The BUCCANEER

Cover artwork of an original Blackburn brochure showing the Buccaneer S.1.

BLACKBURN AIRCRAFT LIMITED

BROUGH · YORKSHIRE · ENGLAND


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Blackburn Aircraft Ltd. - A short overview

Robert Blackburn (born 26 March 1885 - died 10 September 1955) started to build aeroplanes in 1909, although his first design, a monoplane, never flew. It was his second monoplane that actually flew when it made its first flight in March 1911. He designed and built more monoplane types, but without great success. In 1913 he built his first floatplane, the Type L and although only one was build, it was impressed by the British Admiralty when the First World War broke out in 1914.

Before the war the Blackburn Aeroplane Co. was founded with a small production workshop at the Balm Road in Leeds, Yorkshire. The company moved later to the nearby Olympia works at the Roundhay Road in Leeds. The monoplane was soon followed by the twin-fuselage T.B. seaplane, which was built in small quantity (8) for the Royal Naval Air Service. The next type that would see limited production was the large twin-engine Kangaroo bomber. After the war, the Kangaroo was also used as a civil airplane.

Eventually all construction work was moved to the Brough factory, where it remained until their last type, the Buccaneer was built. The final company name became Blackburn Aircraft Ltd.

Blackburn also designed and built a special small flying boat racer to participate in the 1923 Schneider Cup flying contests, but this already crashed before the event took place!

Until the outbreak of the Second World War Blackburn produced for the greatest part naval aircraft types, although not all of these were successful. Especially the large flying boat R.B.3 Perth should be mentioned. Although it was produced in very modest numbers, the Perth was extensively used for maritime patrol missions. Blackburn also tried, and mainly failed, to introduce a number of single engine military aircraft types in the late twenties and early thirties. Only the Ripon naval reconnaissance/torpedo bomber biplane was built in some numbers with a total of 96 delivered as a land-based plane with wheels and as a floatplane.

By the late thirties, Blackburn manufactured in somewhat larger numbers the naval aircraft Skua dive bomber and the Roc fighter, fitted with a four-gun turret. Both were a low-wing monoplanes fitted with a Bristol Mercury or Perseus engine, but at the start of the war they were already outdated!

During the Second World War Blackburn produced the Botha, a twin-engine reconnaissance bomber. Although it had very mediocre performances and poor single-engine flying characteristics it was built in fairly large numbers with a total production of 676 aircraft.

Blackburn also developed and built a naval fighter as the B.37 Firebrand, fitted with a Napier Sabre liquid-cooled engine. As a fighter it was never used, but fitted with a Bristol Centaurus radial engine it was used on a small scale as a torpedo bomber but it arrived too late to play any role in the war.

After the war, the most important Blackburn product except for the Buccaneer was the Beverly transport plane, a project taken over from General Aircraft Ltd, where it was known as the G.A.L. 60 Universal freighter. It was built as standard transport plane for the R.A.F., but also here only in limited numbers!

Before the Buccaneer, Blackburn had very little experience with jet aircraft design, but at least they built one, although this is quite unknown. Under their own designation YB-2 Blackburn constructed for Handley Page a small jet-propelled research plane intended as a flying test model for the crescent-winged Handley Page Victor V-bomber. Instead of building this themselves, the project was contracted out initially at Supermarine, but later at General Aircraft. When the latter was taken over by Blackburn, it was completed by Blackburn. This jet plane is better known as the Handley Page HP.88 and it must have contributed almost nothing to the Victor project since it soon crashed after its first flight in 1951 following structural problems. At least this project provided Blackburn some basic knowledge and experience on the construction of fast jet-propelled aircraft!

Concluding we may say that before Blackburn merged into Hawker Siddeley/British Aircraft Corporation it was a relatively small aircraft manufacturer.

The design and final construction of the Blackburn Buccaneer was for this company a very ambitious and challenging project and in fact it was the best aircraft they made during their existence!!

1 - *The twin-fuselage Type T.B. of 1916 was for its time a very modern design, although the few machines built were hardly used operationally.*

2 - *The Pellet Schneider Cup racer of 1923 already sank before the contest took place.*

3 - *The Lincock was an attempt from Blackburn to enter the biplane fighter market in the late twenties, but at the end only three were built! Also licence production of this type in Italy by Piaggio never emerged and only one single machine was produced. The photo depicts the Lincock III.*

4 - *The Blackburn Ripon of the thirties was built in some numbers as a reconnaissance and torpedo plane for the Royal Navy. Some were exported to Finland. A number was also licence-manufactured in Finland.*

5 - *The Perth was in the thirties a very familiar sight and it served very well although only a handful were actually built.*

6 - *The Blackburn Roc was, just like the Boulton Paul Defiant, a fighter armed with a multi-gun rear turret. It performed definitely less than the Defiant!*

7 - *The Botha was the Blackburn type built in most numbers, although it never excelled as a really good plane (Johan Vischendijk collection).*

8 - *The Blackburn B.20 of 1940 was a very advanced flying boat with a retractable hull. Only one was built and it crashed at an early flight stage.*

9 - *The Firebrand torpedo bomber was too late to be used in the Second World War. Some 175 were supplied after the war to the Royal Navy.*

10 - *The Y.B.1 was a naval torpedo bomber and attack plane/U-boat hunter, but it lost from the Fairey Gannet, which showed a remarkable resemblance with the Blackburn type. It was powered by an Armstrong Siddeley Double Mamba turboprop engine.*

11 - *The ungainly looking, but very effective Blackburn Beverly became after the war a standard R.A.F. transport plane. A few were also used on the civil market.*

12 - *The short-living Handley Page HP.88 was in fact built by Blackburn and gave the company its badly needed experience on jet aircraft design when they started later the Buccaneer project. The single HP.88 flew in military markings with R.A.F. serial number VX330.*


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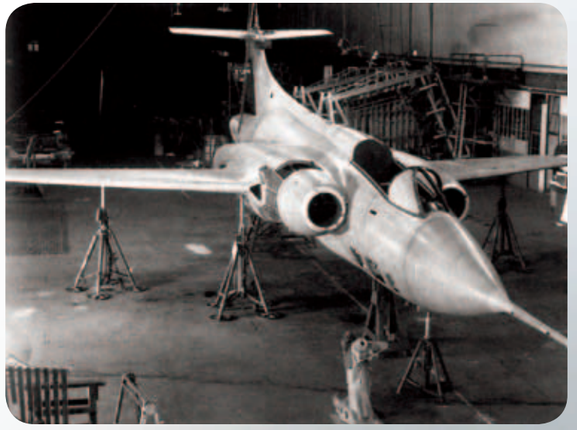
Introduction

The Blackburn Buccaneer was the first jet aircraft specially designed for flying very low under the radar at high subsonic speeds. It was developed in the fifties and entered service at the Royal Navy in 1962. Later it also flew as an attack bomber at the R.A.F. and it even played a role in the Gulf War in 1991 before being retired in 1994 after an operational career that spanned three decades...

Early development and test flying

The need for a special shipboard attack plane as a counter-threat against Soviet warships in the North Sea area became apparent at the early fifties. The idea was to develop an aircraft that could fly during an attack undetected below the ship's radar. The new airplane plane was planned to be jet-powered and fully navalized for operation from aircraft carriers. In 1954 the British Admiralty released specification M.148T for such a type, better known as 'NA.39'. A dozen companies drew up designs, but finally Blackburn received in 1955 the acceptance of their submitted project. Main person responsible for this project was chief designer B.P. Laight. For Blackburn it was a quite challenging project since this company had at that time hardly any experience with jet-propelled aircraft.

The new attack plane was so urgently needed by the Royal Navy that Blackburn received an order for not less than twenty pre-production aircraft, the first one scheduled for its first flight in April 1958. For continuous low-flying the airframe had to be carefully designed to give optimal airflow at the lowest possible drag. As a result the shape of the fuselage was largely dictated by the new 'Area-Ruling' principles as discovered by U.S. NACA aerodynamicist Richard T. Withcomb. In fact, early designs had to be drastically changed to incorporate these new aerodynamic principles. The Whitcomb rules resulted in a very pronounced bulge in the rear fuselage of the NA.39. The final NA.39 design B.103 showed a twin-engine aircraft with the both engines placed in parallel in the centre fuselage section. Each engine had its separate air intake and exhaust. Further the new 'low-flyer' had broad-chord swept wings and a T-tail.



Buccaneer prototype XK486 under construction at Blackburn in the Brough factory.
(Blackburn)

The extreme end of the fuselage was used for a split air brake. A quite hidden feature of the NA.39 was its system of boundary layer control to lower the landing speed. The NA.39 had a large rotating bomb-bay below the fuselage that was hydraulically operated. It could be fitted with various weapons and extra fuels. If needed it could carry a tactical nuclear bomb. The new attack plane had a crew of two seated on Martin Baker ejection seats under a large single-piece backwards sliding canopy. Since the new aircraft had to operate at low altitude the structure was strengthened to withstand continuous low-level airflow.

The NA.39 prototype was built under great secrecy. The first flight with the first prototype *XK486* took place on 30 April 1958 from RAE Bedford by Blackburn chief test pilot Derek Whitehead with flight test observer Bernard Watson in the rear seat. The second prototype *XK487* followed with its first flight on 12 September 1958. The four evaluation aircraft *XK488-XK491* followed over the period November 1958-May 1959. A further 14 pre-production aircraft for service evaluation with RAF serial numbers *XK523* to *XK536* were delivered by the end of 1961.

NA.39 prototype *XK486* made in September of that year its first official public appearance at the SBAC airshow at Farnborough. By that time it was officially named '*Buccaneer*' with S.1 as type designation. The flying program had a serious setback when *XK490* crashed

First NA.39 Buccaneer prototype XK486.
(Srecko Bradic)

'Blackburn B.103 early design.
(Srecko Bradic)

The first NA.39 Buccaneer prototype XK486, with non-folding wings, at an early test flight in 1958. *(Blackburn)*

Ground view of the XK489 with a Blackburn Beverley transport plane visible on the left.
(Blackburn)

in October 1959 when flown by a U.S. NASA crew. Pilot W.H. Alford stalled it when he set the thrust lever at zero during landing approach forgetting the blown flaps needed compressed air from the jet engines. The plane was too low for a safe ejection and both Alford and his flight observer J.G. Joyce were killed.
In spite of this, flight testing continued. The first prototypes were in fact nothing more than flying 'empty shells' without any military equipment. The first two machines even lacked folding wings! *XK486* was used for general handling trials.

XK486, XK 488 and XK490 in flight for a display held on 26 March 1959 to celebrate 'Founder's Day' (the birthday of Robert Blackburn). *(Blackburn)*

NA.39 prototype XK490 with the De Havilland Gyron Junior jet engine.
(Aviodrome collection)

The second prototype *XK487* was used for flutter tests. The third prototype *XK488* was the first to be fitted with folding wings and an arrester hook. Together with pre-production aircraft *XK523* it was used for trials on board of the aircraft carrier HMS *Victorious* in the English Channel in January 1960. *XK490* was the first Buccaneer with the rotating weapons bay for armament trials and an in-flight refuelling probe. *XK491* was used for electrical tests and flight-refuelling sorties with an English *Canberra* bomber converted into a tanker.

- *XK486* was lost on 5 October 1960 when it crashed due to an engine failure. The crew ejected safely.
- *XK487* was later used by Ferranti for radar experiments associated with the B.A.C. TSR.2. It was withdrawn in 1967 and burned a year later.
- *XK488* is now on display in the Fleet Air Air Museum at Yeovilton.
- *XK489* was withdrawn and scrapped in 1964.
- *XK490* crashed with an American crew as already discussed.
- *XK491* was withdrawn and scrapped in 1966 after being used for spinning and ejection seat tests.

In 1960 Blackburn was acquired by the Hawker Siddeley group, being part of British Aircraft Corporation or B.A.C. (later British Aerospace or B.AÈ), and the name of Blackburn as an aircraft manufacturer finally disappeared in 1963. The Buccaneer was the last Blackburn design built.....

In service at the Royal Navy

The Buccaneer S.1
Fourteen Buccaneers S.1 from the pre-production were evaluated by No.700Z Sq. at Lossiemouth. *XK531* and *XK532* were the first to arrive in March 1961 but by the end of this year also *XK533-XK535* arrived, soon followed by the all-white painted *XK535*. They were all extensively test flown. The first operational squadron flying with the Buccaneer was No. 801 at Lossiemouth. They received the first operational production S.1's in July 1962 and soon embarked on board of the aircraft carrier *Ark Royal*. Later they were transferred to the aircraft carrier *Victorious*.

No. 809 squadron was the second one equipped with the Buccaneer S.1, based at Lossiemouth. Later it was re-formed into No. 736 squadron acting as an operational training centre for Buccaneer crews.
No.800 Sq. was the third and last squadron to be equipped with the Buccaneer S.1. They were stationed on board of the aircraft carrier *Eagle* and later on the *Ark Royal*.
The total number of Buccaneer S.1 built was 60, including the prototypes and development machines. The last S.1 left the production line in December 1963.
Although fully operational, the Buccaneer

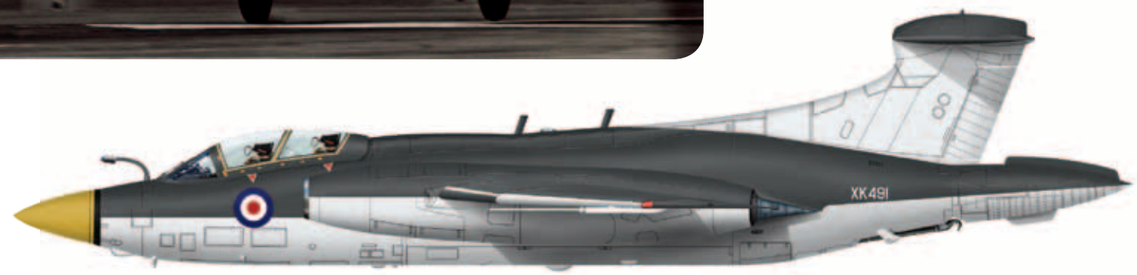
S.1 had as most important shortcoming that its two De Havilland Gyron Junior engines of 3221 kg thrust each provided not enough power for take off at maximum fuel load from an aircraft carrier. To solve this problem temporary a number of S.1's was used as a tanker to fuel-up the other Buccaneers in flight shortly after take off. Final solution was a version with more powerful engines; the Buccaneer S.2. Concluding we can say the Buccaneer S.1 never fully met its expectations and it had a relatively short operational career at the Royal Navy when all machines were permanently grounded after two crashes in December 1970.
Except for a few machines used as museum piece or gate guard and some S.1's being converted into S.2 versions, most were soon scrapped.

No. XN929 was one of the first batch of production S.1 models. We see it here on 8 September 1962 during the exhibition at the Farnborough airshow. The aircraft was painted in anti-radiation gloss white.
(Mick Gladwin collection)

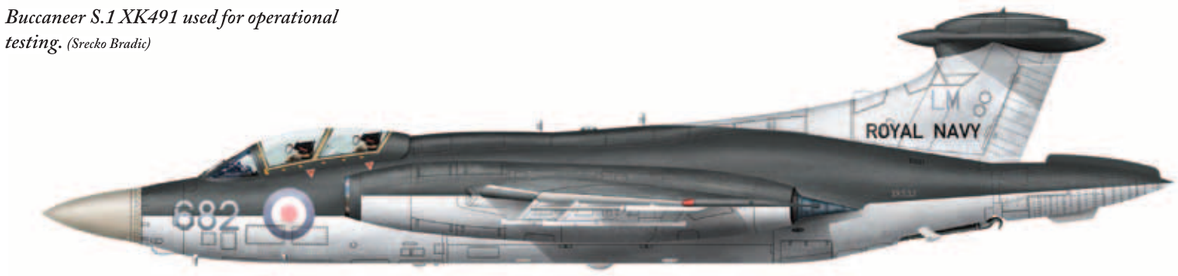
Buccaneer no. XK534, one of the batch of evaluation aircraft, at the SBAC Show, Farnborough on 9 September 1961. Also this aircraft was painted in anti-radiation white. The name on the air intake was placed strictly for the airshow! Registration '668/LM' was for Royal Navy 700Z In Flight Testing Unit (IFTU). It was permanently based at Lossiemouth.

XK534 is seen here taxiing to the runway for its demonstration at the 1961 Farnborough airshow.
(Thijs Postma collection)

XK534 taking off at the 1961 Farnborough airshow.
(Thijs Postma collection)



Buccaneer S.1 XK491 used for operational testing. *(Srecko Bradic)*



Buccaneer S.1 XK533 no. 682 based at Lossiemouth *(Srecko Bradic)*

Unguided rocket firing trials with Buccaneer XN981. It was originally supplied as a S.1, but it was later converted into a S.2 when it joined the R.A.F.
(Johan Visschedijk collection)