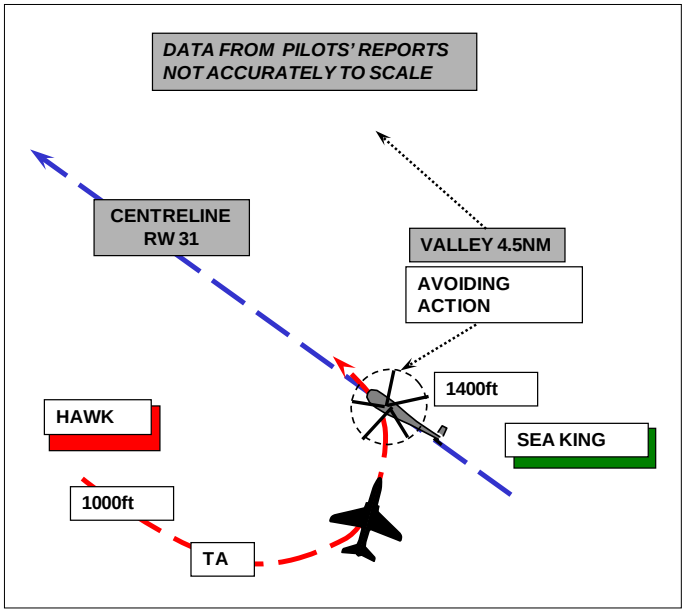
AIRPROX REPORT No 2012015

Date/Time:	15 Feb 2012 1304Z	
Position:	5311N 00427W (5nm SE Valley - elev 36ft)	
Airspace:	Valley MATZ	(*Class: G*)
	Reporting Ac	*Reported Ac*
Type:	Sea King	Hawk T Mk2
Operator:	HQ JHC	HQ Air (Trg)
Alt/FL:	1200ft QFE (1029hPa)	1000ft QFE (1029hPa)
Weather:	VMC CLBC	VMC CLBC
Visibility:	30km	20km



Reported Separation:

200ft V/0 H 400ft V/ 0 H

Recorded Separation:

400ft V/0 H (from Hawk Mission recording system)

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SEA KING PILOT reports flying a yellow helicopter under RC, he thought, from Valley, squawking with Mode C, but TCAS was not fitted. The ac was being flown from the RHS by a pilot wearing an IF visor. While at 1200ft QFE on a PAR to RW31, heading 318° at 90kt, ATC directed them to climb immediately, which they did, due to traffic approaching from their 6 o'clock at 1nm. Immediately after receiving the instruction a Hawk T2 appeared from underneath their ac, on the same heading & with an estimated vertical separation of 200ft. The Hawk continued straight & level towards Valley.

He assessed the risk as being medium.

THE HAWK TMk2 PILOT reports that he was carrying out an end-of-course check for a student QFI and had launched as a pair from RAF Valley to carry out Basic Fighter Manoeuvres prior to splitting for individual GH. Having rejoined via a straight in PFL, the trainee instructor (who was the handling pilot in the rear seat) was instructed to transit to 'initial' to carry out visual cct teaching on RW31 RH.

At 1301:46 the pilot was cleared to join the cct by the ADC. The ADC informed the Hawk crew that there was instrument traffic at 7nm and the trainee QFI (HP) replied that he was "*looking for that traffic*". The student QFI turned left and levelled at 1000ft to transit to initial. Since Mona was active and operating on RW04, this was an appropriate height to arrive at initial. Current practice is to turn left outbound to initial when operating on RW31. At 1302:47 another joining ac was instructed that there was one joining and instrument traffic at 5½ miles. The trainee QFI stated to the front seat occupant that he was *"just going to look for that traffic".* At 1302:57 the trainee QFI confirmed that he was visual with the pair joining and asked the front seat occupant to confirm that he was also visual and he confirmed that he was.

During the left hand downwind flight to initial, the student QFI discussed the parameters required both for the join and for the cct and both front and rear cockpit pilots gained visual contact with the helicopter 5nm away while downwind. The trainee QFI initiated the left turn to initial with the intention

of passing below and laterally displaced to the right of the instrument traffic. At 1303:39 the TCAS, which was selected to TA, gave a 'Traffic,Traffic' alert to indicate that there was potentially conflicting traffic at 2nm. Without adjustment to the flight profile while heading 310° at 350kt, the front and rear seat occupants both confirmed that they were visual with the helicopter. TCAS indicated the traffic to be 500ft above, confirming their agreed visual assessment. At 1303:57 the rear seat handling pilot confirmed his intention to 'stay below him', both pilots confirming again that they were 'visual'.

At 1304:08 the trainee QFI called 'initials' and he was informed again by the ADC that there was instrument traffic at 4nm, to which he replied that he was 'visual'. The trainee QFI's visual assessment of a 500ft separation was approximately correct and the TCAS showed 400ft vertical separation as the Hawk transited below the helicopter.

During the de-brief it was stated that whilst vertical separation alone is safe, more lateral separation would have been preferable to ensure there was no misunderstanding of the Hawk's intentions or flightpath from ATC or by the helicopter crew.

They assessed the risk as low.

This report of events is taken from the Hawk TMk2 mission replay facility, which allows precise and complete review of the entire sortie, displaying HUD imagery, audio (from both cockpits and externally) as well as GPS position, TCAS and all front and rear cockpit multi function displays. The sortie record has been retained and is available for review.

THE VALLEY TALKDOWN CONTROLLER reports that he was the Talkdown controller for the PAR of a Sea King. Around 4 miles he saw an ac return appear on both azimuth and glidepath, in the Sea King's 9 o'clock turning towards the centreline. The speed of the return, heading and height, was sufficient for him to assess there was a risk of collision and he therefore initiated an avoiding action instruction to climb with TI. Following the climb the Sea King captain reported visual with the ac passing directly underneath and that he was to file an Airprox report. Once the confliction had been resolved he continued the talkdown without further issue.

THE VALLEY ATC SUPERVISOR reports that his comments are were written after analysis of the tape transcripts of the ADC and PAR frequencies and from speaking to the controllers involved.

The Sea King pilot reported that an Airprox occurred with a Hawk TMk2 while a Hawk TMk1 formation was also joining the cct.

[UKAB Note (1): Points covered in the BM SM report have been edited for brevity.]

At 1303:59 PAR issued an avoiding action climb to the Sea King due to an ac believed to be on a collision course; this would appear to have been the Hawk TMk2 re-joining through initials. The Airprox appears to occur between 1303:59 (the avoiding action) and 1304:06 (Sea King pilot stating that the ac had under-flown him). The avoiding action instruction is, *"climb to height 1000ft";* at this range from touchdown on PAR (4nm ish) the ac would have been at around 1200ft on a 3° glidepath, so it would not be possible to achieve this avoiding action; however, the instruction to climb was very clear and this error did not in contribute to the Airprox. The Sea King pilot does not address this issue in his report, stating that an avoiding action climb was given and he infers that he was underflown immediately after the climb was given.

The actions of the PAR controller, height error accepted, are consistent with the normal actions expected when a controller assesses a collision risk on PAR. PAR lateral coverage is limited at 4nm from touchdown and any fast-jet ac positioning from the visual cct to initials will appear very late and very fast on the PAR screen. Given that the controller must assess rate of closure, heading, and height, it is not surprising that the avoiding action was a last-minute measure. But again, the avoiding action offered is not a contributory factor. It is assessed that ATC carried out the correct actions and ensured that all ac were made aware of the locations and intentions of all other ac; this is supported by the tape transcripts.

This Airprox appears to have been caused when the Hawk TMk2 underflew the Sea King which was conducting a PAR. The Hawk had been informed about rotary instrument traffic both directly by the ADC and again by hearing the information being passed to the Hawk formation on the same frequency. It is the responsibility of ac joining through initials to avoid PAR traffic by a safe margin; ATC assist in this process by passing TI on instrument traffic - this was done in this case.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Sea King operating IFR conducting a PAR GCA in receipt of a TS from Valley Talkdown (TD) and a Hawk TMk2 operating VFR in the visual cct area at Valley.

Given the range of RAF Valley from NATS radar heads and the height at which the Airprox occurred, no radar replay was available to inform the investigation.

The ADC reported his workload was medium, with low task difficulty. TD reported their workload as medium to low, with average task complexity. The incident sequence commenced at 1300:52, with Valley operating to RW31 RH, as the ADC made the '8-mile' broadcast on the TWR freq. At this point, the Hawk TMk2 was ahead of the Sea King conducting a straight-in PFL, monitored on SRE.

At 1301:44 the Hawk called TWR to join, stating that they were, "*turning left downwind to initials*." The ADC instructed the Hawk to, "*join runway three-one right hand, Q-F-E one-zero-two-nine, circuit clear, there is rotary instrument traffic* (the Sea King) *at seven miles*." The Hawk replied that they were, "*looking for that traffic*." The Initial Point for RW31 RH is 4nm from the aerodrome on the extended centreline.

At 1301:58, the ADC broadcast on the radar clearance line to TD, "*one out over the bay to initials*" referring to the incident Hawk routeing to initials. Immediately, TD re-broadcast on the radar clearance line and on freq to the Sea King, "*one wide downwind to initials*". Following Airprox 2011123 at RAF Valley, the FOB was amended so that turns out from the visual cct for initials were to be conducted on the deadside; therefore, the Hawk would not have flown, "*wide downwind to initials"* as stated by TD but, *"out over the bay*" as stated by the ADC.

At 1302:14, TD informed the Sea King of an unrelated pair of Hawks [TMk1s] joining for a visual recovery "*passing down your left hand side, visual with yourself*." At 1302:45 this unrelated formation called TWR, were given clearance to join and informed of the, *"one joining* (the reported Hawk), *rotary instrument traffic at five and a half miles*." The unrelated formation reported visual with both the reported Hawk (TMk2) and the Sea King. Simultaneously, TD passed TI to the Sea King on the unrelated formation as, "*traffic left nine o'clock, two miles, indicating slightly below*."

At 1303:48 the unrelated formation reported initials and the ADC re-stated the position of the Sea King and passed the surface wind. At 1303:59, 5sec after the Sea King passed through 4.5nm from touchdown, TD issued avoiding action to the Sea King, instructing them to, "*climb to height one thousand feet immediately, traffic was six o'clock, one mile*." The Sea King replied, "*it's okay, visual, he went underneath us*". Simultaneously, the Hawk had called initials on the TWR freq and was advised that there was, "*one deadside, instrument traffic four miles, wind three-two-zero twelve knots*." This was acknowledged by the Hawk, reporting that they were, "*visual with that traffic*." The Hawk crew has subsequently reported that they were visual throughout the incident sequence and under-flew the Sea King, assessing that the 500ft vertical separation was sufficient. With hindsight, during the de-brief, the Hawk crew acknowledged that "whilst vertical separation alone is safe, more lateral separation would have been preferable to ensure that there was no misunderstanding of their intentions".

The MMATM Chapter 29 Para 23 states:

> "Provided that the aircraft return and Data Block can be clearly seen, lower range scales can be selected as soon as the aircraft reaches the relevant range from touchdown (i.e. …at 5 nm, the 5 nm range can be selected). If the PAR controller observes another radar contact, whose

position and/or track is likely to affect the PAR close to the point where the range would normally be reduced, then the range change **should** be delayed until the controller is satisfied that he can monitor the situation on the lower range setting."

Aircrew human factors appear to have been the causal factor in this Airprox event; however, some of the ATM aspects do warrant further analysis. In terms of the ADC's actions, BM SM contends that, the TI given to the Hawk on its initial join and TI given on the freq to the unrelated Hawk formation, sufficient information was provided to the Hawk on the Sea King. Further specific TI would have been nugatory and would arguably not have changed the Hawk's flight profile and thus the incident outcome.

In terms of TD's broadcast to the Sea King referring to the Hawk routeing to initials, it is possible that this created an incorrect mental image of the situation for the Sea King crew. However, given that they were flying a GCA and that TD could not have affected the Hawk's flight profile, this would not have affected the outcome of the occurrence and, therefore, is neither causal nor contributory.

In terms of TD's actions, and as SATCO Valley has pointed out, given the 5nm range scale at which they were operating the PAR, TD was faced with having to make a rapid assessment of the rate of closure, heading and height of the 2 ac. It is to TD's credit that the assessment of the requirement for avoiding action and the principle of issuing a climb for avoiding action was sound; however, given that the Sea King was approaching 1200ft QFE at the time, the instruction could have been interpreted as either a descent to 1000ft QFE, or an immediate climb. In the event, the Sea King crew did not have time to action TD's instruction and the instruction was not a factor in this incident. However, this incident is a reminder to all PAR controllers to maintain situational awareness of where their ac are in 3 dimensions and to consider what their actions might be at any stage in a GCA when faced with similar circumstances.

BM SM will highlight the findings of this investigation to all military ATCOs.

HQ AIR (TRG) comments that the Hawk crew flew sufficiently close to the Sea King to cause them and the controller concern. Whilst it was not noted in their report, the Hawk crew complied with the requirement to route through initials (left of centreline) but observed the Sea King further to their left. Their options were then to err closer to the centreline and the liveside or to route further to the left. The first option would reduce separation from cct traffic and both options would have resulted in the Hawk crossing the PAR controller's display. The offset of the PAR approach might also be considered to be contributory. In the event, the Hawk crew were visual with the Sea King throughout and there was no risk of collision. The fact that they were visual was not communicated in a timely enough fashion to the PAR controller and the Sea King crew to allay their eventual concern. However, the situation was made more likely by the potential conflict in approach directions between the PAR and the visual initial point. Whilst there is also no generally accepted principle regarding visual joiners avoiding instrument traffic by deconflicting laterally to the deadside, doing so at an early stage in this case would have prevented the underflight and the resultant concern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There was some discussion regarding the alignment of the RW31 PAR and the position of the IP. It was established that the PAR is not offset [formally], although a pilot with local knowledge opined that traffic that indicates on the C/L to the PAR controller is often slightly left of the C/L. Further, the RAF Valley FOB promulgates the IP for RW 31 as being at a point 3.8nm (from touchdown) on the C/L (Bearing 130.24°T). Further it states:

'a. **Instrument Traffic**. Instrument traffic has priority over traffic joining visually. Aircrew are to ensure that all instrument traffic is afforded safe separation either by visually acquiring it or by procedurally avoiding its reported height and/or position. Aircrew are to be aware of how the Tacan final approaches converge with and cross the visual recovery lanes. PAR and SRA traffic are to be anticipated to be positioned closer to the runway centreline.'

Members noted that the Hawk crew had been visual with the Sea King throughout and had avoided it in compliance with the instruction above. Members agreed however that the PAR Controller, on seeing an unknown return approaching the Sea King took the correct action by instructing it to climb, albeit with an instruction that was not totally clear. Had the Hawk crew avoided the Sea King by a reasonable lateral margin as well as vertically, or the talkdown controller been informed by the ADC that the Hawk was visual with the Sea King, he would probably have not been concerned. Members agreed that it is good practice to overtake on the right and not to under-fly other ac, although in this case proximity to Mona may have precluded this.

No radar information was available but Members accepted that the separation provided by the Hawk crew from their Mission Recording System to be accurate.

Members agreed unanimously that the Hawk crew had complied with the RAF Valley FOB but might have anticipated that they would cause the PAR Controller concern.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: By flying underneath the Sea King on a PAR approach, the Hawk crew caused its crew and the Talkdown Controller concern.

Degree of Risk: E.