

## **AIRPROX REPORT No 2012167**

Date/Time: 4 Dec 2012 1202Z

Position: 5514N 00133W  
(12.5nm NNE Newcastle A/D)

Airspace: Scot FIR (Class: G)

Reporting Ac Reported Ac

Type: JS41 Tucano T Mk 1

Operator: CAT Mil Trg

Alt/FL: 3800ft 5000ft  
QNH (999hPa) RPS (NR)

Weather: VMC NR VMC NR

Visibility: >10km NR

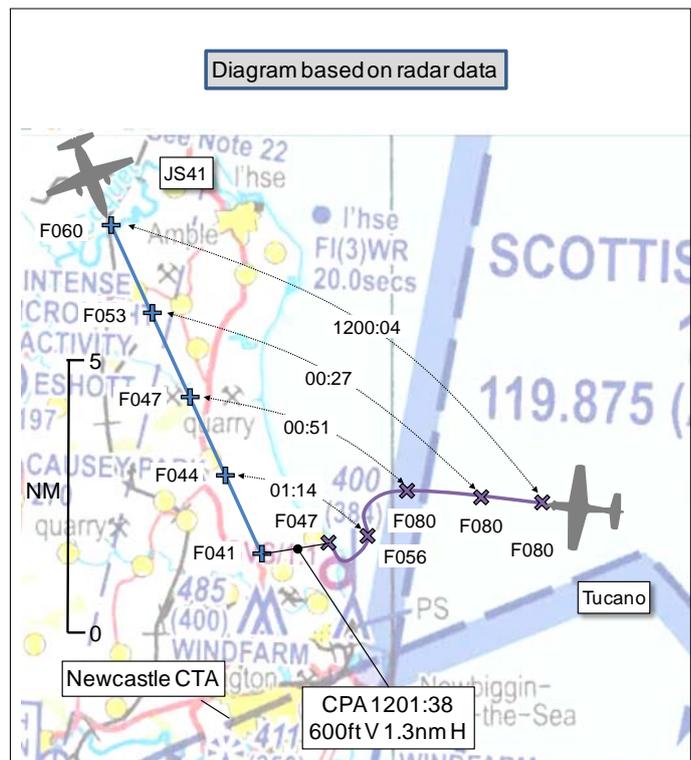
Reported Separation:

NR NR V/2nm H

Recorded Separation:

600ft V/1.3nm H

0ft V/2.7nm H



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

**THE JS41 PILOT** reports flying the final descent into Newcastle A/D. She was operating under IFR in VMC with a RCS from Newcastle APP, she thought [124.375MHz]. The white and blue ac had navigation, conspicuity and strobe lights selected on, as was the SSR transponder with Modes A, C and S. The ac was fitted with TCAS II. When 9nm NE of Newcastle A/D, heading 165° at 220kt and descending through altitude 3800ft, she was informed by Newcastle APP of a 'light ac' turning away from her. She saw the ac about 4nm to the E, which appeared to both crew to be doing aerobatics. A short while later she received a TCAS TA and then RA 'monitor vertical speed', indicating a 2900fpm RoD, followed by 'climb climb'. She reported the Airprox to Newcastle APP.

She assessed the risk of collision as 'Low'.

**THE TUCANO PILOT** reports commencing his descent into low level after a medium level transit from his home base. He was operating under VFR in VMC with a TS from Newcastle RAD [284.600MHz]. The black and yellow striped ac had navigation, landing and strobe lights selected on, as was the SSR transponder with Modes A and C. The ac was fitted with TCAS I. He had been cleared to descend from FL110 with descent stopped at FL80 due to Jetstream traffic in his 1 o'clock position at 'about 6nm and 5000ft'. He was approaching his low level entry point and, content that there were sufficient large gaps in the cloud below him to descend through, he informed Newcastle RAD that he 'was VMC' and was continuing en-route. The controller asked him to remain on frequency in order to update him on the previously notified traffic. As he had informed the controller that he was VMC and continuing en-route, he believed he was now in receipt of a BS and that the controller was 'just keeping [him] on frequency to provide updates on the Jetstream'. He did not believe the Jetstream to be a factor, as his SA put the ac several miles to the NW, and he descended rapidly through a gap in the cloud in order to set up for entry to low level, a high workload part of the sortie. He remained VMC throughout the descent, but with some of his attention focused on 'the navigational aspects' of the sortie. He then overheard an RT exchange between the Jetstream pilot and Newcastle RAD from which he understood that the Jetstream pilot was 'going to have to file an Airprox' because she had 'received a TCAS TA' as he passed through her level at 5000ft. He did not

see the Jetstream but noticed on TCAS that it was just inside 2nm range; he did not receive a TA throughout the incident.

He assessed the risk of collision as 'Low'.

**THE NEWCASTLE APPROACH CONTROLLER** reports the JS41 pilot was inbound to Newcastle on a DS, heading 160° and descending to altitude 3500ft. The Tucano pilot was on a TS, requesting to go low level to the N and cleared to descend to FL80 until clear of the JS41. When the Tucano pilot requested to go en-route he gave him an update on the JS41 and passed the Tyne RPS. He requested the Tucano pilot to advise him when going en-route, which he acknowledged, replying, "wilco". He observed the Tucano descending and immediately gave TI to the JS41 pilot on the Tucano who then advised him of the TCAS RA. He acknowledged this and confirmed that the Tucano pilot was still on frequency. The JS41 pilot confirmed that she had the Tucano in sight during the descent.

**ATSI** reports that an Airprox was reported by the pilot of a British Aerospace Jetstream 41 (JS41) when it received a TCAS RA against a Tucano T1 (Tucano) at 1201:30 in Class G airspace, 12.6nm NNE of Newcastle A/D.

## Background

The JS41 pilot was operating IFR on a flight from Aberdeen to Newcastle and was in receipt of a DS from Newcastle APP on frequency 124.375MHz, which was cross-coupled with frequency 284.600MHz. The Tucano pilot was on a flight operating from RAF Linton-on-Ouse and was in receipt of a TS from Newcastle APP on frequency 284.600MHz.

CAA ATSI had access to written reports from the JS41 and Tucano pilots and the Newcastle Approach controller together with area radar recordings and RTF recordings from Newcastle APP.

The Newcastle weather was recorded as follows:

METAR EGNT 041150Z 28007KT 9999 FEW035 03/02 Q0999=  
METAR EGNT 041220Z 28005KT 9999 FEW015 03/02 Q0999=

## Factual History

At 1148:10, the Tucano pilot, level at FL110, contacted Newcastle APP requesting a TS. Newcastle APP replied that he was identified on transfer and agreed a TS, instructing the pilot to report ready for descent. At 1155:30, the JS41 pilot, descending to FL120, contacted Newcastle APP requesting a DS. This was agreed and the JS41 pilot was subsequently given descent to FL70.

At 1157:20, the Tucano pilot informed Newcastle APP that he would be ready for descent in one minute's time. The controller replied, "*Roger report ready*".

At 1157:30, the JS41 pilot was instructed to fly heading 160° and given descent to altitude 5000ft [QNH 999hPa].

At 1158:00, the Tucano pilot reported ready for descent and the controller instructed him to descend to FL80, which was read back correctly.

At 1158:22, the JS41 was 24.6nm N of Newcastle, tracking 160°, and the Tucano was 19.9nm NE of Newcastle tracking W.

At 1159:00, the JS41 pilot was instructed to descend to altitude 3500ft.

At 1159:30, the Tucano pilot was instructed to maintain FL80 on reaching and was given TI on the JS41. The Tucano pilot read back, "*maintaining eigh- fli-er flight level eight zero*".

At 1200:10, the Tucano pilot reported to the controller that he was, “VMC and continuing en-route er thanks for the service”. The controller updated the TI on the JS41 and passed the Tyne pressure setting, stating, “taking your own terrain clearance”. The Tucano pilot replied that he had copied the traffic and read back the new pressure setting. The controller instructed the Tucano pilot to squawk 7000 and report when going en-route. The Tucano pilot replied, “-service squawking seven thousand er wilco [C/S]”.

At 1200:36, the Tucano was indicating FL079 tracking W with the JS41 6nm NW, descending through FL051 on a converging track.

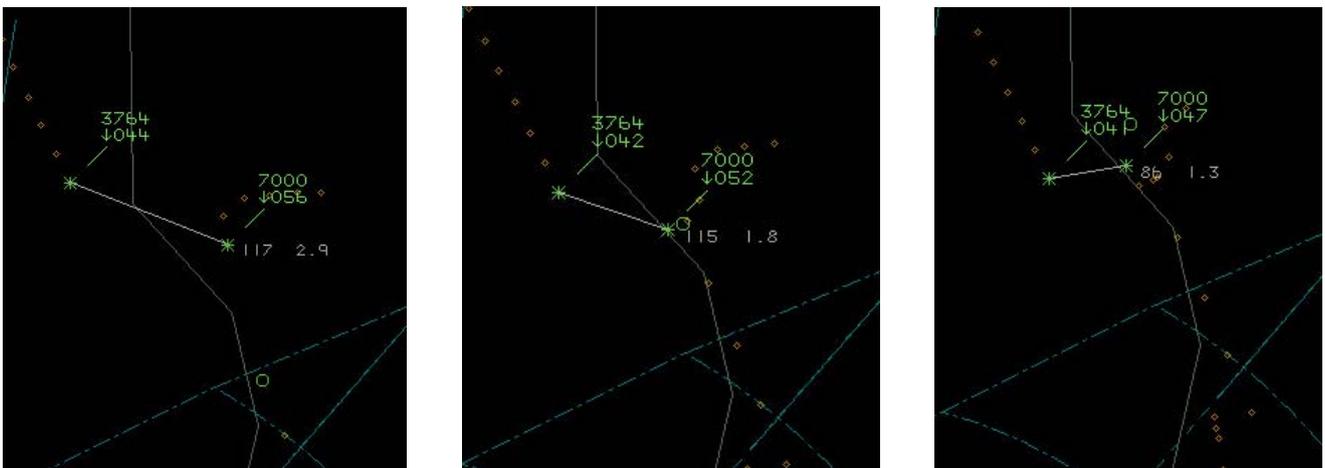
At 1201:00, the Tucano was indicating FL067, descending. The controller transmitted to the JS41 pilot, “Tucano ac just to the er southeast of you by about two and a half miles manoeuvring he’s turning left to go eastbound descending through your level very shortly er he’s indicating five thousand two hundred feet”.

At 1201:20, the Tucano pilot had turned L and was at FL056 at a range of 2.9nm from the JS41; he appeared to be turning away. The JS41 pilot acknowledged the TI and the controller advised that, “he’s just clearing your left hand side he’s in your eleven o’clock range of three miles”.

At 1201:30 the Tucano pilot was in a RH turn, 1.8nm ESE of the JS41, descending through FL052, while the JS41 pilot was descending through FL042. At 1201:35 the JS41 pilot advised the controller that she had received a TCAS RA.

The controller acknowledged the TCAS RA by replying, “roger”. At the end of that transmission the Tucano pilot was tracking N and passed down the LH side of the JS41 at a range of 1.3nm. The controller asked the Tucano pilot if he was still on frequency. The Tucano pilot replied that he was but that he was going en-route. The controller requested the Tucano pilot to remain on frequency due to the TCAS RA reported by the JS41 pilot.

The screenshots below, using the Great Dun Fell radar, show the sequence of events between 1201:20 and 1201:40.



At 1202:00, the JS41 pilot reported clear of conflict.

During a telephone interview with ATSI, Newcastle APP stated that when the Tucano pilot requested to go en-route and the controller updated the TI on the JS41, he had expected that the Tucano pilot would avoid the JS41. When the Tucano pilot descended and turned L, the controller believed that he was in the process of doing so. The controller expected the Tucano to then continue E-bound and turn L towards the Amble lighthouse, which would have taken him behind the JS41. When the Tucano pilot turned R the controller was not sure if he was still on frequency and decided that passing TI to the JS41 pilot on the Tucano position was the best course of action.

The written report from the JS41 pilot stated that ATC advised her of a light ac turning away to the E. When the crew saw the traffic it appeared to be conducting aerobatics. After watching the ac 'for a minute' the crew observed the Tucano making a series of tight turns. They subsequently received a TCAS RA.

The written report from the Tucano pilot stated that he was in receipt of a TS from Newcastle APP outside CAS and had been given descent to FL80 from FL110. He was aware that the descent had been restricted due to a Jetstream 6nm away at 5000ft. He was approaching his low level entry point and was content that there were sufficient gaps in the cloud to descend through, so he informed the controller that he was VMC and going en-route. He believed that the controller asked him to stay on frequency to update the TI on the JS41. The Tucano pilot believed in retrospect that he and the controller had different ideas of the service being provided; the pilot believed that the service had changed to a BS as he had informed the controller that he was VMC and going en-route. The Tucano pilot descended in a gap to set up for the low level entry, whilst remaining VMC. He noticed on TCAS that the JS41 was just inside 2nm but he did not receive a TA.

### Analysis

Both ac were operating in Class G airspace where, regardless of the service being provided, pilots are ultimately responsible for their own collision avoidance.

The Newcastle Radar controller had previously instructed the Tucano pilot to stop descent at FL80, due to the inbound JS41, which the Tucano pilot was aware of. The controller was providing a Deconfliction Minima of 3nm or 1000ft between the 2 ac. CAP493, the Manual of Air Traffic Services, Section 1, Chapter 5, Page 10, Paragraph 10.1.5 states:

'Aircraft under Deconfliction Service. If the intentions of the Mode C transponding aircraft are not known, the vertical deconfliction minima must be increased to 3000ft ...'

When the Tucano pilot stated he was going en-route the controller passed updated TI on the JS41 and had an expectation that the Tucano pilot would avoid it. However, the 2 ac were converging and the controller did not further agree co-ordination with the Tucano pilot. CAP 774 Chapter 1, Page 2, Paragraph 6, states:

'Agreements can be established between a controller (not a FISO due to limits of the licence) and a pilot on a short-term tactical basis, such that the operation of an aircraft is laterally or vertically restricted beyond the core terms of the Basic Service or Traffic Service. This is for the purposes of co-ordination and to facilitate the safe use of airspace, particularly those airspace users with more stringent deconfliction requirements. In agreeing to a course of action, pilots must take into account their responsibilities as defined under the Rules of the Air, including that for terrain clearance. Unless safety is likely to be compromised, a pilot shall not deviate from an agreement without first advising and obtaining a response from the controller. Controllers shall remove restrictions as soon as it is safe to do so.

Agreements may be made which restrict aircraft to a specific level, level band, heading, route, or operating area. Controllers should be aware that not all requests for an agreement will be accepted and they should try to take account of the pilot's operating requirements whenever possible. Consequently, controllers should avoid excessive or unnecessary use of agreements and be prepared to act accordingly if an agreement is not met.'

When the Tucano pilot turned L and descended the controller passed TI to the JS41 pilot but believed that the Tucano was turning away from the JS41. The controller was not expecting the Tucano pilot to then turn R, towards the JS41, and was unable to take any action to assist the JS41 pilot in discharging her collision avoidance responsibility due to the limited time available.

### Conclusion

The Airprox occurred when the controller allowed the 2 ac to continue on converging tracks, without agreeing co-ordination with the Tucano pilot, which resulted in loss of the deconfliction minima and prompted a TCAS RA.

[UKAB Note(1): A TCAS Performance Assessment of the incident was provided by NATS Ltd. Note that as no TCAS RA events were downlinked, there are none included in the simulation.

Date: 04/12/2012 12:02

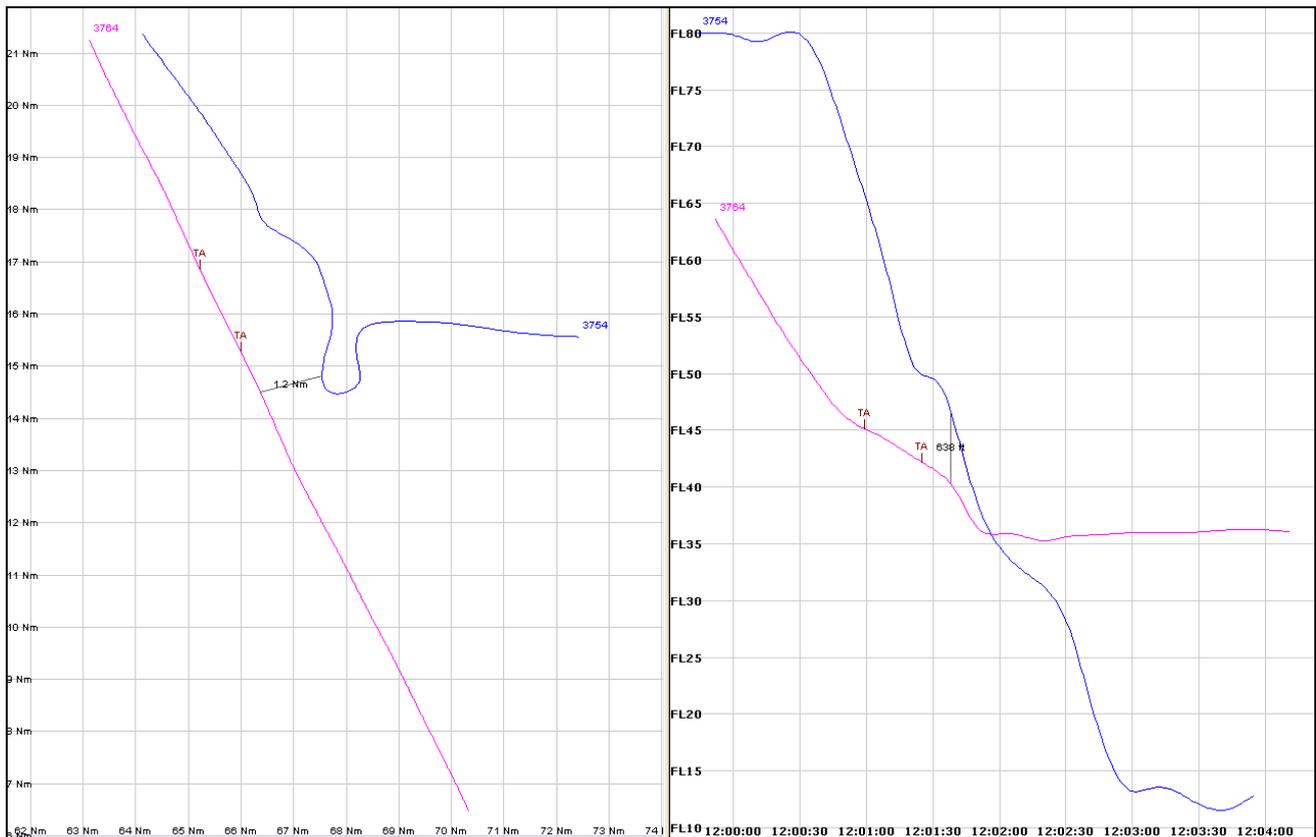
Mode A code for A/C 1: 3764

Mode A code for A/C 2: 3754, then 7000

Mode S Downlink

No TCAS RAs were recorded via Mode S downlink.

InCAS Simulation



InCAS Alert Statistics

**Mode A: 3764**

<i>Alert Time</i>	<i>Alert Description</i>	<i>Altitude (FL)</i>	<i>Intruder Range (Nm)</i>	<i>Vertical Sep. (ft)</i>
12:00:59	TRAFFIC ALERT	45	3.39	2063
12:01:25	TRAFFIC ALERT	42	2.19	731

**Mode A: 3754**

<i>Alert Time</i>	<i>Alert Description</i>	<i>Altitude (FL)</i>	<i>Intruder Range (Nm)</i>	<i>Vertical Sep. (ft)</i>
This aircraft was not TCAS II equipped				

### Closest Point of Approach (CPA)

<i>CPA Time</i>	<i>Horizontal Sep. (NM)</i>	<i>Vertical Sep. (ft)</i>
12:01:38	1.21	638

### Minimum Lateral Separation

<i>Min. Latsep Time</i>	<i>Horizontal Sep. (NM)</i>	<i>Vertical Sep. (ft)</i>
12:01:38	1.21	637.93

### Minimum Vertical Separation

<i>Min. Vertsep Time</i>	<i>Horizontal Sep. (NM)</i>	<i>Vertical Sep. (ft)</i>
12:01:56	2.66	11.15

### Assessment of TCAS Performance

Eurocontrol's automatic safety monitoring tool (ASMT) did not record any RAs relating to this encounter. The encounter was modelled in InCAS using MRT data (Multi Radar Track) in order to capture both sections of the Tucano track before and after its SSR code change.

As no TCAS RAs were recorded via Mode S downlink it was assumed that at least one aircraft was not TCAS II equipped. The Tucano was modelled as Mode S only and the JS41 was modelled as TCAS II equipped.

InCAS simulation suggests a geometrical CPA of 1.21nm and 638ft at 12:01:38.

InCAS simulation based on the stated equipment assumptions suggested that the JS41 pilot received two TAs at 12:00:59 and 12:01:25. Approximately 40 seconds after the second TA, the JS41 pilot levelled-off at a Mode C altitude of 3,600ft. At this point the pair were over 3.5nm apart laterally, and diverging both laterally and vertically.]

**HQ AIR (TRG)** comments that the Tucano pilot assessed he could continue safely in VMC without an ATS and that he had enough separation based on TI and TCAS to descend clear of the JS41. The student pilot was re-briefed after the event that a better course of action would have been to ensure lateral separation before attempting the descent. In this case, continuing the turn to the L would have maintained greater separation. CAP774 requires pilots under an ATS who have made an agreement with their controller not to deviate from that agreement without first informing and gaining an acknowledgement from the controller; whilst the Tucano pilot did not specifically state he would descend below FL80 it is clear that the controller understood that this was his intention. The Tucano TCAS alerts are triggered at much closer range than other systems to avoid nuisance warnings and in recognition of the increased manoeuvrability over a commercial airliner. However, it provides a significant increase in situational awareness.

## **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 photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board initially discussed the JS41 pilot's reported belief that she was under a RCS. Civilian pilot Members noted that confusion could be caused when pilots left CAS, passing from a RCS to ATSOCAS, with pilots mistakenly believing they were still under a RCS. It was opined that this misapprehension can be mitigated by controllers' meticulous use of the phrase 'leaving controlled airspace'. In this case it was noted that the JS41 operating company regularly flew 'off airways' on

this route and that the JS41 pilot may have been using RCS 'in a generic sense'; alternatively, as she had requested a DS on first contact with Newcastle and the Airprox occurred shortly before the JS41 entered CAS, the reference to RCS may have been a memory/reporting error. The Board noted that the JS41 pilot correctly reported the TCAS RA and clear of conflict on the RT.

Turning to the actions of the Tucano pilot, a military pilot Member opined that he could have assisted the situation by electing to continue his L turn or by turning R instead of L. He also pointed out that the Tucano pilot's SA was such that he did not believe the JS41 to be a factor and that the Newcastle APP had cleared him en-route, passing the RPS and instructing him to squawk 7000. ATC Members noted that the controller was providing an excellent service and had achieved a deconfliction plan when the Tucano pilot agreed to maintain FL80 but by subsequently clearing him en-route he had changed his deconfliction minima from 3nm and 1000ft (co-ordinated ac) to 3nm and 3000ft (intentions of the Mode C transponding aircraft not known). At that stage he was working under the belief, in hindsight mistaken, that the Tucano pilot would affect deconfliction. Whilst this belief may have been based on previous 'normal' military traffic behaviours, he had rendered his original deconfliction plan invalid. Finally, ATC Members were concerned at the lack of avoiding action to the JS41 pilot once the Tucano had flown within deconfliction minima.

In assessing the Cause and Risk, the Board agreed that once the controller had cleared the Tucano pilot en route he no longer had a deconfliction agreement and that he then did not take further action to achieve deconfliction minima, albeit there was limited time available. Despite this, the controller's TI enabled the JS41 pilot to gain visual contact with the Tucano turning L over 2nm away. Given this visual sighting and the separation ranges and altitudes shown on recorded radar, the Board concluded that safety margins were not significantly reduced.

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

Cause: In the absence of an agreement with the Tucano pilot, the controller did not take further action to achieve deconfliction minima.

Degree of Risk: C.