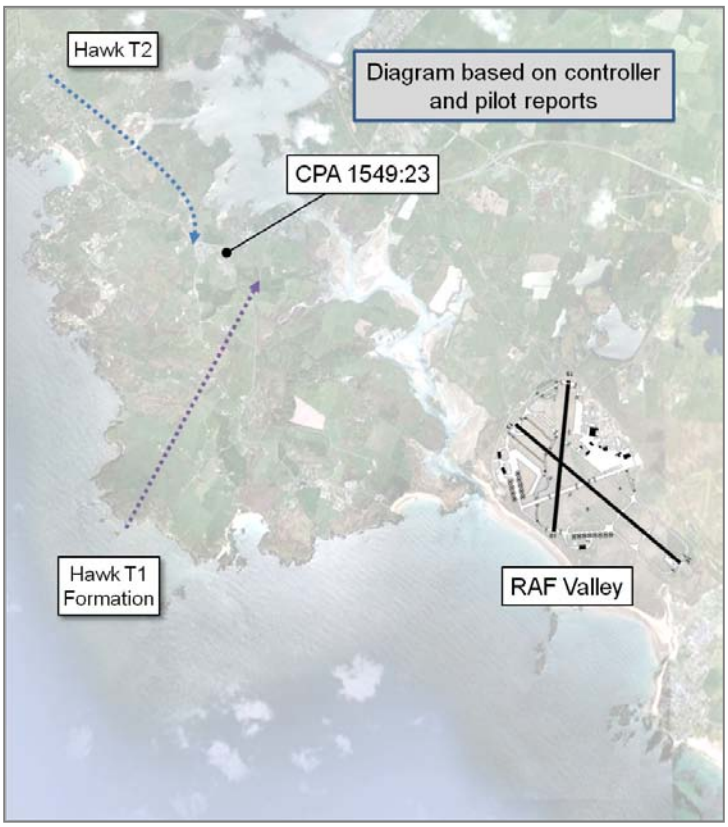
AIRPROX REPORT No 2013015

Date/Time:	18 Mar 2013 1549Z	
Position:	5315N 00432W (RAF Valley MATZ – elev 36ft)	
Airspace:	Valley MATZ	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	Hawk T Mk2	Hawk T Mk1
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	1000ft QFE NR	NR
Weather:	VMC CLBC	VMC CLBC
Visibility:	10km	NR
Reported Separation:	400m	<0.5nm
Recorded Separation:	NK	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T MK2 PILOT reports recovering to RAF Valley RW13 with a 'radar to visual' approach for a visual run-in and break (VRIAB). He was the student and PF, occupying the front seat and operating under VFR in communication with 'Valley ATC' [Valley TWR, 268.625MHz]. The black ac had external lights selected on, as was the SSR transponder with modes A, C and S selected. The ac was fitted with TCAS II. He had been flying towards the A/D from the direction of Holyhead mountain [8nm NW of the A/D] with a 3-ship formation of Hawk T1 ac also positioning for a VRIAB, approaching from the W 'over the bay'. He descended below cloud approximately 5nm from the RWY extended C/L, with a TS from Valley DIR, and when visual with the A/D switched to TWR. No TI had been called whilst on DIR frequency. Before he had an opportunity to transmit, due to busy RT, the TCAS gave a TA. The rear seat instructor saw the Hawk T1 formation at an estimated range of 1.5nm and directed the student pilot to 'look right' for the traffic. When no action was taken the instructor took control and manoeuvred the ac to the R to deconflict.

He assessed the risk of collision as 'Low'.

THE HAWK T MK1 PILOT reports recovering to RAF Valley, leading a 3-ship formation of Hawk T1 ac. He was the instructor, occupying the rear seat, with the student, who was PF, in the front. The black ac was operating under VFR in VMC on TWR frequency with external light selected on. The SSR transponder was also selected on with Modes A and C. The ac was not fitted with an ACAS. He had initially contacted Valley APP to begin a descent to recover to RW13 with a TS. When in sight of the A/D he opted for a visual recovery. TI was called at 3nm and at 2.5nm on traffic conducting a 'straight-in PFL' to RW13, he thought. The formation switched to Valley TWR to request join when approximately 3nm S of the A/D on the reciprocal runway heading. He briefly discussed in-cockpit the requirement not to turn in to initials until sure that the PFL traffic was clear. Approaching initials from the S heading 030°, perpendicular to the RWY, none of the formation members were visual with the 'straight-in PFL' traffic. TWR then reported traffic in the formation's R 2 o'clock, converging. No traffic was seen until the formation number 2 called 'Look Left'. He saw traffic in the L 10 o'clock at a range of approximately ½nm converging and the rear-seat Captain took control. As the converging aircraft was seen breaking R away from the formation, the lead and number 3 remained straight and level and the formation number 2 broke upwards.

He assessed the risk of collision as 'High'.

[UKAB Note(1): The RAF Valley weather was reported as follows:
METAR EGOV 181550Z 04010KT 9999 FEW015 BKN070 06/02 Q0992 BLU NOSIG]

THE RAF VALLEY DIR reports that he vectored the Hawk T2 pilot for a radar-to-initial (RtoI) recovery for RW13. The pilot was given a standard RtoI, to be sequenced behind another Hawk conducting a 'straight-in' PFL (SIPFL). The Hawk T2 pilot was turned on to a heading of 110° at 8½nm and the controller informed TWR of the joining traffic. The Hawk T2 pilot reported visual with the A/D and switched to TWR frequency.

He assessed the severity of the occurrence as 'Low'.

THE RAF VALLEY APP reports that he was screening on APP and controlling the Hawk T1 formation that recovered from the E of Valley for a radar-to-visual approach. The formation was cleared to descend to altitude 4000ft initially, to stay above the climb out lane. As the formation descended through about 5000ft, the leader changed intentions to a visual recovery; he was given own navigation and further descent. When about 4nm SE of Valley, he reported visual and switching to TWR, at which point there were no conflicting tracks.

He assessed the severity of the occurrence as 'Low'.

THE RAF VALLEY ADC reports instructing a U/T controller during what had been a quiet session. At about 1545 a formation of 3 Hawk T1 ac called to join and was given a standard join instruction for RW13 . At this point the visual cct was clear with instrument traffic, a 'straight-in' PFL (SIPFL) at 4nm to touch and go and depart. After the SIPFL ac had departed, a formation was cleared for takeoff with the joining formation still outside initials. Using the Hi-Brite equipment, he observed a track on the deadside of RW13 [S of the A/D], about 9nm out indicating 1200ft, which he believed to be the Hawk T1 formation, and another track about 4nm W tracking NW and also indicating 1200ft. He pointed the W'ly track out to the U/T controller although at that point it was not a factor for the visual cct. The W'ly track then turned R 90° towards initials, as the track believed to be the Hawk T1 formation was about 3nm from initials, on the deadside. TI was passed immediately to the Hawk T1 formation, "[Formation C/S], *traffic believed to be you has traffic right 2 o'clock, 2 miles crossing right-left*", he thought. The number 2 of the Hawk T1 formation then called, "*traffic left climb immediately*, [Formation C/S] *2 is out yo-yo*", he thought. He stated that the formation became visual from the VCR at this point, with the number 2 ac climbing vertically and the other 2 ac turning away to the L. The unknown track appeared to turn away to the R.

He assessed the severity of the occurrence as 'High'.

THE RAF VALLEY SUP reports that he was in position in the ACR. An experienced controller was manning DIR with trainees in position on APP, TWR and PAR. He was monitoring the TWR and PAR frequencies and was aware that TWR was beginning to get busy. He was not directly monitoring DIR frequency but did hear DIR tell the Hawk T2 pilot to continue with TWR when at about 7nm final to RW13. He expected to hear the Hawk T2 pilot call TWR and be informed of the other joining ac. He heard TWR call traffic to the Hawk T1 formation but did not hear the Hawk T2 pilot check-in. At this point, the Hawk T1 formation called visual with the Hawk T2 and took avoiding action.

[UKAB Note(2): The R/T transcriptions are reproduced as follows:

RAF Valley DIR:

Time	From	To	Speech Transcription	Remarks
15:46:13	Hawk T2	DIR	[Hawk T2 C/S] heading 250 level 6000 ft.	
15:46:17	DIR	Hawk T2	[Hawk T2 C/S] roger.	
15:46:19	DIR	Hawk T2	[Hawk T2 C/S] descend to height 3000 ft.	
15:46:20	Hawk T2	DIR	Descend to height 3000 ft, [Hawk T2 C/S].	
15:46:22	Other ac1	DIR	[Other ac1 C/S] level 2000 ft.	
15:46:25	DIR	Other ac1	[Other ac1 C/S] roger.	
15:46:26	PAR	DIR	Talk-down free, contact valley northwest 6 miles squawking 3756.	
15:46:32	DIR	PAR	*Unintelligible* on the procedure, Traffic Service, Straight-in PFL.	
15:46:34	PAR	DIR	Identified Stud 7.	
15:46:36	DIR	Other ac2	[Other ac2 C/S] contact talk-down Stud 7.	
15:46:38	Other ac2	DIR	Stud 7 [Other ac2 C/S].	
15:46:47	DIR	Hawk T2	[Hawk T2 C/S] descend to height 2000 ft.	
15:46:51	Hawk T2	DIR	Descend to height 2000 ft, [Hawk T2 C/S].	
15:46:58	DIR	Other ac1	[Other ac1 C/S] turn right heading 010 degrees.	
15:47:01	Other ac1	DIR	Right 010 degrees, [Other ac1 C/S].	
15:47:12	DIR	Hawk T2	[Hawk T2 C/S] turn right 040 degrees.	
15:47:15	Hawk T2	DIR	Right 040 degrees [Hawk T2 C/S], descending to 2000 ft.	
15:47:45	PAR	ADC	3 miles, [Other ac2 C/S] touch and go.	Radar Clearance
15:47:47	ADC	PAR	[Other ac2 C/S] cleared touch and go, circuit clear, formation joining.	Radar Clearance
15:47:50	DIR	Hawk T2	[Hawk T2 C/S] turn right heading 110 degrees.	
15:47:52	Hawk T2	DIR	Right heading 110 degrees, [Hawk T2 C/S].	
15:47:54	DIR	Hawk T2	[Hawk T2 C/S] descend to height 1200 ft.	
15:47:56	Hawk T2	DIR	Descend 1200 ft.	
15:48:02	DIR	Other ac1	[Other ac1 C/S] turn right heading 040 degrees, cockpit checks report complete.	
15:48:04	Other ac1	DIR	Right 040 degrees, Wilco [Other ac1 C/S].	
15:48:31	DIR	Hawk T2	[Hawk T2 C/S] aerodrome 12 o'clock 7 miles report visual.	
15:48:35	Hawk T2	DIR	Wilco [Hawk T2 C/S].	
15:48:38	Unknown	DIR	*Unintelligible (2 transmissions at once)* field in sight to Tower.	Believed to be Hawk T2
15:48:59	DIR	Hawk T2	[Hawk T2 C/S] roger.	

RAF Valley APP:

From	To	Speech Transcription	Time	Remarks
APP	Form Ldr	[Form C/S] confirm Radar to Initial	15:47:05	
Form Ldr	APP	[Form C/S] negative, happy to visual to Tower	15:47:07	

From	To	Speech Transcription	Time	Remarks
APP	Form Ldr	[Form C/S] own navigation, taking your own terrain clearance, descent approved.	15:47:13	
Form Ldr	APP	Descent approved [Form C/S], [Form C/S] Stud 2 go.	15:47:16	
APP	Form Ldr	[Form C/S]	15:47:19	

RAF Valley ADC:

From	To	Speech Transcription	Time	Remarks
PAR	ADC	6 Miles, [Other ac2 C/S] Straight-in PFL touch and go further.	15:46:59	Radar Clearance
ADC	PAR	[Other ac2 C/S] touch and go further.	15:47:01	Radar Clearance
ADC	All	Hawk, Straight-in PFL turning inbound touch and go further.	15:74:02	
Form Ldr	ADC	[Form check-in], Valley Tower [Form C/S] request join.	15:47:25	
ADC	Form Ldr	[Form C/S], Valley Tower, join RW 13 QFE 990 hectopascals circuit clear, instrument traffic Straight-in PFL 3 miles.	15:47:30	
Form Ldr	ADC	13, 990, copy the instrument traffic, [Form C/S].	15:47:40	
PAR	ADC	3 miles, [Other ac2 C/S] touch and go.	15:47:44	Radar Clearance
ADC	PAR	[Other ac2 C/S] cleared touch and go, circuit clear, formation joining.	15:47:46	Radar Clearance
ADC	All	Hawk 2 and half miles touch and go.	15:47:58	
Helo	ADC	Valley Tower good afternoon, [Helo C/S] ready for vertical departure, request cross 01 undershoot.	15:48:39	
ADC	Helo	[Helo C/S] Valley Tower, clear vertical take-off surface wind 050 10, cross 01 undershoot.	15:48:44	
Helo	ADC	Clear vertical take-off, wind copied, cross 01 undershoot, [Helo C/S].	15:48:49	
Other Form	ADC	[Other Form check-in], Valley Tower [Other Form C/S] ready for departure.	15:48:56	
ADC	Other Form	[Other Form C/S] Valley Tower, cleared for take-off, surface wind 050 10.	15:49:01	
Other Form	ADC	Cleared take-off, [Other Form C/S].	15:49:06	
ADC	Form Ldr	[Form C/S], *unintelligible (2 transmissions at once)* traffic believed to be you has traffic right 1 o'clock 1 mile crossing right to left similar height.	15:49:11	
Unknown	ADC	*Unintelligible*, copied.	15:49:20	
Form Ldr	All	[Form C/S] you tally left.	15:49:21	
Form Ldr	All	*Unintelligible*, climb.	15:49:23	
Form Ldr	ADC	Tower, [Form C/S] we've just, uh been close to *unintelligible* that traffic, it's now broken out.	15:49:28	
Form No2	All	[Form C/S No 2] out, yo-yo.	15:49:35	
Form Ldr	Form No2	Copied.	15:49:38	
SUP	ADC	Sup.	15:49:39	Intercom
ADC	SUP	Come to tower immediately.	15:49:39	Intercom
SUP	ADC	On my way.	15:49:40	Intercom

From	To	Speech Transcription	Time	Remarks
Form Ldr	ADC	[Form C/S] 1 Flt, plus 1 and 3, now positioning behind the Holyhead.	15:49:41	
ADC	Form Ldr	[Form C/S] 1 Flt.	15:49:46	
Hawk T2	ADC	Tower, [Hawk T2 C/S] with you, we've come right, were clear of um [Form C/S].	15:49:48	

]

BM SAFETY POLICY AND ASSURANCE reports that this Airprox occurred at approximately 1549:23 on 18 Mar 13 between a formation of 3 Hawk T1s (Hawk T1 Formation) conducting a visual join and a Hawk T2 conducting a RtoI join; both elements were recovering to RW13 at RAF Valley.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated. Unfortunately, given the height and distance from the NATS radar heads of the occurrence, the Airprox was not recorded on radar; the Hawk T2 and Hawk T1 Formation dropped outside coverage at 1547:32 and 1548:12 respectively.

Analysis

DIR was manned by an experienced controller who described his workload as medium to low and reported that the task was not complex. In addition to the Hawk T2, he was providing an ATS to 2 additional Hawk T2s in the RTC; one conducting a SIPFL ahead of the incident Hawk T2 and one being vectored for a PAR behind the incident Hawk T2. APP was manned by a trainee and an instructor who described their workload as high to medium with moderate task complexity, albeit that the Hawk T1 Formation were the only ac to which APP were providing an ATS. ADC was manned by a trainee and an instructor, who described their workload as medium to low, with moderate task complexity. In addition to the Hawk T1 Formation, the ADC was providing an ATS to a departing Griffin helicopter and sequencing the departure of a formation of Hawk T2s against the Hawk T2 conducting a SIPFL.

The incident sequence commenced at 1547:16 as the Hawk T1 Formation switched from APP frequency to TWR frequency. Subsequent to completing their DASOR, the instructor pilot leading the formation stated that his student, as PF, had effected the frequency change earlier than would be considered common. At this point, the Hawk T1 Formation was 4.5nm ESE of Valley, tracking WSW'ly, indicating descent through 4600ft; Hawk T2 was 11.8nm WNW of Valley, tracking NNW'ly, indicating descent through 3300ft. Figure 1 depicts the positions of the respective ac at this point; SSR 3A 3731 is the Hawk T2, SSR 3A 3732 is the Hawk T1 Formation.

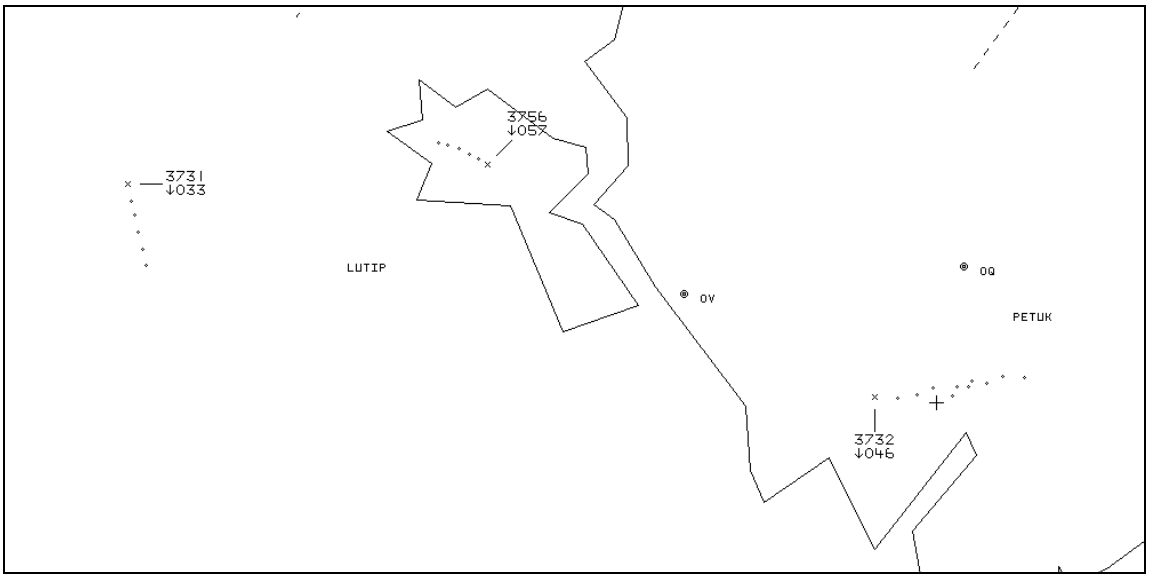


Figure 1: Positions of Hawk T1 Formation and Hawk T2 at 1547:16.

The Hawk T1 formation leader had intended to recover through a RtoI join, which would have required APP to hand the formation to DIR; however, as reported by the formation, a change in the recovery state allowed them to fly a visual join and thus they remained on the APP frequency until visual with the A/D. The ATC Order Book (ATCOB) Pt 3 Order 2 (Orders for the APP Controller) states that 'Once VMC, pilots are to be instructed to contact Tower'. There is no geographical guidance to restrict where the pilot should be instructed to contact TWR. However, subsequent to completing the DASOR, DIR suggested that it was not considered 'good practice' to transfer ac conducting a visual join at the point that the Hawk T1 Formation was transferred. Moreover, the ADC instructor highlighted that the Flying Order Book (FOB) General Orders Part 4 Para 2 states that 'Tower is to be contacted when approx 3 nm from Initial'. Anecdotally, this was introduced as a result of a previous Airprox in the vicinity of the Initial Point (IP) and was designed to ensure that aircrew remained with APP or DIR as long as possible to facilitate the provision of TI and deconfliction by ATC. In this instance, by not specifying geographical guidance for the point of transfer from radar to TWR, the ATCOB does not appear to support the intent behind the instruction within the FOB. Supported by an analysis of the R/T and landline transcript, the unit determined that no liaison occurred between APP and DIR, nor SUP and DIR to advise DIR of the intentions of the Hawk T1 formation. This lack of liaison played an important role in the development of DIR's SA.

At 1547:25, the Hawk T1 formation leader called TWR to request join, which was approved; the airfield details were passed and they were advised, "*circuit clear, instrument traffic straight-in P-F-L 3 miles*" [unrelated to the incident, SSR3A 3756 in Figure 1] which was acknowledged. At this point, the Hawk T1 Formation were 4nm SE of Valley, tracking WSW'ly, indicating 4600ft, maintaining the SSR3A code previously assigned by APP; the Hawk T2 was 12.1nm WNW of Valley, tracking NNW'ly, indicating descent through 3000ft.

Subsequent to completing his DASOR, DIR related that his perception of the Hawk T1 Formation's maintenance of the SSR3A code assigned by APP was that the formation would shortly be handed to him to conduct a RtoI approach. DIR's expectation being that, if the formation had been transferred to TWR, then they would have been squawking the visual cct SSR3A code. For DIR, this view was reinforced by the fact that no liaison had been conducted by either the SUP or APP to confirm the intentions of the Hawk T1 Formation leader; in effect, liaison would have meant that the ac would have switched to TWR, no liaison would mean that the ac would be handed over when APP was ready. The ATCOB Part 3 Order 2 states that an ac conducting a 'visual recovery is to maintain its Squawk until in the Visual Circuit, where it will squawk 3737'. However, there is a nuanced difference to this rule within the FOB General Orders Part 4 Para 3, which states that 'ac joining the visual circuit to land are to maintain their recovery squawk into the circuit. Ac joining to practice multiple visual circuits are to change their squawk to 3737 at the first opportunity'. The FOB does not define whether the 'first opportunity' to change the squawk should be taken inside or outside the visual cct. Whilst DIR was under a mis-apprehension that ac already transferred to TWR would be squawking SSR3A 3737, this error in knowledge was neither causal nor contributory to the Airprox. The key element was that the Hawk Formation leader's maintenance of the SSR3A code assigned by APP, coupled with the formation's position outside the visual cct and tracking away, reinforced DIR's belief that the formation would be handed over by APP.

At 1547:32, the Hawk T2 passed outside NATS radar coverage and then, at 1547:50 the pilot was instructed by DIR to, "*turn right heading 1-1-0 degrees*", towards the IP. At this point, the Hawk T1 Formation was 2.8nm S of Valley, tracking WSW'ly, indicating descent through 3600ft; through extrapolation of the radar data, the Hawk T2 was approximately 11.8nm WNW of Valley. At 1547:55 the Hawk T1 Formation, 2.9nm SSW of Valley, adopted a WNW'ly track, indicating descent through 3300ft. At 1548:12, 2.6nm SW of Valley, the Hawk T1 Formation passed outside NATS radar coverage, indicating descent through 2700ft.

Given that both the Hawk T1 Formation and the Hawk T2 had passed outside NATS radar coverage, the developing air picture was re-created based on extrapolation of the available radar data, the ADCs DASOR and conversation with both the ADC instructor and the DIR. The ADC reported that 'using the Hi-Brite equipment' he observed 'a track lined up on the deadside of RW13 at

approximately 9 miles, indicating 1200ft, and another track approx 4 miles W of Valley, tracking NW also indicating 1200ft'.

At 1548:31, DIR advised the Hawk T2 pilot, "*aerodrome 12 o'clock, 7 miles, report visual*" which was immediately acknowledged by the pilot, who then advised at 1548:38, "*field in sight to tower*", which was acknowledged by DIR. Extrapolation of the available radar data suggests that DIR advised the Hawk T2 pilot of the location of the aerodrome at approximately 8.5nm from Valley. Although DIR could not recall the SSR Mode C of the Hawk T1 Formation, he could recall the incident geometry at the point at which he acknowledged the Hawk T2 transferring to TWR frequency. DIR stated that at this point, the Hawk T1 Formation were approximately 4 to 4.5nm WSW of Valley, on a NW'ly track that would have seen them pass behind the Hawk T2 and that he did not consider there to be a requirement to pass TI, in accordance with the guidance laid out in CAP774. This perception was echoed by the ADC who stated that, when he observed the geometry initially on the Hi-Brite display, the Hawk T1 Formation were on a track that would pass behind the Hawk T2.

At 1549:11, the ADC attempted to warn the Hawk T1 Formation about the proximity of the Hawk T2, advising, "*traffic believed to be you has traffic right 1 o'clock, 1 mile, crossing right to left, similar height*". The ADC subsequently stated that this warning was precipitated by seeing the track that had been 'approximately 4 miles W of Valley, tracking NW' turn R approximately 90° towards the IP. Moreover, DIR related that this turn occurred after the Hawk T2 pilot had left the frequency and that, whilst he observed this turn on radar, insufficient time remained for him to pass a warning to the ADC. Subsequent analysis has determined that the ADC passed a warning based on an incorrect perception that the Hawk T1 formation was the radar contact that had been observed 'lined up on the deadside of RW13 at approx 9nm'; this perception was based on a number of factors, most of which were outside the ADC's control.

The ADC did not receive a 'warn-in' of the Hawk T2 from DIR in accordance with local orders. These require DIR 'to make a "2 minutes" call to TWR with the ac callsign on the Radar Clearance Line when the ac is 10 nm from the airfield; TWR will respond with the cct state or a hold off instruction'. Whilst DIR did attempt to comply with the rule, subsequent to completing the DASOR he related that the timing of the call coincided exactly with an un-related call by the PAR controller gaining a final clearance for the ac conducting a SIPFL, ahead of the Hawk T2. Having heard the ADC's response to the PAR controller, which included the visual cct state, DIR was content that the liaison had been effected; however, the ADC had not heard DIR's call. Moreover, even if DIR's liaison had been effective, given the content of the liaison as mandated by the ATCOB, it would not have assisted the ADC in positively identifying one or other of the incident ac; it would only have alerted them to the fact that there was more than one speaking unit conducting a visual join. This effect was accentuated by the fact that local orders do not require ac conducting visual recoveries to be 'warned-in' to TWR. Finally, DF is not available on the Hi-Brite display and thus the ADC was unable to correlate an ac's transmission with a surveillance radar return. Consequently, the ADC's mental picture was constructed from the fact that the only callsign on frequency that was known to be conducting a visual join was the Hawk T1 Formation. The information on the Hi-Brite display that best fitted this mental picture was that the ac approaching the IP on deadside was the Hawk T1 Formation. This perception was reinforced by the fact that the Hawk T2 had been unable to establish 2-way R/T with the ADC due to other, un-related, visual cct traffic.

The Hawk T1 Formation leader reported that, following the warning from TWR, 'no traffic was seen until [Formation C/S] 2 called "look left"'. The Hawk T2 was then visually acquired by the reporter at 'approximately ½nm and converging' and action was taken to break the conflict. The leader of the Hawk T1 Formation reported that he had discussed in 'cockpit about not turning in to initials until sure that the [Straight In] PFL traffic was clear. Approaching initials from the S, perpendicular to the RWY, none of [Hawk T1 Formation C/S] were visual with the [Straight In] PFL traffic'. Subsequent conversation with the formation leader confirmed that the formation had adopted a N'ly track towards the IP and that the formation leader's lookout was focussed towards the A/D.

The Hawk T2 instructor reported that he observed the Hawk T1 Formation 'at range' [approx 1.5nm] and directed the student pilot to "look right" for the traffic. When no action was taken the instructor

took control and manoeuvred the ac to the R to deconflict. The CPA occurred at approximately 1549:23; due to R/T congestion, the Hawk T2 pilot was unable to call TWR to request a join until 1549:48.

Turning first to the ADC's role in the Airprox, based upon the available information, his perception of the identity of the Hawk T1 Formation was understandable. Moreover, use of the Hi-Brite display to enhance SA was laudable, as was the attempt to pass a traffic warning to the Hawk T1 Formation; unfortunately, due to the faulty mental model of the situation, the warning probably served to slightly delay the Hawk T1 Formation's visual acquisition of the Hawk T2. From DIR's perspective, and based upon his and the ADC's description of the building geometry prior to the transfer of the Hawk T2 pilot to TWR, his decision not to pass TI to the Hawk T2 was understandable. That said, given the location of the Hawk T1 Formation relative to the Hawk T2, and whilst cognisant that APP was a trainee and that DIR, as an experienced controller, may have been giving APP the opportunity to act for themselves, with hindsight a better course of action would have been for DIR to challenge APP on the intentions of the Hawk T1 Formation. It would then have become apparent that APP was no longer 'working' the formation and have prompted DIR to pass TI to the Hawk T2. Moreover, whilst the timing of DIR's warning to TWR was unfortunate, the lapse in determining that the liaison had been effective directly contributed to the ADC's reduced SA. Finally, from APP's perspective, whilst the guidance within the ATCOB regarding the timing of the transfer of ac conducting visual joins to TWR is at variance both with the FOB and with what DIR considered to be 'good practice', the decision to release the Hawk T1 Formation to TWR was, again, in the circumstances understandable. Whilst BM SPA is cognisant that Valley is a busy unit, with the consequent requirement to minimise R/T and landline liaison, a better solution may have been for APP to have contacted TWR to 'point-out' the Hawk T1 Formation, warning that it had left APP's frequency early.

This Airprox resulted from a sequence of unconnected events, associated with a number of systemic issues, which breached the ATM related safety barriers and caused a conflict in the vicinity of the IP. The procedures within the FOB for ac recovering through the IP rely on 'see and avoid' and, in this instance, that final safety barrier did not operate until a relatively late stage in the incident sequence. The crux of the matter, from an ATM perspective, was the lack of liaison that occurred between individuals within the ACR and between the ACR and TWR.

Recommendations

BM SPA has recommended to Stn Cdr RAF Valley that he consider:

a. Initiating a review of the FOB and ATCOB to ensure that the documents fully complement each other; specifically that the differences between ATCOB Pt 3 Order 2 and FOB General Orders Part 4 Paras 2 and 3 are addressed.

b. Directing a review of the requirements within the ATCOB to 'warn-in' traffic to TWR that are conducting Radar-to-Visual and Visual recoveries.

The ADC related that the SSR Code allocation for RAF Valley used to be sufficient to enable their controllers to differentiate between ac in receipt of an ATS from each control position; however, a recent change mandating the provision of a surveillance based ATS to Valley-based ac has meant that more ac are in receipt of an ATS at any one time. This has had a 2nd order effect in that the controllers have been required to pool the unit's SSR 3A code allocation and thus have lost the situational awareness afforded by control position specific SSR codes. BM SPA has also recommended to Stn Cdr RAF Valley that he consider initiating a review of SSR Code allocation procedures; specifically those used to differentiate IFR and VFR traffic and the timing of SSR code changes with regards to ac conducting visual recoveries.

Observations

BM SPA is aware that many ATM units utilise the Radar Clearance Line (RCL) for some routine liaison calls, in addition to obtaining radar clearances. In this instance, the simultaneous use of the

RCL by PAR and DIR contributed to the incident in that the ADC did not receive notification on the Hawk T2. MMATM Chapter 24 Para 33, supporting RA 3024 (1), (2) and (3), makes reference to the PAR controller utilising the RCL to obtain radar clearances but does not specify the operational uses of the RCL. BM SPA has recommended to the MAA that they consider specifying the operational uses of the RCL.

HQ AIR (TRG) comments that this incident has been thoroughly investigated and steps have been taken to resolve some discrepancies. It highlights the potential for errors and mistakes that prevent any system of safety defences being 100% effective. However, it also emphasises the importance of the final but generally most significant safety barrier, namely lookout, and it is reassuring to note that both parties saw each other in sufficient time to react. The report is a demonstration of an excellent reporting culture and the investigation and lessons learnt exemplify the benefits that this culture brings.

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 authorities.

The Board first considered the two significant factors involved in this incident, which a military pilot Member noted were; the Hawk T1 formation leader switching to TWR earlier than would normally be expected and the ADC mis-ID of joining traffic and subsequent incorrect TI call. However, whilst the situation was not ideal, the 'see and avoid' principle had functioned correctly, no doubt with the assistance of TCAS in the Hawk T2 cockpit.

Turning to controller aspects of the incident, the incident had highlighted a lack of effective teamwork across controller positions. Civilian controllers opined that organisational aspects effectively resulted in the SUP being a 'single point of failure' within the system and that this would have been mitigated by improved teamwork between ATC positions. The military controller Adviser agreed that lack of effective liaison had played an important role in this incident and further noted that the change to the Flying Order Book mandating a TS for Valley traffic had removed ATC position-allocated squawk codes and hence the barrier of other controllers being able to detect pilots' intentions. A military ATC Member stated that training reviews had resulted in an increased emphasis on team-working within RAF ATCO training. He also noted that APP had used channel intercom to ADC, as opposed to a dedicated phone line, and that this could result in a lack of formality in the exchange of information with a consequent erosion in the quality of information exchanged. The CAA SRG Advisor noted that aspects of this Airprox correlated with civilian Airprox in the cct and that the overriding consideration was to pass TI as appropriate to traffic at the time.

Although the ADC had used his Hi-Brite display, in the absence of adequate information from APP or DIR about the ac joining, his SA was incorrect and the TI he provided was misleading. Since neither Hawk T2 nor Hawk T1 flight received useful information from ATC to assist with their responsibility to see and avoid other traffic, the Board concluded that, overall, ATC barriers had been ineffective. Conversely, and notwithstanding the late sighting of Hawk T2 by the T1 formation, aircrew barriers had been effective with the notable contribution of the Hawk T2 TCAS. The Board considered that the Hawk T2 instructor had seen the Hawk T1 formation with time to allow his student the opportunity to react. When this did not occur he took control and took effective action to avoid a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In the absence of TI, a conflict resolved by the Hawk T2 instructor.

Degree of Risk: C.

ERC Score: 2.