AIRPROX REPORT No 2012001

Date/Time: 4 Jan 2012 0910Z

Position: 5606N 00150W (6½nm S of NEXUS [17nm NE of ST ABBS VOR])

Airspace: Scottish FIR (*Class: G*)

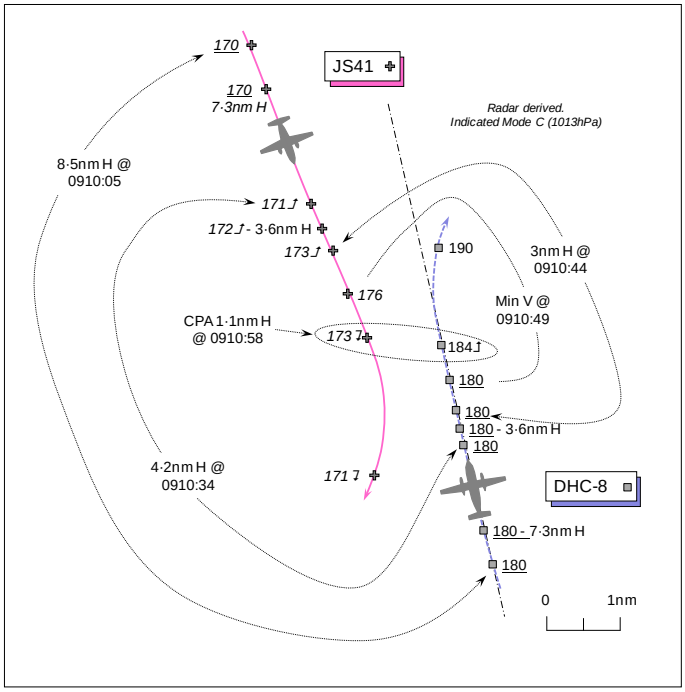
Reporter: Prestwick Centre – TAY Sector

	1st Ac	*2nd Ac*
Type:	DHC-8	JS41
Operator:	CAT	CAT
Alt/FL:	FL180 SAS	↑FL210 SAS
Weather:	VMC NK	VMC CLAC
Visibility:	'Good'	CAVOK
Reported Separation:	600ft V	1000ft V/1nm H

Recorded Separation:

1·1nm Min H @ 1100ft V

400ft Min V @ 1.9nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PRESTWICK CENTRE TAY SECTOR COMBINED TACTICAL & PLANNER CONTROLLER (TAY SC) reports that he was working with a trainee on the combined Sector, which was busy with GAT inside CAS and multiple ac in Class G airspace between NATEB and Aberdeen. PAPA18 had just closed for the morning, so they pre-noted Scottish MILITARY about the 3ac southbound from Aberdeen and kept the single northbound DHC-8 inbound to Aberdeen. The southbound JS41 was co-ordinated not above FL170 against the northbound DHC-8 not below FL180. At 0910, when the two ac were head-on to each other, the DHC-8 crew reported a TCAS RA and climbed. STCA was triggered and an avoiding action turn onto a heading of E was immediately given to the DHC-8 crew to avoid the JS41. As there was further traffic affecting the DHC-8 when it began to climb, when 'clear of conflict' was reported the DHC-8 crew was told to maintain FL190. Horizontal separation was eroded to 3nm and vertical separation reduced to 700ft.

UKAB Note (1): PAPA18 is a Class D Category 1 Conditional Lower ATS route (CDR) active between 0530 and 0900 UTC, which then reverts to Class G outwith notified hours.

THE DHC-8 300 PILOT-IN-COMMAND reports she was the PF under a RCS, she thought, from Scottish CONTROL [actually a DS], IFR, in a level cruise at FL180, whilst inbound to Aberdeen from Leeds/Bradford. Approaching a point about 22nm NE of ST ABBS VOR, heading 355° at 210kt, they were advised of traffic they might see 1000ft below them. Flying out of the sun, the crew were visual with the other ac – a JS41 –some 1000ft below their ac, but then their TCAS display indicated the JS41 was climbing. A TA was enunciated by TCAS - TRAFFIC TRAFFIC - and with the JS41 about 600ft below them a CLIMB RA was demanded, which was complied with after disconnecting the AP. The PNF advised ATC of the TCAS RA, who then issued a new heading of 090° and told them to maintain a new level of FL190. When the CLEAR OF CONFLICT was enunciated by TCAS they advised ATC and resumed their course to Aberdeen. Minimum vertical separation was about 600ft below them and the Risk assessed as 'medium'.

THE BAe JS41 PILOT-IN-COMMAND reports that he was in transit from Aberdeen to Humberside under IFR and in receipt of a DS from Scottish MILITARY in VMC, some 5000ft above cloud, with unlimited visibility and the sun on the beam. Heading 165° at 290kt at about 85nm S of Aberdeen, he instructed his 1st Officer to request a climb from FL170 to FL210 to make better use of the tailwind at higher level. This was done and they were cleared by Scottish MILITARY to climb to FL210, with opposite traffic ahead co-ordinated. Commencing the climb they received a TCAS TA on traffic at 11 o'clock, which he and his 1st Officer started to look for. On sighting the other ac they then received a TCAS DESCEND RA demanding a descent at 500ft/min, which they complied with. The other ac – the DHC-8 - was sighted during the TCAS TA and they were visual with it throughout the descent with very little chance of collision. He assessed the Risk as 'low'.

THE ScATCC (MIL) PRIMARY TACTICAL NORTH (TAC N) CONTROLLER [ScATCC (Mil)] reports that she was controlling her first controlling session following the Christmas break. She took a pre-note from TAY Sector on 2 south bound CAT ac, the JS41 routeing to Humberside and another in transit to Norwich. At the same time she co-ordinated with the TAY controller against one of their ac that was routeing northbound - the DHC-8 - that would be maintaining FL180 against the JS41 not above FL170 and another company ac not below FL190. Both flights called on frequency and were identified. As the JS41 and DHC-8 approached each other she passed TI on the co-ordinated DHC-8 to the JS41 crew; this was the only ac under her control that would now affect it. The JS41 crew was then given own navigation towards OTR. As the JS41 turned she realised the new track would take the ac too close to the D323 complex, which was active, so the crew was placed under their own navigation towards UMBEL. The JS41 crew then requested a climb to FL210 and so she instructed them to climb to FL210 before correcting this to a climb to FL215, the correct quadrantal. Realising immediately that this instruction would breach the co-ordination agreement, she instructed the JS41 crew to stop climb and then issued an avoiding action turn onto 270° to try and get lateral separation. The SUPERVISOR was immediately informed of the incident.

THE ScATCC (Mil) SUPERVISOR (SUP) reports that during the period of the Airprox the Unit was operating at close to capacity because two controllers had called in sick and one other was on an approved absence. Whilst capacity was momentarily reached, it was never exceeded and traffic did not have to be refused. They were aware that the USAF had requested the activation of the Vale of York Spider towline from 0830Z-1030Z for up to 16 F15s, and had been monitoring the tanker's location in ARA8 and a number of F15s that were general-handling in TRA3. Once it became clear that the tanker intended to route into the Vale of York to establish the Spider towline, and that a number of F15s would follow, the Northern ICFs were removed from the Southern Primary Planner (PLN) (who was bandboxing N and S) and the Northern PRI-TAC position was opened. A TAC controller and PLN had also been established on Console 2, which was to become the tanker console. In all, this meant 3 consoles were open (PRI TAC and PLN S, Console 2 TAC and PLN, and TAC N). As per the Local Order Book, capacity would be up to 5 ac working console 2, and up to 2 being able to be worked by the PRI-TAC S (more at the SUP's discretion). TAC N had no traffic before the prenotes from TAY at about 0905L for the two southbound CAT ac; these tracks would be within the capacity guidelines laid out in the LOB.

He did not witness the incident as he was dealing with the details of a Spider Towline - as stated, this had required the opening of Console 2 TAC and PLN to augment the controllers already in position. As PRI-PLN S was busy taking prenotes and Console 2 was already working 4 speaking units with more to come, his attention was taken away from the Northern AOR. He deemed the subject TAC N controller sufficiently experienced not to require close attention or monitoring but he was not aware that she had taken two ac from TAY Sector following the routine closure of P18 at 0900L. The first he knew of the incident was when the PRI-TAC N informed him that she had just broken co-ordination with TAY. After receiving a quick brief from her the controller, she was relieved from the console, he spoke to the SAC Local Area Supervisor and reviewed the radar replays and frequency recordings with the Civil Watch Supervisor, whereupon he was informed that the civil controller intended to classify the incident as an Airprox.

NATS EN-ROUTE LTD - PRESTWICK CENTRE reports that this report was written with the full co-operation of ScATCC (Mil) as part of a drive towards joint investigations. ScATCC (Mil) and Prestwick Centre have fully consulted and agreed the outcomes.

The two flights had been on Temporary Airway P18 receiving a Radar Control Service from Scottish CONTROL. P18 reverts to Class G airspace at 0900 local whereupon Scottish MILITARY provide ATSOCAS to these flights subject to workload and task priority. Both the DHC-8 and the JS41 crews were being provided with a DS from TAY Sector prior to the JS41 being transferred to Scottish MILITARY.

At 0902:41, P18 had been closed for just over 2min when TAY Sector called Scottish MILITARY to enquire about them providing an ATSOCAS service to 3 flights. Scottish MILITARY agreed to provide a service to the JS41 cruising at FL170. A Scottish MILITARY squawk A6111 was allocated and the Scottish MILITARY controller requested that the ac be climbed to FL175 the correct quadrantal level. This was agreed at first by the TAY controller who then corrected herself, co-coordinating the JS41 to remain at FL170 stating, "*can you see opposite direction to him the* [DHC-8 C/S]?" The response from Scottish MILITARY was, "*Yea, are you going to keep him?*" Following this there were a few moments of discussion as to who would work the DHC-8 but it was agreed that TAY Sector would retain the DHC-8. The agreed co-ordination was then re-iterated and a transfer frequency to Scottish MILITARY was given for the JS41. Further co-ordination then ensued relating to another company ac that was following behind the JS41. At 0906:33, the telephone call ended with both co-ordination agreements being emphasised again. The TAY controller stating "[JS41 C/S] *not above FL170"* to which the Scottish MILITARY controller responds, "*Affirm*". It should be noted at this stage however, that despite the co-ordinations being re-iterated and apparently being clearly understood by both controllers the actual level of the DHC-8 - FL180 - was not mentioned.

At 0907:42, the JS41 was transferred from TAY Sector to Scottish MILITARY. At 0907:52, the DHC-8 crew was given TI on the opposite direction JS41 that had just been transferred to Scottish MILITARY. At 0908:10, the JS41 crew called Scottish MILITARY and requested a DS, which was provided.

The Scottish MILITARY controller provided the JS41 crew with TI on the DHC-8 at 0908:58, "*…..traffic 12 o'clock 1-5 miles opposite direction co-ordinated above*" that the JS41 crew acknowledged. At 0909:22, Scottish MILITARY advises the JS41 crew to route direct OTR. Later at 0909:49, Scottish MILITARY apologises to the JS41 crew stating that Danger Area D323 is active and that they can route towards UMBEL. This is acknowledged by the JS41 crew who then request a climb to FL210 to cruise. The Scottish MILITARY controller responded saying, "*…roger. Climb FL210*".

A few seconds later at 0910:12 the Scottish MILITARY controller changes that instruction and states "[JS41 C/S] *can you make it flight level 2-1-5 for the correct quadrantal*?*",* which is accepted by the JS41 crew.

The following RT exchanges then occurred between the JS41 crew and ScATCC (Mil) controller from 0910:38: ScATCC (Mil) to JS41 – "[JS41 C/S] *apologies stop climb immediately for co-ordination".* JS41 to ScATCC (Mil) - "[garbled/unclear] *standby* [JS41 C/S]". A few seconds later the ScATCC (Mil) controller instructed the JS41 crew "…*avoiding action turn right heading 2-7-0 degrees",* which was acknowledged. The JS41 crew advised at 0911:08, "*clear of traffic*" and that they would like to proceed direct UMBEL at FL215. Whereupon the Scottish MILITARY controller instructed the JS41 crew to maintain FL170.

During this same period the following exchanges were made between the DHC-8 crew and the TAY SC from 0910:45: DHC-8 crew to TAY SC - "[DHC-8 C/S] *TCAS R-A".* Some 4sec later TAY SC responded, - "[DHC-8 C/S] *Scottish…amm…avoiding action turn right immediately heading 0-9-0 degrees",* which was acknowledged by the DHC-8 crew. At 0911:04, the TAY SC advised the DHC-8 crew that they are clear of traffic and explain who the conflict was with.

STCA activated red at 0910:43, 5sec after the Scottish MILITARY controller initiated the stop climb instruction and 2sec before the DHC-8 crew reported the TCAS RA.

Analysis

The TAY Sector was manned with a trainee monitored by an OJTI. The trainee had already been valid on TAY Sector for about 6 years but after an extended period of absence from duty (due to non operational reasons causing validations to lapse) was being retrained, with approximately 20 hours on the Sector since August.

The trainee was aware that the workload was beginning to increase and had called for the assistance of a Planning controller. When the Planning controller arrived she began to brief him on the Sector and was 'heads down' in the fps bay highlighting to the Planning controller what was needed to be done with certain ac.

The trainee recalls hearing the DHC-8 crew call a TCAS RA and looked up at the radar. She immediately saw the conflict with the STCA flashing red. Although she had heard 'TCAS RA' her reaction to seeing the STCA red alert was instinctive. Since this event was so sudden she had not – cognitively - fully absorbed the implications of the RA and reacted to seeing the STCA. Following a momentary pause/hesitation an avoiding action turn to the R was issued. Although the ac were almost abeam each other at the time of the avoiding action the radar display was selected to 60nm range, which would have made the assessment of conflict distance more difficult.

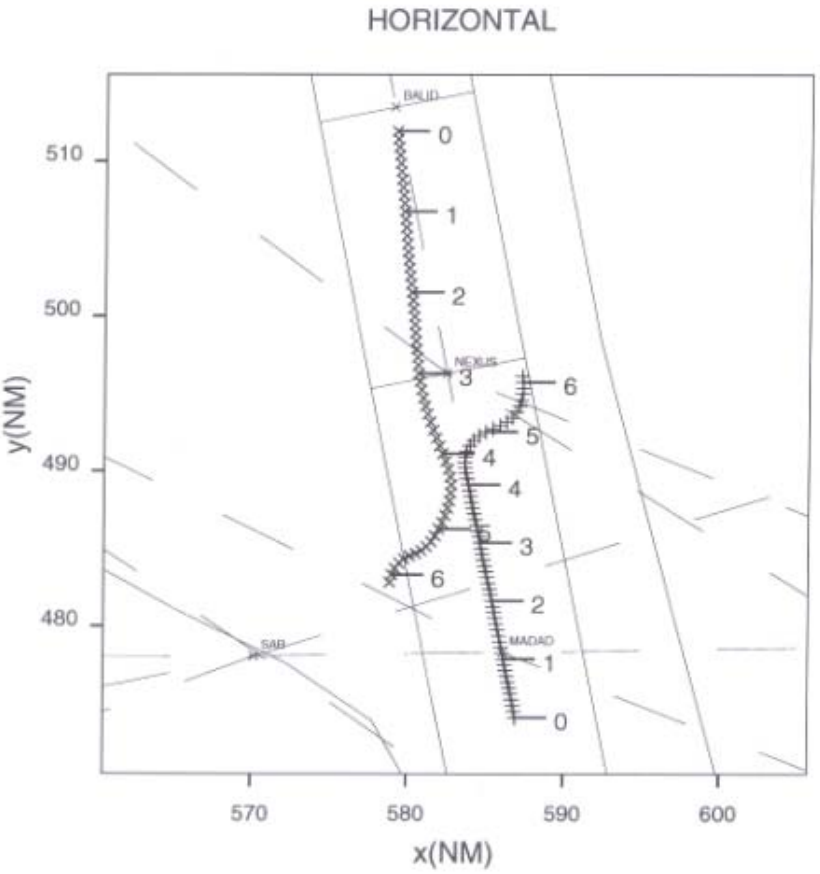
Regarding the turn issued when the TCAS RA was called, the trainee realised that there should have been a 'hands off' approach although there was some debate about taking action in the horizontal plane following a TCAS RA.

Both the trainee and the OJTI were asked what factors in the event could have prevented it from occurring then or in the future. They both made the following points:

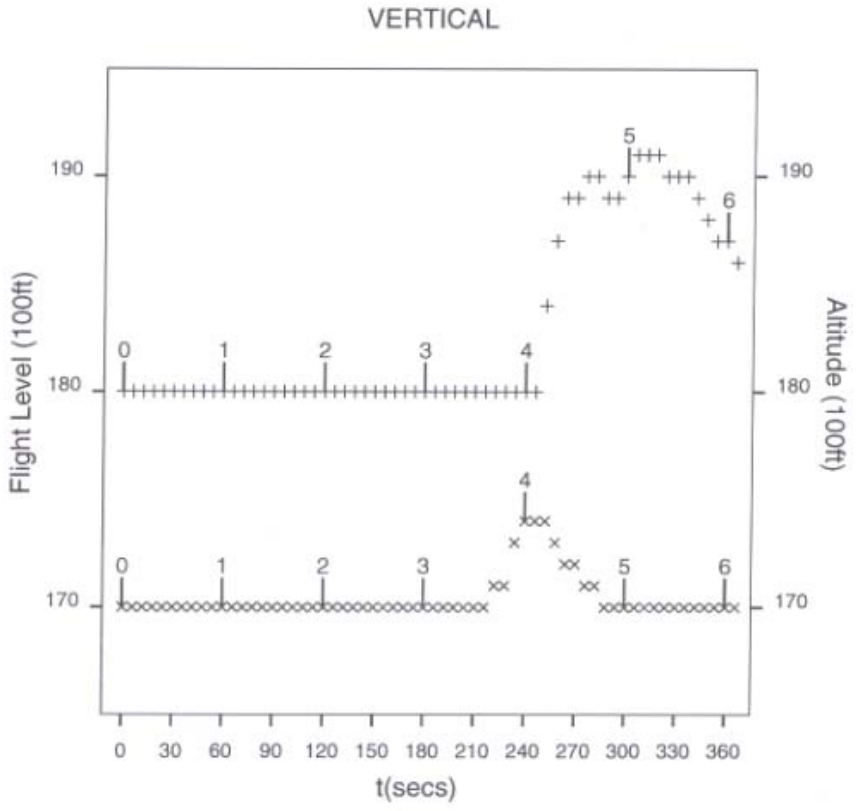
> P18 could be made a permanent airway or the hours extended beyond the 0900 local closure. With hindsight one controller (either civil or military) keeping all relevant traffic may have prevented the incident.

<u>SMF data</u>

The following data was produced by SMF (Separation Monitoring Function) which supports the minimum separation already assessed.



SMF data 1



SMF data 2

Radar and RT replay

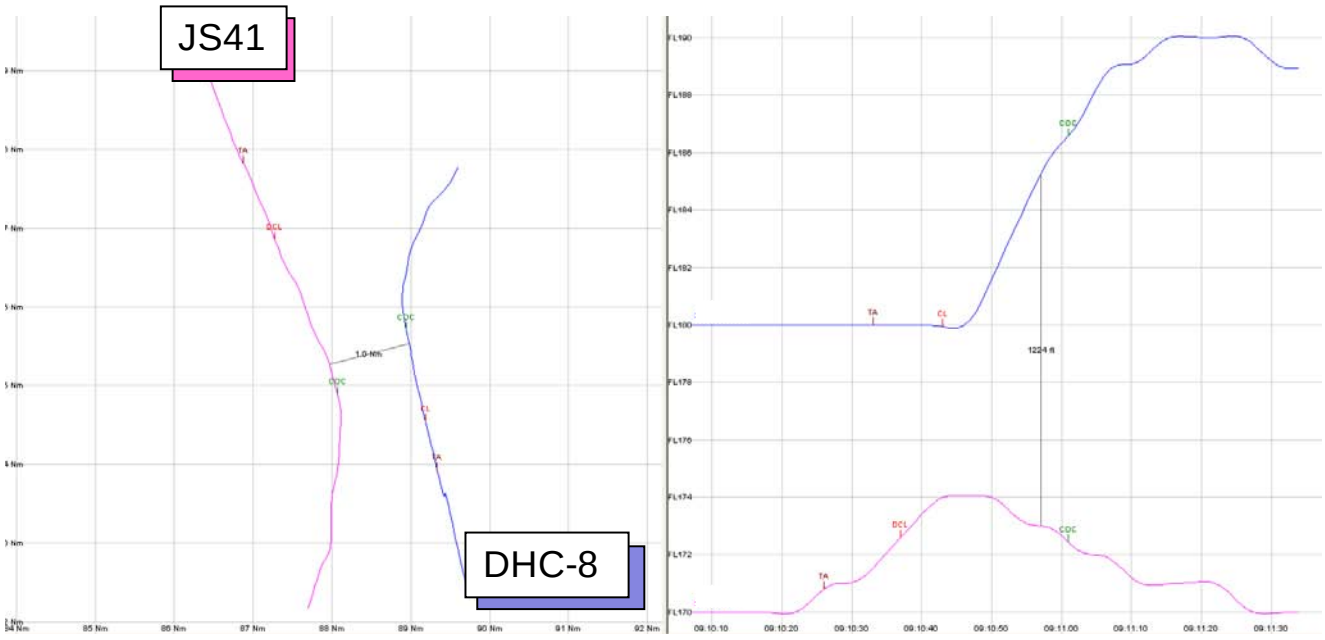
It was also confirmed during RT playback that despite there being clear co-ordination between both controllers which was re-iterated and that both controllers appeared to have a full situational awareness, there was never a specific mention of the level that the DHC-8 was at i.e. the words "FL180" were never actually spoken. See "Extract from MATS Part 1" section.

STCA/TCAS Simulation Report

Following data is sourced from both TCAS simulations and STCA.
Table 1 below relates to the TCAS Simulation data.

CODE	***DESCRIPTION***		***CODE***	***DESCRIPTION***
TA	Traffic Alert		AVS	Adjust Vertical Speed
RA	Resolution Advisory		CL	Climb
COC	Clear of Conflict		DCL	Don't Climb

Table 1



TCAS Simulation Data

This gives the closest lateral and vertical points as follows:-

Minimum Lateral Separation

Min. Latsep Time	*Horizontal Sep. (NM)*	*Vertical Sep. (ft)*
09:10:57	1.05	1224

Minimum Vertical Separation

Min. Vertsep Time	*Horizontal Sep. (NM)*	*Vertical Sep. (ft)*
09:10:45	2.29	581

Assessment of TCAS Performance

EUROCONTROL's automatic safety monitoring tool (ASMT) recorded three resolution advisory (RA) messages, one from the downlinked Mode S data of the JS41, the other two from the DHC-8. The JS41 received an *adjust vertical speed* within one second prior to 0910:38. The DHC-8 then received a *climb* within four seconds of 0910:42 followed by an *adjust vertical speed* within one second of 0910:53.

Simulation of this encounter suggests that both aircraft received a traffic alert (TA); the JS41 at approximately 0910:26, followed by the DHC-8 about 7sec later. The JS41 then received the first RA at 0910:37. The RA was a *don't climb* (enunciated "Adjust vertical speed, adjust") and the ac levelled off 8sec later. The DHC-8 then received its first RA which was a *climb* ("climb, climb") at 0910:43 and started to climb 4sec later.

Information regarding the flight path of an aircraft is available in roughly 4-second intervals based on radar data, whilst TCAS uses a 1-second update cycle based on SSR interrogations. Hence, for simulation purposes, the period of time between consecutive radar points is interpolated to give a reasonable estimate of the flight path of the ac. The time of the initial *adjust vertical speed* and the *climb* RA messages in simulation is in good agreement with the downlinked times based on Mode S data. The ASMT recorded an *adjust vertical speed* RA for the DHC-8 at 0910:42 which was not generated in the simulation - this is probably due to the interpolation between radar points. The *clear of conflict* message was issued at a simulated time of 0911:01.

Time	***Cycle***	***L(Nm)***	***dZ(Ft)***	***Alert***
09:09:59	18	9.92	1000	
09:10:03	19	9.32	1000	
09:10:07	20	8.69	1000	
09:10:11	21	8.09	1000	
09:10:15	22	7.48	1000	
09:10:19	23	6.86	1000	
09:10:23	24	6.25	975	
09:10:27	25	5.64	975	
09:10:31	26	5.02	950	
09:10:35	27	4.41	875	
09:10:39	28	3.83	800	
09:10:43	29	3.21	707	Y
09:10:47	30	2.67	590	Y
09:10:51	31	2.10	471	Y
09:10:55	**32**	**1.60**	**601**	**Y CCPA**
09:10:59	33	1.19	987	Y
09:11:03	34	0.94	1190	
09:11:07	35	1.20	1401	
09:11:11	36	1.60	1630	
09:11:15	37	2.15	1755	
09:11:19	38	2.67	1862	

STCA Cycle

The above data shows the STCA cycle with the alert beginning at 0910:43 and confirms the radar observations.

CCPA (Cycle of Closest Point of Approach) is given as 1.6nm and 601ft where controllers were seeking to achieve 5nm or 1000ft.

Extracts from CAP493 MATS Part 1

Appendix E Paragraph 3.1

"Readback of ATS Co-ordination Messages
Controllers must ensure they obtain a read-back of any operationally significant information contained in telephone and intercom co-ordination messages, including:
• Levels;
• Headings;
• Speed Restrictions;
• Airways or route instructions;
• Runway in use;
• SSR Codes;
• Pressure Settings;
• Frequencies;
• Release and contact points"

This is the only reference to mentioning level during co-ordination and relates more to read-back of levels rather than a requirement to specifically state the level during all co-ordinations.

It could be argued that paragraph 3.1 above is sufficient instruction to make it clear that levels must always be mentioned but in this incident the act of co-ordination centred around the levels that the two flights controlled by ScATCC (Mil) were to operate below and above. This was the executive co-ordination and those readbacks were all made by both the ScATCC (Mil) and TAY controllers. The implication was that the DHC-8 would stay at FL180 but since there was no mention of that level there was no need for a readback.

So while the military MAA MATM states that both controllers are to refer to level of their ac there is no such laid down criteria for civil controllers.

However, the ScATCC (Mil) report states that 'Had FL180 been stated on the landline conversation, it may have been reinforced in the controller's thoughts…." This may be worthy of consideration in the civil world.

Conclusions

This investigation has concluded that a number of events that were factors in this incident. It has also raised a high number of situational factors (compared to causal or aggravating) that may or may not have contributed. A situational factor is defined as a factor that was present during the incident but its effects cannot be determined or proven to have contributed.

It is clear that the main causal factor (CF) was the ScATCC (Mil) TAC N controller's decision to allow the climb of the JS41 (CF1) to FL210 (then FL215) and break the co-ordination agreement with TAY Sector for that aircraft to remain at FL170.

While the ScATCC (Mil) controller is uncertain as to why exactly she gave the climb, there is evidence from the ScATCC (Mil) report that the controller mis-perceived the call from the JS41 as being from another company ac on frequency (CF2).

Aggravating factors included the ScATCC (Mil) controller being under loaded (CF3). The level of concentration provided in her decision to climb the JS41 clearly did not set any "alarm bells" ringing when the request for a climb was made.

It could be argued that CF4 is Causal, Aggravating or Situational. However it has been listed as aggravating in that it made the situation worse. If control of both ac had been with the ScATCC (Mil) controller CF2 may have occurred anyway but she may have reacted to the error more quickly. It should be noted that there is in element of conjecture in the assessment of the severity of this causal factor but no doubt remains that it has a degree of significance.

There is also evidence from other incidents in Class G airspace that point clearly to co-ordination/misunderstandings/awareness etc issues that arise from different agencies working different ac in the same piece of airspace.

The following six causal factors are all situational i.e. they are factors that were present in the event but their impact cannot be determined or proven.

Military

Procedures clearly state that during co-ordination the level of traffic must be verbalised. While civil procedures do not state that explicitly it is deemed to be 'Good Practice' and the level of the DHC-8 was never actually mentioned by the TAY or ScATCC (Mil) controllers (CF5). So although both controllers had full situational awareness (evidence is from the traffic information that both controllers gave to both aircraft and that the co-ordination was emphasised twice) there remains the lack of re-enforcement to the ScATCC (Mil) controller of the DHC-8's level.

Airway P18 is described as CDR Category One (CDR 1) between ADN and NATEB, Mon-Fri 0530-0900, and from 1700 Fri or the day preceding a PH to 0900 Mon or the day following a PH Winter (Summer 1hr earlier). The Airway is not available for use during these periods when MoD requires access to the airspace. This limited availability (CF6) will obviously mean that the route (which is regularly used by civil passenger flights) is generally Class G airspace and will subsequently involve flights being operated by different agencies in that airspace.

It is possible that the ScATCC (Mil) controller was at least partially distracted when the track of direct OTR she had given to the JS41 crew was going to infringe upon D323 (CF7). It is not uncommon for a minor error such as this, whether it is corrected or not, to cause a controller to become unsettled and unfocused. The fact that this 'distraction' occurred immediately before the JS41 crew requested FL210 would seem to support that possibility.

The ScATCC (Mil) report states 'The controller stated that it was the first day back after the Christmas period therefore *lack of currency* (CF8) may have been an issue. Although this is the same for other controllers coming back from leave or extended absence, this may have been a contributory factor as to why a lapse in concentration had been suffered in this instance.'

Civil

The TAY trainee offered lateral avoiding action after the DHC-8 crew had reported a TCAS RA (CF9). While this factor had no impact on the incident it does require to be noted.

It should also be noted that the JS41 crew did not clearly state to the ScATCC (Mil) controller that they were receiving a TCAS RA (CF10). This lack of correct or clear information to the ScATCC (Mil) controller resulted in her also providing avoiding action when none should have been given.

Both controllers mitigated the event to some degree by passing TI to both crews well in advance (CF11 & CF12) and therefore providing them with good situational awareness. However, this raises the question of why the JS41 crew requested a climb to FL210 when they were aware of the company traffic. Did they check on TCAS?

Prestwick Centre Recommendations

It has been noted from previous incidents that there are signs of a trend where controllers (on civil side and in this case the military side) have made significant safety errors where there should have been enough cognitive and skills capacity to avoid such mistakes. The trend, albeit statistically minor, has often involved being under loaded and demonstrating a lack of concentration leading to surprisingly uncharacteristic but significant errors.

Prestwick Centre conducted a highly successful 'Watch out for Gorillas' campaign in 2007/08, where controllers were alerted to looking out for the obvious that we sometimes do not see.

It is recommended that Unit Management, in conjunction with Scottish MILITARY, conduct a campaign highlighting and emphasising to both civil and military controllers at Prestwick, the vulnerability of the human to not seeing the obvious and then putting this lesson into an ATC context. This recommendation will be satisfied when all PC controlling staff (and Ops Room support staff if considered necessary) have been exposed to this campaign and that Unit Management are satisfied the message has been successfully delivered.

This Recommendation was accepted by General Manager Prestwick Centre.

While not having any impact on this incident the avoiding action given by the TAY trainee controller requires to be addressed. MATS Part 1 states:

> 'When a pilot reports a TCAS RA, controllers shall not attempt to modify the aircraft's flight path'.

Although the TAY trainee controller appears to have instinctively reacted to observing STCA following her discussion with the new planner and hearing the DHC-8 *"..TCAS RA"* the fact remains that an avoiding action was given when controllers should have been 'hands off'. The military controller also gave avoiding action but the TCAS RA call from the JS41 crew was either not given or was unclear.

It is recommended that Unit Management ensure that all controllers are reminded of the MATS Part 1, Section 1, Chapter 9, and Paragraph 5.2 through Safety Co-ordination Team actions such as TRUCE, ART or Watch Briefings.

This Recommendation was accepted by General Manager Prestwick Centre.

ATSI endorsed the NATS Ltd joint civil/military report. It was noted that two recommendations were accepted by the civil ATS provider, and importantly, the final recommendation, which will remind Scottish Area civil controllers of their roles and responsibilities when a TCAS RA is reported, is scheduled to be completed by 31 July 2012. [ATSI Note: the CAA's AATSD En Route Inspectorate has sight of these reports through the internal MOR distribution process and they are therefore available for follow-up at the regulatory oversight level).

As a further step, ATSI shall be highlighting the report to the Editor MATS Part 1/Chair ATC Procedures Working Group.

BM SAFETY MANAGEMENT reports that both ac were operating IFR in VMC: the JS41 in receipt of a DS from ScATCC (Mil) TAC N and the DHC-8 in receipt of a DS from SAC TAY Sector.

Taskload and complexity for TAC N were low, with the incident ac and an un-related Saab 2000 on the frequency flying about 11nm astern of the JS41 throughout the Airprox. Significantly, the incident occurred approximately 10min after TAC N took over the control position at the start of her shift, her first shift back after the Christmas 2011 break. Whilst TAC N was rostered for a number of shifts

over the Christmas period, they completed little controlling due to low traffic levels. Moreover, their shift times in the 2-months prior to the incident were as follows:

Date	Activity
31 Oct – 4 Nov	Mon – Thur, mentoring on simulator, Fri PM Supervisor
7 – 11 Nov	Annual leave
14 – 18 Nov	PM Supervisor
21 Nov – 9 Dec	Detached – non controlling
12 – 16 Dec	PM Supervisor
19 Dec – 3 Jan	Christmas Leave, night shift 24 & 25 Dec, low traffic levels, minimal controlling

RAF ATM Force Order 300.125.3b states that:

> 'In order to maintain currency, controllers are to, as a minimum, achieve on console an operating currency of 8 hours per month in each discipline for which an endorsement is held. When a controller fails to meet this minimum requirement over 3 consecutive months, they will be required to undergo a standards check comprising a practical examination and a working knowledge check. Notwithstanding the 8-hour requirement, any controller/assistant who does not consider themselves to be current in a particular discipline should inform the supervisor/ATCO IC who is to arrange remedial action.'

The incident sequence commenced at 0904:06 as TAC N liaised on the landline with TAY Sector over the transfer of control of the JS41 and the unrelated Saab 2000 from TAY Sector to TAC N. Although the landline call continued until 0906:13, from the perspective of the investigation the critical element was the co-ordination that was agreed and re-iterated between 0905:49 and 0906:05. TAC N confirmed with TAY Sector that they would, *"not be below flight level 1-9-0 with the* [un-related Saab 2000 C/S] *when he comes to me against your* [DHC-8 C/S]." TAY then re-iterated, *"not below flight level 1-9-0 and not above flight level 1-7-0 with the* [JS 41 C/S]" to which TAC N replied, *"affirm."* At this point, the DHC-8 was 46.7nm S of the JS41, with the ac maintaining FL180 and FL170 respectively.

At 0908:07 the JS41 crew made initial contact with TAC N and at 0908:58, was passed TI on the DHC-8 as, *"traffic 12 o'clock, 1-5 miles* [radar replay confirms 18.6nm] *opposite direction co-ordinated above."*

At 0909:23 TAC N authorised the JS41 crew to route under their own-navigation to OTR; however, the controller realised at 0909:51 that this route would take the JS41 through EG D323 which was active and amended the JS41's route via UMBEL.

At 0910:05, with the DHC-8 8.5nm SE of the JS41, the latter's crew requested a climb to FL210 that was approved and then amended at 0910:14 to accommodate the correct quadrantal level. At this latter point 7.3nm lateral separation existed.

At 0910:34 with 4.2nm lateral separation between the 2 ac, the JS41's SSR Mode C indicates a climb to FL171. At 0910:38, with 3.6nm separation, TAC N transmitted to the JS41 *"apologies, stop climb immediately for coordination";* however, the JS41 crew's reply was initially garbled and then advised TAC N to standby. During this, at 0910:44, STCA activated high-severity Red. TAC N immediately instructed the JS41 crew, *"..avoiding action, turn right heading 2-7-0 degrees"* which was readback by the JS41 crew. At this point, the JS41 was passing FL174, 2.5nm NW of the DHC-8.

The CPA occurred at 0910:58 as the JS41 passed 1.1nm W of the DHC-8, with the JS41 descending through FL173 and the DHC-8 climbing through FL184, both in accordance with their respective TCAS RAs. [Minimum vertical separation of 400ft is shown for one sweep at 0910:49, with horizontal separation of 1·9nm.]

Although the unit investigation concluded that the improper format of the coordination that occurred between TAC N and TAY Sector may have caused TAC N's cognitive error in issuing the climb instructions, BM SM contends that this is not likely. TAC N demonstrated their understanding of the agreement in both their report narrative and their use of language in the TI passed to the JS41 at 0908:58, describing the DHC-8 as "coordinated above." Moreover, subsequent to completing her report, the controller has commented that she may have been distracted by the unrelated Saab 2000 from the same company, thinking that it was the ac requiring the climb. However, the flow of the conversation when the climb instruction was issued makes this unlikely, given that the JS41 linked their request to climb to FL210 to the conversation begun by TAC N in amending the JS41's routeing.

For TAC N to have issued effectively 2 separate climb instructions (FL210 at 0910:05 and FL215 at 0910:14) without having perceived the confliction posed by the DHC-8 when it was 7.9nm and 7.3nm away respectively, suggests that either TAC N was not looking at their surveillance display when she issued the instruction or, more likely, had mentally discounted the DHC-8 as a conflict as it was coordinated. This is suggestive of low levels of situational awareness, alertness and/or cognitive arousal, which it is reasonable to argue, were caused by the individual's shift pattern history over the preceding weeks.

TAC N's climb instruction to the JS41 placed the flight in confliction with the DHC-8, breaking the coordination agreement with Tay Sector.

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 together with a joint unit report that included TCAS analysis and comment from the appropriate ATC authorities.

The DHC-8 crew was evidently aware of the JS41 from the TI issued by TAY and had spotted it on their TCAS display. Moreover, they had also seen the JS41 below them before it commenced its climb so they had good SA even before the TA was enunciated. The TCAS analysis indicates the DHC-8 crew complied with the TCAS RA promptly and it was clear to Members that the crew's part in this Airprox was limited to following the instructions issued to them. Whilst the trainee on TAY had incorrectly issued an avoiding action turn instruction after the DHC-8 crew announced their RA, Members agreed that it had no effect on the outcome.

Evidently, this Airprox stemmed from the instruction issued by TAC N to the JS41 crew to climb to FL210/FL215, following their request for a higher cruising level. Whilst the JS41 crew had been informed of the DHC-8 15nm ahead that was *"…co-ordinated above.."* when they first called TAC N, they had not been informed of its level. A Member postulated that if TAC N had told the JS41 crew that the DHC-8 was only 1000ft above them at FL180, they might not have asked for the en-route climb at that point; however, once the crew made the request, it remained TAC N's responsibility to prevent any conflict with the co-ordinated traffic so the JS41 crew was also just following TAC N's instructions. Although the Unit report highlights that specific levels were not mentioned, the DHC-8's Mode C was plainly displayed to the controller and if TAC N had been looking at the radar when she instructed the JS41 crew to climb the potential for conflict would have been readily apparent. A civil area Member questioned the efficacy of two ATC units providing a transit middle airspace radar service in the same vicinity. However, the Board recognised this was commonplace throughout UK airspace and the NATS Advisor added that there was no evidence to suggest that if the same unit had been working both flights the Airprox would not have occurred.

The BM SM Advisor reaffirmed that there was no doubt that TAC N was aware of the DHC-8's level beforehand, but it was the controller's inappropriate reaction to the JS41 crew's request, approving a climb through the DHC-8's level in breach of the agreement with TAY, that had resulted in this conflict. The Advisor believed that this was a momentary error by the TAC N controller, who had quickly realised her mistake. A military controller Member opined that TAC N's work rate had not been able to match the demands of the traffic situation, which, in his view, was indicative of a lack of

currency; Members discussed this issue and the difficulties confronting more experienced controllers who are understandably employed more frequently in supervisory roles. Nevertheless, the rules seemed plain enough so the issue of controller currency was a matter for the individual and the unit concerned. After a wide ranging debate, Members agreed unanimously that the Cause of this Airprox was that TAC N climbed the JS41 into conflict with the DHC-8.

TAC N had plainly been distracted in correcting the JS41's projected track clear of D323 and altering the JS41 crew's requested level to the appropriate quadrantal cruising level rather than focusing on the potential for conflict, despite the co-ordination beforehand. Nevertheless, only 24sec elapsed between the instruction to climb to FL215 and TAC N issuing the *"..stop climb immediately.."* instruction, when it was evident she had realised her mistake. The Board noted that shortly after the STCA 'red' warning the controller incorrectly issued an avoiding action turn while the JS41 crew was reacting to a TCAS RA; however, Members recognised that the controller would not have been aware of the TCAS event because the relevant RT call was garbled. The TCAS analysis confirms that the JS41 crew complied with the RA promptly. Moreover, with both ac on a steady course they were set to pass abeam with 1·1nm horizontal separation even before any avoiding action turns could begin to take effect. Vertical separation had also been restored by that point with 1100ft evident on Mode C. The Board concluded, therefore, that the foregoing coupled with the sound appreciation and swift response of all concerned had effectively removed any Risk of a collision in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: TAC N climbed the JS41 into conflict with the DHC-8.

Degree of Risk: C.