

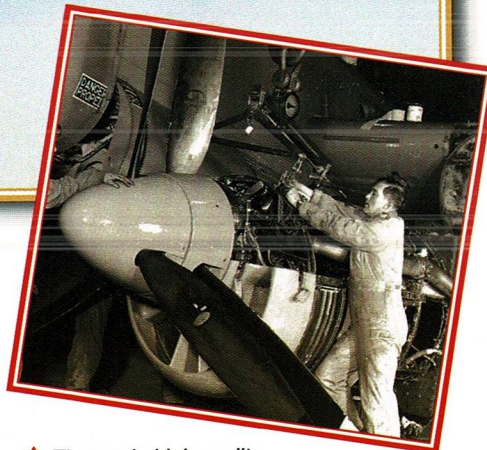
AVRO

SHACKLETON AEW

● Long serving ● U.K.'s sole AEW asset for 20 years ● Piston-engined



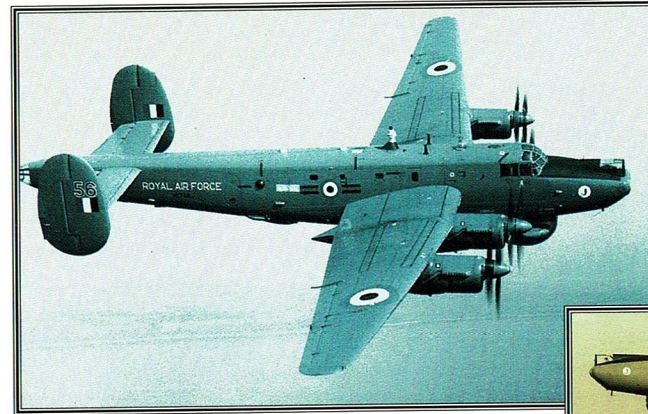
WARPLANES
OF THE 1950s,
1960s AND 1970s



▲ Thorough, high quality maintenance kept the Shackletons in service 20 years longer than had been expected. They maintained the highest levels of serviceability at all times.

On March 26, 1991, the first Boeing E-3D Sentry AEW.Mk 1 arrived at RAF Waddington. Finally, the Shackleton AEW.Mk 2s of No. 8 Squadron could be retired, along with their antiquated radar system with its 1940s technology. After the intended Nimrod AEW replacement was cancelled, the U.K. had maintained a limited Airborne Early Warning (AEW) defense with the Shackleton since 1971—thanks to the skill and ingenuity of its crews.

AVRO SHACKLETON AEW

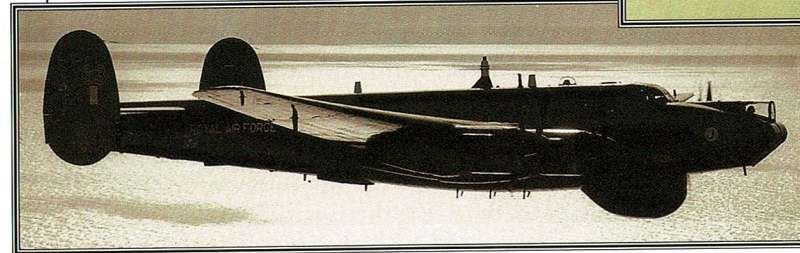
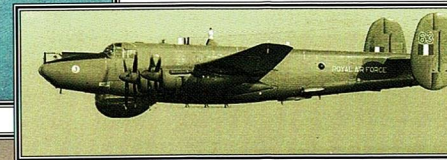


◀ Famous ancestor

This view clearly shows the similarity between the Lancaster and Shackleton, even though the latter was a larger machine.

▼ "Ermintrude" in action

No. 8 Squadron named all of its aircraft after characters from the British children's television series The Magic Roundabout.



◀ Lumps and bumps

This near-silhouette shows the plethora of antennas and the large "guppy" radome beneath the forward fuselage, associated with the AEW systems.

▶ Griffon power ▶

Six-blade contra-rotating propellers were a distinctive Shackleton feature.



◀ AEW original

On September 30, 1971, the first Shackleton AEW.Mk 2 made its maiden flight. The conversions were based on the MR.Mk 2, since the newer MR.Mk 3s were at the end of their fatigue lives.

FACTS AND FIGURES

- ▶ Late in 1952, the first MR.Mk 2 entered service. The last MR.Mk 2, as an AEW.Mk 2, retired 39 years later!
- ▶ One aircraft was tragically lost just before the final retirement.
- ▶ All AEW Shackletons retained a search and rescue (SAR) capability.
- ▶ Much of No. 8 Squadron's initial aircrew complement was made up of ex-Fleet Air Arm Gannet personnel.
- ▶ The RAF had originally planned to retire its Shackletons starting in 1980.
- ▶ Budget cuts early in the program reduced the operational force to six.

Avro's last operational design

How long was the Shackleton AEW in service? When the AEW.Mk 2 finally left RAF service in 1991, several restored World War II Spitfires benefitted from engines and other parts donated by the venerable Avros.

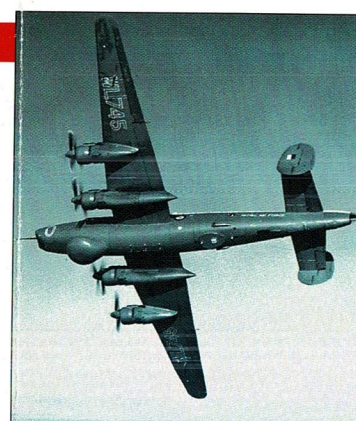
By the early 1980s, even the Shackleton's most ardent supporter admitted that the aircraft of No. 8 Squadron belonged to another era. The aircraft went on to become the RAF's last frontline piston-engine aircraft—a testimony to the

quality of the original design and to the skill of its crews.

In 1971 the Royal Navy (RN) was preparing to lose its aircraft carriers and fixed-wing airpower. Therefore, no AEW coverage would be available to RN ships, since the shipborne Fairey Gannet AEW.Mk 3 would no longer be in service. In order to provide naval forces and the U.K. air defense system with the cheapest AEW cover possible, APS-20 radars were removed from the Gannets and rebuilt to improved APS-20F(1) standard

before being installed on 12 Shackleton MR.Mk 2 airframes.

The resulting aircraft continued to serve throughout the troubled Nimrod AEW.Mk 3 program and until the Sentry AEW.Mk 1 arrived in 1991.



Left: WL745 originally appeared wearing the letter "O" as applied during service with No. 204 Squadron as an MR.Mk 2. It later became Sage.

Below: Because Nimrod AEW proved impractical, the antique Shackleton remained in service long past its prime.



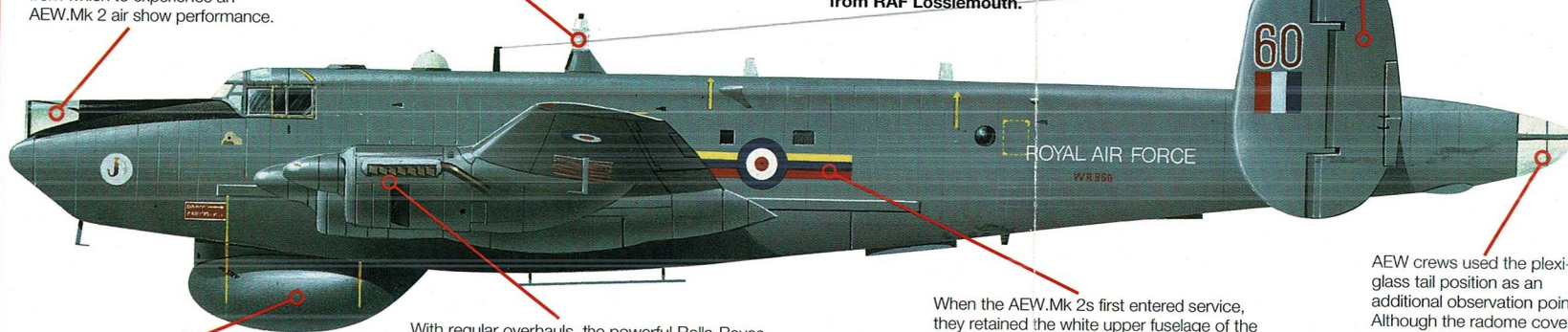
SHACKLETON AEW.Mk 2

Dougal flew with the RAF's only Shackleton AEW.Mk 2 squadron, No. 8. The aircraft were briefly based at Kinloss, but spent most of their career flying from RAF Lossiemouth.

Avro designer Roy Chadwick was responsible for the entire line of bombers which led to the Shackleton. All used a similar and distinctive tail layout.

This position was occupied by the forward gunner on the MR.Mk 2, but on the unarmed AEW.Mk 2 it was used as a navigation position and an additional lookout point. Apparently, it was also a spectacular position from which to experience an AEW.Mk 2 air show performance.

The casual observer might have thought that the AEW.Mk 2 had a funnel, but this unusual antenna actually served the APX-7 Identification Friend or Foe (IFF) system.



A huge ventral radome covered the APS-20 radar. Like the electronics, the radome was also removed from the RN's Gannets and grafted onto the Shackleton.

With regular overhauls, the powerful Rolls-Royce Griffon engines powered the Shackleton fleet with admirable reliability. They also managed to breathe new life into a few Spitfires, whose airframes were not much older than the Shackleton itself.

When the AEW.Mk 2s first entered service, they retained the white upper fuselage of the maritime variants. This was soon replaced by an overall gray scheme, brightened by No. 8's colorful markings and the obligatory character painted on the forward fuselage.

AEW crews used the plexi-glass tail position as an additional observation point. Although the radome covered part of the bomb bay, the remainder of the bay was used to store equipment for the secondary SAR role, including life rafts.

SPECIFICATION Shackleton AEW.Mk 2

- Type:** Airborne early warning aircraft.
- Powerplant:** Four 2,455-hp. Rolls Royce Griffon 57A V-12 piston engines.
- Maximum speed:** 272 m.p.h.
- Endurance:** Maximum 15 hr.
- Initial climb rate:** 850 f.p.m.
- Range:** 3,040 mi.
- Service ceiling:** 23,000 ft.
- Weights:** Empty 56,880 lb., max takeoff 98,000 lb.
- Accommodation:** Typical crew of 10 consisting of four on the flight deck and at least six mission specialists.
- Dimensions:**
 - Span 120 ft.
 - Length 87 ft. 4 in.
 - Height 16 ft. 9 in.
 - Wing area 1,421 sq. ft.

ACTION DATA

SPEED

Long-duration patrols were carried out at the most economical speed. However, AEW aircraft require a high maximum speed to return to base. This helps avoid gaps in AEW coverage due to unserviceability or other problems.

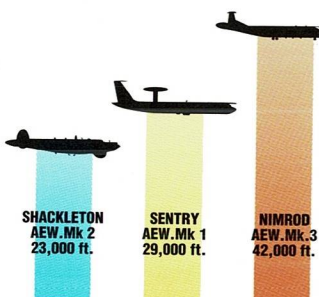
SHACKLETON AEW.Mk 2 272 m.p.h.

SENTRY AEW.Mk 1 529 m.p.h.

NIMROD AEW.Mk 3 574 m.p.h.

CEILING

Since altitude increases radar range, an ability to operate for long periods at high altitude is useful for any AEW platform. The service ceiling of the Shackleton is well below the operational ceiling of the Sentry, while the Nimrod outperforms both.



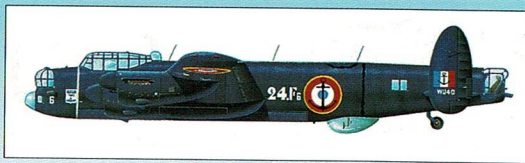
ENDURANCE

The endurance of the Shackleton is truly exceptional. However, the endurance of the Sentry AEW.Mk 1 is achieved at 1,000 miles from base and can be extended to the limits of crew fatigue by air-to-air refueling.



Shackleton family line

■ **LANCASTER:** Developed from the disappointing, twin-engine Manchester, the Lancaster became a classic bomber design. This aircraft was one of the last in operation, flying with the Aéronavale as a B.1(FE) maritime reconnaissance aircraft.



■ **LINCOLN:** Originally known as the Lancaster Mk IV and V, the Lincoln was based on the Lancaster layout, but was a much larger aircraft with more powerful engines. It began to be replaced by the Canberra in 1951.



■ **SHACKLETON MR:** This Shackleton MR.Mk 3 is typical of the last Shackletons built. All aircraft in the series were developed from the Lincoln. The use of auxiliary Viper turbojets caused the MR.Mk 3s to reach the end of their fatigue lives prematurely.

