

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	Vans RV-7, G-RVDB	
<b>No &amp; Type of Engines:</b>	1 Superior XP-IO-360-B1HC2 piston engine	
<b>Year of Manufacture:</b>	2018 (Serial no: PFA 323-14526)	
<b>Date &amp; Time (UTC):</b>	29 August 2022 at 0753 hrs	
<b>Location:</b>	Ronaldsway Airport, Isle of Man	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	71 years	
<b>Commander's Flying Experience:</b>	1,874 hours (of which 1,769 were on type) Last 90 days - 23 hours Last 28 days - 9 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and other AAIB enquiries	

**Synopsis**

After attending to an uneasy passenger while orbiting over the sea, the pilot inadvertently approached and landed on Runway 03 instead of the active Runway 08. The ATCO, who was attending to ground activities, did not observe the aircraft during its final approach.

The report considers the importance of recovering situation awareness and adopting sterile cockpit procedures before commencing with an approach. It discusses vigilance in ATC and the importance of teamwork in detecting possible misperceptions.

The air traffic services unit is taking safety action relating to the monitoring of aircraft, and team resource management training.

**History of the flight**

The aircraft was cleared on Ronaldsway's radar frequency to enter the control zone under VFR, and advised to expect joining right hand downwind for landing on Runway 08, which was in use. When around 3.5 nm south-east of the airport at 2,800 ft amsl, the aircraft was transferred to the tower frequency. The ATCO reported a surface wind from 080° at 9 kt, offering the pilot a choice of Runways 08 or 03.

The pilot requested Runway 08 before being instructed to 'REPORT READY FOR RIGHT BASE RUNWAY ZERO EIGHT.' The aircraft appeared to turn downwind for Runway 08 although its position was also consistent with right base for Runway 03 (Figure 1)<sup>1,2</sup>.



**Figure 1**

G-RVDB's position after pilot requested Runway 08

From there, the pilot reported ready for right base (Figure 2). He was instructed to orbit left to accommodate an ATR 76 on a commercial air transport flight that was joining final for Runway 08 at 8 nm.



**Figure 2**

G-RVDB's position when the pilot reported ready for right base Runway 08

The pilot was unable to see the ATR during its approach so the ATCO advised him when it landed, and the pilot reported ready to leave the orbit (Figure 3).

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#### Footnote

- <sup>1</sup> Figures 1-4 are screenshots of the Air Traffic Monitor from the ATS unit's investigation report on the incident.
- <sup>2</sup> The ATM screen is orientated south up, because of the control tower's orientation.



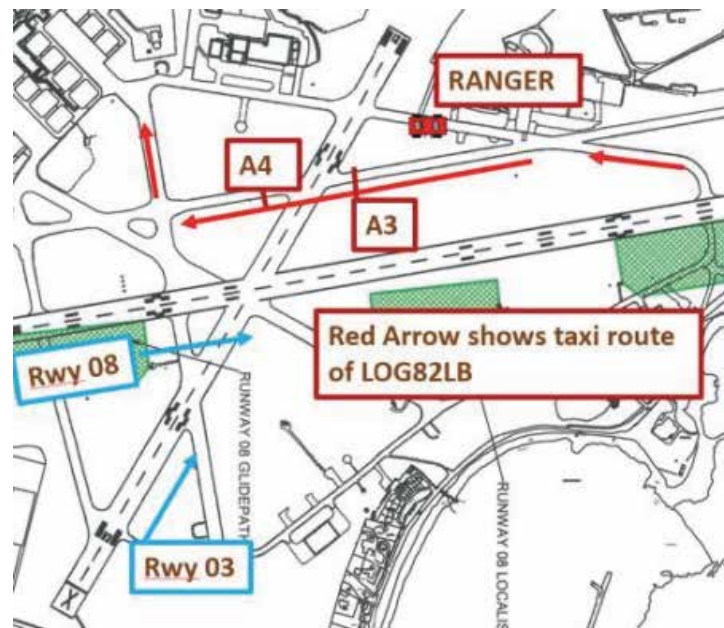
**Figure 3**  
G-RVDB leaving orbit

The pilot reported that he aligned the aircraft with a “large runway slightly off to [his] right”, calling ‘FINAL ZERO EIGHT’ on the radio frequency, and was cleared to land on Runway 08 (Figure 4). However, he inadvertently performed an approach and landing on Runway 03 instead.



**Figure 4**  
G-RVDB reports turning final Runway 08

The aircraft stopped its landing roll around the intersection of the two runways (Figure 5). Confusion over taxi instructions, which the ATCO issued as though the aircraft had landed on Runway 08, led the pilot to re-orientate the airfield against the chart he was using.



**Figure 5**

Ground situation after the ATR had landed

### **Meteorological information**

Ronaldsway's visibility was reported at 0750 hrs as 10 km or more, with few clouds at 1,500 ft.

### **Additional information from the pilot**

The pilot reported he had focussed attention on reassuring the passenger who expressed unease while orbiting over the sea. The absence of fixed ground references made orientating himself during the turning manoeuvre more difficult. He noticed a crosswind after joining final approach but did not check the compass. Having been given a choice of runways, he believes he experienced confirmation bias<sup>3</sup> during the approach by mis-reading the runway designation numbers '03' as '08', while he was thinking about his landing technique.

### **Information from the air traffic services unit (ATSU)**

#### *The ATC tower*

Both the ATCO and air traffic services assistant (ATSA) said it had been a quiet morning. Glare from the morning sun and sea made it difficult to see aircraft from the south-facing control tower, with the sunblinds themselves presenting a "margin" across the window and additional glare from their "shiny" surface (Figure 6).

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#### **Footnote**

<sup>3</sup> Confirmation bias – tendency to seek out and prefer information that supports an existing belief, even in light of contradictory information.



**Figure 6**

View of Runway 03 approach with similar glare and sunblind position as the incident<sup>4</sup>

#### *The ATSA*

The ATSA indicated that around the time G-RVDB reported ready for right base, he told the ATCO that from the air traffic monitor (ATM) he believed the aircraft was not aligning correctly with the runway but that the ATCO did not respond. The ATCO asked the aircraft to orbit, which the ATSA felt corrected the situation to the extent the pilot would need to re-orientate himself. He could see the aircraft while it orbited.

While the ATR was on 'short final' for Runway 08, the ATSA took an operational phone call. He returned looking for G-RVDB on Runway 08's final approach but noticed it had already landed. Sensing it had arrived sooner than he expected, he asked the ATCO if it had landed on Runway 03. The ATCO indicated he believed it had landed on Runway 08.

#### *The ATCO*

The ATCO indicated that because of the outside glare he had observed G-RVDB on the ATM while it was orbiting. He recalled wondering why the pilot could not see the ATR during its approach and felt confident from the pilots readbacks that he would align with Runway 08. He did not visually acquire the aircraft during its final approach because he was checking that the ATR's parking stand was clear. Similar to the ATSA, he said he returned to looking for G-RVDB on 'short final' for Runway 08 to find it had landed. He said he discovered it had landed on Runway 03 during the subsequent couple of days.

The ATCO reflected on the importance of monitoring general aviation aircraft, especially those unfamiliar with Ronaldsway, and responding to colleagues' input. He said he

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#### **Footnote**

<sup>4</sup> Photograph from the ATS unit's investigation report on the incident.

previously worked in a control tower with no ATM and as a result of this incident intends to monitor the ATM more often.

#### *The ATSU's investigation report*

The ATSU's investigation report on the incident listed 'Preventative actions'<sup>5</sup>, including:

1. *A reminder of the obligations to monitor all stages of final approach, in order to recognise when an aircraft might be incorrectly or dangerously positioned on approach should be included in the next safety digest.*
2. *A programme of TRM [team resource management] training should be put in place. All members of the ATS section, including managers should undergo TRM training. This should be done as a matter of urgency...*
3. *The sunblinds within the [visual control room] VCR are commonly acknowledged within the section to cause significant visibility issues.' An 'action' was opened to research an 'alternative solution... or replacement blinds...'*

The Isle of Man's Head of air traffic services reported the first item had been completed, and confirmed their intent to undertake items two and three as safety actions in an appropriate time frame.

#### **Regulatory information**

The CAA's 'Civil Aviation Publication (CAP) 493 Manual of air traffic services – Part 1'<sup>6</sup> included the following:

*'Aerodrome controllers shall maintain as far as practicable, a continuous watch by visual observation on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel on the manoeuvring area. Visual observation shall be achieved through direct out-of-the-window observation, or through indirect observation utilising a visual surveillance system<sup>7</sup> which is specifically approved for the purpose by the CAA...*

*A landing aircraft, which is considered by a controller to be dangerously positioned on final approach, shall be instructed to carry out a missed approach. An aircraft can be considered as dangerously positioned when it is poorly placed either laterally or vertically for the landing runway.'*

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#### **Footnote**

<sup>5</sup> Listed as 'Preventative actions' in the report - these have been confirmed as safety actions by the Isle of Man Head of air traffic services.

<sup>6</sup> Formally adopted by the Isle of Man CAA (IOMCAA).

<sup>7</sup> The IOMCAA stated no such visual surveillance system is approved at Isle of Man.



## Human performance guidance

### *Situation awareness*

The Civil aviation authority of New Zealand's '*Situation awareness*' guidance document states<sup>8</sup>:

*'We have limited ability to divide attention amongst tasks and generally, have to switch attention back and forth between tasks. This leaves us vulnerable to losing track of the status of one task when our attention is drawn away from the task at hand, or while engaged in another task.'*

The UK CAA's '*Civil Aviation Publication 737*' (CAP 737) suggests pilots can update their situation awareness using a systematic process, for example, '*Rotate attention from plane to path to people (aviate, navigate, communicate)...*'; and '*Monitor and evaluate current status relative to your plan... Focus on details and scan the bigger picture...*'<sup>9,10</sup>

Skybrary's '*Situational Awareness Quick Reference & Reminder*'<sup>11</sup> states:

*'Manage workload... Manage attention... Validate your data... Use multiple sources... Check Your Understanding... Check for contradictory elements... Think ahead...'*

Its advice on recovering situation awareness includes:

*'Go to the nearest SAFE, SIMPLE and STABLE solution... Communicate – Asking for help is not a weakness... Take time to think... Be willing to delay flight progress.'*

### *Sterile cockpit procedures*

The European Aviation Safety Agency (EASA) describes '*sterile*' cockpit procedures as time when pilots '*shall not be disturbed... except for matters critical to the safe operation of the aircraft and/or the safety of the occupants.*'

The CAA's Safety Sense Leaflet 31 – '*Distraction*'<sup>12</sup> provides guidance on '*Distraction and interruption in general aviation*'. It states, '*Research suggests that the disruptive effects of distractions and interruptions can be reduced by making us aware of our vulnerability to them*'.

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## Footnote

<sup>8</sup> [Situational awareness guidance \(aviation.govt.nz\)](https://aviation.govt.nz) [accessed 5 May 2023]

<sup>9</sup> Referenced under '*Tips for good SA management (Bovier, 1997)*'.

<sup>10</sup> [CAP737 Flight-crew human factors handbook \(caa.co.uk\)](https://caa.co.uk) [accessed 5 May 2023]

<sup>11</sup> [PowerPoint Presentation \(skybrary.aero\)](https://skybrary.aero) [accessed 5 May 2023]

<sup>12</sup> [Safety Sense Leaflet - Distraction \(caa.co.uk\)](https://caa.co.uk) [accessed 11 October 2023]

## Vigilance

SKYbrary describes vigilance<sup>13</sup> as:

*'...paying close and continuous attention to a field of stimulation for a period of time, watchful for any particular changing circumstances.'*

*...changes may be quite small, but their potential effect may be considerable. The speed and accuracy with which we detect these changes (assuming we detect them at all) determines the timeliness of our decisions and actions. Vigilance is greatly affected by our level of alertness, and this is why we can be affected not only by being overloaded but also by being 'under-loaded'.*

*Perception and vigilance are closely related and affect the accuracy and currency of our mental model of the air traffic situation. The vigilant ATCO can detect situations where a misperception is likely and will therefore be more likely to detect whether their perception is correct than a non vigilant ATCO...*

*Vigilance is not a skill... [It] is a result of a number of circumstances over which the individual does not always have sufficient influence. It is also very difficult for the individual to detect changes in their vigilance... Often, reduced vigilance is revealed by unwanted outcomes of decisions and actions. That is why it is very important that colleagues keep an eye on each other. It is usually easier for somebody else to notice when things start to deteriorate than it is for us. We can, however, take a number of measures that will help us to remain vigilant for a longer period of time. By making sure we are physically fit, well rested, well trained and informed, we enhance our capacity to stay vigilant longer.'*

## Analysis

### *The aircraft*

It may have been disorientating and distracting to orbit without a fixed ground reference while looking for inbound traffic and reassuring the passenger. Pilots can maximise their situation awareness by managing potential distractions and taking time to focus systematically on the aircraft, its flight path, and necessary communications – sometimes summarised as '*plane, path, people*'. Seeking help from ATC and taking time to observe the aerodrome environment can avoid errors like confirmation bias.

### ATC

The radio calls between the ATCO and the pilot were consistent with an aircraft performing an approach to Runway 08, but neither seemed aware G-RVDB was approaching Runway 03 until after it landed. It is apparent the ATSA may have detected that the pilot was making an approach to the wrong runway.

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## Footnote

<sup>13</sup> [Vigilance in ATM | SKYbrary Aviation Safety](#) [accessed 12 July 2023]



The ATSA could see G-RVDB while it orbited. The ATCO referred to the ATM because of sun glare, which was known to impede direct visual observation of aircraft at Ronaldsway. While the ATSU considers sun glare to be inherent to Ronaldsway's south-facing control tower, it intends to explore alternatives to the existing sun blinds.

The ATCO stopped monitoring G-RVDB to check on ground activities, feeling assured the pilot knew which runway to use. The quiet morning may have reduced his vigilance. Being alert to small changes or anomalies, and the possibility for unexpected events, helps ATCOs to maintain their situation awareness and detect possible misperceptions – in themselves or others.

In this case the outcome of G-RVDB landing on the wrong runway was benign. However, Figure 5 illustrates the potential for conflict with other aircraft using the active runway or taxiways.

### **Conclusion**

The runway incursion occurred because the pilot mistook Runway 03 for Runway 08, having been reassuring an uneasy passenger while orbiting over the sea. The ATCO did not monitor the aircraft during its final approach.

### **Safety actions**

The ATSU has published a reminder to controllers to monitor all stages of an aircraft's final approach to recognise when an aircraft might be incorrectly or dangerously positioned. It intends to provide TRM training for all members of the ATS section and to replace the VCR sun blinds if a better solution can be found.