Getting lost during solo navigation

Safety Feedback

Issued by the Air Accident Investigation Unit of Belgium, section of the FPS Mobility and Transport

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Addressee(s):
All pilots in general aviation

Applicability:
All aircraft

Safety matter

The following event relates a mis-happening that occurred inside LFQQ's CTR. A student-PIC got lost in a Solo navigation, bringing his aircraft in a collision course with an A320.

Related incident

Flying experience:

Total hours	46h00
Last 90 days	17h49
Last 28 days	04h26

An A320 on final course to LFQQ was ordered to preventively go-around (indeed they were collision course); furthermore S-PIC merged another GA aircraft twice while overflying the A/F of Lille/Marcq-en-Baroeul, (North of LFQQ), from North to South and vice versa.

Radar track indicates that they first merged co-altitude with an estimated lateral spacing of 1200 feet, where S-PIC got visual on it and could even determine it was a DR400; then they re-merged 11 minutes later overflying each other with an estimated split altitude of 200 feet, unseen by S-PIC this time.

S-PIC's narrative:

"I had to make my big navigation of 150 NM between EBCI - EBKT - EBLG - EBCI. It had already been postponed for three weeks due to bad weather conditions. My aircraft, was a C-150 LR not equipped with a VOR. I had prepared all my navigation in the morning, and my instructor checked that everything was ok before departure to Kortrijk. He also verified that my computations (headings, timing, fuel) were accurate. Moreover, we had just reviewed the procedure to apply when one gets lost …

For what concerns the routing, I had to proceed via NW (exit North RWY25 EBCI), Braine-l'Alleud, Tubize, S1 (entry point of EBKT), S2, then integrate the circuit at EBKT . I was in contact with EBCI TWR on 121.3 to NW, and my transponder indicated 2000. Shortly after leaving this point, I left their frequency for Brussels Information on 126.9, and I set my transponder to 7000. Contact Brussels Information, and after giving my route and all required information, ATC asked me to set my transponder back to 2000, which I did. So I proceeded on Braine-l'Alleud and Tubize without the slightest problem, before turning on the long leg (about 30 NM) towards S1. About 5 minutes before my arrival on S1, I asked to leave the frequency to switch on Kortrijk Radio.
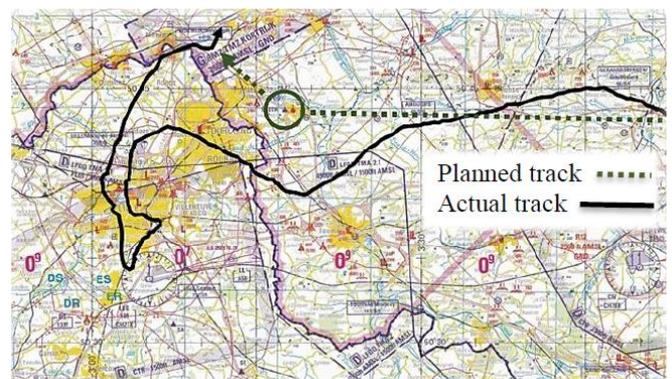

Figure 1

I was not sure I found this point S1 when I veered North to reach S2. There was a bit of drift, but I thought that what I was identifying on the ground was S1. Of course, the sequence of landmarks did not correspond with what I should have found on my map … So I tried to identify other landmarks to find my position, which were also inaccurate thereafter. I did not go back to the Brussels Information frequency directly, as I thought I still had reliable landmarks. I disregarded my stopwatch, judging that it was giving me no more useful

information. With the stress, I lost awareness about time, which explains why I spent 10 to 15 minutes without knowing where I was precisely . Then I saw a runway, which I identified as being the one of Kortrijk (I was still in contact with EBKT). I then saw a second runway perpendicular to the first one; it was Lille (LFQQ), which is also in the middle of a city. I immediately turned away to leave the area as soon as possible, and then I saw an A320 going around. Following this, and aware of my mistake, I immediately contacted Brussels Information. The controller gave me a heading of 035 ° and told me that I was 10 NM South of EBKT.

Once in sight of the airfield, I switched back to the Kortrijk Radio, and the landing went ok. On the ground, I called my instructor to tell him the issue, and we debriefed … "

S-PIC's add-on

"I was a little tired and stressed by the navigation, like during any solo flight foreseen in the training. I had only about 50 hours of flight, and there is always some apprehension to fly solo for such a long flight… I had to perform about 4 hours of flight on that day; I had never done that before. When I realized that I got lost, I had a lot of stress, but I managed to contact Brussels Information to ask for help. It may have been a bit early to perform such a big solo navigation, but the program being very tight, I had no real choice. It was time to do it, and since I had already done a tour of the CTR of Florennes few weeks ago, Kortrijk did not present any particular difficulties. When I was there for the first time with my instructor, the visibility was really bad and we had trouble finding the aerodrome. So I was apprehensive about going back over there. My Flight Instructor then told me that in conditions of good visibility, there was no difficulties in finding the airfield.

ATO's Safety Manager Analysis

S-PIC performed two airspace infringements in a row involving the French airspace and the CTR of LFQQ. He was lost for an approximate time of 20 minutes until he asked for help to Brussels Info.

What could lead a pilot/crew to get lost in a VFR navigation:

- **Flight planning:** drawing the track on the 1/250.000 map is the first step (avoiding any airspace, Notams, obstacles, etc…), the second step is the navigation study; it's important to highlight en-route's remarkable points such as highways, railways, rivers, high tension lines, and to note the leading features to all turning points. For what concerned "S1" the leading features would have been city – church - Yankee shape highways crossing; furthermore some windmills are located 2nm South of that turning point (no windmills North of it). Airborne, those windmills should have trigger the flag in S-PIC's mind.

- **Instruments error:** either the magnetic compass or/and the directional gyro do not work as advertised, bringing the aircraft's nose in an offset direction. In our case study, the turn after the what S-PIC thought being "S1" and the vectors given by Brussels Info show that both intruments were performing within the prescribed limitations.

Figure 2

- **Navigational error:** South of Amougies, a deviation of 40°, noticeable on radar track, happened approximately 5 minutes prior reaching EBKT. Looking at S-PIC's report, that was the time when he left Brussels Info for Kortrijk Radio. Because that specific deviation led to the mis-happening, let's focus on that particular moment. Although flight instruments were working properly, we can imagine that S-PIC mis-prioritized the task in his cockpit, probably busy with his Nav Log / Map / Comm box instead of aviating - navigating and then communicate…

Chair flying VFR navigation shouldn't be underestimated, especially with low flying experience. That will help setting up priorities at the right moment.

- A known mnemonic for lost aircraft procedures is "**The 5 C's**"; five steps to be performed when lost during navigation. Depending on the source there are additional steps (marked with *);

- **Confess:**
  - be humble and confess to yourself that you are lost
  - **Initiate** the next steps

- **Chrono*:**
  - **Verify** that the chrono is working properly and thrust it.
  - If you were on time / on track 2 minutes prior, you shouldn't be far from your turning point (providing you don't offset more than 10° on directional gyro).

- **Correction angle*:**
  - If you know the drift angle, **apply twice** that **angle as correction** to get back to course.

- **Circle:**
  - If not knowing your position at all and are able, you want to minimize your travel so you can orient to the location without anything changing and not get any further off track
  - Circle **at standard rate turn** and **maintain airspeed**

- **Climb** ("to cope"):
  - **Climb to MSA** to have a safe better view (but **mind possible TMA's** above you- part of flight preparation) of the region
  - This will **improve as well radio reception and transmission range** ('comm' and 'navaid')

- **Transpose the ground** features to your 1/250.000 map and try to locate yourself.
  - The use of '**navaids**' is a good tool to enhance your situational awareness too.
  - Be sure not to fly around aimlessly, circle if required during a climb

- **Conserve:**
  - Be **fuel minded**, and fly with max endurance power setting if situation dictates

- **Communicate:**
  - Don't expect that a FIS will always warn you for controlled airspace ahead or coordinate with ATC if not clearly asked for help.
  - If you're still lost**, ask** for help to any close-by agency. **"Brussels Info"** (126.900) is a Flight Information Service (FIS) provided in Golf airspaces of the Brussels FIR, H24.
  - Stay visible: **keep your transponder switched on** to your assigned squawk (or default 2000 code when receiving air traffic services)
  - If unable to contact a Flight Information Service, try calling an approach control frequency with a PAN report and request vectors
  - If **required set transponder 7700**

- **Comply *** with instructions if **ATC** then responds

- And **always keep a sharp look out!** Beware that in such "lost" situation your field of view might be reduced, looking at ground features, forgetting to look for possible traffic in the vicinity.

More information

The aircraft made an airspace infringement when it was lost. Both the BCAA and EASA have made an informative page on their respective websites with links to leaflets and video's on the subject:

- https://www.easa.europa.eu/airspace-infringement
- https://mobilit.belgium.be/en/aviation/airspace_infringements

About this Safety Feedback

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