AIRPROX REPORT No 2011072

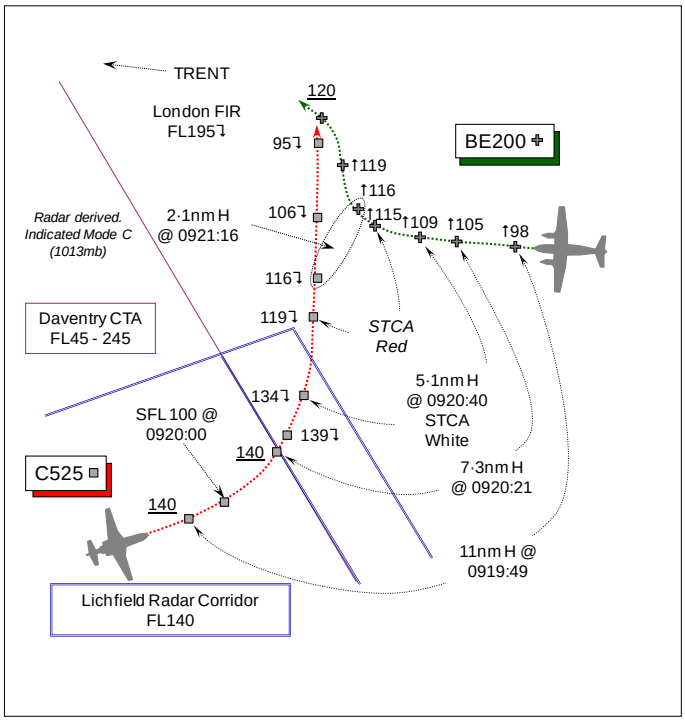
Date/Time: 8 Jul 2011 0921Z

Position: 5259N 00104W (8nm E of ROBIN)

Airspace: London FIR (*Class:* G)

Reporter: SAC (Prestwick) SE RADAR

	1st Ac	*2nd Ac*
Type:	BE200 King Air	Cessna C525
Operator:	HQ Air (Trg)	Civ Exec
Alt/FL:	↑FL120	↓FL140
Weather:	VMC NR	VMC NR
Visibility:	NR	30nm
Reported Separation:	1000ft V/½nm H	4nm H
Recorded Separation:	Nil V @ 2·1nm H 0·3nm Min H @ 2900ft V	



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SAC (PRESTWICK) SE RADAR CONTROLLER (SE RAD) reports LJAO requested use of the Lichfield Radar Corridor (LRC) for a C525 eastbound at FL140, which was granted. The C525 was close to exiting the LRC when the BE200 King Air crew free-called on the Sector frequency requesting an airways join at TRENT at FL120. The CAS joining clearance was issued and the flight offered a TS, which the pilot accepted. As the C525 left the LRC he noticed it turn N toward the BE200 with FL100 displayed on Mode S as the crew's selected flight level (SFL). He passed TI to the BE200 crew and observed the C525 commence a descent. Updated TI was passed to the BE200 crew before upgrading the radar service to a DS as he believed that there was a real risk of collision between the 2 ac without avoiding action being proffered. The pilot accepted his avoiding action instruction and vertical separation was restored shortly afterwards, although deconfliction minima were not achieved. However, he felt that it was his responsibility to provide avoiding action otherwise he believes that only providence would have prevented the ac from missing each other.

THE SAC (PRESTWICK) SE PLANNER (SE PLAN) reports the C525 had been cleared through the LRC eastbound at FL140 when the BE200 crew checked in on frequency to join CAS E of TRENT at FL120. The C525 was observed leaving the LRC and turning northbound, pointing at the BE200, both ac outside CAS. The C525's Mode S SFL displayed FL100, which put it in confliction with the BE200 15nm away. At this point SE RAD passed TI. He called LJAO CENTRAL TACTICAL (CEN TAC) but there was no reply for 5-6 seconds. At the same time an incoming call was received from an outside line. Thinking that the call might be from the controller working the C525, the call to LJAO CEN TAC was ended and the incoming call answered, which turned out to be another LJAO controller asking for a joining clearance on a different ac, who was told to call back later. A call was made again to LJAO CENTRAL using the 'Priority' function. When the landline call was answered the ac were about 5nm apart with STCA flashing white and the C525 already at a similar level to the BE200. The LJAO controller stated that the pilot of the C525 had visual contact with the BE200 and was descending through its level. SE RAD upgraded the BE200's ATS to a DS and avoiding action was given with a R turn. STCA flashed red; he believed the separation was 2nm and 100ft at the closest point. The confliction was resolved when the C525 descended to FL80 clear of the BE200.

THE BE200 KING AIR PILOT, a QFI, reports he had departed from Cranwell under IFR on an instructional sortie to join CAS on track TRENT, calling Scottish CONTROL on 134·425MHz to obtain his airways joining clearance. After gaining his CAS clearance, he thought flying level at his assigned joining level of FL120 [but actually still climbing] in VMC approaching a position 25nm E of TRENT heading 275° at 240kt, Scottish advised him that there was another ac descending out of the LRC – the C525 - that was potentially on a collision course. Shortly thereafter, the Scottish controller advised that the C525 was still on a conflicting course descending to FL100. The controller then upgraded the TS to a DS and issued an avoiding action R turn instruction onto 360° to avoid the other ac, which was first displayed on TCAS bearing 240° at a range of 5nm, 2000ft above their level. As he started the turn in compliance with avoiding action instructions TCAS enunciated a TA. The C525 was not in sight, but his TCAS now indicated that the other ac was in their 7 o'clock about half a mile away and 1000ft above his level but still descending. This was the only TCAS warning he received. Once clear of the traffic the controller turned him back towards TRENT and advised that the C525 crew had reported being visual with his BE200 and elected to continue their descent remaining clear. The Scottish controller asked if he wished to file an Airprox, but he declined on the basis that the C525 crew was visual with his BE200 and had avoided visually. Moreover, he had only received a TCAS TA and no RA was enunciated. The Scottish controller stated on the RT that he would not file as he had been content but subsequently, he heard that the controller had reported an Airprox. He assessed the Risk as 'low'. The assigned squawk was selected with Modes C & S on; the HISLs were on.

He opined that this is the third occurrence of this nature that has happened to him in the last few years whilst en-route from Cranwell to join CAS at TRENT. The main factor, in his opinion, was that traffic exiting the LRC had been given a clearance to descend despite there being conflicting traffic, inbound to join CAS flying steady and level beneath. If the ac leaving CAS was held above the joining traffic until the conflict was past then these situations would not occur.

THE CESSNA CITATION 525 PILOT (C525) reports he was in transit from Guernsey to Doncaster and had routed through the LRC under a RCS from London MILITARY on 128·70MHz. A squawk of A6402 was selected with Mode C; enhanced Mode S and TCAS is fitted.

Exiting CAS at the eastern end of the LRC he was 'cleared' by the controller direct to Doncaster and 'cleared' to descend from FL140 to FL100. Near the NE corner of the LRC turning L through 080° to 350° at 320kt he became aware of traffic 15nm away, initially from his TCAS before he saw it visually. As there was no chance of losing visual contact on the low-wing twin – the BE200 – he increased his rate of descent to pass with the best possible margin - he estimated with 4nm horizontal separation. No TAs were enunciated by TCAS. Had he not been visual, he would have stopped descent at FL130 to let the other aircraft pass. As there was no risk of collision he did not bother the London MILITARY controller with the details.

THE LJAO CENTRAL SECTOR TACTICAL CONTROLLER (CEN TAC) reports that the C525 was transiting the LRC at FL140 inbound to Doncaster. It was deemed unnecessary to allocate the track to LJAO NE and it was prenoted direct with Doncaster for a visual recovery. When asked, the C525 pilot advised that he would require a TS on leaving CAS and requested descent. The flight was descended initially to FL100, 2nm before the end of the LRC and a TS applied thereafter. The C525 crew then asked for a direct track to Doncaster, which was approved. Subsequently, she called traffic at a range of 5nm crossing R - L indicating FL108. The conflicting traffic – the BE200 - indicated that it had a Mode S SFL of FL120. The C525 pilot initially asked for updates on the traffic but then called visual with the climbing BE200 as soon as TI had been passed. Reaffirming that he was visual with the traffic the C525 pilot requested further descent and as the C525's Mode C was indicating below the climbing traffic she issued further descent to FL80. Instructing the C525 pilot to select the allocated Doncaster squawk the flight was told to switch to Doncaster ATC.

BM SAFETY MANAGEMENT reports that this Airprox occurred between the C525 operating VFR in VMC in receipt of a TS from the LJAO CEN TAC controller and the BE200 operating IFR in VMC in receipt of an ATS from SAC (Prestwick) SE RAD.

The BE200 departed Cranwell to join CAS on-track TRENT at FL120. At 0919:24, the BE200 crew selected their assigned GAT SSR code, also displaying Mode S information. The ac's Mode C indicated FL92 climbing; Mode S displayed a SFL of FL120.

[UKAB Note (1): At 0917:17, the C525 crew advised, *"And er we can take own navigation to the centre fix* [at Doncaster] *when you er can permit us",* to which CEN TAC responded, *"roger standby".* With 3½nm to run to the boundary of Class A CAS (the promulgated LRC boundary is not co-incident with the eastern edge of the Daventry CTA and extends 2nm into Class G), at 0919:44, the C525 crew was instructed by CEN TAC to, *"..descend flight level 1 hundred"*, which was read-back by the C525 crew. At this point, the BE200 was 11.8nm NE of the C525 climbing through FL97. Moments later at 0919:54 the C525 crew advised, *"..just in the left turn now for senny????"* [probably for Doncaster], to which CEN TAC replied 4sec later at 0919:58, "[C525 C/S] *roger and clear of controlled airspace Traffic Service",* which was acknowledged. The C525 did not exit Class A CAS until 0920:21.]

At the point that CEN TAC gave tacit approval for the L turn, the BE200 was climbing through FL99, 10.3nm NE of the C525, maintaining FL140. The C525's Mode S SFL indicated a change to FL100 at 0920:00. CEN TAC passed accurate TI to the C525 crew on the BE200 at 0920:41, stating, "*traffic 12 o'clock 5 miles crossing right to left..indicating flight level 1-0-8 climbing*." The C525 pilot replied on RT that they were visual with the BE200 just after 0920:48 adding in his written report that 'in the turn to the north, I became aware of the traffic initially on TCAS, then visually'. Whilst descending through FL129 at 0920:54, the C525 pilot requested further descent, which was granted to FL80 and acknowledged by the C525 pilot, who re-iterated that they were visual with the BE200.

Co-incident with the activation of a high severity red alert by STCA at 0921:06, the turn taken by the BE200 crew in response to the deconfliction advice from SAC SE RAD is evident on the radar recording.

Cap 774 Ch 3 Para 6 states:

> 'Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller. If after receiving traffic information, a pilot requires deconfliction advice, an upgrade to Deconfliction Service shall be requested.'

After discussing the incident with the BE200 pilot the LJAO SUPERVISOR reports that the pilot stated that they were VMC but that the turn issued by SE RAD put them in a *'belly-up profile*' to the C525 '*significantly reducing their ability to see it*.'

At the point when the instruction to descend to FL100 was passed by CEN TAC to the C525 crew, the BE200 and C525 were on diverging flight paths. However, the L turn towards Doncaster introduced the confliction between the BE200 and C525. Based upon LJAO's investigation, CEN TAC either did not assimilate the C525's course to Doncaster or did not appreciate where the ac would route in relation to the BE200. That said, CEN TAC passed accurate and timely TI to the C525 crew who reported visual with the BE200. Moreover, it is clear from the C525 pilot's report that they were visual with the BE200 early enough for them to discharge their collision avoidance responsibilities. Whilst the decision by CEN TAC to permit the C525 to route own navigation was arguably not 'good practice', it was not a causal factor in this Airprox.

Based upon extrapolation of the respective ac's tracks before SE RAD issued the BE200's avoiding action turn and without the potential intervention of TCAS, the CPA would have been at 0921:34, with horizontal separation of about 0·1nm and vertical separation of 1100ft existing. The C525 pilot states

that they increased their ROD to 'pass with the best possible margin,' the extrapolation suggests that, the addition of horizontal deconfliction by the C525 pilot might have been appropriate.

We would conclude that this Airprox occurred as a result of the difference in perception between SE RAD, who believed that a collision risk was evident; whereas the C525 pilot believed that he had provided adequate separation against the BE200.

ATSI reports that at 0904, LJAO Central contacted the SAC SE Sector (SE PLAN) to request co-ordination for the C525 (squawking A6402) to cross the LRC eastbound at FL140. Co-ordination was agreed at FL140. At the time, the C525 was passing W of Gloucester, heading N at FL190.

The SAC MATS Part 2, Page SEa-43 describes the LRC:

> 'The Lichfield Radar Corridor is 12nm wide and the centreline based on the Coningsby (CGY) TACAN 252 radial. The primary crossing level is FL140 with FL150 reserved as an alternate/additional tactical level. The corridor is established to permit LJAO controllers to vector aircraft through the Daventry CTA in the vicinity of PEDIG. LJAO is the only military unit authorised to use the Radar Corridor'.

The BE200 crew established communication with SE RAD at 0918:27. At the time, the C525 was within the LRC at FL140, passing N of East Midlands Airport, 22nm WSW of the BE200. The pilot of the BE200 was instructed to squawk A6020, *"when you're finished with your previous agency"* and reported climbing to FL120 requesting to join airways at TRENT. The controller replied, *"you are clear to join controlled airspace on direct track for TRENT maintaining Flight Level 1-2-0 and you can expect a Traffic Service...".* The pilot read back the level and ATS correctly. When the BE200 was passed TI shortly afterwards (not concerning the C525), the pilot confirmed he was good VMC.

At 0920, as the C525 was approaching the eastern edge of the LRC, SE RAD passed TI about it to the BE200, *"there's also military traffic currently in your 10 o'clock range 10 miles left to right its 2 thousand feet above you're cleared level".* As soon as the pilot acknowledged the information, the controller responded, *"that traffic now showing descending down to Flight Level 1 Hundred it's fast moving 10 o'clock range 8 miles left to right it looks like you're on a constant bearing".* The radar recording shows the C525 still maintaining FL140 but its Mode S SFL was indicating FL100. At 0920:37, the controller transmitted to the BE200, *"Yeah* [C/S] *to avoid that traffic now I suggest you take avoiding action turn..right onto a radar heading of..3-3-0 degrees".* The pilot responded, *"Right 3-3".* The radar photograph shows that both ac are in Class G airspace. The BE200 is tracking W, passing FL107. The C525 is 6nm SW of the BE200, passing FL138 and turning L towards the N and the BE200. This TI was updated at 0920:49, *"Yeah* [C/S] *traffic 9 o'clock range 5 miles left to right still indicating drif- descending down to Flight Level 1 Hundred".* The pilot reported in the turn.

During this period, SE PLAN, realising the developing situation, telephoned LJAO CENTRAL to establish their intentions with the C525. Whilst waiting for CENTRAL to answer this call, the outside line rang. Thinking this might be from LJAO CENTRAL, he answered the incoming call. However, as this was from another LJAO position, the call was ended. SE PLAN then telephoned LJAO CENTRAL using the Priority function. By the time he was able to discuss the situation with the appropriate LJAO controller, the subject ac were about 5nm apart. It was established that the C525 was visual with the BE200.

Realising that the subject ac were still closing in confliction and not yet being aware that the C525 was visual with his traffic, SE RAD decided to change the type of ATS provided to the BE200 crew. The following transmission was made at 0920:59, "[BE200 C/S] *just upgraded to a..deconfliction service I'm not going to be able to completely deconflict you but climb now if you can expedite your climb up to Flight Level 1-2-0 turn right onto radar heading 0-1-0 degrees with avoiding action turn".* The pilot read back the message. The radar recording, timed at 0921:00, reveals that the horizontal distance between the two ac had reduced to 3.5nm. They were on conflicting flight paths, with the C525 descending through FL126 and the BE200 climbing through FL112. The distance between the subject ac continued to decrease. The C525 remained on a northerly track whilst the BE200 made

its R turn. At a range of 2.5nm the BE200 was climbing through FL115 and the C525 descending through FL119 [STCA triggered high severity red, at 2.1nm the levels of the two ac crossed, both ac indicating FL116]. Vertical separation then increased with the C525, subsequently, passing 0.3nm behind the BE200, with vertical separation of 2900ft indicated.

Not only was the BE200 being provided with a TS by SE RAD but also it is understood LJAO CEN TAC was providing the C525 with the same service after it had left CAS. A TS is defined in MATS Part 1, Section 1, Chapter 11:

> 'A Traffic Service is a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility. The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information. Traffic is normally considered to be relevant when, in the judgement of the controller, the conflicting aircraft's observed flight profile indicates that it will pass within 3 NM and, where level information is available, 3000 ft of the aircraft in receipt of the Traffic Service. However, controllers may also use their judgement to decide on occasions when such traffic is not relevant, e.g. passing behind or within the parameters but diverging. Controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5 NM, in order to give the pilot sufficient time to meet his collision avoidance responsibilities and to allow for an update in traffic information if considered necessary. Distances displayed on ATS surveillance systems can be at variance to the actual distances between aircraft due to the limitations in accuracy of surveillance systems. Furthermore, some aircraft may not be displayed at all by ATS surveillance systems. Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller. If after receiving traffic information, a pilot requires deconfliction advice, an upgrade to Deconfliction Service shall be requested. The controller shall make all reasonable endeavours to accommodate this request as soon as practicable and provide deconfliction advice at the earliest opportunity. When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima'.

On this occasion SAC SE RAD, initially, recommended a turn to the BE200 pilot that would route it away from the C525. However, realising that the two aircraft were on quickly conflicting tracks he took positive action and changed the ATS provided to a DS, albeit that the pilot had not requested any change.

> 'A DS is a surveillance based ATS where, in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information and issues headings and/or levels aimed at achieving planned deconfliction minima, or for positioning and/or sequencing. However, the avoidance of other traffic is ultimately the pilot's responsibility. A controller shall provide traffic information, accompanied with a heading and/or level aimed at achieving a planned deconfliction minima against all observed aircraft in Class F/G airspace. The deconfliction minima against uncoordinated traffic are:
>
> • 5 NM laterally (subject to surveillance capability and CAA approval); or
> • 3000 ft vertically and, unless the SSR code indicates that the Mode C data has been verified, the surveillance returns, however presented, should not merge. (Note: Mode C can be assumed to have been verified if it is associated with a deemed validated Mode A code.)'

The SE RAD controller decided that the best way to resolve what he believed would be a very close encounter between the subject ac, was to change the ATS being provided from a TS to a DS. He then issued an avoiding action turn to the BE200, together with an expeditious climb rate. Although this did route the BE200 away from the C525 and prevented their radar returns from merging, it reduced the possibility of the BE200 crew observing the other traffic. SE RAD was unaware that the C525 crew had sighted the BE200 until after he had issued the avoiding action instructions; had he been aware beforehand, he would have continued to provide a TS.

HQ AIR (TRG) comments that whilst this was a relatively benign incident, it could have been prevented only by increased coordination between the respective ATSUs. The TI provided enabled the crews to acquire each other on TCAS and visually in order to deconflict safely in Class G airspace.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was plain that the SE RAD controller believed that he should proffer avoiding action to the BE200 when he spotted the C525 had turned L onto a new course and descended towards the BE200 joining CAS, resulting in a potential conflict outside the boundary of his Sector in Class G airspace. This was an uncommon occurrence insofar as the reporting SE RAD controller had proactively upgraded the radar service afforded the BE200 crew to a DS. Whilst some might say that this was 'overcontrol', SE RAD acted with the best of intentions and the BE200 crew had accepted it. Members stressed that they would not discourage controllers from providing avoiding action if it was the most appropriate way to resolve a close quarters situation. Members also noted that the controller prioritised sensibly by issuing the avoiding action before declaring the change of service. Moreover, in addition to his attempts to effect some horizontal separation between the ac, the controller had provided a good flow of TI which, coupled with the ac's TCAS, kept the BE200 crew closely apprised of the geometry of the situation. Whilst the point had been made that the subsequent avoiding action turn placed the BE200 crew 'belly-up' to the C525, a civilian area controller Member believed there was no scope to turn the BE200 the opposite way and that SE RAD's appreciation of the geometry of the situation had been correct. The Board commended the controller for his initiative and conscientious application of the ATS provided to the BE200 crew. However, the controller was plainly unaware at the time that after exiting Class A CAS the C525 pilot had acquired the BE200 visually at range and was taking his own VFR separation.

This Airprox illustrated the benefits of the displayed Mode S SFL, which had significantly improved SE RAD's SA. This Mode S SFL was also available to CEN TAC from the BE200's SSR and it would have been evident to the LJAO controller that the ac was climbing up to FL120, with an obvious potential for a conflict to develop when the C525 exited the LRC and descended through the BE200's level. Members considered that CEN TAC could have been more proactive and a level-off at FL130 until clear of the BE200 co-ordinated with SE PLAN, as suggested by the BE200 pilot, would have prevented this Airprox. Liaison with SAC SE Sector about the C525's descent beforehand would also have allayed SE RAD's concerns here, for it was evident from the ATSI report that if he had been aware that the C525 PIC was taking his own separation on the BE200, then SEC RAD would not have proffered the avoiding action turn and would have continued to provide a TS. However, it was not until SE PLAN called CEN TAC that this was ascertained, which led some Members to suggest that this Airprox was the result of a controller perceived conflict.

The LJAO RT transcript confirmed that CEN TAC had not approved the C525 pilot's earlier request to take up his own navigation for Doncaster under the RCS that pertained, although the BM Safety Management report had suggested the controller might not have appreciated the C525 pilot's route would take it close to the BE200 before the jet flew into close quarters. Members noted that it was after the C525 pilot's unilateral declaration that he was, *"..just in the left turn now.."* that CEN TAC

was slightly premature in placing the C525 under a TS, for the radar recording revealed that the ac had not crossed the lateral boundary of the Daventry CTA into Class G airspace. Some Board Members considered that the controller's response could be taken as tacit approval of the pilot's request to continue under his own navigation as suggested within the BM Safety Management report. However, whilst this was not good practice, the Board concluded it was not fundamental to the Cause. Following this turn, which placed the C525 directly in conflict with the BE200, CEN TAC passed accurate and timely TI to the C525 crew who almost immediately reported visual contact with the BE200. However, it was also clear that the crew did not commence their descent from FL140 until after they had exited the CTA. Having cleared CAS and with the BE200 in sight, the C525 pilot elected to descend rapidly beneath it. It was this descent to a level beneath the BE200, directly in conflict with the latter, which had been the catalyst to SE RAD's concerns and reaction. This was not meant to imply criticism of the C525 pilot and CAT pilot Members stressed that the C525 pilot was acting legitimately in taking his own visual separation against the BE200 in Class G airspace, where he afforded considerable vertical separation. This led the Board to conclude that this Airprox had resulted because the C525's flight path caused the SAC SE RAD controller concern.

Turning to the inherent Risk, it was plain that the BE200 pilot had complied with SE RAD's R turn instructions and had identified the C525 on his TCAS. Thus cognisant of the 'threat' he monitored the C525's descent as he turned, but the TA he received placed the C525 1000ft above his ac at 7 o'clock still descending. Although the two ac were only 2·1nm apart when the C525 pilot descended through the level of the climbing BE200, 2900ft of vertical separation was achieved at the closest point as the C525 crossed 0·3nm astern clear below the BE200. Moreover, the BE200 crew received good TI from SE RAD and their TCAS had not enunciated an RA. Furthermore, since the encounter occurred in Class G airspace where 'see and avoid' prevails and the C525 pilot was visual with the BE200 throughout, some Members considered that normal standards had been maintained and the Airprox should be classified as an 'E' – reportable but, following analysis, so benign as to be considered a non-event. However, other Members considered that there were sufficient unusual and non-standard factors for the event to be assessed as a 'genuine' Airprox, albeit that no risk of collision existed. A vote was required and, by the narrowest of margins, the latter view prevailed.

Post Meeting Note: During the Board's assessment of this Airprox, the promulgated dimensions and rational for the extensions of the Lichfield Radar Corridor into Class G airspace, in line with all other RCs, was discussed. After further discussion between DAP and BM Safety Management outwith the meeting, it was concluded that further review of this topic was warranted.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C525's flight path caused the SAC SE RAD controller concern.

Degree of Risk: C.