

**AIRPROX REPORT No 2011129**

Date/Time: 26 Sep 2011 1007Z

Position: 5141N 00058W  
(6nm NE Benson)

Airspace: Benson MATZ (Class: G)  
Reporting Ac Reported Ac

Type: Merlin Puma

Operator: HQ JHC HQ JHC

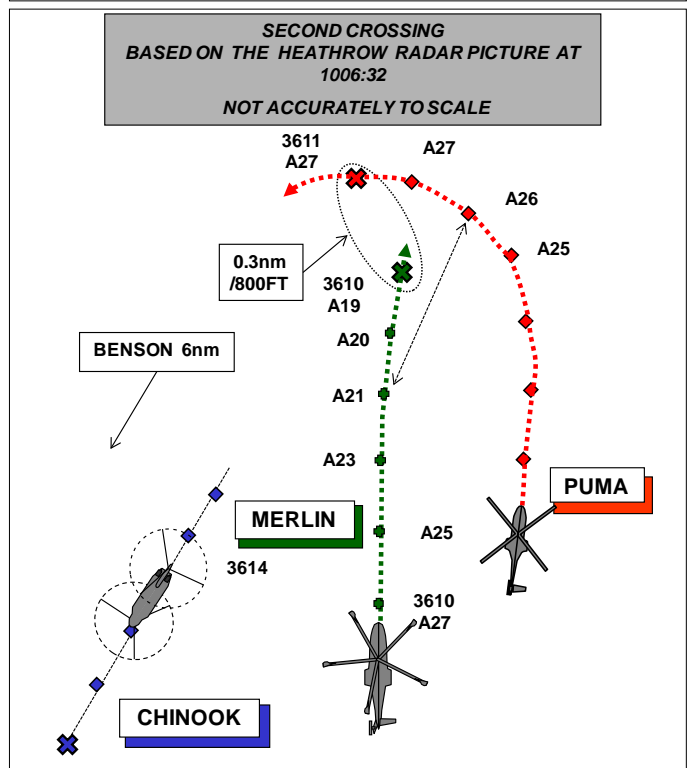
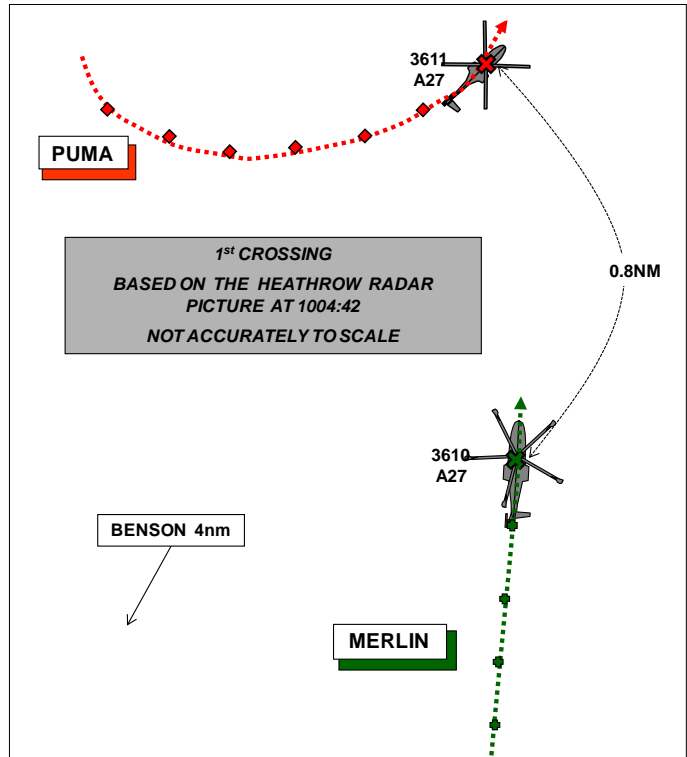
Alt/FL: 2500ft 2500ft  
QFE (1012mb) QFE (1012mb)

Weather: IMC CLBL IMC CLBL

Visibility: 1km 10km

Reported Separation:  
NK NK V/ 0.5nm H

Recorded Separation:  
800ft V / 0.3nm H



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

THE MERLIN PILOT reports that they were conducting a local Procedural IF sortie for a Merlin Re-role Course, squawking as directed with Modes C and S but ACAS was not fitted. Having completed a S'ly SID to CPT, the ac was repositioned to conduct the 'Copter TAC RW19' with holding at the IAF. Although IMC conditions prevailed, there were gaps in the Cumulus cloud formations that made occasional visual identification of 'ATC called' traffic possible. The ac was in receipt of a TS and it was evident that the instrument traffic density markedly increased during this period. The crew were aware that a Puma was conducting a VOR to ILS/DME RW19 profile [ahead] and a visiting Chinook had also joined the procedural pattern for an ILS [also ahead].

Following completion of the training holds at 3500ft QFE, ATC clearance was given to track outbound for the procedure. law the TAP, the ac was flown outbound on 006° (at 120kt) and descended to maintain the outbound height of 2500ft QFE. ATC communications between all previously mentioned ac became busier but it was perceived that the Chinook was holding at 3500ft QFE in the vicinity of the IAF for the ILS approach; visual contact with this traffic was established for a short period.

Of greater concern was the Puma which was known to be holding at 2500ft QFE at the IAF for the ILS. All crewmembers were looking out to try to obtain visual contact when not in cloud and when

ATC provided information on the location of the Puma. Visual contact was then established with the Puma in the 1 o'clock at a similar level and at a range of about 800m. At that point, the Puma was directed to complete another hold. On realising that this would be to the L and across the flightpath of the Merlin, the crew decided to descend since the now 'stationary' position of the Puma in the windscreen indicated a collision course. In addition, the flight path of both ac would have shortly taken each into the same cloud. ATC directed the Merlin to descend to 2000ft QFE but the Captain elected to continue a descent to 1600ft QFE to remain VMC and remove all doubt regarding the orientation of the ac as they converged laterally. They then lost sight of the Puma as it entered cloud.

He reported the incident to ATC and informed them that it would be discussed on the ground on completion of the sortie; the flight was continued without further incident. He assessed the risk of collision as being high.

**THE PUMA PILOT** reports flying a training flight in receipt of a TS from Benson APP, squawking as directed with Modes C and S; ACAS was not fitted. They were tracking 320° at 120kt and on turning to enter the hold at the IAF for the Benson VOR-ILS RW19 at 2500ft QFE, the NHP in the LHS saw a Merlin in their 9 o'clock on a similar track to the inbound for the hold and at the same level. The NHP then called for a descent to ensure separation from the Merlin whilst maintaining VMC (maintaining height or climbing would have put the Puma in IMC) so they rolled wings level and descended. The Merlin was visual with them and also took avoiding action and reported the incident on the RT.

Both ac were under a TS at the time and the Merlin was instructed to descend to 2000ft QFE but only after avoiding action was deemed necessary by the pilots of both ac.

After re-establishing at 2500ft QFE in the hold and continuing with the procedure the ac was recovered to RAF Benson without further incident. He assessed the risk as being medium.

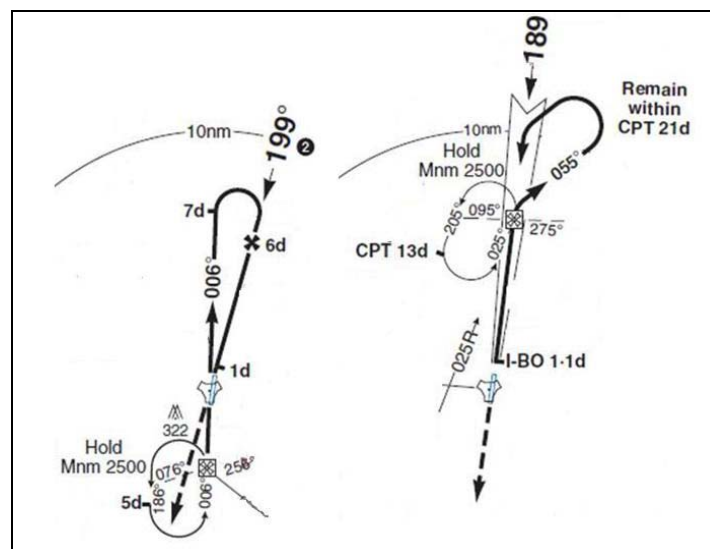


Figure 1: RAF Benson COPTAC (left) and VOR ILS/DME Procedure (right) RW19.

**THE RAF BENSON CONTROLLER (DIR)** reports that she was screening a UT DIR when the incident developed. They had a Merlin in the TAC Hold at 3500ft S of Benson 3-4nm, a Puma in the ILS Hold at 2500ft NW Benson 2-3nm, an AAC Squirrel in the normal RTC and a VHF police helicopter joining from the E for a radar vectored ILS when they were handed a Chinook from the S also for the ILS Hold. At that point the UT controller was beyond his capacity and she (the screen) stepped in just prior to the Merlin approaching the IAF for the procedure.

As there were two talkdown controllers she cleared the Merlin for the procedure at the same time as she turned the police helicopter inbound for the localiser. She then instructed the Merlin pilot not to descend until advised as the Chinook was then in the ILS hold (which is to the NW of Benson) at 3000ft. As the Merlin tracked through the O/H the controller called the Chinook to the Merlin and instructed the pilot to report visual. When the Merlin called visual, she instructed the pilot to descend on the procedure as required. The controller then called the Puma to the Chinook and vice versa as they were both in the ILS hold at 2500ft and 3000ft respectively but she did not think the Puma would be a factor to the Merlin on the TAC approach as they were heading away from each other at that time.

There was then an information code change with new weather which changed the QFE so she did an all-stations broadcast and obtained readbacks from all 4 ac. She then tried to get up to date with some basic admin as she was still sitting off-centre to the radar screen and the UT controller was still in position and managing all her logging. She saw that the Puma and Merlin were then in conflict and immediately called the Puma to the Merlin as it was in its 12 o'clock at 1nm. She had mistakenly believed that the TAC procedure would take the Merlin to the E of the inbound lane. Her mistake then became apparent; she had confused the TAC procedure with the ILS procedure, the ILS goes outbound heading 055° and the TAC goes outbound on a 006° heading.

The Merlin called visual and shortly afterwards asked for further descent as they would shortly be going IMC on the procedure, so she gave a descent to 2000ft since the Puma was maintaining 2500ft in the Hold. During this time a 7000 squawk contact popped up about 8nm NW of Benson tracking SE, which she called to the Merlin. As the Merlin was turning inbound for the FAF she noted its Mode C reading 014, she asked its height which was reported at 1400ft and the pilot said he had elected to descend further to gain separation against the Puma. When the controller told him that 2000ft would have been enough as the Puma was maintaining 2500ft, the pilot said he had seen a potential risk of collision and added that he would phone to discuss the situation after landing. In descending to 1400ft, the Merlin pilot placed himself into conflict against the previous 7000 squawk which by then had a Benson Zone squawk and she was told that it was routing into an unofficial helicopter landing site within the MATZ; she called this traffic when they were a 1nm and 300ft apart and the pilot called visual. The Merlin was then transferred to Talkdown for the TAC procedure to be monitored.

DIR was working to capacity with little input from the Supervisor who was in the ACR but dealing with other problems elsewhere. There were many people in the ACR, all positions were manned and there was a standards check in progress with one of the Talkdown controllers; the UT did not move away from the radar screen so she was offset for the whole period, because of this it was a noisy and frenetic environment.

**THE RAF BENSON SUPERVISOR (SUP)** reports that he was busy attending to a myriad of tasks in the ACR and had briefly switched off the DIR frequency in order to concentrate on something else and therefore missed the moments of the incident. He had most, if not all, of his controlling staff plugged in on a console in a bid to maximise training and 'grab' the traffic that had presented itself.

Some PDs had been accepted by the APP controller while the SUP was in a meeting earlier in the morning and between them they had not realised that 2 station-based helicopters would also be getting airborne for the RTC at a similar time. This led to an unusually busy period with traffic levels significantly higher than normal. The UT DIR, although well advanced in training, rapidly became 'snowed under' and he witnessed his Screen Controller step in and at this stage was content that she had the experience and ability to recover the situation. He made a number of liaison calls (prenotes to TWR) to assist and he incorrectly assumed that the APP controller had informed DIR; this ironically served to increase the DIR's workload. During the moments when he was attending to other matters he lost SA on exactly what DIR was doing and was struggling to regain this SA. The ACR was extremely busy and, with a number of seats between him and the DIR's flight strips, he could not see what was being done (there were 4 controllers in the DIR and TD 1 seats). The SUP at Benson does not have his own radar display and has to peer over the APP controller's position to see the DIR display and his flight strips. Had he stepped in to ask what was happening, this would

have been counterproductive as the DIR would not have had time to reply. The APP controller was occupied handing over traffic to Zone and DIR. In consultation with DIR he held off another PD and asked Odiham to hold onto their traffic until they could take it.

After being informed by DIR of what had happened with the Merlin ac descending through the other ac levels, he elected to wait until the traffic situation had calmed down as to attempt a controller handover at that point would have been dangerous; in any case he had no other qualified controllers available. In addition he wanted to get a full description of the event from the controller once she had been relieved.

He impounded the tapes and had a tape transcript produced. He spoke at length with the pilot of the Merlin on the telephone and both of them were keen for lessons to be learnt from the incident. Following a period of reflection, he elected to ensure the controller was given a standardisation check as he believed that suspending her endorsement and conducting further training would have been of no benefit. In hindsight, although he was busy, he is disappointed that he put his controller in this position; he should have anticipated the traffic surge and stemmed the flow in order to protect both the UT and the screen controllers. Furthermore, once the traffic was on frequency, he should have focused most, if not all, his attention on assisting DIR. In the debrief that he gave the controller he advised that the Merlin should have been instructed to maintain outbound heading and height until advised, in order to ensure procedural separation; the controller also recognised that this is what should have been done.

**BM SAFETY MANAGEMENT** reports that this Airprox occurred between a Merlin conducting a COPTAC approach and a Puma conducting a VOR ILS/DME approach to RW19 at RAF Benson. Both ac were flying in prevailing IMC with occasional gaps between clouds. Both ac were in receipt of a TS from Benson DIR.

For the purpose of the investigation, the incident sequence commenced at 1001:20. At that point, while DIR reports that she was screening a trainee, she took over the console at about 0958. Subsequent to filing the incident report, DIR confirmed that the trainee remained in place throughout the incident sequence completing the logging on their flight progress strips (FPS); consequently, DIR was offset from the console. Moreover, at the time of the incident, both PAR consoles were manned; PAR 1 had both a controller and a Standards Officer conducting a controller standards check; Zone had a further trainee and instructor in position. Consequently, 10 controllers were on console. The radar room at RAF Benson is relatively narrow and precludes movement of personnel behind the consoles to allow sight of the radar and FPS at each control position; the console layout is at Figure 2 below. It should be noted that the SUP does not have a dedicated radar screen, nor a wireless/long-lead headset to facilitate movement around the ACR.

PAR 2	PAR 1	DIR	APP	SUP	ZONE	SRA
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Figure 2: Console Layout in the ACR at RAF Benson.

Figure 1 above depicts the COPTAC and VOR ILS/DME procedures to RW19; the base height for the hold for both procedures is 2500ft QFE. The COPTAC approach requires aircrew to maintain 2500ft QFE from the IAF to 7d on the outbound leg of 006°. The VOR ILS/DME approach requires aircrew to maintain from 2500ft QFE until they pass the IAF on the outbound leg of 055°.

Given the height of the outbound leg of the COPTAC procedure and the base height of the VOR ILS/DME hold, there is no procedural deconfliction between these procedures. RAF Benson ATC has confirmed that there is a local procedure to deconflict level allocation between the two holds. The specific scenario encountered in this Airprox is covered in local training material and Benson controllers receive synthetic based training and consolidation on IFR hold deconfliction.

At 1001:20, DIR had five ac on freq in the positions at Figure 3 and described their workload and task complexity as high. The incident ac were a Puma in the VOR ILS/DME hold at 2500ft QFE, SSR 3A 3611, and a Merlin departing the COPTAC hold at 3500 ft QFE, SSR 3A 3610. There were three further unconnected ac: a Chinook flying towards the VOR ILS/DME hold at 2500ft QFE, SSR 3A 3614; a Squirrel in the RTC, SSR 3A 3617 and a Police helicopter, SSR 3A code-callsign converted to P252.

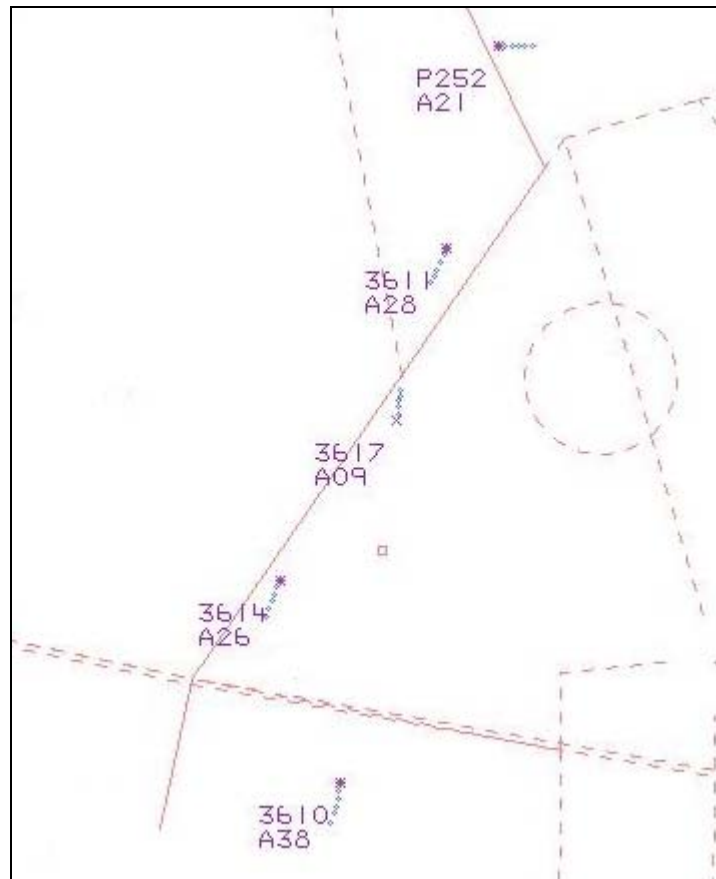


Figure 3. Position of DIRs Traffic at 1001:20.

While the unconnected ac, through the taskload that they represented, undoubtedly played a part in raising DIR's level of psycho physiological stress, which will have thus affected her task performance, they had no involvement in the incident sequence itself; consequently, except where relevant, the following timeline does not include their presence to avoid further confusion.

At 1001:58 the Merlin reported approaching the IAF ready for the procedure and DIR replied that the Merlin was, "*clear the procedure*" but not to, "*descend until advised*". DIR reported that this descent restriction was put in place due to the Chinook being in the hold at 3000ft, 500ft beneath the Merlin's height. This is supported by later events where DIR questioned whether the Merlin was visual with the Chinook prior to allowing it to descend on the procedure. At 1001:58 the Merlin was 4nm SSE of the Chinook on a similar heading, flying at 140kt G/S, with the Chinook flying at between 130-140kt. Although the Chinook was instructed to climb to 3000ft QFE at 1001:37, it did not commence that climb until 30sec later.

Between 1002:14 and 1004:03, DIR was involved in a continuous exchange of RT and landline liaison, including passing a series of TI to the ac on their freq about each other. No TI was passed to the Puma or Merlin on each other, although it is clear from their reports that the respective crews were aware of each other. At 1003:28, DIR instructed the Merlin to, '*descend on the procedure as required*', necessitating the Merlin to descend from 3500ft QFE to 2500ft QFE; the instruction was readback by the pilot. At that point the Merlin was in the Benson overhead, the Chinook was 3.4nm

N of it, tracking NE and the Puma was 5.4nm N of the Merlin, tracking SW at 2500ft QFE. At 1003:52 the Merlin commenced a descent to 2500ft QFE; the Puma was then 4nm NNW, tracking SW at 2500ft QFE. At 1004:16, the Merlin descended through 3000ft QFE with the Puma 2.5nm NW in a L turn onto 025°.

DIR stated in her report that she mistakenly believed that the COPTAC procedure would take the Merlin to the E of the inbound lane and had confused the COPTAC procedure with the ILS procedure, 'the ILS goes outbound heading 055° and the COPTAC goes outbound on a 006° heading'. Subsequent to filing the report, DIR has confirmed that she believed that the Merlin would route outbound from the Benson overhead on a heading of 055°.

Between 1004:03 and 1005:10, DIR passed a new QFE to, and obtained read-back from, the ac on freq, then obtained the DH and intentions from and passed climb-out instructions to the Chinook. During this exchange at 1004:52 the Puma passed from L to R through the Merlin's 12 o'clock, 0.8nm away with the Merlin levelling co-altitude with the Puma at 2500ft QFE. Based on the Merlin and the Puma crews' reports, though aware of each other, neither crew was visual with the other at that time.

At 1005:11, DIR passed TI on the Puma to the Merlin stating, '*Puma, twelve o'clock, one mile, similar height, two thousand five hundred feet QFE*' and the Merlin pilot replied that they were, '*visual*'. DIR then passed TI on the Merlin to the Puma; the Puma did not acknowledge the TI but stated that they were approaching the IAF. DIR instructed them to maintain in the hold which the Puma pilot readback, informing DIR that they were visual with the Merlin. DIR states in the report that the point at which she noticed the confliction between the Merlin and the Puma was immediately prior to passing this TI.

CAP 774 states that in providing a TS,

"Controllers shall aim to pass information on relevant traffic before the conflicting ac is within 5nm, in order to give the pilot sufficient time to meet his collision avoidance responsibilities and to allow for an update in traffic information if considered necessary. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information'. DIR did not reduce the service to any ac on freq due to high workload."

From 1005:42 to 1006:09, DIR's attention was taken by a call from the unconnected Squirrel until, at 1006:09, the Merlin stated that they were, "*about to be IMC in the descent to maintain clear of the Puma*". The Merlin's crew reported that they had realised that if the Puma were to maintain the hold, it would have to turn L and across their flight path and that the flight paths of both ac would shortly take both into the same cloud. At 1006:19 the Merlin's SSR Mode C indicated that it had commenced a descent. The CPA occurred at 1006:32 following the Merlin's avoiding action descent with 0.3nm lateral and 800ft vertical separation existing.

While the MMATM states that the DIR is responsible for the 'control and sequencing of ac in the radar circuit' (RTC), neither CAP 774, MAA RA 3011, MAA RA 3024 nor the MMATM stipulate separation criteria for ac operating within the RTC under a TS. Best practice in this regard suggests that, where possible, DIR provides standard or reduced vertical and lateral separation between ac within the RTC, regardless of ATS.

The Supervisor has stated frankly in his report both the difficulties associated with monitoring DIR from the Supervisor's position and that he 'lost SA on exactly what DIR was doing' as a result of a 'myriad of tasks'. Moreover, he states that he had not anticipated the traffic surge and did not stem the traffic flow to protect DIR; however, this lack of anticipation was grounded in a lack of information on which to base a plan. The system by which ATC received flight details from Stn based crews was long-term unserviceable; consequently, ATC had no visibility of any late changes to flight details. In this case, both the Merlin and the Puma were not originally planned to conduct IF Trg; hence ATC

had accepted requests for PDs from non-Station-based ac. That said, once the traffic situation started to develop, opportunities still existed to manage the flow.

While the RAF Benson FOB states that a TS will be automatically applied to flights operating IFR, unless pilots ask otherwise, CAP 774 states,

“pilots should be aware that a Traffic Service might not be appropriate for flight in IMC when other services are available.”

From the aircrews' perspective, both the Puma and Merlin crews maintained good situational awareness and became visual with each other enabling both to take robust action to resolve the deteriorating situation. That said, the Merlin's crew reported that IMC prevailed and, notwithstanding the policy in the RAF Benson FOB, it is reasonable to argue that a TS was not wholly appropriate. That is not to say that the provision of a DS would have necessarily affected the outcome of this occurrence; however, it is a notable observation and a feature that has been identified in the investigation of other Airprox. This Airprox was caused by both a systemic failure involving IFR procedure design and through ATM Human Factors related errors.

The design of the COPTAC and VOR ILS/DME procedures, specifically the confliction between an ac on the outbound leg of the COPTAC and an ac at the base of the VOR ILS/DME hold, provides no element of procedural deconfliction. Although there is a local procedure to manage this confliction, it is wholly down to the ability and/or capacity of the DIR to identify this issue and to take corrective action; this means that the procedure is susceptible to ATM human error. In this instance, for a number of reasons, DIR specifically and ATC generally did not perceive the confliction.

DIR stated that she confused the COPTAC and VOR ILS/DME procedures, mentioning that she expected the Merlin to route outbound from the overhead on a heading of 055°, the implication being that this would have provided lateral separation. However, whilst this suggests both negative transfer of information from Long Term Memory and a Working Memory capacity issue, it also highlights a deeper misunderstanding of the two procedures, given that the VOR ILS/DME procedure requires an outbound heading of 055° from the hold, not the overhead.

While DIR provided TI between those ac that were already vertically separated, TI was not prioritised to the 2 ac that were becoming proximate. Specifically, neither the Merlin nor the Puma received TI on each other until a range of 1nm, after the Puma had crossed co-altitude, through the Merlin's 12 o'clock, 0.8nm away at 1004:52. While this error is linked with DIR's confusion between the 2 IFR procedures, given that she did not detect the confliction until 1005:11, it also suggests that her visual scan of the surveillance display was affected, which is an error of perception and vigilance rather than memory. Given her high workload and perception of task complexity, it is possible that this was caused by attention tunnelling, caused in turn by her elevated level of psycho physiological stress.

From an ATM perspective, the final issue that requires examination is the Supervision of the radar room. Firstly, at key points in the incident sequence the Supervisor's attention was diverted, necessarily, to other tasks which, at the time, were of sufficient importance to require attention. This is a matter of circumstance, rather than omission. Secondly and critically, it is clear that the ergonomics of the radar room do not permit the Supervisor to maintain effective oversight of all control positions; the factors include the physical design of the radar room, the positioning of the Supervisor away from the DIR console and the lack of direct access to a surveillance display. The impact of the ergonomics of the radar room is then heightened by the lack of provision of a wireless/long-lead headset for the Supervisor, effectively forcing him to choose between maintaining situational awareness and physically overseeing and managing operations. As suggested by the Supervisor, it appears reasonable to argue that had they been able to maintain their situational awareness, then they would have been better able to perceive the developing confliction.

Overall, there was no deliberate act or omission on the part of ATC that caused this Airprox. All those involved were trying to make the most of the trg opportunity that had presented itself, in a burst of relatively high intensity taskload. A series of disparate events conspired to create a period of high

workload and task complexity, especially for DIR and removed the mitigatory barrier provided by the Supervisor. During this time, errors by DIR relating to memory, perception and vigilance combined with the latent weakness of the COPTAC and VOR ILS/DME procedures to cause an Airprox. This weakness in the IFR procedure design, through the inevitable action of human error, caused the system at RAF Benson to fail unsafe.

This Airprox has identified a number of ATM and safety issues that are being addressed by a number of Defence organisations including JHC, MAA and ATM Force Commander.

Although not as a result of this Airprox, RAF Benson ATC, in association with AIDU, has undertaken a review of IFR procedures with the aim of reducing the current level of complexity by reducing the number of IFR holds, in accordance with PANSOPS procedure design guidelines.

UKAB Note (1): The recording of the Heathrow 10cm Radar shows the incident clearly as depicted in the diagram(s) above. All contacts suffer from track jitter and have been adjusted accordingly.

**HQ JHC** comments that a number of ATM and safety issues has been identified and are being addressed by several Defence organisations. JHC are investigating whether Benson ac have been operating IMC under a TS and how this should be addressed specifically regarding the Mid Air Collision risk on the ODH risk register.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

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

It was clear to Members that the traffic situation at Benson was both busy and complex with three ac flying two different instrument procedures, another one inbound to the field and a fifth helicopter inbound to a site within the MATZ; this was compounded by relatively poor weather. Controller Members opined that the supervisor should have noted this and given most of his attention to the Approach position as this was, in their view, the most important task. Members discussed whether the Screen Controller had waited too long before stepping in to take over from her student, noting that it is often difficult for instructors to realise when situations deteriorate beyond the capabilities of their students. However, in this case, not being in possession of the full scenario, the Board decided not to make any further comment. Controller Members agreed however, that on taking over the position, despite the physical awkwardness, the Screen Controller should have positioned herself directly behind the workstation rather than remaining offset, thus removing any parallax, giving a clearer, more familiar view of the radar picture and the flight progress strips.

It was also clear to Members that the TACAN procedure and the ILS procedure overlap and, if they are to be flown simultaneously, then deconfliction by the Approach Controller is required. A Controller Member pointed out that this is not unique to Benson and the 'approach plates' should be displayed prominently so that controllers, who should in any case be familiar with the procedures, can refer to them readily and, if necessary, take appropriate action to prevent conflicts. The Board discussed whether it was appropriate for the ac to be operating under a TS while IMC. Although both ac involved were in receipt of a TS, both were in the MATZ where ATC instructions are mandatory and in any case the default at Benson is to provide a TS to IFR flights (unless a DS is specifically requested). Although a DS does in most situations provide ac with safe separation, in this case had the procedures been correctly implemented the ac would have been safely separated under the TS. Prior to the reported CPA, Members noted that the two ac had been separated by 0.8nm while co-alt and IMC as the Puma rolled out of its turn at the S end of the ILS Hold; although aware of each other in their respective Holds, neither crew were in visual contact with each other at that stage. Therefore the Board decided that the entire incident should be assessed as a single Airprox event that could be attributed a single cause (and degree of risk).



Controller Members thought that the Approach Controller could have been operating under a self-imposed urgency to get the ac on the ground quickly when a safer action would have been to build in more separation between them, if necessary by requiring the Merlin to conduct a further hold in order to feed the Puma approach safely ahead of it. Although there were several less than ideal ATC aspects of this incident, Members agreed unanimously that the cause had been the Controller descending the Merlin on the TACAN procedure into conflict with the Puma that was already established in the (conflicting) ILS hold. While accepting that the controller had made an error, the Board could not endorse the BM SM view that "Overall, there was no deliberate act or omission on the part of ATC that caused this Airprox" believing this to be an oversimplification, and they determined the erroneous clearance for the Merlin to descend on the procedure had been the cause of the incident. (Members accepted, however, that this had not been a deliberate act as the controller believed that the ac would be laterally separated).

It was clear to Members that the Merlin pilot had maintained good SA and that he had been both fully justified and correct in descending to remain below cloud so that he could 'see and avoid' the Puma that before entering cloud was co-alt with him and would most likely cross his flightpath from R to L shortly thereafter; further, he correctly informed ATC of this action.

Members could not agree the degree of risk, being evenly split between A and B, roughly along controller/pilot lines. When considering his casting vote the Chairman pointed out that there had been 0.8nm separation on the first crossing, therefore the ac were not going to collide, and on the second both the Merlin and the Puma descended below the base of the cloud thereby remaining in visual contact. Although this prevented any collision risk between the ac there had in his view been a degradation of normally accepted safety margins; he therefore voted for a B.

The Board commended the Supervisor for his open and honest report which clearly and self-critically addressed the part he played in this incident.

The Board also noted the actions already put in place by HQ JHC, BM SM and other MoD agencies to resolve the issues arising from this incident.

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

Cause: DIR instructed the Merlin crew to descend on the TACAN approach into conflict with the Puma in the ILS hold.

Degree of Risk: B.