My first EME QSO

Man has always been fascinated by the moon, since prehistoric times. The "Blanchard Bone" dating back to about 30,000 years ago, has 69 engravings arranged in a spiral on the surface. They are engravings that rudimentary recall the phases of the Moon over two and a quarter month. The archaic peoples had a deep knowledge about the movement of our satellite. That lady who dominates the skies has always exerted a great fascination on me too. The night of the first of the year 2010, everything is ready. It is a full moon night. Beautiful and bright, in the clear January sky. Moon is at the Perigee, which is the closest point to the Earth. Our dear old Moon is "only" 358,696 kilometers away. Cosmic noise conditions are optimal. The sky is clear. In other words, there are the best conditions to do EME. I sit down in front of my radio, my computer and a cup of coffee. *"I had a good cup of hot coffee with me,*" Michael Collins said, when he was orbiting alone on the dark side of the moon during the Apollo 11 mission. I check on the EME chat and I see the post of the German station DL9MS, Joachim, who from the far north of Germany, almost 1000 kilometers away, calling CQ EME. I point the antenna carefully and tune the receiver to the calling frequency and I start to listen. The moon is rise and well visible above the horizon, but nothing. I have not any signals. But the EME requires a lot of patience. "Mister Faraday is always lurking". The minutes pass quickly. The Moon continues its perennial motion. Other minutes pass, everything is silent, the screen shows no trace, only some disturbance. In the meantime, I continue to keep an eye on the elevation of the Moon, which slowly continues to rise. But suddenly, the first echoes begin to appear on my computer screen. An incredibly clear first trace, that is coming from space. These are the echoes of DL9MS that departed from northern Germany, on the Baltic Sea, after hitting the Moon, come back and after having traveled almost 720,000 kilometers, they are captured by my antenna. His call sign comes clear: "CQ DL9MS JO54", with a DT of 2.5 seconds. Those 2.5 seconds undoubtedly mean that this signal coming from the Moon. I cannot believe it. My emotion is huge. But I don't have much time, because the Moon is rising inexorably and is already 8 degrees above the horizon. I am excited but I concentrate because I must follow the correct procedure. I have never made an EME QSO before. I can't afford mistakes; I would risk compromising everything. *"Pick the rose when it's time, you know time flies… and the same flower that blooms today will wither tomorrow"* because I know I have a simple 13 element Yagi antenna, without elevation and I can have only 100 watts. I know very well that when the Moon has risen above 15 degrees, I will have no more hope, my antenna would no longer "see" the Moon. I start calling. I feel like the heroes of the Apollo 11 mission, the space mission that brought the first humans to the moon. I feel like I'm Neil Armstrong, as he is about to land. Dreaming costs nothing and if you close your eyes, you can go everywhere. William Shakespeare said that we too are made of the material of which dreams are made; and our short life is enclosed in the space and time of a dream. Someone or something, decided that was good and incredibly, DL9MS, immediately answers my call, and sends me his report. It is a fantastic -24 db. But for me, any number would have been great. It is 17:41 UTC, when I see the two dotted lines appear on the screen identifying the RRR that Joachim is sending me. That is the confirmation that my signal has been received and the bilateral QSO has been made. It wasn't a mistake. I had "flown" for those fantastic 720,000 kilometers. I will never forget that day because I arrived on the moon. There is a saying in the EME community: "After your first EME QSO, nothing will be the same again". I believe there is some truth. That night the Moon was magical, and before it escaped my antenna, I was able to do a second QSO. This time with a Russian station, RK3FG.

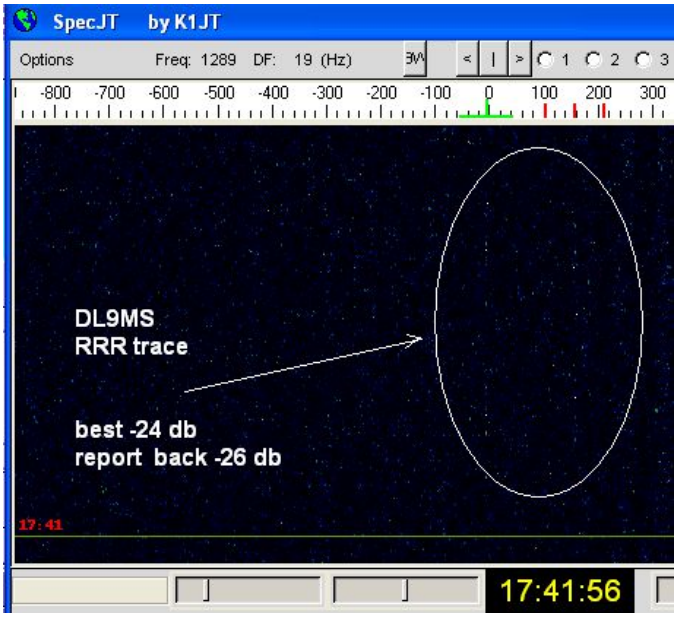

Fig. The RRR signal received by DL9MS confirming my first QSO via Luna.

The adventure with DL9MS did not end there. I have another telling story. I did some other QSOs via EME. Meanwhile, my VHF station had grown. I had added a second antenna, but for reasons of space, I had to make the first one smaller. The result was an array of 2 8-element Yagi antennas, 2 lambdas in length and coupled horizontally. I also joined a new power amplifier, from which I was able to pull out at least 200/220 watts, continue. One day while listening the echoes of DL9MS via the moon, I also received an outstanding signal via Troposphere. The distance between Thiene and Northern Germany is 936 Km. DL9MS is located near Rostock on the Baltic Sea. This is a typical distance for HF communications, also considering my position at the foot of the mountains, with the Alps acting as an impassable bulwark. A sort of mission impossible. But not completely impossible because one day I was also able to receive the DL9MS tropospheric signal. An imperceptible signal at -29 dB, but still a signal. It was a big surprise. I have always been inspired much more from weak signals than strong ones. The lesson I learned from this experience is: don't take anything for granted. I had the antennas directed towards the moon in a westerly direction, at 270 degrees azimuth and elevated 24 degrees above the horizon. I didn't even have the antennas pointed directly at DL9MS. But despite this, a signal phantom has arrived, 5 dB lower than his same signal reflected from the Moon (via EME was -24 dB). I suspect some reflection somewhere, but very difficult to say where. An electromagnetic wave that starts in Northern Germany and goes towards the Moon could go anywhere. Perhaps the reflection took place on the nearby mountains of the “small Dolomites”, which I have just to the west. The peaks of the Small Dolomites (The Carega ridge, 2259 m.a.s.l.). But who can say for sure? This remains a mystery to be solved.

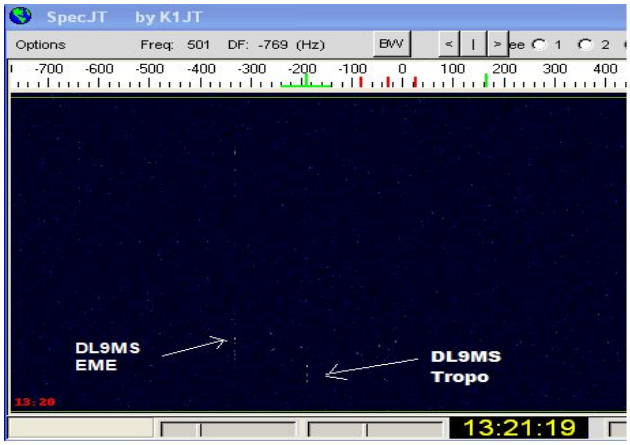

Fig. EME signal and DL9MS trope signal of 5 September 2010. 13:21 UTC. In the 144 MHz band. The QRB is 936 kilometers.

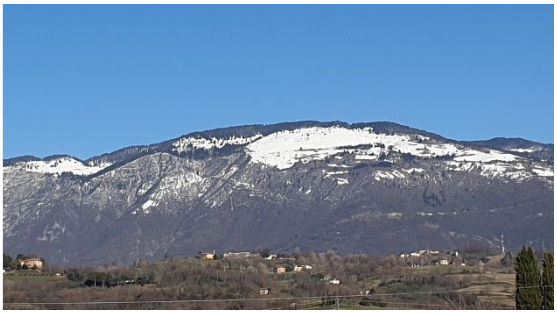

Fig. My take off towards the North. These are the Vicentine Prealps, which have an average height of 1500 m.a.s.l. (left) while to west I have the Carega ridge, 2256 m.a.s.l. (photo above, right side)