

A Venus Transit Midnight Flight over Alta

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Abstract. After the Tromsø conference, the author had planned to observe the 2012 Venus transit from a small plane flying over North Cape. This paper provides a summary report from this unusual expedition.

1. Preparing for a midnight flight over North Cape

The organizers of the Tromsø conference had scheduled a voyage on board of a *Hurtigruten* ship with the objective to reach Vardø, the historical site from where Maximilian Hell observed the Venus transit over the Sun in June 1769. The idea to follow the trace of Maximilian Hell and to try to repeat the observations he made 243 years ago was indeed a quite exciting project.

I had a word with Trevor Sanderson, a close friend and former scientist from the European Space Agency (ESA), on the feasibility of such a project. He objected that the probability to get good weather conditions was rather low at those northern latitudes; but, as we were both private pilots, he agreed that an attractive alternative would be to fly above the cloud layer to try to record the transit from the air.

The choice of the plane was rather straightforward: we would use the well-equipped Piper Arrow IV (owned by Satellite Aviation B.V. based in Rotterdam) on which the two of us were approved to be “pilot in-command”. As a safety measure, Alberto Boetti, another pilot and former colleague from ESA, offered to accompany us.

The choice of the airfield was less straightforward: of course, the first idea was to fly to and from Vardø Airport at Svartnes to join the group coming from Tromsø with the *Hurtigruten*. But Vardø airfield has no refuelling facility that is compatible with our plane. So, we investigated the most northern airfields in Norway (see Fig. 1), as we were seeking to get the highest elevation of the Sun above the horizon during the midnight flight, to avoid potential haze effects over the sea.



Figure 1. Locations of potential airfields. North is up. Based on GoogleEarth.

Valan by Honningsvåg close to North Cape, had also to be discarded as the operational conditions were too marginal in case of bad weather. Finally Mehamn appeared to be the best compromise, as the airfield has a “straight-in approach”, and is located at a walking distance from the town. In addition, the Mehamn airport manager kindly offered to make a special extension of the opening hours of the airport to allow us to perform our “Venus transit midnight flight”.

Even though our flight was not part of a solid scientific programme, we had to consider the photographic equipment to be taken on board. In 2004, I was rather successful recording on film the Venus transit from Strasbourg (France) with my old Asahi-Pentax camera, equipped with an $f = 1000$ mm telephoto lens. But this equipment is rather heavy and bulky, so we chose to only keep the coated green filter in combination with Trevor’s modern CCD camera.

2. Flying over the Norwegian fjords

The plan was to fly from Rotterdam to Tromsø along a scenic route following the coastal fjords of Norway. It went fine, except that I had to leave my colleagues behind in Kristiansund in order to make it to the Tromsø conference in time, due to a delay caused by some unexpected snow showers along our route around Trondheim. By Monday morning June 4, however, the crew was ready to leave Tromsø for Mehamn, with a planned stop at Honningsvåg Airport Valan. Approaching North Cape, the meteorological situation was changing with pretty strong gusts of wind. Being informed by the Honningsvåg control tower of the rapid deterioration of the landing conditions, we decided to divert to Lakselv Airport Banak. A close look at the last weather reports confirmed that an area of bad weather was drifting from the east to the western part of Finnmark. Predicted winds were rather strong, and operations on Tuesday from Mehamn airport were looking marginal for a single-engine light aircraft. Therefore, we decided to activate plan B and to divert to Alta.

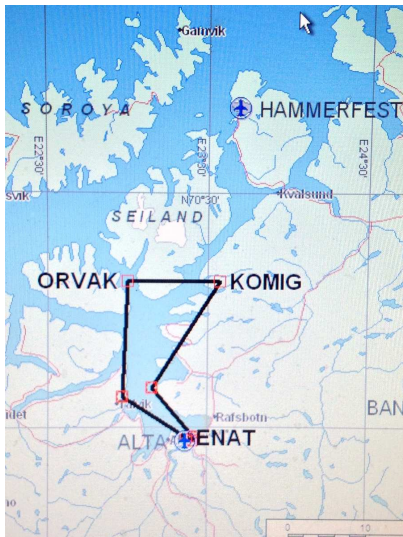


Figure 2. Chart showing the itinerary of the midnight flight. Komig and Orvak have the same geographical latitude and are separated by 12 nautical miles (approximately 20 km). Map Reproduced with permission of Jeppesen Sanderson, Inc. © 2012. NOT FOR NAVIGATIONAL USE.

On Tuesday morning June 5, we woke up with a fantastic blue sky. It was a sunny day in Alta, with excellent visibility. The CCD camera was checked and a special flight plan filed and accepted for our “Venus transit midnight flight”. There was no real need to negotiate an extension of the operation times of the airport, as we could easily witness the first and second contacts; then land to have a rest, and take



Figure 3. Guy Ratier (left) and Trevor Sanderson (right) preparing the plane in Alta on the evening of June 5, 2012. Photo: Satellite Aviation B.V.

off again to witness the third and fourth contacts. To ease the navigation in flight, it was planned to make a kind of extended circuit between two reporting points, well known to Air Traffic Control, located along the same parallel (see the chart in Fig. 2.). Doing so, we would be able to see the Venus transit through the windows on the left or right sides. The circuit could be repeated as required, keeping in mind that a 180 degrees turn would induce a one-minute blank in the recording.



Figure 4. The “Venus transit midnight flight” crew relaxing in Alta (from left to right: Trevor Sanderson, Alberto Boetti, Guy Ratier). Photo: Satellite Aviation B.V.

We arrived well in time at the airport (Fig. 3) to prepare the plane. The internal clock of the CCD camera was synchronized with the on-board GPS. We were ready: Alberto was the “pilot in-command”, Trevor the camera man, and I was doing the coordination of the operations and the radio with Alta Tower (Fig. 4). We just had

to wait for a commercial plane to land, for a wild fox to cross the runway, and soon after we were cleared for take-off.

There are simply no words to describe the incredible beauty of a midnight flight over the Norwegian fjords. There were almost no clouds in the northern direction, whereas towards the east, one could detect the bad weather approaching. At 7000 feet, our selected altitude for operation, the air was calm and the plane was flying smoothly. Unfortunately, it became rapidly clear that we had a problem with the automatic focusing of the camera. We tried various tricks, but none of them were successful. The images recorded between the first and second contact were not exploitable. It was a great disappointment, and we had no other choice than simply to return to Alta and to land.

After landing the controller at the tower, who had no other traffic to monitor, asked us some details about our flight. He was interested to know what we did, as he could follow on his screen the transit broadcasted by the Norwegian TV from a ground station at Tromsø Island (see the paper by Thorvaldsen in these Proceedings). Of course we were a bit sorrowful when hearing this last remark and decided to cancel the flight for the third and fourth contacts.

3. The lesson learned

Back at the hotel in Alta, I had a second thought about the expedition from the Henry brothers at the Pic-du-Midi in December 1882 (Ratier & Rondi 2013). One of the reasons why the Henry brothers were unsuccessful to record the Venus transit has probably its origin in the fact that they were unable to bring their own equipment to the summit of the Pic-du-Midi before the snow came. This was likely due to a shortage of time preparation during the early days of the observatory.

We fell into the same trap, rushed in the preparation of this unusual expedition and missed the need to take along a spare camera. On Wednesday 6 June morning, the sky was fully overcast in Alta. To fly above the cloud layer would have been the only possibility to record the third and fourth contacts. Too bad! The lesson is learned for the next transit... in 2117 !

Acknowledgments

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Reference

Ratier, G. & Rondi, S. 2013, *Observation of Venus and Mercury transits from the Pic-du-Midi Observatory*, these Proceedings