



**ROYAL  
AERONAUTICAL  
SOCIETY**  
LOUGHBOROUGH BRANCH

8 February 2022

## **The RAF P-8A Poseidon Force**

These notes are partially based on  
a presentation delivered to the Branch  
**by Group Captain Jim Beldon**



RAF P-8A Poseidon

This was a well-planned and well-balanced presentation. Our speaker is to be congratulated for providing such a vivid picture of the many facets of this new generation of technology packed systems that have turned dreams of the past into the norm of today. It described a much wider ranging operational capability than could have been felt possible in relatively recent time, and especially with such a small

crew. It is good to see that industry and operators can work together and present such an attractive solution as that we were introduced to digest.

The P-8A Poseidon, entering service in the UK at the time of writing, is a leading component of the sensory elements of the RAF's "Intelligence, Surveillance, Target Acquisition and Reconnaissance" (ISTAR) Force. The aircraft, a derivative of the US Boeing 737-800 airliner, has already fulfilled expectations in several nations. It will be the first non-UK aircraft in RAF service taking on the role, and it is considerably more complex than could be achieved in the past. Notably precursors were the Avro Shackleton and BAE Nimrod, and like the Poseidon, both were based on existing aircraft airframes. The turbojet-powered Nimrod MR2 was withdrawn after almost 40 years in service in 2010. A further development, based on the same airframe as before, called Nimrod MRA4, had by-pass engines and a large range of sensor and onboard digital systems. It was scrapped by the UK Ministry of Defence in 2010. The RAF had already been assessing the Boeing P-8A Poseidon and soon committed to developing a fleet of nine aircraft. The fleet has been delivered over several years with the final aircraft delivered to RAF Lossiemouth on 22 January 2022.



Shackleton MR3



Nimrod MR2

Our presenter currently served as the ISTAR Force as Deputy Force Commander. His lecture provided coverage of the programme milestones, roles and missions, the crewing sensors and

equipment installed in the aircraft, plus an introduction to the Tactical Operations Centre (TOC) and on-going plans to share international co-operation.

### **1. Strategic context, programme milestones**

ISTAR air operations have flying hubs at RAF Waddington (Lincolnshire) and RAF Lossiemouth (Scotland). These are locations from which air operations are launched to gather intelligence on land, maritime and air military and naval capabilities. Data can be gathered from airborne sensors that provide knowledge of various sea, land and air operations on a real-time basis. This has been a process that stems from wartime intelligence techniques over many decades, and within NATO

additional intelligence from other members can also be used. Information is used by strategists, who may be scattered globally, to determine appropriate reaction by applying their own resources. Military reactions will not always be used to determine attack strategies. Information that reveals responses may be used to assist in the saving of civilian lives too.



Nimrod MRA4

### **2. Roles and missions**



Sentinel

Although over-water surveillance was a factor as far back as WW1 the RAF developed airborne surveillance during WW2 when convoy protection was essential and required reconnaissance of threats created by enemy ships and submarines. As requirements have gathered in scale and detail ISTAR has been an acronym that embodies the "Intelligence, Surveillance, Target Acquisition and Reconnaissance" aspects of multiple roles. Assessment may be conducted by specialists who might not even know the actual source of the data they are using due to security, and

the need to convey in-coming and out-going data electronically and almost in real-time.

These are requirements that were beyond the capabilities of systems used on piston engines until the early 1970s. The sensor capabilities were relatively limited in this period. When a turbo-jet successor, the Hawker Siddeley Nimrod, was introduced, more complex and wide-ranging sensory options and advanced data-processing and information exchange systems were introduced. Improved on through updates, the aircraft remained in service until 2010. It would have been replaced by a further derivation (Nimrod MRA4) had the new variant have not been scrapped in 2010. It was a great blow to the manufacturer, by then BAE Systems. They were guided by the MoD assessments that the Boeing P-8A Poseidon was a more cost-effective solution.

A host of additional aircraft that ranged from small to large were necessary to perform other related tasks. Altogether, an inventory of 12 types was necessary to conduct specific and general surveillance, but the 9 aircraft Poseidon fleet now being commissioned is capable of incorporating equivalent roles. Such aircraft as the small Britten-Norman Islander and the much larger Boeing Sentry (AWACS), plus Bombardier Sentinel are now in the process of being taken out of service.

### **3. The crew and roles of specialists in the aircraft**

The new MPA (maritime reconnaissance aircraft) primary roles will be involvement in Anti-Surface Warfare (ASuW) and Anti-Submarine Warfare (ASW). ASuW requires recognition of above surface



activity, and reconnaissance of surface vessels to contribute to the Recognised Maritime Picture (RMP). ASW is an equivalent requirement, but this has to determine many more parameters that relate to the operational capabilities of submarines. Systems need to be capable of determining the parameters such as weapon capabilities and counter measures.

MPA sensor information can be shared real-time data to friendly maritime vessels that might otherwise be unaware of threats, and to be assisted to determine appropriate combat strategies.

Additional roles include Maritime Counter-Terrorism (MCT), which will provide support for Government departments and other military branches. Long-Range Search and Rescue (LR SAR), plus Joint Personnel Recovery (JPR) tasks, are possible in military operations, and made available, subject to circumstances, in the event of civilian vessels requesting assistance at sea. The aircraft can act as an airborne control unit until such time as civilian facilities can take-over.

Each P-8A Poseidon will have a routine crew that comprise 8 or 9 people :

- two pilots – Captain and co-pilot
- two WSO - 'Weapon systems officers' (called TACCos)
- two WSO - Weapon systems operators (acoustics)
- two WSO - Electronic warfare specialists

Experience from other forces already using P-8A aircraft have suggested an extra WSO.

#### **4. P-8A programme milestones**

In forthcoming months a formal set of training programs are planned to accommodate stages that will bring aircraft and crew members together. Many crew members are likely to have had MPA experience, but wherever they may have served in predecessor maritime reconnaissance aircraft or not they will be introduced to a more versatile aircraft in respect of performance and breadth of aircraft and role-related electronic systems. Dates in the planned introduction programme include:

- 21 September 2021 - Interim Capability Milestone (ICM) – initial stand by capability achieved
- 22 January 2022 - delivery of the 9<sup>th</sup> Poseidon at RAF Lossiemouth completed the fleet
- 22 March 2022 - 1<sup>st</sup> UK-based Operational Conversion Units are to be commissioned

#### **5. The Tactical Operations Centres (TOC and MTOC)**

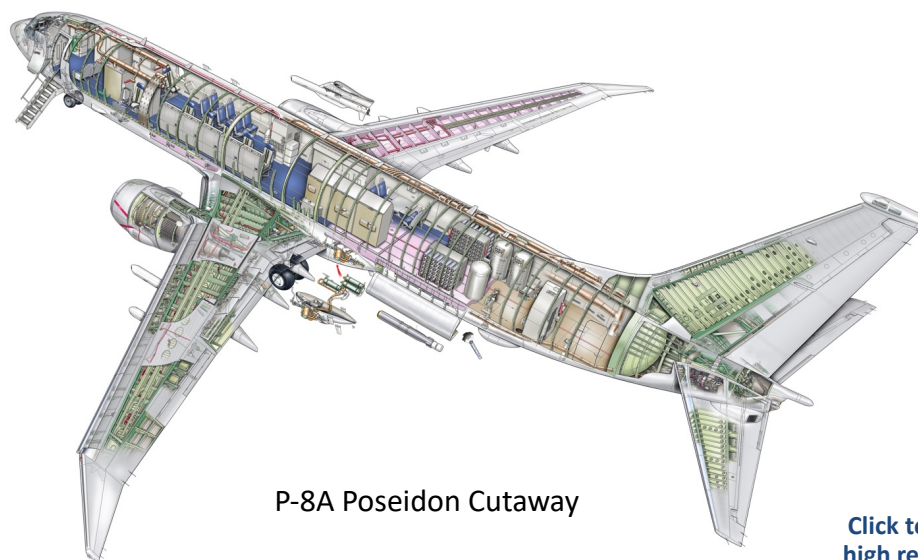
There will be a permanent TOC at RAF Lossiemouth, and two mobile (MTOC) units. Staff will be trained throughout the period when crews are being introduced to the aircraft and its systems. In this period the training objectives are to be:

- Mission Planning, Mission Briefing, Mission Monitoring and Support
- 'Reach-back' analysis of acoustics and imaging
- Debrief and product dissemination
- Post-mission analysis
- Data exploitation and learning

## 6. International co-operation.

There are agreements in place with Norway and USA (who have 5 and 123 Poseidons in service). There are seven countries with aircraft in service, and 4 countries have expressed interest, but have yet to sign any agreements.

The UK, USA and Norway have similar operational requirements to monitor maritime activities in the North Atlantic.



P-8A Poseidon Cutaway

[Click to access high resolution version](#)

## Lecture attendance

The attendance was about 60 people in the room, plus a 'record' 82 who joined the meeting via a "Microsoft Teams" internet link. There were questions from both sections of the audience, and the applause expressed overall delight at having attended a broad and very detailed introduction to everyone involved.

*Lecture notes by Mike Hirst*

### Photo attributions:

**RAF P-8A Poseidon:** By SAC Ciaran McFalls - [www.defenceimagery.mod.uk](http://www.defenceimagery.mod.uk)

**Shackleton MR3:** 1955 Imperial War Museum

**Nimrod MR2:** By Ian Creek - Gallery page <http://www.airliners.net/photo/UK---Air/Hawker-Siddeley-Nimrod/0799125/LPhoto> <http://cdn-www.airliners.net/aviation-photos/photos/5/2/1/0799125.jpg>, GFDL, <https://commons.wikimedia.org/w/index.php?curid=27407126>

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