	-19	1.0	1983	~ CT3KN ON4KHG -19	
105945	-5	1.0	1507	~ CT3KN EA7ALL IM88	
110015	-15	1.0	1983	~ CT3KN ON4KHG -19	
110045	-15	1.0	1982	~ CT3KN ON4KHG -19	
110115	-19	1.0	1983	~ CT3KN ON4KHG -19	
110145	-21	1.0	1984	~ CT3KN ON4KHG -19	
110245	-21	1.0	1986	~ CT3KN ON4KHG -19	
110315	-21	1.0	1987	~ CQ DX ON4KHG JO10	ON
110315	-21	0.8	1877	~ EA8DEC EA8AR 73	
110345	-19	1.0	1985	~ CQ DX ON4KHG JO10	ON
110415	-18	1.0	1987	~ CQ DX ON4KHG JO10	ON

Rx Frequency

UTC	dB	DT	Freq	Message	
105515	-21	1.0	1975	~ CQ DX ON4KHG JO10	ON
105545	-20	1.0	1977	~ CQ DX ON4KHG JO10	ON
105545	14	1.0	1493	~ CT3KN EA4GDA -07	
105600	Tx		1500	~ ON4KHG CT3KN IM12	
105615	-11	1.1	1976	~ CQ DX ON4KHG JO10	ON
105615	8	1.0	1495	~ CT3KN EA4GDA -07	
105630	Tx		1500	~ ON4KHG CT3KN IM12	
105645	13	1.0	1498	~ CT3KN EA4GDA -07	
105645	-13	1.1	1979	~ CT3KN ON4KHG -19	
105700	Tx		1500	~ ON4KHG CT3KN R-13	
105715	-15	1.0	1980	~ CT3KN ON4KHG -19	
105730	Tx		1500	~ ON4KHG CT3KN R-13	
105745	-18	1.0	1979	~ CT3KN ON4KHG -19	
105800	Tx		1500	~ ON4KHG CT3KN R-13	
105815	-18	1.0	1979	~ CT3KN ON4KHG -19	
105830	Tx		1500	~ ON4KHG CT3KN R-13	
105845	-19	1.1	1982	~ CT3KN ON4KHG -19	
105900	Tx		1500	~ ON4KHG CT3KN R-13	
105915	-18	1.1	1982	~ CT3KN ON4KHG -19	
105930	Tx		1500	~ ON4KHG CT3KN R-13	
105945	-19	1.0	1983	~ CT3KN ON4KHG -19	
105945	-5	1.0	1507	~ CT3KN EA7ALL IM88	
110000	Tx		1500	~ ON4KHG CT3KN R-13	
110015	-15	1.0	1983	~ CT3KN ON4KHG -19	
110030	Tx		1500	~ ON4KHG CT3KN R-13	
110045	-15	1.0	1982	~ CT3KN ON4KHG -19	
110100	Tx		1500	~ ON4KHG CT3KN R-13	
110115	-19	1.0	1983	~ CT3KN ON4KHG -19	
110130	Tx		1500	~ ON4KHG CT3KN R-13	

CQ only Log QSO Stop **Monitor** Erase Decode Enable Tx Halt Tx Tune Menus

2m ● 144,174 000 Tx even/1st Hold Tx Freq

Tx 1500 Hz Rx 1987 Hz Report -13

 Auto Seq Call 1st

Generate Std Msgs Next Now Pwr

ON4KHG CT3KN IM12	<input checked="" type="radio"/>	Tx 1	-
ON4KHG CT3KN -13	<input type="radio"/>	Tx 2	-
ON4KHG CT3KN R-13	<input type="radio"/>	Tx 3	-
ON4KHG CT3KN RR73	<input type="radio"/>	Tx 4	-
ON4KHG CT3KN 73	<input type="radio"/>	Tx 5	-
CQ CT3KN IM12	<input type="radio"/>	Tx 6	-

Receiving FT8 Last Tx: ON4KHG CT3KN IM12 0 5/15 WD:6m

Ricardo is using 80W and 2x9 elements antennas. I'm using 1,2 kW and 2x9 elements too. It makes a difference of more than 10 dB, which is somehow reflected in the reports seen. I saw Ricardo -19 dB at best and he saw me -11 at best. At -11 dB, my signal was barely audible in a reduced bandwidth. Hence, even in CW, a QSO would have been hard to achieve (at same RF power level both sides).

In the morning of August 19th, 2 EA1 stations lying on the path (both in IN73DM) have been worked too. EB1B has been worked at 07:27 UTC and EB1FNS at 09:42 UTC.

After analysis of the PSK Reporter data and my log, one can see :

- 06:22 UTC : CT2HXM (IN60CR) sees my signal -12 dB. Thierry sees also G0MBL in JO01 at 07:23 UTC, nobody else around or in between. This can be MS or

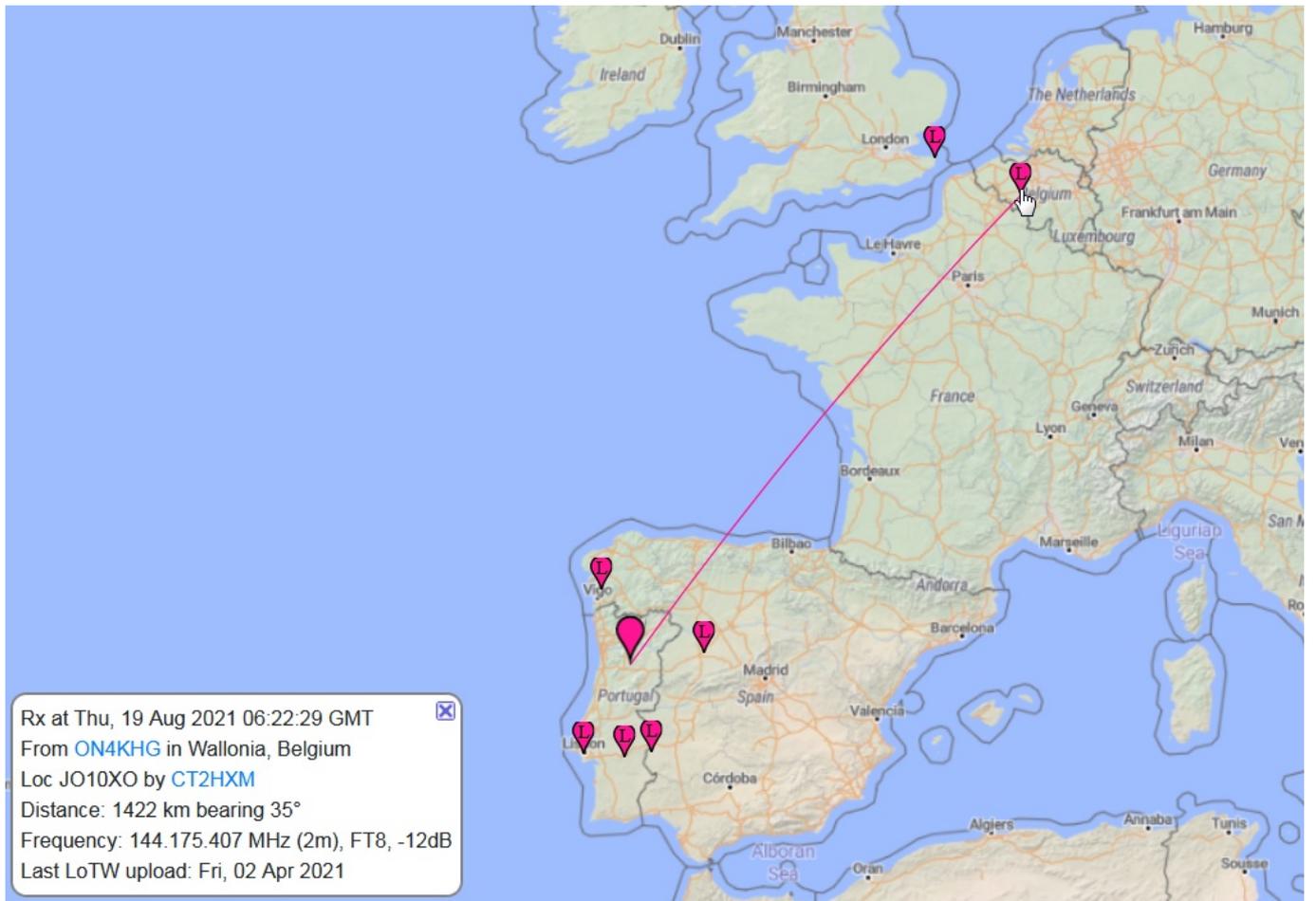
Tropo but I assume it was more MS than Tropo. See the map below.

- 07:27 UTC : I make QSO with EB1B in IN73DM (-08 dB / -08 dB)
- 09:42 UTC : I make QSO with EB1FNS in IN73DM (-08 dB / -01 dB)
- 10:56 UTC : uncomplete QSO with CT3KN in IN12MT (2614 km)
- 11:40 UTC EB1FNS sees my signal +15 dB. So, the duct seems to be stronger now, provided the antenna at the EB1FNS' side was heading the same QTF (to me ?) at 09:42 too.

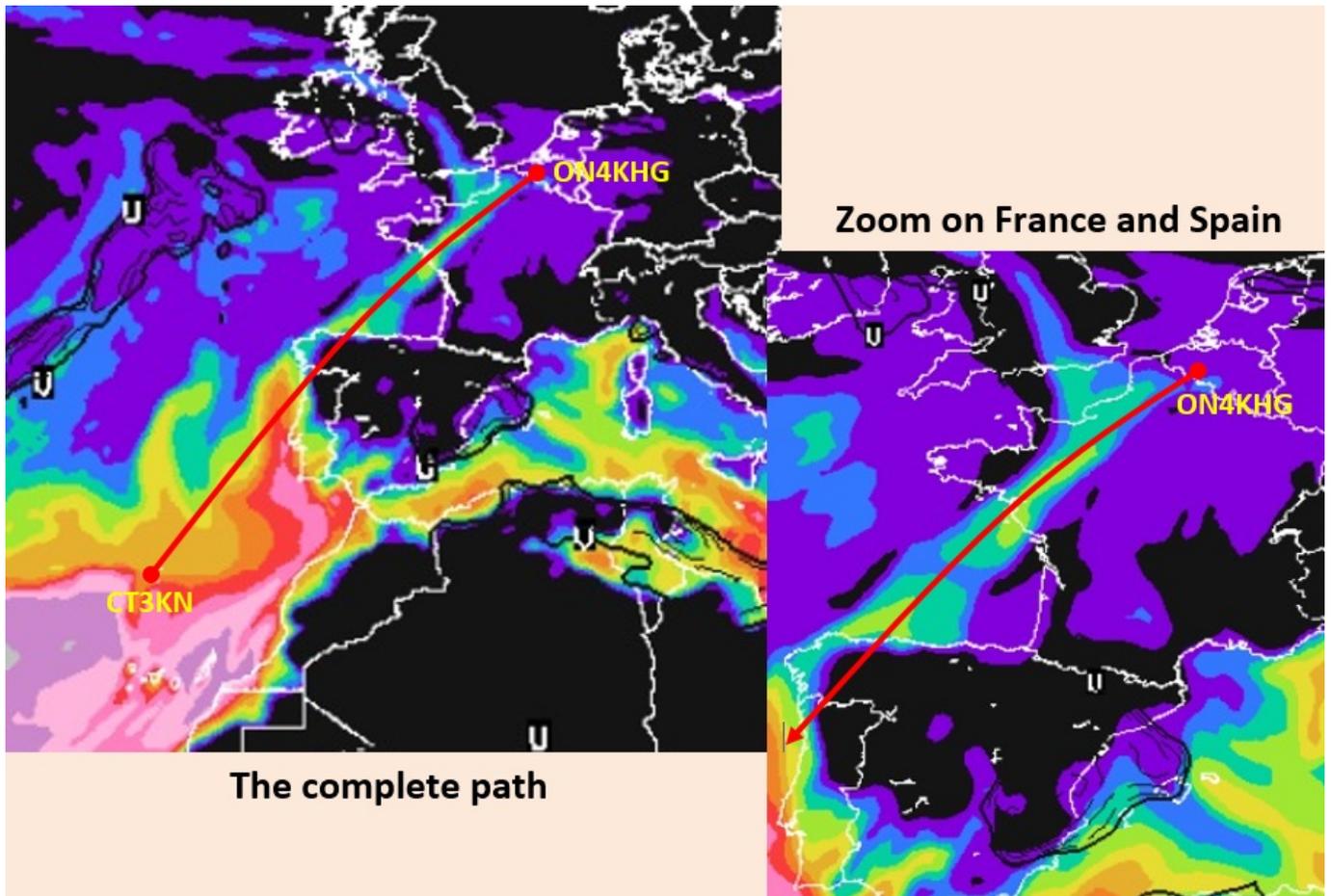
This is the complete path :



CT2HXM, Thierry sees "local" stations and my signal at 06:22 UTC. G0MBL (J001) is seen at 07:23 UTC. Surprisingly, no stations in between or around G0MBL and I. However, I checked PSK Reporter and there were not many F stations QRV on the path between 06:10 and 06:40 UTC (F0FWC and F0GFI, both in J010. F4KKV in IN98. F4ELJ in IN78). At 07:27 UTC, about when CT2HXM sees G0MBL, I have worked EB1B but CT2HXM doesn't see me then. So, the spot of 06:22 is probably MS, unless CT2HXM has turned his antenna between 07:23 and 07:27. Or, since I was in QSO with EB1B, not CQing, PSK reporter didn't report my signal around 07:23-27 UTC at CT2HXM' side ?



Looking at Hepbrun's Tropo maps, the duct was clearly visible. It seems it peaked (for my location) between 09:00 and 12:00 UTC. The map below shows the Tropo forecast at 09:00 UTC on August 19th :



This was a very thrilling experience, even though we couldn't complete a 2 ways QSO !

In such nice tropo conditions, working Ricardo (CT3KN) should be easy in Meteor-Scatter (actually "Tropo-enhanced MS"). Hopefully, as from IM12MT, Ricardo is located on the North side of Madeira, while Funchal (the capital city), is located on the South side, obstructed to Europe by mountains. I'm looking forward to try in MS with Ricardo, if not trying again and succeeding in Tropo !