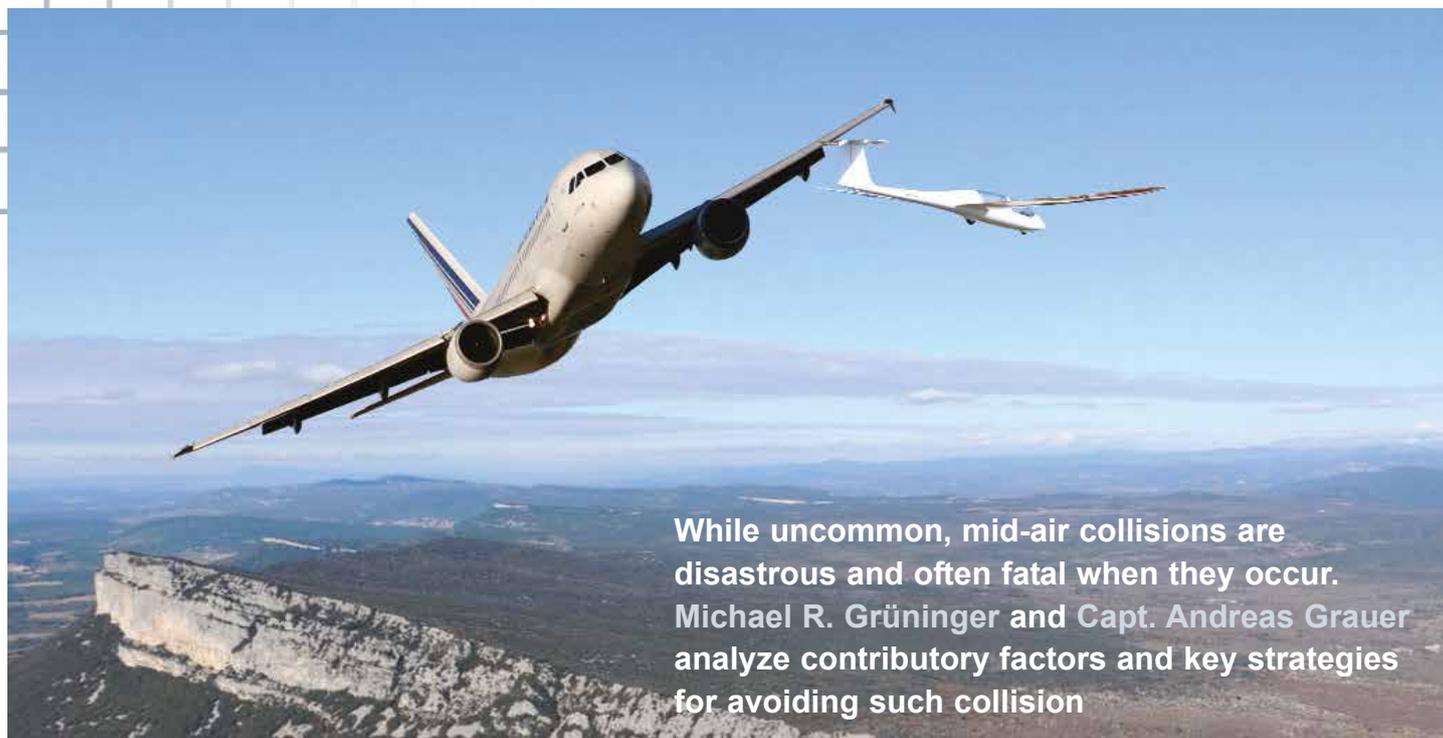


COLLIDING WITH A GLIDER: PILOT IN UNCONTROLLED AIRSPACE



While uncommon, mid-air collisions are disastrous and often fatal when they occur. Michael R. Grüninger and Capt. Andreas Grauer analyze contributory factors and key strategies for avoiding such collision

Friday, 12th February 1999, was a chilly day in the south of France. Strong northerly winds were blowing and generating waves. Glider pilots love such waves as they provide them with a constant and reliable updraft to reach height and stay in the air for many hours.

Using this opportunity, the pilots of a Grob 103 glider, F-CGXB, let themselves be towed out of Saint Martin de Londres airfield towards the Pic Saint Loup. From there, the G103 continued to the lee-side of the Seranne Mountain where the laminar flow was strong above 6000 ft. The glider entered the flow and slowly progressed in the direction of North-Northeast.

Just 7 minutes later, at 14:59, Air France flight number AF 755x0, an Air France Airbus 320 registered as F-GJVG, took off from Paris Orly Airport with destination Montpellier.

The first officer was pilot flying and the commander pilot monitoring. Montpellier Méditerranée Airport is located south of the area where the

glider was enjoying the steady laminar flow. Still at Flight Level (FL) 290 and preparing for the approach, the pilot monitoring of the AF flight listened to Montpellier ATIS "Hotel", which warned of glider activity in the approach sector.

At 15:31, ACC Marseille authorized the A320 to descend to FL 120.

At 15:36, Montpellier Approach cleared the A320 to further descend to FL 80 on course to the Very High Frequency (VHF) Omni-Directional Range (VOR) Montpellier Méditerranée (FJR) on a magnetic heading of 136°. The A320 approached FL 80 three minutes later at 15:39.

The A320 now flew in Airspace Class G. The Airway G6 was located 7 nm to the east of the position of AF 7550.

One minute later, at 15:40, the A320 commander observed a glider flying below them on the left. Soon after, the copilot, announces that he has another glider in sight right in front.

Descending through FL 85, the commander took control of the aircraft, disconnected the autopilot and executed an immediate escape maneuver to the right. One minute later the A320 was cleared to descend to altitude 5000 ft. The commander notified ATC about the airprox.

At this stage, the crew of the A320 was not sure whether they had collided with the glider or not.

At the same time the pilots of the G 103 felt a hard hit. Alerted and worried about the hit, they looked around and saw an A320 in descent performing a right turn. The situation was clear to them immediately.

The sailplane pilots considered abandoning the glider and jumping to safety by using their parachutes. However, they carefully tested the remaining functionality of the glider and found that with due care a safe return to the airfield might be possible. By avoiding abrupt maneuvers and high aerodynamic stress, the pilots landed the G 103 safely.

FATAL
One of the most hazardous consequences of a loss of separation between aircraft is mid-air collision.



Your Swiss Partner

for Aviation Safety and Compliance...
Now celebrating 100 years of combined aviation experience



Once on the ground, the pilots saw that the upper left horizontal stabilizer was severely damaged.

The A320 also landed safely. But the pilots had doubts whether they had in fact collided with the glider or just barely missed it. During taxi to the gate, the commander informed ATC about his doubts. ATC confirmed the collision and informed the commander that the glider had landed safely and that no personal injuries were reported.

Once the Airbus was parked, an inspection of the wings revealed that the leading edge of the left wing was damaged.

Separation by ATC

Separation of air traffic, and the methods of separation, is the key to the organization of the airspace system. Understanding these separation concepts is crucial for pilots. Pilots should never feel to be protected by ATC separation, when in fact they are not.

In 1990, ICAO adopted the current airspace classification scheme. It introduced seven airspace classes. Classes A to E are so-called controlled airspaces. Classes F and G are uncontrolled airspaces.

However, controlled airspace doesn't necessarily imply that ATC is responsible for or ensures separation between aircraft.

In general, the classes are defined in terms of flight rules and interactions between aircraft and ATC. For ICAO airspaces the responsibility for avoiding other aircraft is either assigned to ATC or to the aircraft commander, depending on the airspace class.

In Class E airspace, ATC separates IFR from IFR traffic, but not from VFR traffic. In Class G airspace, no separation is provided by ATC.

Flying IFR through Various Classes of Airspace

It is difficult for a pilot to constantly be aware of the classes of airspace crossed while preparing for an approach and looking outside in compliance with the "see and avoid" rule.

The mid-air collision between the Grob 103 glider and the Air France A320 is a good example for the difficulty of pilots to constantly be aware of the types of airspace they cross.

The glider was in wave flight at FL 80 and the A320 on arrival to Montpellier Airport. The Airspace Class at the moment of the mid-air collision was Class G.

The A320 successively crossed various Airspace Classes in fast sequence:

- From cruise to initial descent: Class A controlled airspace
- Descending below FL 195: Class D controlled airspace
- Passing FL 115: Class G uncontrolled airspace
- The mid-air collision occurred at FL 80 in this class G airspace. Class G airspace is Uncontrolled Airspace. In class G airspace, operations may be conducted under IFR or VFR. ATC has no authority, but VFR minima are to be known by pilots. Traffic Information may be given by ATC as far as is practical in respect of other flights.
- Minutes after the collision: Class D controlled airspace
- Descending through 5700 ft: Class E controlled airspace
- At about 4900 ft: Class D, destination airport
- Then the A320 flew until landing in this Class D controlled airspace.

Problems with separation between VFR and IFR traffic often occur on charter flights and scheduled services to smaller airports.

The problem is even bigger in Business Aviation where passengers charter a business jet specifically because it enables them to fly directly to small airfields, as close as possible to their destination, which sometimes does not even have any instrument facilities. Due to the great difference in speeds and the fact that gliders and very light aircraft are sometimes difficult to spot in the air, maintaining visual separation is a challenge.

See and Avoid

"See and Avoid" is recognized as a method for avoiding collision when weather conditions permit and require that pilots should actively search for potentially conflicting traffic, especially when operating in airspace where all traffic is not operating under the instructions of ATC.

The operator could include awareness training of airspace classes in their route and aerodrome competence training. Such training might provide pilots a clear picture of the airspace

classes they are going to cross on their routes and identify the implications for collision avoidance.

In the unmanned aircraft world, see and avoid is replaced by detect and avoid. This is an automated system, where airborne sensors detect obstacles and other flying objects and automatically initiate an escape maneuver. Of course, this is not possible in manned aircraft operation.

Detection is also provided in manned aircraft, by a Traffic Alert and Collision Avoidance System (TCAS). TCAS detection would have worked at least in those cases, where conflicting aircraft are all equipped with a TCAS or another compatible collision avoidance system.

At the time of this serious incident, commercial aircraft were not yet required to be equipped with Airborne Collision Avoidance Systems.

"See and Avoid" is rarely described in detail in the Operating Procedures of most operators since they operate mainly in controlled airspace.

Air Traffic Control (ATC), Automatic Terminal Information Service (ATIS) broadcasts and/or Notices to Airmen (NOTAMS) often provide information about VFR traffic in the vicinity.

It is important that the pilots are aware of their responsibility for collision avoidance, when flying in uncontrolled airspace and in Class E controlled airspace, where ATC does not separate IFR from VFR traffic.

Fortunately, this particular mid-air collision between such unequal aircraft did not result in harm to persons. 

Michael R. Grüniger is Managing Director of Great Circle Services (GCS) Safety Solutions and Capt. Andreas Grauer is the Deputy Managing Director of GCS. GCS assists in the whole range of planning and management issues, offering customized solutions to strengthen the position of a business in the aviation market. Its services include interim and start-up management, training and auditing (IS-BAO, IOSA, EASA), consultancy, manual development and process engineering. GCS can be reached at www.gcs-safety.com and +41-41 460 46 60. The column Safety Sense appears regularly in BART International since 2007.