

AIRPROX REPORT No 2014208

Date/Time: 23 Oct 2014 1252Z

Position: 5454N 00142W
(11nm S Newcastle Airport)

Airspace: Airway P18 (Class: D)

Reporter: Newcastle Radar 1 Controller (3)

Aircraft 1 Aircraft 2

Type: B777 Pirat glider

Operator: CAT Civ Pte

Alt/FL: 6000ft 7000ft
 QNH QFE (985hPa)

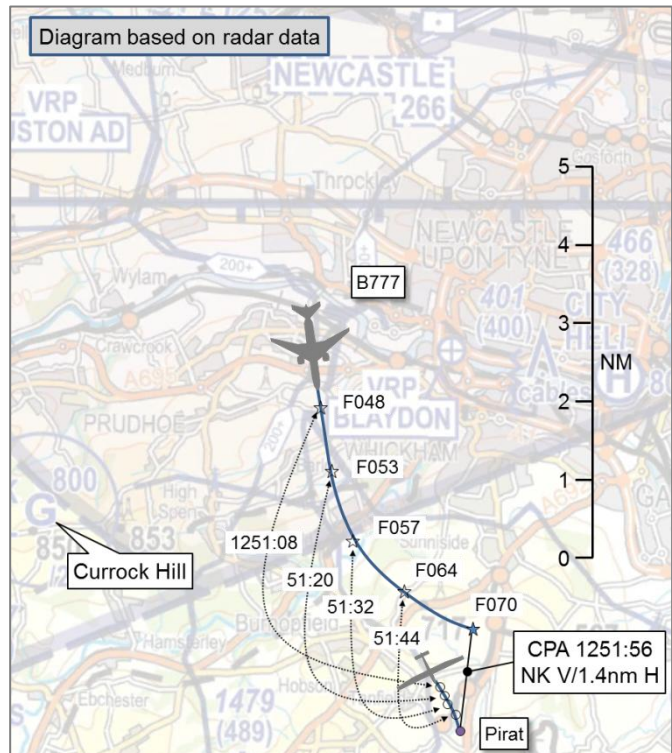
Conditions: VMC VMC

Visibility: NK >10km

Reported Separation:

NK NK

Recorded Separation: NK V/1.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

In the period leading up to the Airprox the Newcastle Radar 1 position was handed over on two occasions. Controller (1) initially cleared the glider pilot to climb to FL100 before handing over to Controller (2). Shortly afterwards a further handover took place and it was Controller (3) who issued avoiding action to the B777 pilot and subsequently filed the Airprox report.

THE NEWCASTLE RADAR 1 CONTROLLER (1) did not file a report.

THE NEWCASTLE RADAR 1 CONTROLLER (2) reports that he took over the position at 1230. At handover the off-going controller gave him information on two gliders operating at Currock Hill Gliding Site. He stated that one had departed to the west and had left the area, whilst the other (the subject glider) was operating up to FL100 over the gliding site. The traffic was not identified as it was believed to be within the lateral boundary of the agreed gliding area. He noticed a very faint primary contact 10nm south of the airport outside the CTA and to the east of Currock Hill Gliding Area. This contact was very slow moving and dropping in and out of cover; the surface wind was southerly and he thought the return may have been caused by 'anaprop'¹ (anomalous propagation – interference). The contact disappeared just south of the River Tyne on the eastern edge of Currock Hill Gliding Site. At this point an airliner [not the subject B777] departed from Newcastle heading 180° for Airway P18. He pointed out the unknown contact to the oncoming controller, commenting that he believed it to be a false contact. As a precaution, he turned the outbound airliner further left onto heading 170°, and the oncoming controller suggested turning the aircraft onto 160° before he would accept the handover. After handing over the position, the contact re-appeared, stronger this time and heading south. The departing airliner was clear of the contact and, at this point the B777 departed. The unknown contact moved south-east and was now due south of the airport. After the B777 pilot was transferred from the Tower frequency, avoiding action and Traffic Information were issued to him.

¹ The National Meteorological Library and Archive Fact sheet 15-weather radar describes anaprop: 'Radar beams are like light beams, in that they travel in straight lines through a uniform medium but will be bent (refracted) when passing through air of varying density. When a low-level temperature inversion exists, the radar beam is bent downwards and strong echoes are returned from the ground, in a manner akin to the formation of mirages'.

THE NEWCASTLE RADAR 1 CONTROLLER(3) reports that, on taking over the Radar 1 task, the B777 was just airborne heading 180° and, due to high Aerodrome Control workload, was slightly late in being transferred to his frequency. He noticed a primary contact to the south of the B777 and, on its current heading; the two blips would have merged. Therefore he gave avoiding action and a left turn of 090° to the B777 and passed Traffic Information. Subsequent investigation identified the other aircraft as a glider at 7800 ft. He reported the minimum separation as 1000ft vertical and 2nm horizontal.

THE NEWCASTLE AERODROME CONTROLLER reports that he cleared the B777 pilot for take-off RW25 at 1246. He confirmed via the Aerodrome Traffic Monitor (ATM) that the B777's departure conformed with the clearance issued. Because he was busy dealing with other traffic, the transfer of the B777 pilot to Radar was delayed. The B777 pilot was transferred (passing 3800ft) to Newcastle Radar at 1250:40.

THE B777 PILOT reports that his aircraft was coloured white, all external lights were illuminated; SSR Modes C and S (enhanced) were selected; and it was equipped with TCAS. After departure from RW25 at Newcastle on an IFR flight in VMC, they followed their ATC clearance, which was a left turn on reaching 1.5nm from Newcastle. Whilst climbing at around 6000ft (in receipt, he reported, of a Deconfliction Service from Newcastle Radar) they were advised to turn left for traffic avoidance (210° or 215° he recollected). They complied, and flew the heading until advised clear of traffic. A right turn was given and subsequent clearance to Ottringham. They tried to visually acquire the traffic, but did not see anything. No traffic was displayed on TCAS, and no TA or RA was received. The ATIS received did not mention that the Currock Hill Gliding Site was active.

THE SZD-30 PIRAT GLIDER PILOT reports that he was on a local VFR flight in VMC from Currock Hill Gliding Site. The glider was coloured white and blue, no external lighting was carried and it was not equipped with FLARM. On receipt of a clearance to FL100 from Newcastle ATC he climbed into Class D airspace. Due to the strong upper wind in comparison to his low airspeed, he unintentionally entered airspace in which he had not intended to operate. He was flying 1000ft above scattered cloud, and there was a bank of cloud between him and Newcastle airport obscuring other traffic. He did not realise that he had encroached on Newcastle's airspace until on the ground because of his lack of familiarity with operating at those altitudes and misconstruing visual cues which led him to believe that he was closer to his own airfield than was actually the case. Navigation equipment has since been fitted to the glider. He did not see the B777.

THE GLIDER CLUB CFI reports that, as a club, they have undertaken the following:

A review of their airspace, operating areas and Letter of Agreement [with Newcastle ATC].

Installed navigation equipment in club aircraft and recommended private owners to do the same.

Issued guidance for standardised R/T when speaking to Newcastle.

Taken up the offer of a visit to Newcastle ATC to see the club's operation from their point of view.

Additionally, he will fly with the Pirat pilot to review airspace boundaries from the air before he flies solo again.

Factual Background

The Newcastle weather was:

METAR EGNT 231250Z 21008KT 170V260 9999 FEW028 16/11 Q1010=

Analysis and Investigation

CAA ATSI

CAA ATSI had access to Newcastle RTF and area radar recordings together with written reports from the pilots of both aircraft, the Aerodrome and Radar Controllers and the ATSU unit investigation report.

The Airprox occurred 11nm south of Newcastle Airport within Class D airspace of Airway P18 between a B777 and a Pirat Glider. The B777 was an IFR departure from Newcastle in receipt of a Radar Control Service from Newcastle Radar on frequency 124.375MHz. The glider pilot was operating VFR from Currock Hill Gliding Site which lies partly within the Newcastle CTR/CTA and had been cleared to operate not above FL100 within Class D airspace. The glider pilot indicated that he was not in receipt of an ATIS. However, the glider pilot was in communication with Newcastle Radar within Class D airspace and effectively in receipt of a Radar Control Service.

Currock Hill Gliding site was active and the following agreement was in operation:²

A Letter of Agreement (LOA), which details the procedures agreed between Newcastle International Airport and the Northumbria Gliding Club (Currock Hill Gliding Site), has been approved by the Civil Aviation Authority Safety Regulation Group and DAP:

The Northumbria Gliding Club operates from Currock Hill Gliding Site, approximately 8nm south west of Newcastle Airport and has an elevation of 800 ft amsl. The gliding activity takes place within the Newcastle CTR, CTA and Airway P18 which is Class D airspace. Both club and privately owned gliders operate from the site, along with at least one tug aircraft and occasional visiting gliders. With Runway 25 in use:

Area 1 Circuit - Maximum altitude 3000' amsl
 Area 1 - Maximum altitude 5000' amsl
 All Areas - Maximum altitude 5000' amsl.

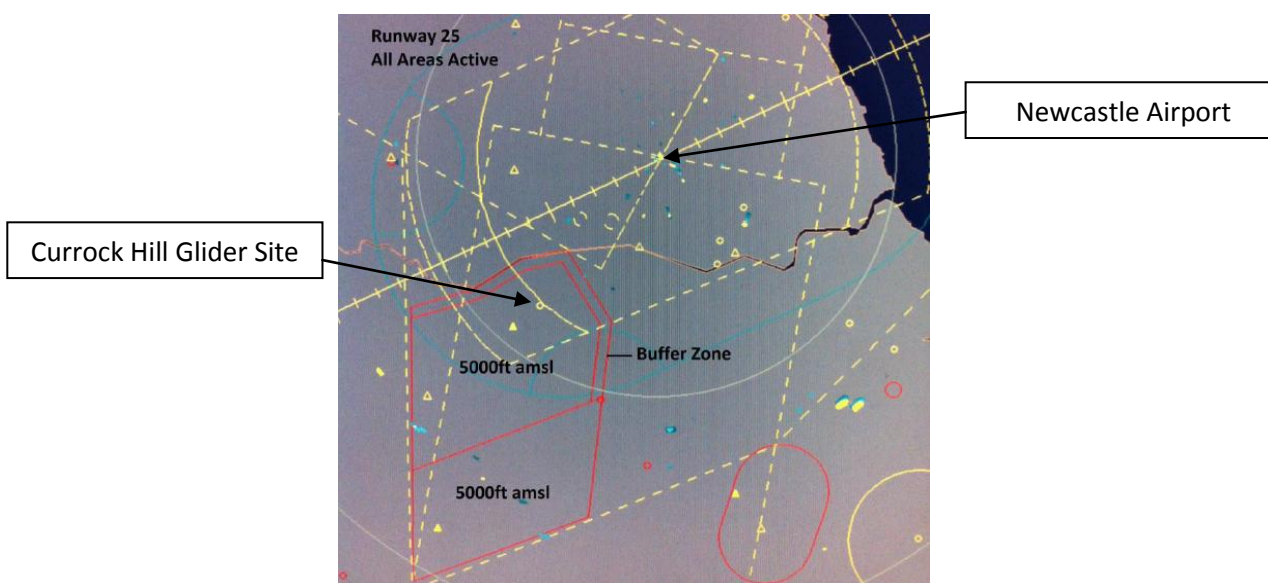


Figure 1 – Position of Currock Hill Gliding Site.

The procedures contained within the Currock Hill LOA of agreement enhance the flight safety between flights operating to and from Newcastle International Airport while providing Northumbria Gliding Club an acceptable degree of freedom of operation to the west and south of the Currock Hill Gliding Site.³ However, the Newcastle ATSU indicated that there is no formal agreement to laterally restrict glider pilots who wish to operate above the current agreed levels (5000ft) for Currock Hill.

² Newcastle MATS Part 2, Paragraphs 1.1.1, 1.1.2 & 4.1

³ Newcastle MATS Part 2. Paragraph 1.2.4

The Airprox occurred within Class D airspace of Airway P18 (which extends from FL55-FL125). Below FL55 is Newcastle CTA-5 (which has a base of 3000ft) and above FL125 is the Class A airspace of Airway P18 (which extends from FL125 to FL195). When Currock Hill is active, the outbound noise preferential routing for runway 25 is:⁴

Climb straight ahead to 1.5 (DME 1nm I-NWC), turn left heading 180°, climb 6000ft amsl.

At 1210:42 the glider pilot contacted Newcastle Radar and the following RTF exchange occurred:

Glider "Newcastle Radar (Glider C/S) airborne from Currock Hill".
 Radar "(Glider C/S) pass your message".
 Glider "Er I'm just above the site at Currock Hill at four thousand two hundred request er clearance to climb in the Class D please up to er ten thousand perhaps".
 Radar "(Glider C/S) roger er not above er a-flight level one hundred er you are cleared to er climb and advise if you need to go above".
 Glider "Thank you very much not above flight level one hundred".

At 1230:00 Radar Controller (1) handed over the radar position. The on-coming Controller(2)'s written report indicated being advised about two gliders operating from Currock Hill, one to the west of Currock Hill and, the second operating up to FL100 over the site.

Radar Controller(2) reported observing a faint primary contact south of Newcastle and to the east of Currock Hill. This contact was very slow moving and given the wind direction, he considered this might be due to 'anaprop'. At approximately 1245:00 the radar position was being handed over as part of the watch change-over and the on-coming Controller(3) was made aware of the intermittent contact which due to the faint and slow nature of the return, the off-going Controller(2) believed was a false return. Both controllers agreed that a pending departure (not involved in the Airprox) should be vectored around the unknown contact. Controller(3) then took over the position and at 1245:28 the unknown contact was shown within the Newcastle CTR. (Figure 2.)

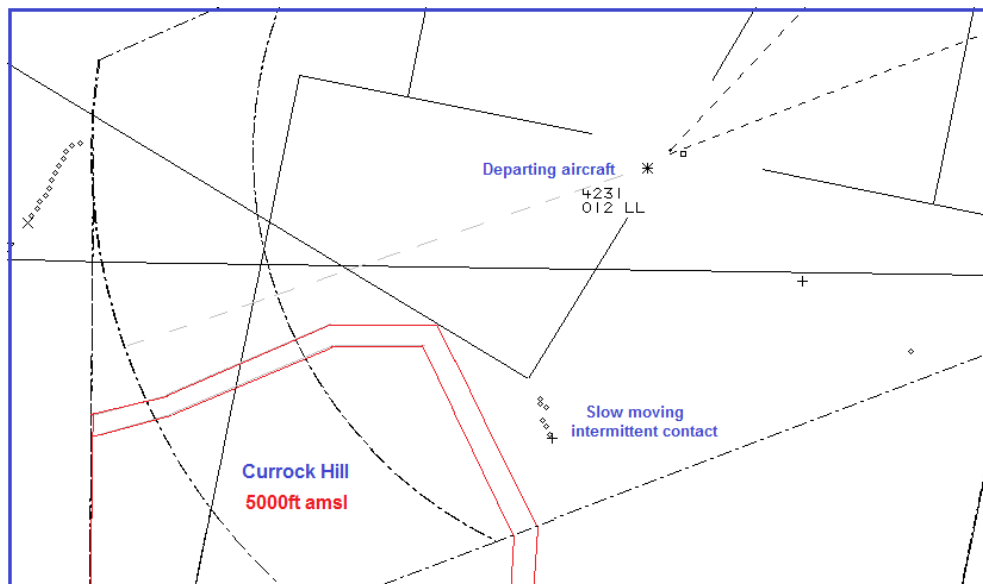


Figure 2 – Swanwick MRT at 1245:28.

At 1249:17 the B777 departed and, at 1249:29, the area radar recording showed the B777 passing FL014 (converts to 1319ft on Newcastle QNH 1010hPa with 1hPa equal to 27ft). Meanwhile the glider faded from the radar recording. (Figure 3.)

⁴ Newcastle MTS Part 2, Paragraph 4.1

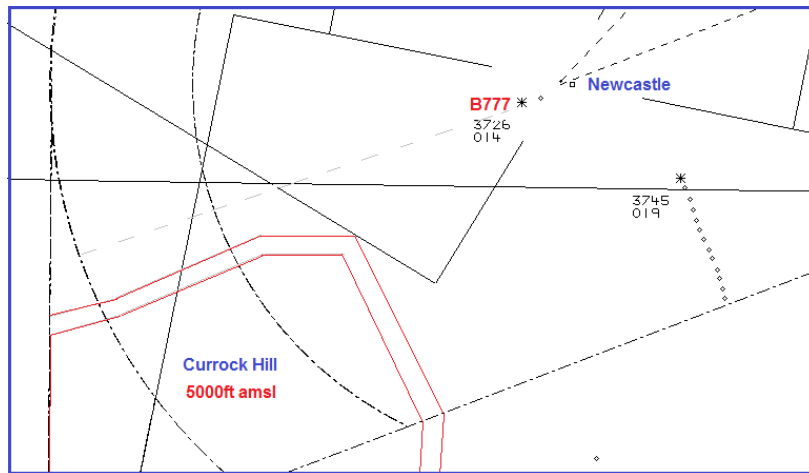


Figure 3 – Swanwick MRT at 1249:17

As the B777 pilot commenced a left turn, the Aerodrome Controller became focussed on a number of issues in the ATZ and on the ground, and this resulted in a delay to the transfer of the B777 pilot to radar. At 1250:10 the unknown contact (the glider) re-appeared on radar outside the CTR tracking southeast and, at 1250:40, the Aerodrome Controller transferred the B777 pilot to radar. The B777 was tracking south with the glider showing in the B777 pilot's 12 o'clock at a range of 5.3nm. (Figure 4.)

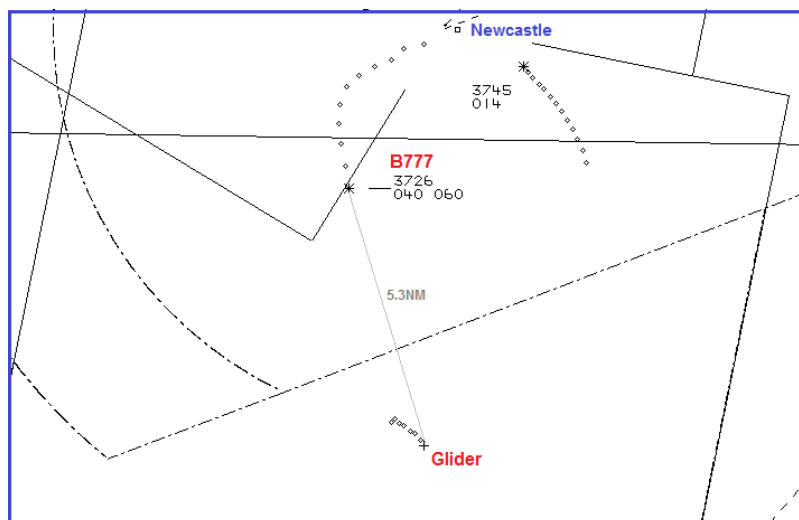


Figure 4 – Swanwick MRT at 1250:40.

Controller(3)'s written report indicated that he observed the unknown contact departing the Newcastle CTA to the south. There was no SSR label showing but the movement of the primary contact was sufficient enough for Controller(3) to immediately issue avoiding action to the B777 pilot on his first call. At 1250:55 the B777 pilot contacted Newcastle Radar and the following RTF exchange occurred:

- B777 *"Newcastle Radar good afternoon (B777 C/S) just passing altitude four thousand four hundred climbing six thousand and radar heading one eight zero degrees".*
- Radar *"(B777 C/S) good afternoon to you and avoiding action turn left immediately heading zero nine zero degrees there is traffic south of you with no height or type by er four miles".*
- B777 *"Roger turning now east (B777 C/S)".*
- Radar *"(B777 C/S) climb flight level one five zero in the turn"*
- B777 *"Climb flight level one five zero (B777 C/S)".*
- Radar *[1251:30] "(B777 C/S) in the turn the previously mentioned traffic south of you by a range of er two miles no height or type"*
- B777 *"(B777 C/S)".*

At 1251:44 the B777 pilot had commenced the left turn and was passing FL064 (6319ft). The distance between the two aircraft was 1.8nm. (Figure 5.)

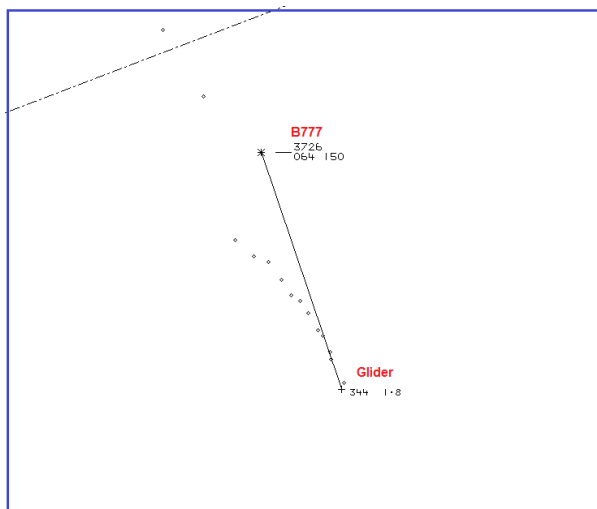


Figure 5 – Swanwick MRT at 1251:44

The glider pilot transmitted:

- Glider *“Er Newcastle Radar (Glider C/S) I’m two and a half miles southeast of Consett at seven thousand eight hundred on Currock’s QFE”*
 Radar *“(Glider C/S) Roger”*
 Radar *“(B777 C/S) you’re now clearing that traffic...”*

CPA occurred at 1251:59 when the distance between the two aircraft was 1.4nm. The B777 was passing FL072 (7119ft). The glider pilot had reported at 7800ft on Currock QFE which equates to an altitude of 8600ft (Currock Hill is 800ft amsl). The B777 was estimated to have been 1418ft below the glider. (Figure 6.)

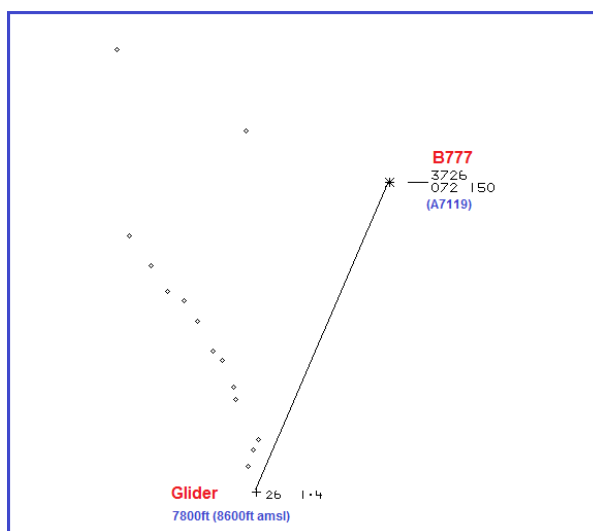


Figure 6 – Swanwick MRT at 1251:59.

The two pilots then continued without further incident.

In discussion, Controller(3) indicated that it had been a busy day. During the handover he had been advised of a glider operating from Currock Hill up to FL100 and that, prior to taking over the position, he had observed an intermittent contact manoeuvring in the Currock Hill area. Controller (3) had also been concerned about the unknown contact routeing south within the CTR, and

which he regarded as a rogue aircraft. This had departed the CTR and might well have been operating below the base of CTA-5 (3000ft). However, Controller(3) indicated that he was sufficiently concerned about the unknown aircraft that as soon as the B777 pilot called he decided to give avoiding action in order to avoid the contact. The late handover of the B777 pilot from Aerodrome Control had resulted in the avoiding action being given later than anticipated.

As a result of this investigation the ATSU have recommended:

The LOA with Currock Hill be reviewed to take into account flight outside the vertical dimensions of the area.

Review the point when departures are transferred from Tower to Radar – Current best practice is 2000ft.

Remind all ATCOs about priorities and developing defensive controlling techniques.

The glider pilot's written report indicated that it had been his intention to remain within the lateral limits of Currock Hill and that he accidentally strayed outside these limits. Controller(1) had an expectation that the glider pilot intended to remain within the lateral bounds of Currock Hill. However, in response to the request from the glider pilot, Controller(1) cleared him to climb not above FL100 within Class D airspace, without specifying any lateral limit of operation. This in effect gave approval for the glider pilot's flight in Class D airspace, albeit that the outcome was not planned or intended.

Both Controller(2) and Controller(3) were concerned enough about the unknown contact operating within the CTR that they both agreed to ensure that an outbound was vectored clear⁵.

If radar derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure: IFR flights shall be given avoiding action and traffic information shall be passed.

They initially believed the faint intermittent contact to the east of Currock Hill was a spurious return (interference) and had not considered that it might be the glider which they had been advised was operating overhead the Gliding Site. The unknown contact became more prominent as it departed the CTR and Controller (3) regarded it as a rogue aircraft with unknown intentions.

The delay in the transfer of the B777 pilot from the Tower resulted in the B777 being well established on the southerly track and passing 4400ft before the pilot made the first call to Radar. Controller(3) elected to give immediate avoiding action to the B777 pilot in order to avoid the unknown rogue aircraft.

ATSI recommended that:

The CAA SARG Principal Inspector (Stirling RO) in consultation with Newcastle ATSU ensure that the ATSU undertake a review of their procedures in order to provide guidance and establish the conditions for approving a glider's request to operate within Class D controlled airspace outside the vertical and lateral limits of Currock Hill.

UKAB Secretariat

Notwithstanding that the pilots were in receipt of an ATC clearance, they shared an equal responsibility to avoid colliding with the other aircraft⁶. It was considered that the B777 was effectively overtaking the glider and so the glider pilot had the right of way⁷.

⁵ MATS Part 1, Section 1, Chapter 6, Table 5

⁶ Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

⁷ Ibid., Rule 11 (Overtaking).

Comments

BGA

An unfortunate incident which has resulted in prompt and thorough action by the local gliding club.

Summary

The Airprox occurred within Class D airspace of Airway P18. The glider pilot was given a clearance by Newcastle Radar to operate not above FL100 within Class D CAS; however, no lateral limits were specified in the clearance. The glider pilot reported that it was not his intention to route outside the lateral limits of Currock Hill Gliding Site but, due to the strong upper wind in comparison to his low airspeed, he accidentally entered airspace in which he did not intend to operate. Nevertheless he did comply with his ATC clearance to operate not above FL100 within Class D airspace. He did not sight the B777. The Radar controller issued an avoiding action turn to the B777 pilot, albeit later than intended due to a late handover from Aerodrome Control. The B777 pilot did not see the glider. The B777 pilot did not receive a TCAS alert because the glider was not carrying a transponder. The two aircraft were 1.4nm apart at the CPA. At the time the glider pilot reported at 7800ft on Currock QFE; the B777 was at FL72. It is estimated, therefore, that the B777 was 1418ft below the glider at CPA.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from both pilots, two of the controllers concerned, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board first discussed the actions of Newcastle ATC and noted that, in the period leading up to the Airprox, there had been two handovers of the Radar position. Controller (1) had been in position when the glider pilot had been given clearance to climb to FL100 within Class D airspace and it was apparent to the Board that the controller had believed that the glider pilot would be operating within the geographical limits of the gliding area as specified in the LoA between Newcastle ATC and the Gliding Club. However, the Board observed that, in fact, the LoA contained no lateral restriction on flights above 5000ft, and opined that the controller could have issued a restriction for the pilot to remain overhead the Gliding Site when clearing him to climb to FL100. Notwithstanding the glider pilot's subsequent navigational ambiguity, this would have then formally ensured that the glider would have remained clear of the standard southern departure route from Newcastle. Acting in the mistaken belief that the glider pilot was operating over the Gliding Site, this information was handed over to Controller (2) who subsequently also handed it over to Controller (3).

The Board then considered the actions of the glider pilot. The civil pilot gliding member explained that the glider involved was of an old design and the pilot would have been navigating visually as it did not carry any navigational equipment. He added that the pilot was relatively inexperienced and, although intending to operate over the Gliding Site in observance of the LoA limits, he had unintentionally left that area. The Board agreed that, although he had effectively been allowed to do so by virtue of no lateral restriction placed on his flight above 5000ft, this had resulted in him entering into airspace where the B777 would be routeing, without the knowledge of ATC. The gliding member also stated that the Gliding Club and Newcastle ATC had a good understanding of each other's operations. The Club CFI had immediately liaised with the ATSU to determine any action that could be taken to try to prevent a similar situation arising in future, and both parties had not considered it necessary to change the LoA; instead, the CFI took action to inform local gliding members to remain within the geographical area of the Gliding Site even if they were cleared to climb above 5000ft. Furthermore, to assist the pilots in this endeavour, he had installed navigational equipment in the Club's gliders and had recommended that private owners fitted similar equipment. The Board commended his prompt actions.

The Board also commended the actions of Controller (3). He had observed an intermittent return on his radar display that he thought might be from an unknown aircraft within Newcastle's Class D airspace. On first contact from the B777 pilot he had correspondingly issued an avoiding-action turn.

He had no means of establishing the unknown aircraft's level from the radar display and, consequently, he did not know how close the aircraft were apart vertically.

In the end, the Board agreed that the cause of the Airprox was that the Newcastle Radar Controller had been concerned by the proximity of a primary contact to the B777. In turning its attention to the risk, the Board noted that the avoiding action turn issued by the controller had prevented any risk of a collision and the two aircraft passed 1.4nm apart. Additionally, the Board noted that further investigation had estimated that there had been 1418ft vertical separation between the B777 and the glider. Consequently, because effective and timely action had been taken to prevent the aircraft colliding, the Airprox was assessed as risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

<u>Cause:</u>	The Newcastle Radar Controller was concerned by the proximity of a primary contact to the B777.
<u>Degree of Risk:</u>	C.
<u>ERC Score</u> ⁸ :	102.

⁸ Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.