

COMISIÓN DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN CIVIL

Report IN-019/2017

Incident involving an AIRBUS A321 aircraft, registration G-OZBH, and an AQUILA A-210 aircraft, registration D-EPIG, at the Menorca Airport (Balearic Islands, Spain) on 21 July 2017

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Edita: Centro de Publicaciones Secretaría General Técnica Ministerio de Fomento ©

NIPO línea: 161-18-200-3 NIPO papel: 161-18-199-0

Depósito legal: M-28340-2018

Diseño y maquetación: Centro de Publicaciones

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Foreword

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission (CIAIAC) regarding the circumstances of the accident object of the investigation, and its probable causes and consequences.

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with articles 5.5 of Regulation (UE) n° 996/2010, of the European Parliament and the Council, of 20 October 2010; Article 15 of Law 21/2003 on Air Safety and articles 1., 4. and 21.2 of Regulation 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future civil aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent from their reoccurrence. The investigation is not pointed to establish blame or liability whatsoever, and it's not prejudging the possible decision taken by the judicial authorities. Therefore, and according to above norms and regulations, the investigation was carried out using procedures not necessarily subject to the guarantees and rights usually used for the evidences in a judicial process.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

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Abbreviations

° ' " Sexagesimal degrees, minutes and seconds

° C Degrees centigrade
ACP Area control rating
ACS Air control rating

ADI Aerodrome cotrol instrument rating
ADV Aerodrome Visual Control rating
AEMET National Weather Agency
AESA National Aviation Safety Agency
AIR Air control endorsement

AP Autopilot

APP Approach control procedural rating
APS Approach control surveillance rating

ARP Aerodrome Reference Point

ATC Air traffic control
ATS Air Traffic Service

ATPL(A) Airline transport pilot license (airplane)
CAA United Kingdom Civil Aviation Authority
CATCL Community air traffic controller license

CIAIAC Civil Aviation Accident and Incident Investigation Commission

E East

EGBD ICAO Code for the Birmingham airport (UK) (ICAO)

FD Flight director

FDM Flight Data Monitoring

ft Feet

GMC Ground movement control endorsement
GMS Ground movement surveillance endorsement

h Hours

ICAO International Civil Aviation Organization

IFR Instrument flight rules
ILS Instrumental Landing System

Kg Kilograms
Km/h Kilometers/hour

LEMH ICAO code for the Menorca Airport

LESL ICAO code for the aerodrome of San Luis (Menorca)

m Meters
N North
NM Nautical miles
PNF Pilot not flyving
PF Pilot flying

PPL(A) Private pilot license (airplane)

RAD Radar endorsement

s Seconds

TCAS RA Traffic collision avoidance system - resolution advisory

TCL Terminal control endorsement

TWR Control tower

UTC Universal Time Coordinated

UK United Kingdom VFR Visual flight rules

Vamax Maximum angle of attack speed

Vmax Maximum speed VSI Vertical speed indicator

Synopsis

Owner and Operator: MONARCH AIRLINES ¹ Aircraft: AIRBUS A-321, registration G-OZBH

Date and time of incident: 21 July 2017 at 10:49 h (local time ²) Site of incident: Menorca airport (LEMH) Balearic Islands, Spain

Persons on board: Two hundred fourteen (214). 5 crew and 209 passengers (uninjured)

Flight rules: IFR

Type of flight: Commercial air transport – Scheduled – International - Passenger

Owner and Operator: Private

Aircraft: AQUILA A-210, registration D-EPIG

Date and time of incident: 21 July 2017 at 10:49 h (local time) Site of incident: Menorca airport (LEMH) Balearic Islands, Spain Persons on board: Two (2). One pilot and one passenger (uninjured)

Flight rules: VFR

Type of flight: General aviation – Private

Date of approval: 27 June 2018

Summary of event

On Friday, 21 July, an AIRBUS A-321 aircraft, registration G-OZBH, started an ILS approach to runway 01 at the Menorca Airport (LEMH) after having been cleared by ATS.

Minutes earlier, an AQUILA A-210 aircraft, registration D-EPIG, had taken off from the aerodrome of San Luis (LESL), very close to LEMH, from runway 02 to go on a local VFR flight.

The pilot of the AQUILA-210 airplane, who did not keep the other traffic in sight, was cleared by approach control to cross from east to west behind the flight path of the AIRBUS-A321 aircraft.

At that point, the crew of the AIRBUS-A321 received a TCAS RA ("LEVEL OFF"), so they levelled off the airplane and then carried out a missed approach (go-around maneuver) to make a new approach. They eventually landed normally. The other aircraft continued on its flight normally. There were no injuries among the occupants of either aircraft and there was no material damage.

The investigation determined that the incident occurred because the pilot of the AQUILA airplane did not correctly follow the instructions provided by ATS and executed a maneuver that was different from the one he had requested and that had been authorized.

¹ The company ceased operations in October 2017.

² Unless otherwise specified, all times in this report are local. To obtain UTC, subtract two hours.

1. FACTUAL INFORMATION

1.1. History of the flight

On Friday, 21 July, an AIRBUS A-321, registration G-OZBH, took off from the Birmingham Airport (EGBB) in the United Kingdom en route to the Menorca Airport (LEMH) in the Balearic Islands, Spain.

At 10:48:00, it started the ILS approach to runway 01 at the destination airport, as cleared by ATS.

Minutes earlier, at 10:44:45, an AQUILA A-210 aircraft, registration D-EPIG, had taken off from the aerodrome of San Luis (LESL), near LEMH, from runway 02 to go on a local VFR flight.

The pilot of the AQUILA-210 airplane was cleared by approach control to cross from east to west behind the flight path of the AIRBUS-A321 aircraft.

At 10:49:27, when the AIRBUS-A321 was 2.5 NM away from the runway at an altitude of 1200 ft, the AQUILA A-210 crossed without maintaining horizontal separation, crossing 400 ft below the AIRBUS-A321.

At that point, the crew of the AIRBUS-A321 received a TCAS RA (LEVEL OFF), so they levelled off the airplane and then missed the approach (go-around maneuver) to make a new approach. They eventually landed normally.

The other aircraft continued its flight normally.

No one on board either aircraft was injured and there was no material damage.

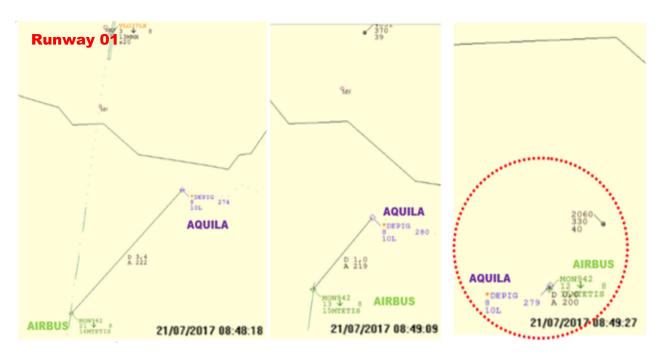


Figure 1. Crossing sequence as seen on radar display.



Figure 2. Crossing area.

1.2. Injuries to persons

Injuries	Crew		Passengers		Total in the aircraft		Other	
	AIRBUS	AQUILA	AIRBUS	AQUILA	AIRBUS	AQUILA	AIRBUS	AQUILA
Fatal								
Serious								
Minor								
None	5	1	209	1	214	2		

1.3. Damage to aircraft

The aircraft were not damaged.

1.4. Other damage

There was no other damage.

1.5. Personnel information

1.5.1. Crew of the AIRBUS A-321 aircraft

The pilot was 52 years old and had an airline transport pilot license, ATPL(A), issued on 14 July 2014 by the United Kingdom's Civil Aviation Authority (CAA) and valid until 31 December 2017. He had instrument, night-time and A-320 ratings. He had a class-1 medical certificate that was valid until 12 October 2017.

The copilot was 38 years old and had an Airline Transport Pilot License (Airplanes) - ATPL(A), issued on 20 May 2011 by the United Kingdom's Civil Aviation Authority (CAA) and valid until 30 November 2017. He had instrument, night-time, A-320 and DHC8 ratings.

He had a class-1 medical certificate that was valid until 9 February 2018. No information could be obtained on the crew's experience.

1.5.2. Pilot of the AOUILA A-210 aircraft

The pilot was 61 years old and had a PPL (A) license, issued on 11 February 2014 and valid until 29 February 2018.

He had a class-2 medical certificate that was valid until 10 December 2018. He had a total of 2,074:09 flight hours, almost all of them on the type.

1.5.3. Controller on duty

The controller had a community air traffic controller license (CATCL) with an aerodrome control instrument (ADI) rating and the following endorsements: control tower (TWR), ground movement control (GMC), ground movement surveillance (GMS), air control (AIR) and aerodrome radar control (RAD).

He also had an approach control surveillance (APS) and area control surveillance (ACS) ratings, both with a terminal control (TCL) endorsement.

He also had an aerodrome visual control (ADV) rating with a radar endorsement, and approach control procedural (APP) and area control procedural (ACP) ratings.

His license and ratings were issued by the National Aviation Safety Agency (AESA) on 19 September 2003, and they were all valid, as was the associated medical certificate.

His language endorsement listed his Spanish level as six (6) and English level as five (5). It expired on 31 January 2024.

1.6. Aircraft information

1.6.1. AIRBUS A-321 aircraft

The AIRBUS-A321 is a transport airplane that is 44.51 m long, 11.76 m tall and has a wingspan of 34.1 m.

The incident model, registration G-OZBH, was manufactured in 2004 with serial number 2105. It had a valid standard certificate of airworthiness, issued by the United Kingdom's Civil Aviation Authority (CAA) on 11 February 2008, pursuant to type certificate EASA.A.064, which was valid until 25 October 2017.

No information was available on the last maintenance inspection.

According to the operator's flight crew technical manual, in the event of a TCAS advisory, the pilot flying (PF) must say "TCAS, I have control". No evasive manoeuvre should be initiated without a resolution advisory (RA).

If a TCAS RA is issued, however, the crew must follow the instructions given by the system, even if they contradict any instructions given by ATC. The manual states that if the pilot does not follow the TCAS RA instructions, and if the intruding aircraft is equipped with a TCAS unit, its pilot could be maneuvering toward it in response to a RA, a response that would be coordinated with his own instruction. This could compromise the safe separation.

The manual states that the flight directors (FD) must be disengaged when the autopilots (AP) are disengaged in order to ensure the auto-thrust mode and avoid potential confusion between the flight director indications and the acoustic commands given by the TCAS and the VSI.

The sequence of actions to take is as follows:

- The PF disengages both FD without attempting to see the intruder.
- The PF shall avoid excessive maneuvers and maintain the vertical speed outside the red area of the VSI and in the green area. If necessary, the PF may use the maximum speed range between Va max ³ and Vmax.
- The pilot not flying (PNF) must notify ATC.
- The flight crew must never maneuver in the direction opposite to the RA order since TCAS maneuvers are coordinated.
- When on final approach if a "CLIMB", "CLIMB NOW" or "INCREASE CLIMB" RA is received, the flight crew will follow the RA until clear of conflict and then go around and make a new approach.

When the conflict is clear, the crew must resume normal navigation in keeping with ATC clearances.

1.6.2. AQUILA A-210 aircraft

The AQUILA A-210 AT07 aircraft, registration D-EPIG, is a two-seater monocoque airplane that is 7.3 m long, 2.3 m tall and has a wingspan of 10.3 m. It belonged to a private operator.

³ Maximum angle of attack speed.

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The incident aircraft was manufactured in 2007 with serial number AT01-167. Its empty weight is 500 kg and its maximum takeoff weight is 750 kg. It was equipped with a Rotax 912 S3 engine and an MT-PROPELLER MTV-21-A/175-05 two-blade, variable-pitch propeller with a diameter of 1.66 m, with serial number 070233.

Its cruise speed is 191 km/h and it can reach a maximum speed of 241 km/h. Its stall speed is 80 km/h.

It had a valid certificate of airworthiness that had been issued by the German civil aviation authority on 10 March 2017.

At the time of the incident it had 1,054:21 hours of operation. Its last maintenance inspection, an overhaul, had been performed on 13 March 2017 with 993:33 h on the aircraft.

1.7. Meteorological information

According to the information provided by the National Weather Agency (AEMET), there was a gentle breeze from variable direction in the area of the incident with good visibility and few clouds that diminished over the course of the morning, with the temperature rising from 26° C to 28° C. There were no significant phenomena in the Balearic Islands.

1.8. Aids to navigation

The AIRBUS-A321 airplane was making the approach to runway 01 aided by the category I 4 ILS.

1.9. Communications

The conversations between the control tower and the pilot yielded the following sequence of events:

 At 10:47, the pilot of the AQUILA aircraft was cleared to cross behind the MONARCH AIRBUS-A321, which he acknowledged. The pilot of the AIRBUS-A321 was then informed of this.

 $^{^4}$ A Category I ILS allows landing with a minimum visibility of 2400 ft (732 m) or 1800 ft (549 m) if the centerline and touchdown zones on the runway are illuminated with a minimum cloud ceiling of 200 ft (60 m).

- At 10:48:52, the pilot of the AQUILA A-210 was cleared to turn left, as requested by the pilot.
- At 10:49:34, the pilot of the AIRBUS-A321 reported that he was going around due to a TCAS RA. The controller explained to him that he had cleared the AQUILA A-210 aircraft to make a left turn but that he had not done so.
- At 10:54:24, the controller informed the pilot of the AQUILA A-210 aircraft that the AIRBUS-A321 had to go around because he had gone underneath it, for which the AQUILA A-210 pilot apologized.

1.10. Aerodrome information

1.10.1. Aerodrome of San Luis

The aerodrome of San Luis (LESL) is located 2.5 km south of Mahón (capital of the island of Menorca). The aerodrome reference point (ARP) is at coordinates 39° 51′ 45″ N - 4° 13′ 07″ E and an elevation of 60 m (197 ft). It operates with VFR flights. It has one asphalt runway in a 02/20 orientation that is 1,850 m long and 25 m wide. The traffic pattern for airplanes is to the east of the runway.

1.10.2. Menorca Airport

The Menorca Airport (LEMH) is located 4.5 km southwest of Mahón (capital of the island of Menorca). The aerodrome reference point (ARP) is at coordinates 39° 51′ 45″ $N-4^{\circ}$ 13′ 7″ E and an elevation of 92 m (301.83 ft). It operates both IFR and VFR flights.

It is classified as a category 4D airport as per ICAO Annex 14 ⁵. It has one asphalt runway in a 01/19 orientation that is 2,250 m long and 45 m wide.

The traffic pattern for airplanes is to the west of the runway.

⁵ The number 4 indicates a runway length of over 1,000 m and the letter C a width between 36 m and 52 m (exclusive) and an outer main gear wheel span between 9 m and 14 m (exclusive). Despite this, it is authorized by AESA for category-E aircraft, A330-200 and 787-800.



Figure 3. Menorca Airport and aerodrome of San Luis.

1.11. Flight recorders

Only the AIRBUS-A321 aircraft was required by law to have flight recorders; however, by the time the CIAIAC became aware of the incident, the data from them could not be recovered.

1.12. Wreckage and impact information

Not applicable in this case.

1.13. Medical and pathological information

Not applicable in this case.

1.14. Fire

There was no fire.

1.15. Survival aspects

Not applicable in this case.

1.16. Tests and research

The air traffic services provider, ENAIRE, conducted an internal investigation into the incident and concluded that the event was a type b.1, "Quasi-collision", b.1.2 "inadequate separation" air traffic incident that occurred when the AQUILA A-210 aircraft crossed from the east to the west of the airfield, no keeping with the information and instructions received from the tower.

According to the findings report, the AQUILA A-210 had been instructed to report prior to crossing the south coast of the island, and it had also been given traffic information on the AIRBUS A-321 aircraft that was second in line on final approach to runway 01 at the airport.

The pilot of the AQUILA A-210 confirmed that he had it in sight, and he was then instructed to cross the south coast behind the AIRBUS-A321, an instruction that was correctly acknowledged by the pilot of the AQUILA A-210.

The AIRBUS-A321 also received traffic information on the AQUILA A-210, specifically its position and altitude, and that it would be crossing behind its approach path.

The AQUILA A-210 pilot was given traffic information a second time when the AIRBUS-A321 was 3 NM out on final, exactly when the controller noticed that the former was approaching the approach path of the AIRBUS-A321.

The AQUILA A-210 acknowledged the information received and requested to turn left, which was approved, with the reminder to cross behind the AIRBUS-A321. However, it did not cross behind; rather, it passed 400 ft underneath, which caused the AIRBUS-A321 to receive a TCAS RA and miss its approach. The AIRBUS-A321 was subsequently instructed by ATC to make a new approach, which it completed without further incident.

The investigation determined that the main cause of the incident was the failure of the AQUILA A-210 pilot to comply with ATC's instructions involving the conditions for crossing the path of the AIRBUS-A321 that was on final approach to runway 01.

1.17. Organizational and management information

Not relevant to the investigation.

1.18. Additional information

1.18.1 IReport from crew of AIRBUS-A321 aircraft

Both pilots provided reports of the incident which stated that whilst on the final approach for an ILS to LEMH they were notified of a light aircraft flying in the area. They identified the aircraft and then received a TCAS RA. The Captain disengaged the autopilot and levelled the aircraft. They watched the light aircraft which appeared to be turning away from them, but decided to carry out a missed approach. They then carried out a further approach and landed without further incident. A review of the flight data obtained through the company FDM programme supported the pilots' reports and confirmed the crew took the correct TCAS RA actions.

1.18.2 Report from pilot of AQUILA A-210 aircraft

The pilot reported that at 10:40, he requested clearance from the aerodrome tower to take off from runway 02 and to then proceed south, his intention being to fly around the island.

After taking off, he flew over La Mola toward the south and then turned west. Over Cala Torret he confirmed his position. The tower asked if he had the two aircraft approaching the runway at the Menorca Airport in sight, to which he replied in the affirmative, though he believes this may have been incorrect. He was then cleared to cross the baseline for the approach to runway 01 after the second airplane.

He only had visual contact with the first airplane. However, the second (G-OZBH) was not visible from his position and altitude, which was below 1,000 ft, because the cloud base was at 2,000 ft.

When the airplane was below the cloud base, the pilot informed the tower that he would make a full turn to the left; however, the distance to aircraft G-OZBH was such that its pilot had to go around.

The tower told him that it was his "fault" that the AIRBUS-A321 had been forced to go around. He apologized for the situation that had occurred.

In his statement he also added that he "typically traveled a lot throughout Europe and other parts of America, having experienced similar close proximity situations between IFR

and VFR flights". He said that he "would have appreciated a little more cooperation from the Menorca tower, because at other commercial airports with IFR/VFR traffic, the VFR airplane is made to hold earlier. However, the Menorca tower cleared the VFR traffic to cross the approach path of an IFR flight".

This clearance was based solely on the fact that the VFR pilot thought he was seeing the second airplane. In his opinion, the controller in the tower should have a more general picture and have arranged the sequence differently, since the tower could also see him on the radar display.

He also stated that his observation was not meant to excuse his action.

1.18.3 Report from controller on duty

Visual traffic D-EPIG took off from the aerodrome of San Luis and asked to cross the south approach with runway 01 in use and two aircraft on final.

He was asked if he had the second traffic, a Monarch aircraft on final, in sight and he replied that he did.

He was instructed to cross behind this aircraft. In the meantime, he informed the Monarch aircraft that there was a VFR traffic to his right that would cross behind him.

Said traffic was flying fairly low along the coastline, which is why the controller did not have visual contact with it, but it did with the Monarch airplane, though both were on the radar screen. On it, he saw that the VFR traffic was drawing close to the approach path of the Monarch. The controller informed the VFR traffic that the Monarch was on final, and the VFR pilot replied that he wanted to make a 360° to the left. He was cleared to do so, but the controller then realized that he was not making the turn, nor did the pilot inform him that he had changed his mind.

In the end, the airplane on final decided to go around due to receiving a TCAS RA. Upon informing the VFR pilot later that the other airplane had been forced to go around because of him, he apologized.

1.19. Useful or effective investigation techniques

Not applicable in this case.

2. ANALYSIS

According to the information provided by AEMET, the visibility was good in the area of the incident, though there were low clouds, which made it possible, as the pilot of the AQUILA A-210 stated, for him to believe that he had the AIRBUS-A321 in sight when in fact he was confusing it with another that was on approach to the runway ahead of the AIRBUS-A321.

What does seem clear is that he must have hesitated, which is why he requested clearance from the controller to turn left, away from the approach path. This makes it difficult to understand why, once cleared to make the maneuver he himself had requested, he continued toward the aircraft, forcing it to go around.

This change of mind entailed considerable risk and almost caused a mid-air collision.

The proximity between the airport and the aerodrome makes increases the risk that similar situations may occur, which requires the individual that provide the air traffic service to exercise caution.

In this case, the actions of ATS were correct.

As for the crew of the AIRBUS-A321, their statements indicate that, in general, they followed the TCAS RA procedure correctly.

3. CONCLUSIONS

3.1. Findings

- The AQUILA A-210 aircraft, registration D-EPIG, had taken off from the LESL aerodrome on a visual flight.
- The AIRBUS-A321 aircraft, registration G-OZBH, was flying the ILS approach to runway 01 at the Menorca Airport (LEMH).
- Both the crew of the AIRBUS-A321 and the pilot of the AQUILA A-210 had valid licenses and medical certificates.
- The controller also had a valid license and medical certificate.
- The documentation of both aircraft was in order.
- The pilot of the AQUILA A-210 confirmed having the other traffic in sight and was cleared by ATS to cross behind the AIRBUS-A321, which he acknowledged.
- Shortly afterward, the pilot requested to turn left, which was authorized.
- Instead of turning, the pilot continued straight and passed 400 ft below the AIRBUS-A321.
- The AIRBUS-A321 received a TCAS RA and the crew went around, making a second approach and landing normally.
- The AQUILA A-210 continued its flight without further incident.

3.2. Causes / Contributing factors

The incident occurred because the pilot of the AQUILA A-210 airplane did not correctly follow the instructions provided by ATS and executed a maneuver that was different from the one he had requested and that had been authorized.

4. **RECOMMENDATIONS**

None.