

Chandelle Article: Blackburn's blunt-nosed Dart

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British Navy interest in the potential of torpedo bombers went back to the earliest days of the First World War, when Royal Naval Air Service officers fitted small, obsolete torpedoes to Shorts floatplanes. These experiments met with little success, however, for the aero engines of the day proved incapable of lifting both the torpedo and a bulky pontoon undercarriage off the surface of the water. The warheads fitted to the light but elderly Edwardian torpedoes were, moreover, too small to cope with modern, bulged and sub compartmented capitals ships. As more powerful engines became available and as experience with flight deck operations became more general, interest in ship-based torpedo bombers revived. One design, the Blackburn-built Sopwith T.1 Cuckoo, achieved limited production and underwent service testing by the end of the war, but was still limited by the power available from its temperamental 200-hp Sunbeam Arab engine. It could carry the small, 1000-lb, Mk IX Whitehead torpedo, but not the full-sized, 1423-lb Admiralty Mk VIII. Wartime designs to specification N.1B of 1917, which specified the larger weapon—Blackburn's Blackburn and the Shorts Shirl—proved, in the event, too unsatisfactory to merit production.

The end of the war and the failure of the N.1B contenders did not end the Royal Navy's interest, however. By 1919, the Navy had two full-deck carriers, *Argus* and *Eagle*, fitting out and another, *Hermes*, under construction. The longer flight decks and smoother airflow of these ships made the operation of larger aircraft—and larger torpedoes—entirely practical. A powerful, new light-weight aero engine, the 450-hp Napier Lion, was now available. So, early in 1920, the Air Ministry reissued the 1917 specification on the Navy's behalf.



In the event, only Blackburn responded with a design, the privately funded T.1 Swift, which appeared late in 1920. This was, for the day, a very large, single-seat, two-bay biplane powered by the Napier engine and fitted with a split-axle undercarriage to facilitate carriage of the Mk VIII torpedo. From the first, Blackburn catered for landing loads by building the aircraft around an immensely strong, steel-tube truss that formed the front fuselage and engine mounts. This incorporated the strong points for the torpedo, the attachments for the lower stub wings, upper wing center section, and undercarriage, and the mounting for the 66-gallon main fuel tank. A second, 15-gal gravity-fed tank was fitted in the upper wing center section. The remainder of the fuselage was a similar steel-tube structure, while the folding wings and the tailplane

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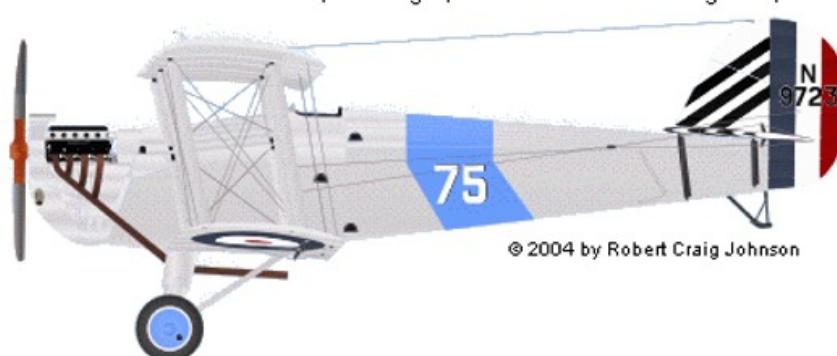
were of wood. The engine compartment and cockpit were panelled with light alloy and plywood, respectively, while the remainder of the airframe was covered with doped fabric. An early Lion IB W-12 engine was fitted along with a flat, car-type frontal radiator. With the wings folded, the Swift was only 17.5-ft wide and 48.5-ft long, so it fit neatly on the narrow elevators of the new carriers.

Trials went well, for the most part, once some initial handling troubles were corrected. Adding slight sweep back to the wings easily remedied a potentially disastrous center-of-gravity problem and a larger rudder and smaller fin improved directional control. Tests at Martlesham Heath were satisfactorily completed in April 1921. Claw-type arrestor gear (used with the longitudinal arrestor wires found on early carriers) was then fitted to the prototype, now serialised N.139, and deck trials were carried out in May, first at Gosport and then at sea aboard HMS *Argus*.

Blackburn Dart, 460 Flight, embarked HMS Eagle



Blackburn Dart, 463 Flight, embarked HMS Courageous, 1929



Trials were successful enough that the Swift went into limited production for export customers, including Spain and the United States, which took two for evaluation. But, in light of the testing, the Air Ministry wanted its own production aircraft to incorporate certain minor modifications. The Ministry accordingly issued Specification 3/20 to cover the revised airplane, now called the T.2 Dart. The first three Swifts on the stocks at Blackburn were, retrospectively, designated prototypes for the revised model. The first, N.140, introduced a lower-drag radiator installation jointly developed by Blackburn, Napier, and the aerodynamicists of the Royal Aircraft Establishment. This relocated the radiator below the engine, at an incline and enclosed in a tunnel of rectangular cross section and rounded profile. The front end of this tunnel was fitted with articulated, light-alloy slats that regulated cooling—and drag—by opening and closing like the cover of a roll-top desk. Compared to the flat radiator shutters previously used, it was an elegant and widely emulated solution to the problem of cooling drag. Blackburn retained the Swift's swept-back wings, but

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reduced the span by some 3 ft. Wing loading was a low 6 lb/sq-ft. A revised fin and rudder were fitted, along with a Lion IIB engine.

The Dart proved to have an exceptional performance for its day. The landing speed was particularly impressive for a carrier aircraft: a mere 38 mph. Maximum speed with the Mark VIII torpedo in place was 107 mph at 1000 ft. Range was 300 mi.



Blackburn Dart, 460 Flight, embarked HMS Eagle, 1930



Blackburn Dart, 461 Flight, embarked HMS Furious, 1930

Despite worthy competition from the Handley-Page design to Specification 3/20, the HP.19 Hanley, the Dart won the production contract and received an order for 26 airplanes. Deliveries began within months and, by April 1923; the Dart was replacing the elderly Cuckoos. Initially, two units received six aircraft each: 460 and 461 Fleet Torpedo Flights, embarked aboard HMS *Eagle* and HMS *Furious*, respectively. A further 42 aircraft were then ordered, and a third unit, 462 Flight, was formed aboard *Furious*. A final order, for 16 airplanes, placed in 1926, supplied aircraft for 463 and 464 Torpedo-Bomber Flights. These embarked with the new carrier HMS *Courageous* in 1928. Darts continued to serve until 1934, when the last were replaced by the Blackburn Baffin.

Though hardly a spectacular performer, even by contemporary standards, the Dart proved solid, reliable, and easy to handle in all weather, both in the air and aboard ship. As such, she was the perfect equipment for proving the naval aviation concept.

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