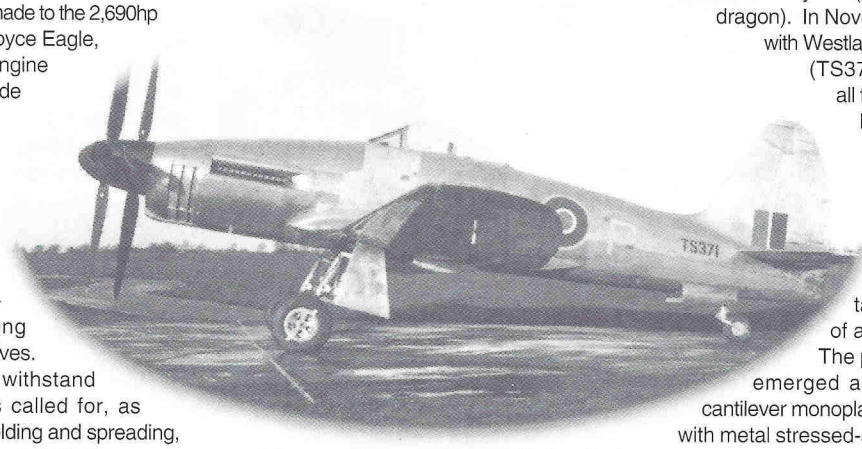
Sole surviving Wyvern — TF.1 VR137 is with the Fleet Air Arm Museum, Yeovilton and (below) Wyvern TF.1 prototype, TS371, with Rolls-Royce Eagle 22-piston engine and Rotol contra-rotating propellers. The type first flew on December 12, 1946. (FP Collection)

Westland Wyvern AT FIFTY

Ken Wixey looks at the history of this naval strike fighter.

THE FLEET AIR ARM had learned from its earlier experiences in the war at sea from 1939 onwards, the necessity to acquire a versatile strike aircraft with long-range capability. Thus on January 1, 1945, Specification N.11/44 was issued stipulating use of, preferably, a British powerplant, reference being made to the 2,690hp (2,006kW) RH2SM Rolls-Royce Eagle, a new 24-cylinder piston engine and the largest of its type made by Rolls-Royce. This would involve the use of two four-bladed contra-rotating propellers by Rotol with a two-speed gear system, but it was emphasised the fuselage was to be capable of accommodating the Rolls-Royce Clyde or Armstrong Siddeley Python as alternatives.

A landing gear able to withstand heavy deck landings was called for, as was power-operated wing folding and spreading, two or four 20mm wing-mounted Mk V cannon, facilities to carry eight rocket projectiles, or three 1,000lb (454kg) bombs, or an 18in (45.7cm) Mk VIII torpedo, or a 1,820lb (825.5kg) Mk VI mine. The maximum landing weight of 17,500lb (7,938kg) was to include fuel reserve for one hour and unused ammunition, while provision was to be made for rocket assisted take-off gear (RATOG); dimension limits were stated as 50ft (15.2m) wingspan (19ft 6in [6m] folded), 40ft (12m) length and 15ft 9in (4.8m) height. The highest possible speed in accordance with the design was to be attained, combined with good combat manoeuvrability, a climb rate of 15,000ft (4,572m) in 5 mins, operational ceiling of 20,000ft (6,096m) and a radius of action of 250 miles (400km).



Of the two companies which submitted proposals, General Aircraft Ltd and Westland Aircraft Ltd, Westland alone was awarded a design contract on April 14, 1944, and in September that year its chief designer, John Digby, finalised the basic plans for project number W.34 which was named Wyvern (a fictitious winged two-legged dragon). In November an order was placed with Westland for six prototype Wyverns (TS371/375/ 378/380/384/387) all to be powered by the mighty but untried Rolls-Royce Eagle. This was of course taking place under war-time conditions, the Wyvern being initiated at a time when an innovatory change was taking place in the design of aircraft powerplants.

The prototype Wyvern (TS371) emerged as a single-seat low-wing cantilever monoplane of all metal construction, with metal stressed-skin covering, eight-bladed contra-rotating propellers by Rotol (largest airscrew system in Britain at the time) and fully-retractable main and tailwheel landing gear. It appeared with non-folding wings, unarmed and minus a deck arrester hook. This aircraft made its initial flight in the hands of Westland chief test

pilot, Harald Penrose, on December 12, 1946. Second prototype (TS375) did not follow until September 10, 1947, it too being devoid of wing folding, armament and arrester hook. However, the third Wyvern prototype (TS378) was flown fully navalised, but its Rolls-Royce Eagle drove a de Havilland six-bladed contra-rotating propeller.

Meanwhile, a contract had been signed in August 1946 for 20 pre-production Wyverns to be designated TF Mk.1s and all powered by the Eagle engine. But by December 1946 this powerplant had been cancelled after discussions between the Naval Air Staff and Ministry of Supply (MoS), when it was decided Rolls-Royce should concentrate on development of gas turbine engines. In consequence the order for 20 Eagle-powered piston engine Wyverns was reduced to ten (VR131-VR140) of which three (VR138-VR140) were cancelled.

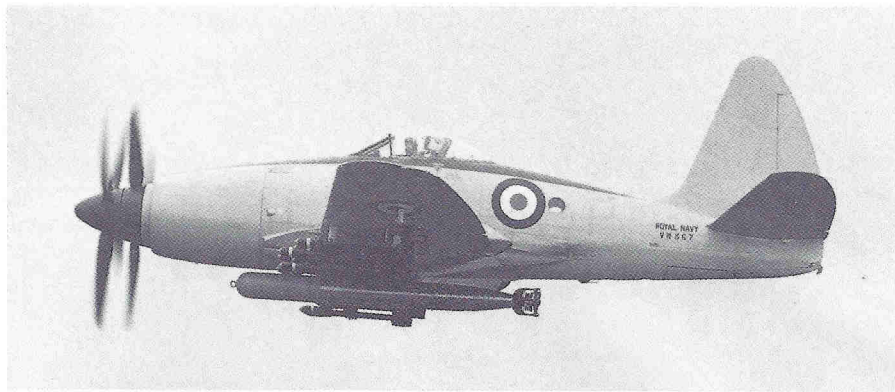
In accordance with MoS plans, three more Wyvern prototypes were ordered to Specification N.12/45, these machines (VP109, VP113, VP120) being designated Westland W.35 and updated as the Mark TF.2. First to fly was VP120 on January 18, 1949 powered by a 4,050ehp (3,021kW) Rolls-Royce Clyde driving a six-bladed Rotol contra-rotating propeller. The Clyde in fact proved quite a successful Wyvern installation, but nearly two years previously it had lost official backing, which left only the Python as a suitable turboprop to power the Wyvern. This engine had flown during January 1949 in an Avro Lancaster test-bed (TW911), its first flight as a Wyvern installation being in VP109 on March 11, 1949. The huge 13ft (4m) Rotol eight-bladed contra-rotating propellers had to be adapted to work in unison with the Python and several Wyverns were flown at Moreton Valence airfield, Gloucestershire, by Rotol's Flight Test Department which, when it closed in 1954 was still using Wyvern VW882.

The Python/Rotol contra-prop problem was partly solved in 1951 when the Rotol Inertia Control Unit (ICU) was introduced, this mechanism governing the propellers in relation to changes of acceleration and deceleration, and not just alterations in speed. The ICU was fitted to Python 3 engines, definitive powerplant for the Wyvern S.4 (originally TF.4), the first Wyvern variant to become operational. In fact from a production batch of 20 TF.2s ordered (VW867-VW886), seven were built as S.4s (VW880-VW886) and four converted to S.4 standard (VW868, VW870, VW871 and VW873). However, even with ICU fitted, early squadron Wyverns had to be restricted to shore bases until in 1954 an updated ICU was available which allowed Wyverns to operate from Royal Navy carriers. Wyvern TF.2s had the Python 2 engine installation, but all Wyvern S.4s were powered by the 4,110ehp (3,066kW) Python 3. A Martin-Baker Mk 1B ejection seat was initially fitted, although after Wyverns had entered service this was changed for a Mk.2B seat.

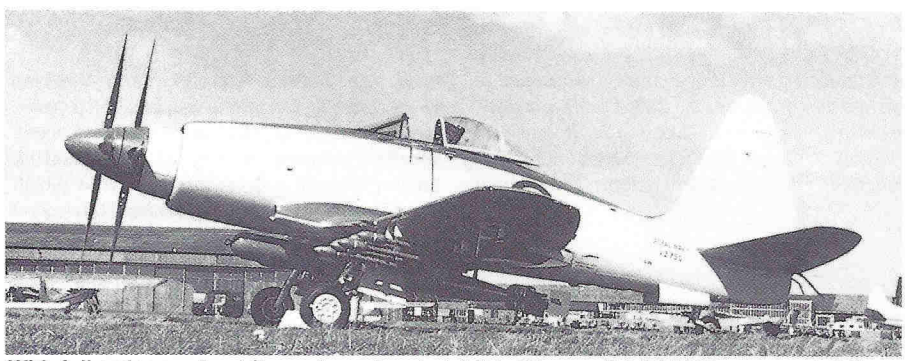
Following the TF.2/TF.4 (S.4) contracts and conversions, a first production batch of Wyvern S.4s was ordered (VZ745-VZ766 and VZ772-VZ799), with contracts signed for a further 37 S.4s to be built in three batches, WL876-WL888, WN324-WN336 and WP336-WP346. A one-off training variant, the W.36 Wyvern T.3 (VZ739) was produced to Specification T.12/48 and made its initial flight on February 11, 1950. It featured a TF.2 airframe in which the rear fuselage was enlarged to accommodate a second seat for the instructor, his forward view being enhanced by a periscope mounted between the cockpits. Powered by a Python 1 turboprop, the sole Wyvern T.3 built underwent a series of trials before becoming a Westland company hack, its career ending on November 3, 1950 after a forced landing and write-off at Seaton, Devon.

Some airframe teething problems were experienced during the Wyvern's development, most being attributed to the employment of a turboprop engine. For example tests revealed the need for an increase in fin area and a dihedral tailplane in order that instability caused by the large contra-rotating propellers could be neutralised. In addition production Wyvern S.4s introduced increased rudder area, modified aileron tabs, cut-back engine cowling to allow a cartridge start and auxiliary fins fitted to the tailplane for improvement in low-speed handling qualities. Further modifications added after Wyverns entered service included a revised canopy and ventilation for the cockpit, perforated airbrakes beneath the centre-section, deletion of outer-folding wingtips, facilities to fit Venom-type wingtip fuel tanks, provision to carry a centre-line fuel tank as an alternative to a torpedo and replacement of the original curved windscreen by a flat bullet-proof type.

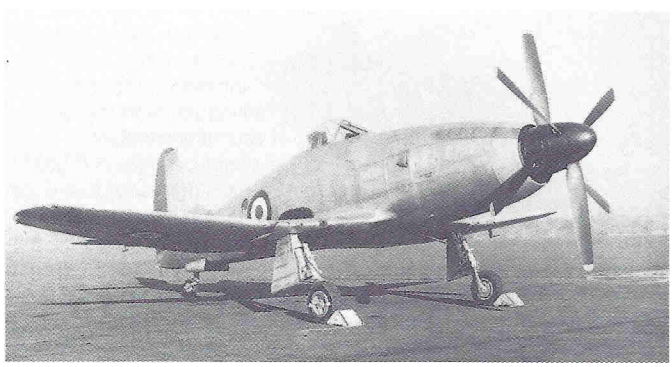
The RAF showed interest in the Wyvern for development as a long-range escort fighter, Air Ministry Specification F.13/44 being issued on July 17, 1945, calling for a range of 1,500 miles (2,414km), reduced in an amendment of August 28 to 1,000 miles (1,609km). The Rolls-Royce Eagle R.Ea.2SM piston engine was stipulated driving a pair of four-bladed Rotol contra-rotating



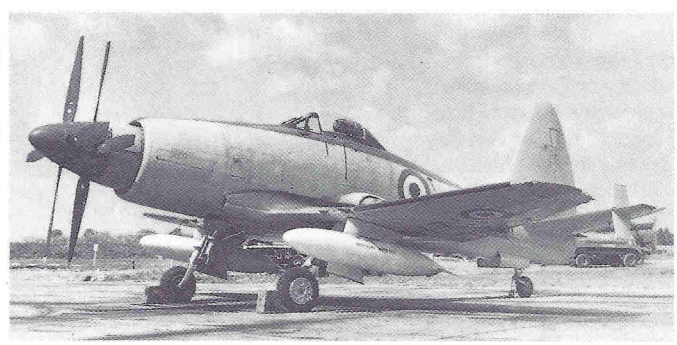
The first of 20 production Wyvern TF.2s ordered (VW867) of which a number were built or converted as S.4s; here the aircraft carries a full load of torpedo and RPs. (FP Collection)



With full ordnance load (torpedo and rockets) this Wyvern S.4 (VZ750) appeared at the 1952 SBAC Show, Farnborough. ('MAP')

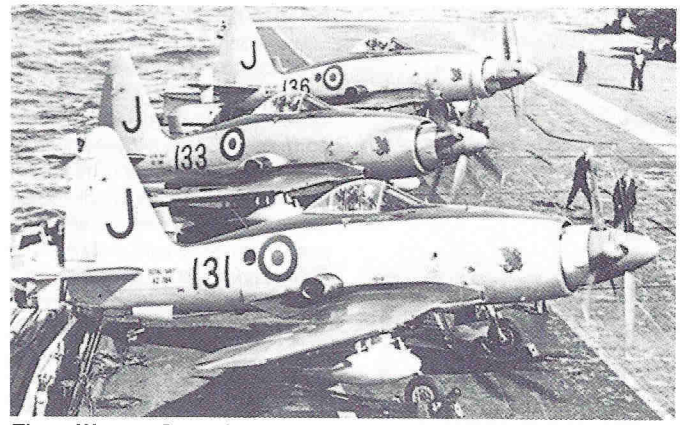


The only Clyde-powered Wyvern TF.2, VP120, in 1949. Note: contra-rotating, three-bladed Rotol propellers. (FP Collection)



Wyvern S.4, VZ748, employed mainly by Westland and the RAE, Farnborough, as a trials aircraft. Note: auxiliary tailplane fins and underwing drop tanks. (Westland Helicopters Ltd)

Wyvern S.4s of 813 Squadron in echelon starboard. Nearest aircraft is VZ758/'188'. ('MAP')



Three Wyvern S.4s of 827 Squadron aboard HMS Eagle in 1955. Nearest aircraft ('J'/131) serialled VZ794. ('MAP')

propellers. The RAF Wyvern was to include protection for the pilot, header tank, ammunition and oil tank against 20mm armour-piercing cannon shells fired from a distance of 200 yards (182.9m), and internal fuel tanks were to be self-sealing. The new fighter was required to be capable of taking off into an immediate climb to 20,000ft (6,096m), where it could undertake combat on full power for 15 minutes. Auxiliary drop tanks would provide an action radius of 1,000 miles (1,609km) when required. It was envisaged two prototypes would be followed by a production run of the new fighter, a number of which were to be provided with space to accommodate cameras as photo-reconnaissance aircraft. In the event, RAF Wyvern requirements were cancelled when the Air Ministry decided Fighter Command would become an all jet fighter force.

The Wyvern S.4 first entered service with 813 Squadron at Ford on May 20, 1953, and remained shore-based until receiving Wyverns fitted with the updated ICU when it was declared ready for deck operations. In September 1954, 813 Squadron embarked aboard HMS Albion and sailed to Malta (Hal Far) returning to the UK in March 1955. In the meantime, 827 Squadron had evolved from 703W Flight and commissioned during November 1954. In the spring of 1955, 813 and 827 Squadrons embarked aboard HMS Eagle but, after returning to Ford in November 1955, they disbanded. However, that same month 830 and 831 Squadrons were newly commissioned, initially using S.4s transferred from the two disbanded units before receiving new Wyverns in January 1956.

It had been intended for 830 and 831 Squadrons to embark on Eagle, but in March 1956, 831 Squadron was reallocated to Ark Royal. No 830 Squadron remained with Eagle and so become the only Wyvern unit actively involved in the Suez Campaign. Israeli intervention at Suez on October 30, 1956 brought 830 Squadron to stand-by readiness, its Wyverns having the yellow and black 'Suez stripes' painted around the wings and rear fuselages. On November 1 operations commenced with the Squadron's Wyverns making a number of bombing and strafing attacks against Dekheila airfield. The next day 15 attacks were made against hangars at Dekheila and on Egyptian tanks and army vehicles near Cairo. Some light flak was encountered but no Wyvern was hit and the raids were considered a success.

Day three involved bombing attacks by 803 Squadron on Gamil Bridge west of Port Said, in which one Wyvern (WN330) was hit by flak. Managing to drop his bomb, the pilot, Lt McCarthy, was able to glide 3 miles off shore, where after ejecting he was picked up by SAR from Eagle. Two days later on November 5, 830 Squadron was ordered to support the Army with bombing and rocket attacks against enemy gun positions and sniper concentrations. A second Wyvern was lost during this operation, when Lt Cdr W H Cowling was forced to eject from WN328. He too was safely recovered by helicopter. On November 6 (last day of the campaign) 830 Squadron's Wyverns used the familiar 'cab-rank' system operated successfully by RAF Typhoons during World War Two. Carrying bombs, rockets and/or long-range tanks, the Wyverns' task was to support the advance to Port Said. When 830 Squadron returned to the UK in January 1957 it was disbanded and its Wyverns dispatched to the Receipt/Dispatch Unit, RNAS, Stretton.

Meanwhile, 813 Squadron had re-formed in October 1956, again as a Wyvern unit to embark on Eagle and, together with 831 Squadron (Ark Royal), remained a first-line Wyvern unit. First to disband was 831 Squadron in December 1957, with 813 Squadron remaining until March/April 1958, after which Wyverns quickly disappeared from service. Some second-line units had also flown Wyverns including 787 Squadron (Naval Air Fighting Development Unit, West Raynham), 703 Squadron (Service Trials Unit, Ford) later renumbered 700 Squadron, 764 Squadron (two Wyverns on pilot conversion) and the Wyvern Conversion Unit at Ford.

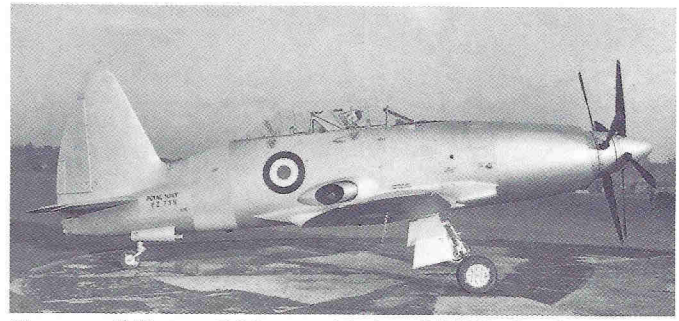
Apart from Westland and Royal Navy units, other Wyvern operators included the Handling Squadron, RAF, Manby, A&AEE, Boscombe Down, RAE, Farnborough, Naval Air Establishment, Thurleigh (Bedford) and the Air Torpedo Development Unit, Gosport (moved to Culdrose May 18, 1956).

The only extant example of a Wyvern is the Eagle-engined TF.1 (VR137) exhibited at the Fleet Air Arm Museum, Yeovilton.

Westland Wyvern S.4 Specifications

Type: Single-seat carrier-borne naval strike aircraft.
Powerplant: One 4,110ehp (3,066kW) Armstrong Siddeley Python ASP.3 turboprop engine driving eight-bladed Rotol contra-rotating propeller.
Performance: Max speed, 383mph (616km/h) at sea level. Cruising speed, 343mph (552km/h) at 20,000ft (6,096m). Climb rate, 2,350ft (716m)/min. Range, 904 miles (1,454km). Service ceiling, 28,000ft (8,535m).
Weights: Empty, 15,608lb (7,080kg). Loaded (normal), 21,200lb (9,616kg); maximum take-off, 24,500lb (11,113kg).
Dimensions: Span (spread), 44ft (13.4m); folded, 20ft (6m). Length, 42ft 3in (12.9m). Height, 15ft 9in (4.8m). Wing area, 355 sq ft (32.9m^2).
Armament: Four wing-mounted 20mm cannon, with ordnance load of either 16 rocket projectiles, a single torpedo or three 1,000lb (454kg) bombs.

Prototype Wyvern VP109, first to fly with Python turboprop and eight-bladed Rotol contra-rotating propeller on March 22, 1949. Note: revised fin and rudder. (FP Collection)



The one-off Wyvern T.3 two-seat trainer (VZ739) showing rear canopy and yellow fuselage stripe. (FP Collection)