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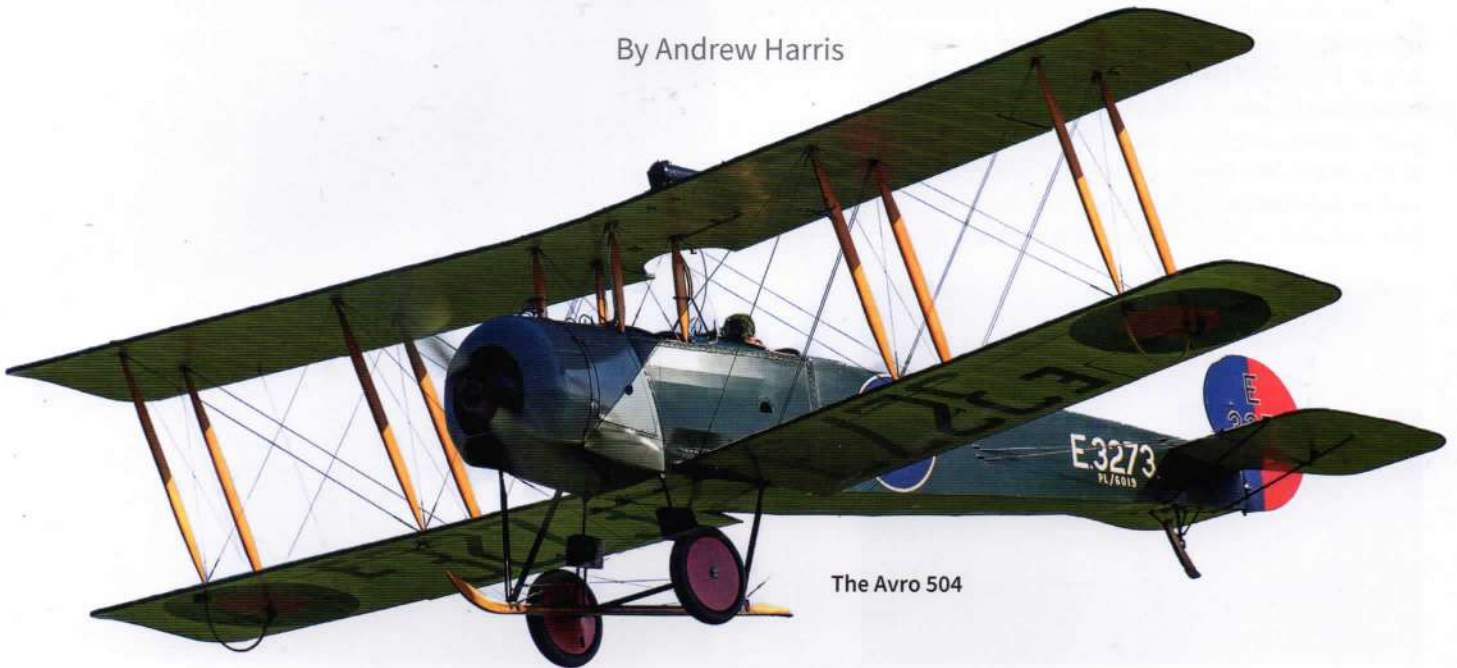
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The Most Iconic Aircraft Made in the North West

By Andrew Harris



The Avro 504

From a modest start in the First World War – and a lull between the wars – our region became a major force in aircraft production during the 1939-45 conflict and has maintained this role to this day. This is a story of great aircraft and the companies and factories in the north-west which built them - and continue to build great aircraft. We start more than 100 years ago, honour 15 types of aircraft which changed the world, mention those that got away and glimpse the future.

When World War 1 broke out, the Royal Flying Corps and Royal Naval Air Service – which combined to form the RAF in April 1918 – were using the 2-seat Avro 504 biplane. Although designed pre-war in 1913 the Avro 504 became the most numerous type of aircraft to serve in what was then called the Great War. During the war this plane was used for reconnaissance, bombing, fighting and training. It had light and powerful controls and was fully aerobatic. No fewer than 4,500 – 42% of all Avro 504s - were built in Avro's factories in Miles Platting and the Park Works in Newton Heath. Production continued until 1932.



The Avro Anson

The Avro Anson first flew just 3 years later – on the 24th March 1935 – and in 1936 was the first twin-engined monoplane to enter service with the RAF. Dependable and sturdy the Anson equipped 26 bomber and coastal squadrons of the RAF by the outbreak of World War 2. Although lacking the glamour of Spitfires and Hurricanes it went on to fulfil vital transport and training roles. Avro built 4,161 Ansons – out of 11,020 built everywhere - at Newton Heath, Chadderton and Woodford. Production ceased in 1952 but in the winter of 1962/3 your columnist dropped bales of hay from an RAF Anson to starving sheep in Northumberland. The last RAF Anson retired 5 years later.

The Bristol Blenheim



When it first flew on the 12th April 1935 the Bristol Blenheim was acclaimed as the fastest bomber in the world. However, by the outbreak of war in 1939 it formed the largest part of the RAF's front-line equipment but was obsolescent and suffered heavy losses. The Blenheim went on to perform night fighting, anti-shipping and reconnaissance roles as well as valuable second-line duties. It had the distinction of being the only aircraft type ever to serve in every RAF Command and every theatre of operations during the war. Despite the name, 3,560 Bristol Blenheims were built by Rootes Securities and Avro at Speke, Woodford, Chadderton and Newton Heath. Production stopped in 1942 by when 60% of all Blenheims had been built in the north-west.

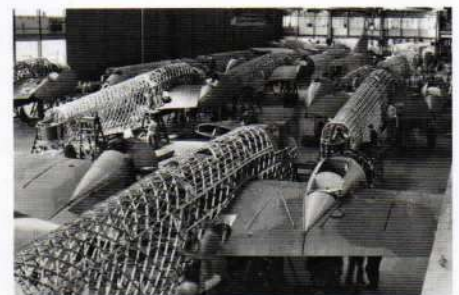
No other British bomber was built in such numbers as the Vickers Wellington. A total of 11,461 were completed of which no fewer than 8,946 or 78% were built at Broughton near Chester, Cranage near Holmes Chapel and in a huge factory at Squires Gate in Blackpool. Until the 4-engined Halifaxes and Lancasters became available in large numbers the Wellington formed the backbone of RAF Bomber Command. First flown on the 15th June 1936, it equipped six squadrons by the outbreak of war. It incorporated the innovative geodetic construction – as illustrated – developed by (later Sir) Barnes Wallis who went on to make

the dambuster and other raids possible. As a result the Wellington was incredibly strong. The Wellington was used worldwide in many roles. It helped to win the war. ▶



Above: The Vickers Wellington flying over the Blackpool factory where it was made. Picture from an un-named source.

Right: The geodetic construction which made the Wellington so strong.



The Halifax may not be as well-remembered as the Lancaster but it offered greater versatility and bore the brunt of the RAF's bomber campaign in the difficult early days. A total of 6,178 Halifaxes were built - more than half of them (3,215) by English Electric at Preston and Samlesbury and Rootes Securities at Speke in Liverpool. The potential of the Halifax was achieved when the Merlin engine gave way to the more powerful Hercules radial engine. The type was flown by the Free French from RAF Elvington east of York which is now the Yorkshire Air Museum where a preserved Halifax is a major attraction.

The first Lancaster didn't fly until the 9th January 1941 but quickly became the mainstay of RAF Bomber Command. Its main claim to fame was a huge bomb bay which enabled it to carry a massive payload. This eventually involved the bouncing bombs of the dambuster raid and the 12,000-22,000 lb 'Grand Slam' weapons which devastated targets like the Tirpitz battleship which menaced the arctic convoys until it was sunk.

Below:
The Handley Page Halifax



The famous Avro Lancaster



By March 1945 there were 56 Lancaster Squadrons in RAF Bomber Command. 4,365 Lancasters were built by Avro in Chadderton, Ringway and Woodford, by Metropolitan Vickers at Trafford Park and Vickers Armstrong at Broughton near Chester. About two-thirds of all Lancasters were built in the north-west but the saddest statistic is that 55,523 aircrew of RAF Bomber Command died.

Britain's first jet fighter flew on the 5th March 1943 but was of a conventional design. The De Havilland Vampire followed on the 20th September 1943 but had a more radical twin-boom structure. It entered RAF service in April 1946 and the Vampire Mk 3 - with a more powerful Goblin engine - made the first transatlantic crossing by a jet aircraft in July 1948. The same



The de Havilland Vampire



The Avro Shackleton maritime patrol aircraft

month saw the first jet – a Sea Vampire - being launched from a carrier by catapult. Vampires were sold to more than 30 countries and the type was refined to become the Venom which flew on the 2nd September 1949. It looked similar but had a slimmer swept-back wing, a more powerful de Havilland Ghost turbojet and wingtip tanks. More than half – 2,212 – of all Vampires and Venons were built by de Havilland at Broughton near Chester and Fairey Aviation at Ringway – now Manchester Airport. We joined the jet age early!

The Avro Shackleton is probably the most cleverly adapted aircraft of all time. It was indirectly descended from the Avro Lancaster and first flew on the 9th March 1949. Primarily designed for long-range maritime patrols (your columnist spend 23 hours in one over the Atlantic) all 185 were built from 1948-58 by Avro at Woodford and Chadderton and entered RAF service in April 1951 and were capable of a 3,000 nautical mile range using features like contra-rotating propellers. Mk 2 had a retractable radome but the Mk 3 was refined with a tricycle undercarriage, better radar and more weapons like homing torpedoes and Lulu nuclear depth charges. The biggest tribute is that for more than 20 years it remained in RAF service in the maritime patrol and Airborne Early Warning roles until replace by the Nimrod in the 1970s.

The English Electric Canberra first flew on the 13th May 1949 and was Britain's first jet bomber. After the relatively slow cumbersome bombers of World War 2 the new plane must have been amazing. The test pilot Wing Commander Roland Beamont was rebuked for flying it as a fighter



when he demonstrated it at the Farnborough Air Show. He later flew from Aldergrove in North Ireland to Gander Lake in Newfoundland in 4 hrs 18½ minutes – an average speed of 480 mph. The Canberra sold to 15 nations including the USA. This amazing aircraft served many roles. More than half - 706 - of all Canberras were built in the north-west; 631 by English Electric at Preston, Samlesbury, Warton and Accrington and 75 by Avro at Chadderton and Woodford. The aircraft was so good it served the RAF for 55 years - until July 2006. A record!

The beautiful English Electric Canberra

The Avro Vulcan



The Hawker Siddeley / BAe Hawk



When it first flew on the 30th August 1952 the Vulcan's huge delta wing was a radical departure for an aircraft of its size. The first Vulcans entered RAF service in August 1956 but it wasn't until July 1960 that the first Mk 2 Vulcans - with a kink in the leading edge of the wing and uprated Olympus engines instead of the planned Avons - equipped 4 more RAF squadrons and all Mk 1 versions were upgraded to be Mk 2 Vulcans. Nine years later the RAF lost its nuclear role to the Royal Navy but in 1982 the Vulcan performed record-breaking 9-hour 4,100 mile 'Black Buck' sorties when they attacked Argentine targets in the Falklands to good effect. Two years later the type was finally retired but Vulcan XH558 - which first flew on 25th May 1960 - retired after more than 55 years on the 28th October 2015. All 136 Vulcans were made by Avro - part of Hawker Siddeley Aviation from 1963 - at Woodford and Chadderton from 1951-65. A true icon!

Arguably the most impressive British jet fighter ever produced, the Lightning thrilled pilots and public alike with its awesome performance and sleek appearance. It was the first RAF Mach 2 interceptor and last all-British fighter with that capability. Its crisp handling and superb acceleration was only let down by its limited endurance and basic mission systems. Range and endurance were improved by a ventral and overwing tanks as illustrated.

The lightning prototype first flew on the 4th August 1954 and all 341 aircraft were built by English Electric and (from 1960) British Aircraft Corporation at Preston, Warton, Samlesbury and Accrington from 1953 to 1972.

As the Shackleton evolved from the Lancaster so did the Nimrod from the Comet - the world's first jet airliner. Designed to replace the ageing Shackleton it produced an amazingly capable aircraft to fulfil maritime surveillance, anti-submarine and (later) airborne early warning roles. It first flew on the 23rd May 1967 and served in the RAF for an astonishing 42 years



from 1969 to 2011. All 46 Nimrods were built by Hawker Siddeley Aviation and (from 1977) the British Aerospace Aircraft Group at Woodford and Broughton near Chester between 1966 and 1986. The nine advanced MRA4 versions were aborted in 2010 after unacceptable cost increases.

The Tornado first flew on the 14th August 1974 and entered RAF service in 1982. It was designed to fly low and fast. Guided by terrain-following radar, with variable-geometry wings that could be cranked back for high-speed flight, no aircraft was

The English Electric Lightning

faster at 50 feet when it first appeared. Developed from 1968 as a joint programme between Britain, (then) West Germany and Italy the twin engine Tornado had a bombload comparable to the much larger Lancaster, a top speed faster than Concorde yet with swept wings it was smaller than the Lightning. During the Desert Storm conflict the fighter versions flew combat air patrols and the bomber versions attacked Iraqi air bases but 7 were lost. In 2003 the more advanced GR4 versions returned to Iraq without losing a single plane. Between 1973 and 1998 BAE Systems (as it became) produced 527 Tornados at Warton. The last planned flights of RAF Tornados were on the 14th March 2019 which brought 37 years of service to an end.



Above:
The Panavia Tornado shows its power

The Hawker Siddeley – later BAe – Hawk is considered by many to be the finest jet trainer ever and production at Warton continues to this day. It first flew on the 21st August 1974 and entered RAF service in April 1976. The US Navy have operated more than 200 specially adapted versions of the Hawk which has been flown to great effect by the Red Arrows since 1979. Now used by 19 countries the Hawk was the last aircraft from the Hawker Siddeley stable but BAE Systems continued production near Hull and latterly at Warton so we don't know how many Hawks will be built but it will probably be over 1,000.

Like the Tornado, the Eurofighter Typhoon is the product of European collaboration and is thought to be the best fighter RAF has had since the English Electric Lightning in the 1960s. It is still a fourth-generation fighter with a low radar profile but without the new 'stealth' technology. The Typhoon first flew on the 27th March 1994 but due to much haggling between the partners about work sharing, production deliveries didn't start until 2003. It entered front-line RAF service in March 2006 and took over Quick Reaction Alert duties the following year. Following modifications

Above:
The Hawker Siddeley / BAe Nimrod



it was declared multi-role in 2008 and was able to take over the ground attack role of the Tornado by the time the older type retired in 2019. Typhoons for the RAF and Saudi Arabia were all assembled at Warton.

Left:
Two Eurofighter Typhoons

Sadly we can't honour all types built in the north-west. The Short Sunderland was a magnificent and massive flying boat but only 35 of 749 were built here – at White Cross Bay on Lake Windermere. 770 Handley Page Hampden twin-engined light bombers were built by English ▶

Electric at Strand Road, Preston and Samlesbury between 1939 and 1942 but this wasn't a successful aircraft. 300 Sepecat Jaguar strike and training aircraft were built by BAC – now BAE Systems - at Warton. A collaboration between the UK, France and India, the Jaguar was upstaged by other types and had a relatively short service life.

The cost and expertise involved in developing and producing modern aircraft dictate the way ahead. This is illustrated by two aircraft types – one in production and one on the drawing board. Such collaboration is the future and, thanks to BAE Systems, we in the north-west continue to be winners in an intensely competitive industry.

The fifth-generation Lockheed Martin F35 Lightning II is the most advanced military aircraft in the world. It comes in three variants: conventional, short take off and vertical landing (STOVL) and for carriers at sea. The UK is the sole Tier 1 partner which ensures a good share – of about 15% by value – of the work. BAE Systems at Samlesbury build the rear section of the plane and the vertical lifting jet is made by Rolls Royce with other UK companies providing specialist inputs like ejector seats and parts of the undercarriage. Since the USA plans to buy 2,456 F35s through to 2044 the scale and value of work is massive. This is one form that the future is taking. For the other read on . . .

As threats and capabilities evolve the future need – after 2035 – will be for a sixth-generation which will have to be stealthy, able to fly unmanned, use swarming technology to control drones, incorporate artificial intelligence and a 'virtual' cockpit using the pilot's helmet-mounted display or the equivalent on the ground. The concept is the 'Tempest' which is being overseen by the Rapid Capabilities Office of the Royal Air Force. The project is British-led but in partnership with Italy and Sweden and possibly other nations. Industry partners are BAE Systems based at Warton, MBDA, Leonardo and two



The F35 Lightning II

other Italian companies. The Ministry of Defence has committed the equivalent of \$2.6 billion to develop the concept through to 2025 when the partners will decide whether to roll out the completed aircraft by 2035. The final form of the aircraft might change but the mock-up featured shows how it might look. Very futuristic!

In 1945 the British aircraft industry comprised 27 airframe manufacturers, 8 companies making aero-engines and many specialist suppliers. These have since consolidated into BAE Systems and Rolls-Royce but still with many expert suppliers. The north-west can be proud of its history of producing excellent aircraft. This tradition is safe in the hands of BAE Systems based at Warton and Samlesbury. The future of combat aircraft is both exciting and frightening. But the north-west is part of that future.

Andrew E. Harris gratefully acknowledges the help provided by many sources including James H. Longworth's magisterial work 'Triplane to Typhoon'. Unless otherwise attributed the images are courtesy of BAE Systems. For our previous articles about BAE Systems at Warton and Samlesbury, 'The Passing of the Tornado' and 'Tempest – A Vision of the Future' go to published articles/aviation topics at www.andreweharris.co.uk



A mock-up of how the Tempest might look

