



**MINISTRY OF TRANSPORT, CONSTRUCTION
and MARITIME ECONOMY
STATE COMMISSION ON AIRCRAFT ACCIDENT INVESTIGATION**

FINAL REPORT

Serious Incident

Occurrence No:932/10

Aircraft:

G58, SP-MAP/

ZENAIR CH 601UL, G-CDFL

22 August 2010

Area of Warszawa-Babice aerodrome (EPBC).

This report is a document presenting the position of the State Commission on Aircraft Accident Investigation concerning circumstances of the air occurrence, its causes and safety recommendations.

The report is the result of the investigation carried out in accordance with the applicable domestic and international legal provisions for prevention purposes only. The investigation was conducted without the need of application of legal evidential procedure.

In connection with the Article 134 of the "Aviation Law" Act (Journal of Laws 2006, No 100, item. 696 with amendments), the wording used in this report may not be considered as an indication of the person guilty or responsible for the occurrence.

The Commission makes no judgments about fault and responsibility.

In connection with the above, any form of use of this report for any purpose other than air accidents and serious incidents prevention, can lead to wrong conclusions and interpretations.

This report was drawn up in the Polish language. Other language versions may be drawn up for information purposes only.

Warsaw 2011

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Terms and Acronyms

AMSL	Above Mean Sea Level;
APP	Approach Control Service;
AFIS	Aerodrome Flight Information Service;
ATC	Air Traffic Control;
ATIS	Automatic Terminal Information Service;
CTR	Control Zone;
SP-MAP	Registration marks and Call sign of G58 airplane;
Inf FIS	FIS (Flight Information Service);
Feet-(ft)	Altitude measurement unit 0,3048 m;
FIS	Flight Information Service;
FL	Flight Level;
G-CDFL	Registration marks and Call sign of Zenair CH 601UL „Zodiak” airplane;
IFR	Instrument Flight Rules;
LMT	Local Mean Time;
METAR	Meteorological Aviation Report;
MFD	Multi Functional Display;
NM	Nautical Mile – 1852 m;
QNH	Atmospheric pressure adjusted to mean sea level. Altimeter set at QNH will read altitude above mean sea level;
RWY	Runway;
TWR	Aerodrome Control Tower;
UTC	Co-ordinated Universal Time;
VFR	Visual Flight Rules;
WAR	Navigation point, (radio beacon VOR).

GENERAL INFORMATION

Type of occurrence:	Serious incident
Type and model of aircraft :	G58/ZENAIR CH 601 UL
Aircraft registration marks:	SP-MAP/G-CDFL
Aircraft commander :	G58 - CPL(A) Licence; ZENAIR CH 601 UL - PPL(A) Licence
Flight organizer :	Ad Astra Executive Charter/Private
Aircraft user :	Ad Astra Executive Charter/Private
Aircraft owner :	Leasing/Private
Place of occurrence :	Area of EPBC aerodrome
Date and time of the incident :	22 August 2010, 12:38 UTC
Damage to the aircraft :	No damage
Injuries to persons :	No injuries

SYNOPSIS

Note: all times in the Report are expressed in UTC (LMT = UTC + 2 hours)

On 22 August 2010 a pilot (male), holding CPL(A) Licence performed a commercial flight from Warszawa-Babice (EPBC) to Copenhagen (EKCH), operating G58 – “Baron” airplane, registration marks: SP-MAP. After taking off from runway 28L, during the climb in the area of the aerodrome traffic circuit a dangerous airprox occurred with arriving aircraft, Zenair CH 601 UL – “Zodiak”, registration marks: G-CDFL. The incident occurred at an altitude of about 1400 ft AMSL at around 12:38 hrs. Both aircraft performed VFR flights. The aircraft passed each other maintaining only a small vertical separation (50m - according to the statement of G58 pilot or 50 ft - according to “Zodiak” pilot).

Investigation of the incident was conducted by the SCAAI Investigating Team in the following composition:

MSc (Eng.) pilot Waldemar Targalski– Investigator-in-Charge - Member of SCAAI
MSc (Eng.) Bogdan Fydrych - Member of SCAAI

In the course of the investigation SCAAI determined that the cause of the serious air incident was:

Improper observation of the airspace by the airplanes pilots, which led to dangerous airprox.

After conclusion of the investigation SCAAI have made four safety recommendations.

1. FACTUAL INFORMATION

1.1. History of the flight.

On 22 August 2010, the pilot of G58 airplane (SP-MAP) performed a commercial flight from Warszawa-Babice to Copenhagen (EKCH). Departure from Babice aerodrome was carried out as a VFR flight with the planned later transition to IFR flight.

The flight was performed to pick up passengers. The aircraft is certified for operation by a single pilot and there was no other person on the board.

At 12:37 hrs (according to statement of Warszawa-Babice AFIS officer - performing duty at that time) the G58 took-off from runway 28L.

The pilot held CPL(A) licence. After taking off from runway 28L, during the climb in the area of the aerodrome traffic circuit a dangerous airprox occurred with flying to EPBC Zenair CH 601 UL (“Zodiac”) aircraft, registration marks G-CDFL. The incident occurred at an altitude of about 1400 ft AMSL at around 12:38 hrs. Both aircraft performed VFR flights. The aircraft passed each other maintaining only a small vertical separation. G58 pilot reported that there was a „collision in the air” and turned back to land. Both aircraft carried out safe landings at Warszawa-Babice aerodrome.

1.2. Injuries to persons.

Not applicable.

1.3. Damage to aircraft.

Not applicable.

1.4. Other damage.

Not applicable.

1.5. Personnel information.

G58 Commander

Airplane pilot aged 34, held CPL(A) Licence, issued by the Civil Aviation Office on 16 November 2007, valid until 16 November 2012. Ratings entered into Licence:

- SEP(L) - valid until 30 April 2012;
- IR - valid until 31 October 2010;
- MEP(L) - valid until 31 October 2010.

Captain was certified to maintain radiotelephony communication from the aircraft in English and Polish.

He had Class 1 Medical Certificate valid until 29 June 2011 and Class 2 Certificate valid until 29 June 2015. On the day of occurrence the pilot held valid OPC (Operator Proficiency Check) and ratings entered into Licence with the validity dates as given above. The pilot passed Theoretical Knowledge Exam on 26 May 2010, valid until 26 May 2011.

Total flight time:	845 hrs;
Flight time as a Commander:	711 hrs;
Total flight time on G58:	112 hrs;
Flight time as a Commander on G58:	112 hrs;
Flight time over the last 90 days:	114 hrs;
Flight time over the last 30 days:	40 hrs;

The last flight prior to the occurrence date - on 20 August 2010.

Commander of ZENAIR CH 601 UL („Zodiak”)

Airplane pilot aged 56, held PPL(A) Licence, issued by UK Civil Aviation Authority on 16 July 1998, authorizing to perform flights after obtaining a valid Medical Certificate.

He was certified to maintain radiotelephony communication from the aircraft in English.

He had Class 2 Medical Certificate valid until 20 August 2014.

Total flight time:	1240 hrs 45 min;
Flight time as a Commander:	1215 hrs 50 min;
Flight time as a Commander on ZENAIR CH 601UL:	585 hrs 10 min;
Flight time over the last 90 days:	52 hrs 30 min;

Flight time over the last 30 days: 16 hrs 25 min;
Flight time over the last 24 hours: 4 hrs 25 min.

1.6. Aircraft information.

G58 Baron

Trade name: Beechcraft Baron G58. Aircraft owner is Deutche Leasing Polska S.A. seated in Warsaw Wybrzeże Gdynskie 6A Street.



Year of manufacture	Manufacturer	Serial number	Registration marks	No of state registry	Date of registration
2009	Hawker Beechcraft Co.-USA	TH 2257	SP-MAP	4364	10.07.2009

Airworthiness Review Certificate (ARC) valid until: 19 July 2011;
Airframe total flight time since new: 378 hrs 46 min.;
Total Cycles since new: 331;
Date of the last periodic operations: 16 July 2010 (after „50h”).

ZENAIR CH 601 UL („Zodiak”)



Year of manufacture	Manufacturer	Serial number	Registration marks	No of registry	Date of registration
2004	Amateur construction	PFA162A-14309	G-CDFL	Lack	31.11.2004

Permit to Fly valid until: 11 March 2011;
Airframe total flight time since new: 1045 hrs 30 min.;
Engine flight time: 1106 hrs 35 min.

1.7. Meteorological information.

On 22 August 2010 the weather in the area of Warsaw was shaped with a high pressure system with inflow of a stable and dry air masses from the south-west. Below there is shown the weather data on Warszawa-Okęcie aerodrome (EPWA) at the approximate time of the occurrence. Due to stability of atmospheric conditions on the day of occurrence and proximity of Warszawa Babice aerodrome (EPBC) it can be assumed that the conditions were the same. This is also confirmed by the entry related to weather conditions included in the "Daily Report" of AFIS officer from Warszawa-Babice aerodrome, which reads as follow:

Time of observation	Visibility (km)	Clouds			Wind		Weather nature
		Base	Cloudiness	Type	Direction	Speed	
08:00	10 km		CAVOK		240	2 m/s	
19:00	10 km		CAVOK		240	2 m/s	

Data of Warszawa-Okęcie aerodrome:

Source „History Weather Underground”, LT=UTC+2 hrs

METAR EPWA 221130Z 23009KT 180V270 CAVOK 28/16 Q1017 NOSIG

METAR EPWA 221200Z 22008KT 180V270 CAVOK 29/16 Q1016 NOSIG

METAR EPWA 221230Z 24007KT 170V290 CAVOK 29/16 Q1016 NOSIG

METAR EPWA 221300Z 23008KT 170V270 CAVOK 29/16 Q1016 NOSIG

1.8. Aids to navigation.

Not applicable.

1.9. Communications.

During their flights the pilots maintained two-way radio communication:

- „Zodiak” – with FIS and with „Babice Radio” supervising instructor of training flights on 122,300 MHz frequency;

- G58 – with AFIS and with „Babice Radio” - supervising instructor of training flights.

There was no requirement to record radio communications on 122,300 MHz frequency.

1.10. Place of occurrence information.

The incident occurred in the area of Warszawa-Babice aerodrome at crosswind position of RWY 28 at an altitude approximately 1400 ft AMSL.

1.11. Flight recorders.

The aircraft were not equipped with flight recorders.

1.12. Wreckage and impact information.

Not applicable.

1.13. Medical information.

The airplanes pilots, AFIS officer and supervising instructor did not report any health problems.

1.14. Fire.

Not applicable.

1.15. Survival aspects.

Not applicable.

1.16. Tests and research.

Statements of the following persons were collected:

- aircraft pilots involved in the serious incident;
- AFIS officer;
- supervising instructor of training flights;
- assistant of supervising instructor, who informed arriving G-CDFL in English.

Visual evidence secured and delivered by the Polish Air Navigation Services Agency was analysed. Analysis of the incident timing and aircraft routes in the respective time frame was carried out based on radar data records.

1.17. Organizational and management information.

SCAAI was notified about the occurrence on 23 August 2010 by G58 pilot. Management of Warszawa-Babice aerodrome and Warsaw Aeroklub did not notify SCAAI about the incident. SCAAI notified Air Accidents Investigation Branch (AAIB).

1.18. Additional information.

Both pilots of the aircraft, Management of EPBC aerodrome – Center of Logistic Services, Ad Astra Executive Charter and Air Accidents Investigation Branch (AAIB) were acquainted with the Draft Final Report. SCAAI took into account in the Final Report some remarks of “Zodiak” pilot and AAIB. These remarks are attached into documentation of the investigation.

1.19. Useful or effective investigation techniques.

Not applied.

2. ANALYSIS

2.1. Occurrence analysis.

On 22 August 2010 ZENAIR CH 601 UL („Zodiak”) Commander performed a flight from EPZP (Zielona Góra – Przylep) aerodrome to EPBC (Warszawa – Babice). He took off from EPZP at 10:10 hrs, at 11:45 established communication with FIS Warszawa and at 12:33 hrs transferred to „Babice Radio” (122,30 MHz).

FIS Informer: „*GCDFL contact Babice Radio 122 decimal 3 and I suggest descend 1500 ft,...*”;

GCDFL: “*122,3, thank you sir, good by GCDFL*”.

The airplane transponder was set at mode „C” with code 7431. At 12:32:44 hrs the airplane was over VOR WAR (radar record page 11). Having established communication with „Babice Radio” the Commander reported: the airplane type, registration marks, altitude and VFR flight with his intention to land at Babice aerodrome - according to assistant of supervising instructor of training flights.

Due to the fact that supervising instructor of training flights did not speak English, he asked his assistant (instructor-pilot) to communicate with the arriving pilot in English. This explains the fact that the arriving pilot did not receive answer immediately. („Zodiak” pilot stated: „I did not receive a reply from my first call but after my second call I was told that the circuit direction was Wright hand”). The assistant of the supervising instructor of training flights, according to his statement, passed to the „Zodiak” pilot the following information:

- situation in the aerodrome area - gliders and airplanes operations;
- active runway in use (RWY28) and QNH;

- approximate wind direction and speed;
- request to continue VFR flight and to report the downwind position.

The pilot acknowledged the information.

At 12:37:25 hrs (radar recording page 12), according to the instructions and the information about aerodrome traffic, the airplane entered the area of the traffic circuit in the vicinity of the first turn (crosswind position). At 12:37:51 hrs the FIS radar recording shows SP-MAP climbing after take off (radar recording page 13). At 12:38:36 hrs two aircraft approaching each other were recorded (radar recording page 14). It occurred at the crosswind position at the altitude of 1400 feet. Then they went separate ways (radar recording page 15).











In the opinion of the taking off pilot the aircraft passed each other to maintain about 50 meters vertical separation, but “Zodiac” pilot stated that it was about 50 ft (~ 15m). The Commission was not able to determine unambiguously vertical separation between the two aircraft passing each other.

According to a statement of G58 aircraft Commander, after take off and execution of the first turn in climbing phase the on-board Skywatch system warned him: “Traffic, traffic” and simultaneously he noticed in front of his airplane (at the same altitude) another airplane crossing his flight path. To avoid collision the pilot moved vigorously the control column forward and heard the sound, which he interpreted as a collision. Therefore, he reported collision in the air and decided to land on runway 28L. Then he checked controllability of the airplane and found it totally correct.

„Zodiak” pilot spotted G58 airplane only in the last phase of approximation, just after passing each other. In the opinion of “Zodiak” pilot the incident took place on the downwind position. SCAAI considered it as subjective perception of the pilot which may resulted in an irregular (unusual) shape of the Warsaw-Babice airfield circuit pattern. Evaluating the place of the incident SCAAI took into account pilots statement and radar documentation. Both airplanes landed safely, „Zodiak” on the grass runway 28R and G58 on the runway 28L. After landing Commander of G58 inspected the airplane but found no damage, which could indicate a collision with other aircraft. Therefore, he concluded that the sound which he heard during the maneuver to avoid collision was caused by a sudden displacement (up-down) of catering products located in the passenger cabin. The pilot reported this situation personally to AFIS officer, excluding collision in the air and stating, that it was actually dangerous airprox. He decided to take off to continue the interrupted flight.

The above facts were confirmed in the statements of the supervising instructor of training flights and his assistant, “Zodiak” pilot and AFIS officer as well as in a “Daily Report” of AFIS officer and “Reports Book of the supervising instructor of training flights”. The discrepancies concerning time of the incident could occur, in the Commission opinion, as a result of the subjective determination of time by the involved individuals. Therefore, the Commission determined the incident time on the basis of radar recordings from FIS Warsaw and the occurrence analysis was carried out accordingly.

2.2. Operational documentation analysis.

The Operational Instruction of Warszawa-Babice aerodrome (I/2004 Edition, change 3/06.05.2010, page 14/28) item “**3.9 Performing flights**”, Note No 5 contains information that “*The language used in air-ground communications at the airport is the Polish language, or English after prior arrangement*”.

In the Commission opinion, the above information should be also contained in the AIP VFR in the part related to Warszawa-Babice aerodrome (EPBC), because this is the basis for formal aviation documentation.

“Zodiak” pilot possessed such a formal documentation, published by Jeppesen (copies on pages 18 and 19). In both AIP VFR of Warszawa-Babice aerodrome and

Jeppesen publication there was no information that radio communications could be conducted in English **after prior arrangement with the airport manager.**

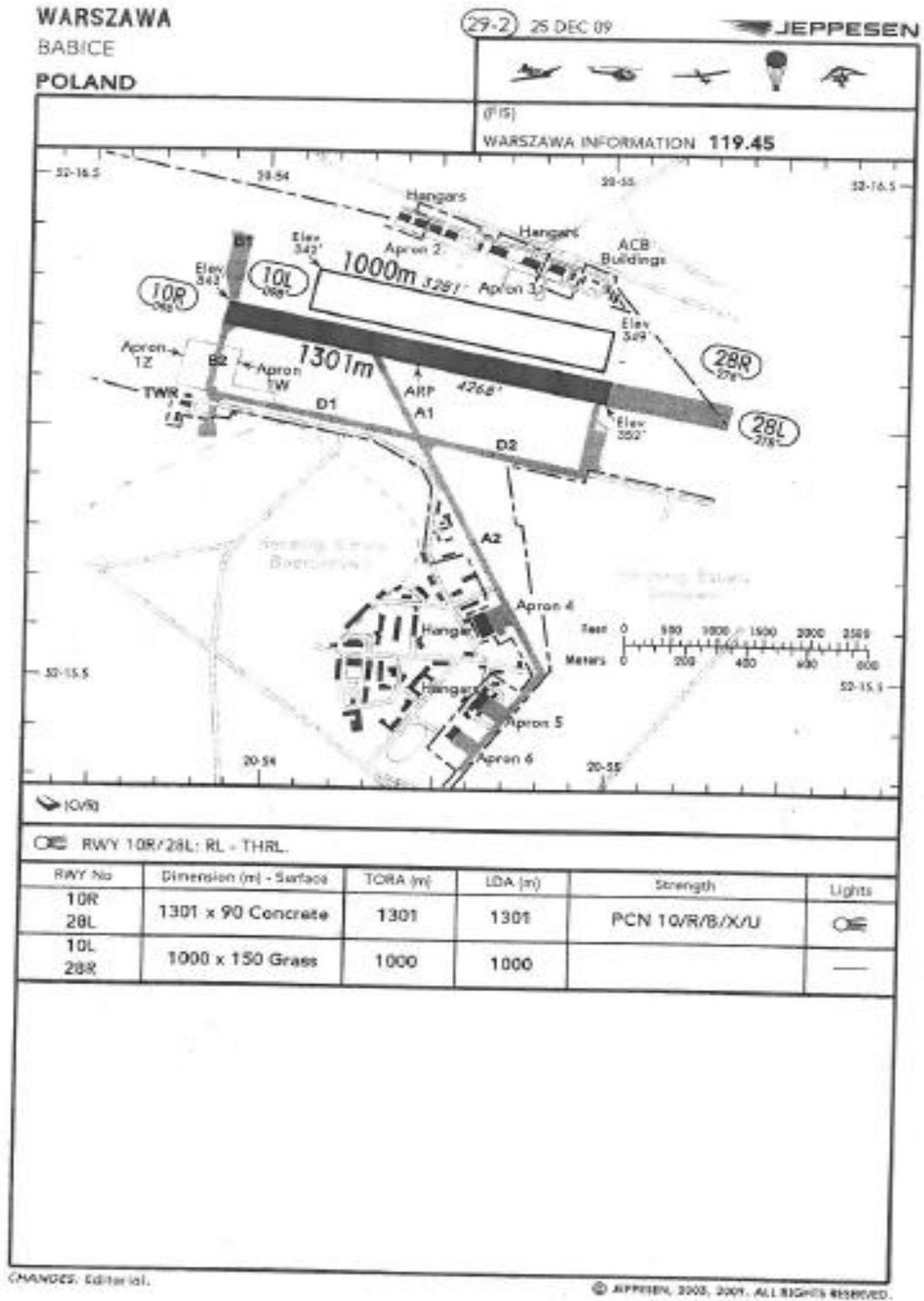
Lack of information (in AIP VFR) about the possibility of communication in English limits the aerodrome capability to receive aircraft flown by pilots who do not speak Polish.

Such a gap in the documentation may lead to a situation that the flight crew without command of the Polish language will have a problem in the correct communication with AFIS officer or “Babice-Radio” using 122,3 MHz frequency. This situation is of major importance taking into account the fact that only three of the eight AFIS officers have been rated to conduct radio communications in English. There is no requirement of proficiency in English for persons authorized by the airport manager to control training flights.

On the incident day such a situation occurred, that AFIS officer was not certified to conduct communication in English, and the supervising instructor of training flights was not able to communicate in that language. In that particular case the problem of communication in English was solved by assistant of the supervising instructor of training flights.



Copy of Jeppesen Publication Card No 29-1 of 25 December 2009 used by "Zodiak" pilot.



Copy of Jeppesen Publication Card No 29-2 of 25 December 2009 used by “Zodiak” pilot.

2.3. Visual Flight Rules (VFR)

The Commission draws attention to several fundamental principles that apply in the case of visual flights:

- flight must be performed in VMC (visual meteorological conditions), which allow to perform flights according to VFR;
- full responsibility for maintaining safe separation from ground obstacles lies with commander of aircraft;
- aircraft commander is also solely responsible for ensuring safe separation from other aircraft;
- navigation is based on the visible ground objects, while the aircraft equipment (GPS, FMC, etc.) should be treated only as a support for navigation. The same applies to warning systems about possibility of collision in the air (TCAS - *Traffic Collision Avoidance System*, or similar system ACAS - *Airborne Collision Avoidance System*).

To summarize the above: **in the VFR flights full responsibility for ensuring safe separation from ground obstacles and other aircraft lies with a pilot.**

G58 airplane was equipped with a warning system detecting the nearest aircraft equipped with transponder using mode “C”. The system is called “Skywatch 497 Traffic Advisory System”. It calculates distance, direction, relative altitude and approach speed of aircraft and on this basis determines a potential conflict within the radius of 11 NM. The system generates a voice warning (TA - *Traffic Advisory*) through the aircraft audio system and displays the aircraft markers on multifunction display (MFD).

The system can track up to 30 aircraft simultaneously and display information about 8 of them, which may pose a potential hazard. The system does not generate *Resolution Advisory* (RA) - does not order/specify the necessary manoeuvre to avoid collision. The maneuver to avoid collision must be preceded by an earlier visual contact with the aircraft posing a hazard.

According to the statement of G58 Commander, he spotted “Zodiac” airplane only **after Skywatch warning (Traffic, Traffic)**, which meant proximity of another aircraft (potential hazard from another aircraft). In the Commission opinion, this warning caused that G58 pilot began visual observation of airspace, spotted “Zodiac”, identified a hazard and performed the maneuver that allowed to avoid a collision. The “Zodiac” pilot spotted G58 airplane just after G58 pilot had completed his maneuver to avoid collision.

Considering the above facts, the Commission is of the opinion, that the pilots of both aircraft conducted visual observation of the airspace in a manner that did not ensure them to maintain safe separation from each other. Proper observation of airspace is very important in each phase of flight to maintain safe separation from another aircraft to avoid collision, and especially important when entering the aerodrome traffic circuit and during take off.

After analysis of the Zodiac pilot statement, the Commission came to the conclusion, that he was aware of quite intensive traffic on the aerodrome, which should have led to intensification of airspace observation while entering the aerodrome traffic circuit.

The Commission is also of the opinion, that the same applies to G58 pilot performing take off and departure along aerodrome traffic circuit route. The more he was aware that “Zodiac” was going to enter aerodrome traffic circuit (G58 pilot stated that he had heard the Zodiac pilot communication from the moment of transition to “Babice Radio” - frequency 122,300 MHz).

3. CONCLUSIONS.

3.1. Commission findings.

1. Zenair CH 601 UL flight was a private flight.
2. G58 flight was a commercial flight.
3. Weather conditions did not affect the occurrence of the incident.
4. Pilots maintained communication at „Babice Radio” frequency – 122,3 MHz.
5. The incident occurred at an altitude of about 1400 ft AMSL between I and II, turn of aerodrome traffic circuit of runway 28 at about 12:38 hrs.

6. Pilots were certified to perform the flights.
7. At the time of the incident the aircraft were airworthy.
8. Pilots of both aircraft conducted observation of the airspace in a manner that did not ensure them safe separation from each other.
9. G58 pilot spotted „Zodiak” and performed a maneuver to avoid a collision as a result of warning generated by the on-board „Skywatch - 497 Traffic Advisory System”.
10. Securing of catering on G58 board was ineffective.
11. Lack of entry in AIP VFR, (not entered by the aerodrome manager) informing about possibility of communication in English only after prior arrangement with the manager.

3.2. Causes of serious incident.

In the course of investigation SCAAI determined that the cause of the serious air incident was:

Improper observation of the airspace by the airplanes pilots, which led to dangerous airprox.

4. SAFETY RECOMMENDATIONS.

Based on the evidence gathered during the investigation, the State Commission on Aircraft Accident Investigation proposes the following safety recommendations:

EPBC aerodrome manager - Center of Logistic Services

1. Enter in AIP VFR information about possibility of radio communication with AFIS officers in English only after prior arrangement with the manager.
2. Consider recording and archiving of radio communication with „Babice Radio” maintained at 122,3 MHz frequency.

AD ASTRA Executive Charter S.A.

1. Conduct with pilots additional training activities on performing VFR flights, in particular concerning the rules to ensure separation from other aircraft in accordance with the principle: “I see and I am seen”.

2. Verify the effectiveness of fastening cargo on G58 board, including catering.

5. ATTACHMENTS.

None.

THE END

Investigator-in-Charge
M.Sc.Eng. pilot Waldemar Targalski