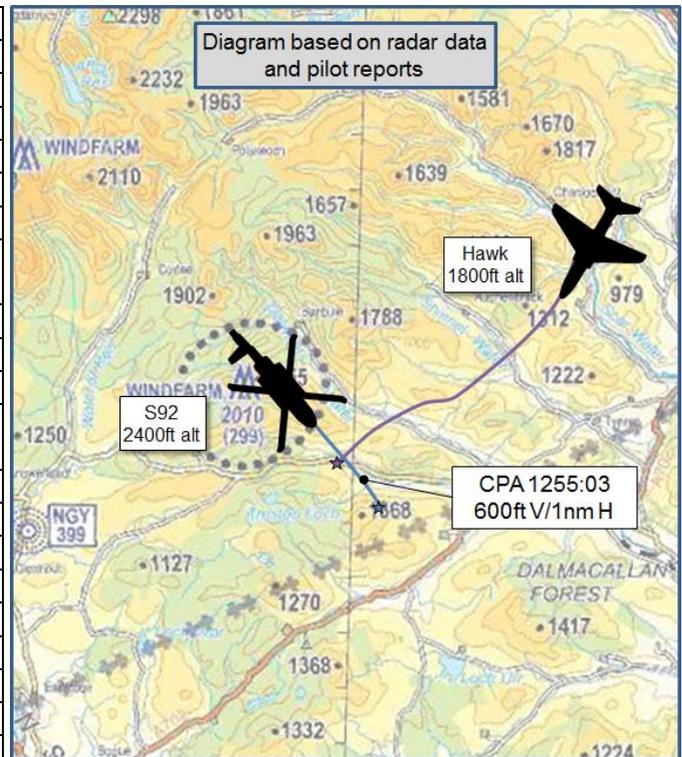


**AIRPROX REPORT No 2016072**

Date: 10 May 2016 Time: 1255Z Position: 5512N 00400W Location: 15nm WNW Dumfries

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	S92	Hawk
Operator	SAR	HQ Air (Trg)
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	None
Provider	Scottish Information	N/A
Altitude/FL	2400ft	1800ft
Transponder	C, S	C
Reported		
Colours	White/Red /Blue/Orange	Black
Lighting	Nav, HISL	HISL, Landing
Conditions	VMC	VMC
Visibility	20km	30km
Altitude/FL	2400ft	700ft
Altimeter	QNH (1012hPa)	QNH (1002hPa)
Heading	155°	240°
Speed	140kt	420kt
ACAS/TAS	TCAS II	TCAS II
Alert	RA	TA
Separation		
Reported	NK	450ft V/1.5nm H
Recorded	600ft V/1nm H	



**THE S92 PILOT** reports that he was en-route to a SAR incident in the Lake District. He observed a TCAS contact which was greater than 1000ft below the aircraft and at a range of 8nm. The TCAS contact then closed with them and an associated 'TRAFFIC' alert was heard through audio. No visual sighting of the traffic was made. The TCAS system then instructed 'DESCEND', which the PF did. The instruction then changed immediately to 'CLIMB NOW, CLIMB NOW'. All instructions were followed by the PF. Whilst carrying out the TCAS instructions the PF observed a fast-jet pass close to the left and behind them. They levelled at 2800ft following the resolution and then reported the incident to Scottish Information.

He assessed the risk of collision as 'Medium'.

**THE HAWK PILOT** reports he filed this report in response to notification of an Airprox report filed against a black Hawk flying at the time he was in the area of the reporting aircraft. He was the instructor supervising a high-low-high navigation sortie planned to LFA16, Dumfries and Galloway area. At approx the mid-point of the low-level portion of the sortie, heading west, TCAS indicated a contact 16nm in the front sector 1000ft above. The crew acknowledged the contact and became visual with a helicopter at approx 6nm. At 4nm the crew made the decision to pass behind the aircraft and, at 3nm, positively moved the aircraft to pass behind. From the HUD video, the helicopter can be seen to pass through the field of view at 2-2.5nm approx 700ft above. They waggled their wings to acknowledge the other aircraft as they passed abeam. They passed through the helicopters 6 o'clock at approx 1.5nm and 450ft below and continued with the rest of the sortie.

He assessed the risk of collision as 'Low'.

**THE SCOTTISH CONTROLLER** reports that he observed the S92 just north of the TMA boundary; he also observed that there was a 7001 Fast-Jet operating south of the TMA north of D405. It was his intention to give a general non-specific traffic warning to the S92 on the basis of the radar derived information. He made one attempt to transmit to the S92 but was unable to reach him. Subsequently the S92 pilot called to advise he had received a TCAS RA. The S92 pilot advised that he had received TCAS "descend", and then a TCAS "climb now". He acknowledged the message and the S92 pilot then informed him it was a fast-moving military jet.

## Factual Background

The weather at Glasgow was recorded as follows:

METAR EGPF 101250Z AUTO 08017KT 9999 NCD 21/11 Q1013=

## Analysis and Investigation

### CAA ATSI

The S92 (SSR code 0023) was operating on an operational Search and Rescue task and was en-route to an incident located to the south of Ullswater in the Lake District. The S92 was in receipt of a Basic Service from Scottish Information.

The Hawk (SSR code 7001) was operating on a high-low-high navigation training sortie, and at the time of the Airprox was operating within LFA (Low Flying Area) 16 in the Dumfries and Galloway area of southern Scotland. The Hawk was not receiving any form of ATC service; however, the crew of two (student and instructor) were monitoring the UHF low-level common frequency.

It was not possible to positively identify the Hawk using the recorded surveillance data despite the contact being Mode S equipped; however, a secondary radar contact transponding 7001 was observed manoeuvring in the area prior to the Airprox. This radar contact then manoeuvred in a manner consistent with the written information contained in the Airprox pilot reports.

At 1251:00, the S92 called Scottish Information and requested a Basic Service. The FISO provided the S92 with a Basic Service and the Belfast Regional Pressure Setting of 1005.

At 1254:40 (Figure 1), the FISO called the S92 but received no reply. In his written report, the FISO stated that the reason for this transmission was his intention to give "a general non-specific traffic warning" based on his awareness of a 7001 squawk operating north of Danger Area D405. At this time the contact believed to be the Hawk was 2.8nm north-east of the S92 tracking south-west indicating an altitude of 1600ft.

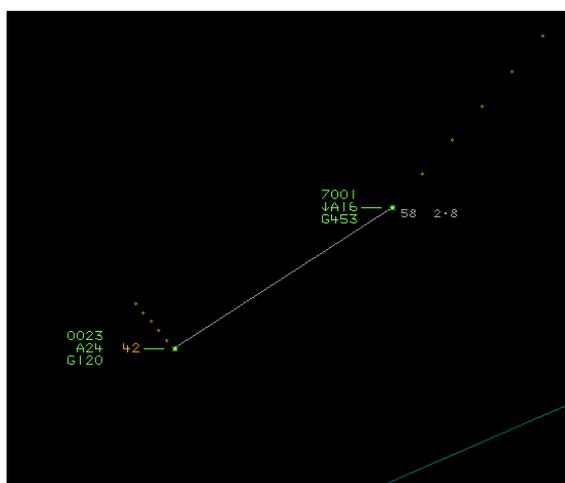


Figure 1 – Prestwick Centre MRT at 1254:40 UTC

The Hawk pilot's report states that they, "...became visual with a helicopter at approximately 6nm. At 4nm the crew made the decision to pass behind the aircraft and at 3nm positively moved the aircraft to pass behind."

At 1254:51 (Figure 2) the contact believed to be the Hawk was 1.5nm north-northeast of the S92, and had turned right onto a west-south-westerly track.

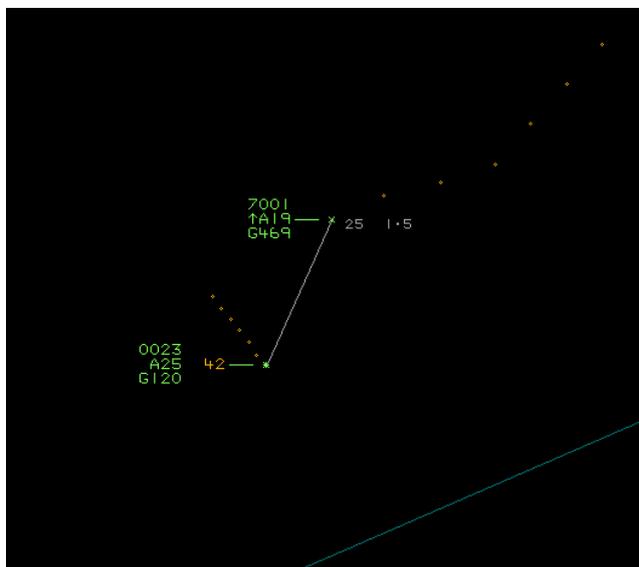


Figure 2

Prestwick Centre MRT at 1254:51 UTC

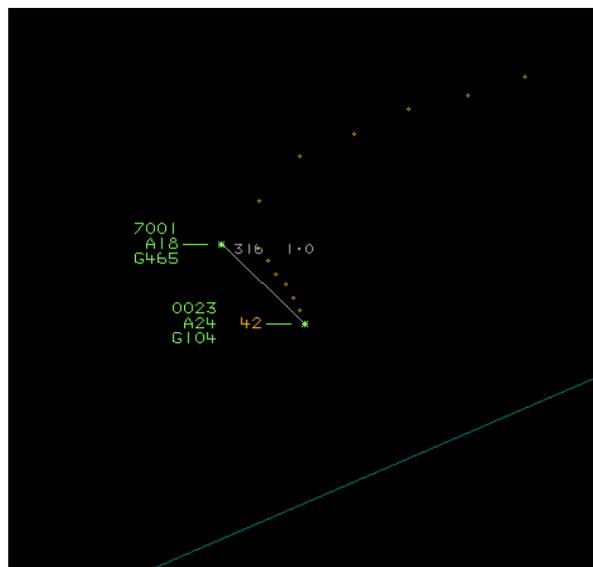


Figure 3

Prestwick Centre MRT at 1255:03 UTC (CPA)

CPA (Figure 3) between the S92 and the contact believed to be the Hawk occurred at 1255:03 with a measured horizontal distance of 1nm and a vertical distance of 600ft.

The FISO was providing a Basic Service within Class G (uncontrolled) airspace. The Area FISO is responsible for the provision of Flight Information and Alerting services within his area of responsibility in order to facilitate the safe conduct of flight, these services are provided without reference to surveillance data and the responsibility for collision avoidance remains solely with the pilot.

### UKAB Secretariat

The S92 and Hawk pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>1</sup>. If the incident geometry is considered as converging then the Hawk pilot was required to give way to the S92<sup>2</sup>.

### Comments

#### HQ Air Command

The Hawk pilot had planned and executed his mission in accordance with extant rules and procedures. The route was entered onto CADS and finally checked for conflicts at 1120Z; it is likely therefore that the aircraft probably launched at around 1215Z. The helicopter's route was entered onto CADS at 1232Z and was related to an operational response with associated short planning timelines. This denied the Hawk crew the opportunity to effect deconfliction but the helicopter crew may have been aware of a possible planned confliction with the Hawk, though it is acknowledged that the confliction could not have been resolved prior to launch.

<sup>1</sup> SERA.3205 Proximity.

<sup>2</sup> SERA.3210 Right-of-way (c)(2) Converging.

Two remaining barriers to MAC, namely lookout and TCAS, were effective in that the Hawk crew became aware of the helicopter at 11nm and visual at approximately 6nm and devised an appropriate course of action to avoid conflict which was swiftly followed by an indication of traffic on the Hawk's TCAS. The generation of the RA within the helicopter is likely attributable to the topography, in that the Hawk would have had an upward vector prior to passing behind the helicopter as the Hawk pilot climbed to avoid the ridge that the helicopter was overflying. All military pilots are well aware of the effect of flight vector on TCAS-equipped aircraft and, in this instance, the Hawk pilot believed that he had given enough separation to not affect the helicopter's CWS. Finally, this incident occurred outside the region where a VHF common frequency is currently being trialled as an aid to airborne deconfliction.

## Summary

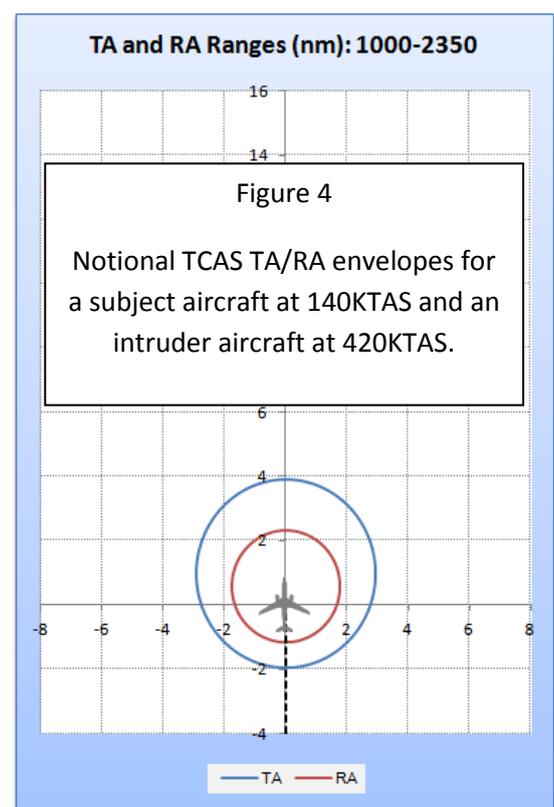
An Airprox was reported when a S92 and a Hawk flew into proximity at 1255 on Tuesday 10<sup>th</sup> May 2016. Both pilots were operating under VFR in VMC, the S92 pilot in receipt of a Basic Service from Scottish Information; the Hawk pilot was not in receipt of a Service.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board firstly commended the S92 SAR operations staff for inputting the details of the SAR sortie onto CADS; they felt this was a good example of best practice in a quickly evolving situation. Unfortunately, in this scenario the Hawk crew would not have seen the SAR flight route because they had taken off before the SAR task was activated. Notwithstanding, members wondered how much CADS information the SAR crew were made aware of prior to getting airborne, and what the practicalities might be of passing such information from their operations staff if a conflict was detected; even just a screen shot for the crew or an R/T call of where a conflict might occur would help their SA as they reacted on task.

The Board then turned to the limitations of using TCAS in Class G airspace. Members highlighted that a low-level military fast-jet will be constantly changing its elevation profile due to the terrain and that this could easily account for the generation of reversing RAs in the S92. Although not originally intended to be employed in such dynamic scenarios, the Board pointed out that pilots should still react to TCAS RAs because it may be that they are being generated by unseen aircraft. Although lookout should continue to be employed to endeavour to determine the intentions of any conflict traffic, the TCAS manoeuvre should come first. For its part, being below 1000ft meant that the Hawk TCAS would not generate RAs to its pilots, and so they would therefore not react. With respect to the particular circumstances of this incident, a UKAB TCAS TA/RA tool indicated that for these altitudes and flying at 140KTAS, the S92 would have received TCAS TA/RA alerts at about 2.7nm and 1.6nm respectively from a 420KTAS fast-jet initially on the beam then passing behind (see Figure 4). The reported alerts from the S92 crew were consistent with these figures and demonstrated the need for fast-jet crews to ensure a considerable margin of separation (ideally 2nm at least) in such scenarios.



Turning then to the actions of the Hawk crew, a member of the UKAB Inspectorate briefed the Board on the content of a video of the Hawk profile which contained the internal communications between the two Hawk crew members. It was clear that the Hawk crew had received a TCAS contact from the S92 at 11nm, and had obtained visual at about 6nm. The Hawk crew members then discussed how to avoid the S92 and decided the safest option was to pass behind, which they initiated when inside about 4nm. Their 'wing waggle' was also evident to indicate to the S92 pilot that they had seen him.

The Board then discussed the cause and risk of the Airprox. They quickly agreed that the Hawk pilot had seen the S92 in plenty of time to assess the safest option and carry out the necessary turn to pass safely behind. Members acknowledged that the S92 pilot had had a TCAS instruction to Descend, followed by a reversal to Climb, but they were confident that this was created as a result of the Hawk's terrain following manoeuvres and the limitations of the TCAS equipment rather than a proximity situation *per se*. That the S92 pilot had reacted appropriately to what was a known limitation of the TCAS system in Class G airspace meant that they concluded that the cause was a TCAS sighting report. The Board then turned to the risk; they felt that the Hawk pilot had carried out appropriate avoiding action and was visual with the S92 at all times. Commenting that it was right that the S92 pilot had filed a report to express his valid concerns, they nonetheless agreed that normal safety standards had pertained in what was determined by analysis to be a non-proximate incident that they therefore assessed as Category E.

### **PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: A TCAS sighting report.

Degree of Risk: E.