

**PROFILE
PUBLICATIONS**

The
Roland
C II

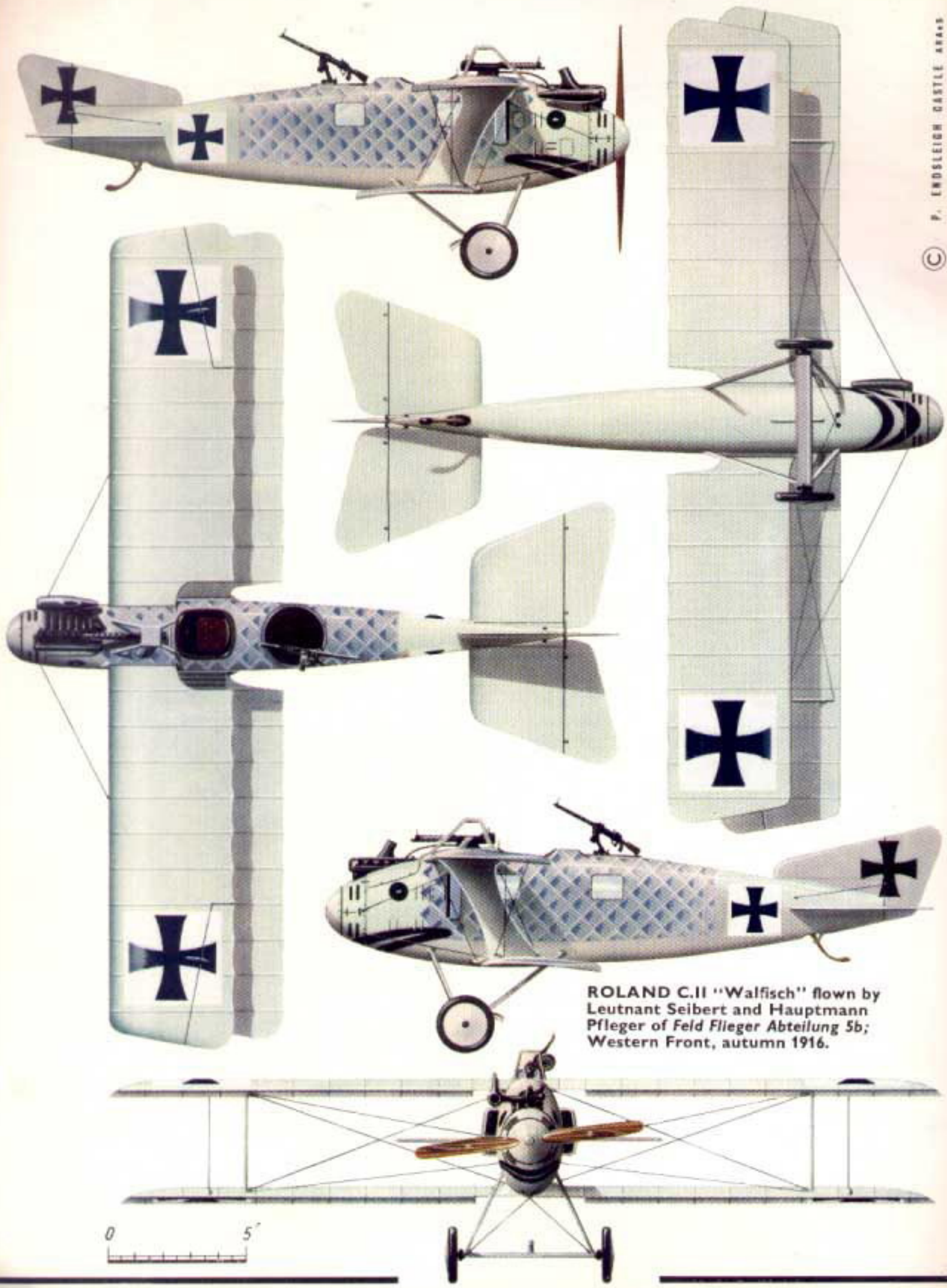
NUMBER 163

RETAIL PRICE

UNITED KINGDOM TWO SHILLINGS

UNITED STATES & CANADA 50 CENTS





ROLAND C.II "Walfisch" flown by
Leutnant Seibert and Hauptmann
Pfleger of Feld Flieger Abteilung 5b;
Western Front, autumn 1916.



The Roland C II

by Peter M. Grosz

Living up to its name of "Golden Boy" (Goldjunge) lettered on the fin, a brand-new early production Roland C.II is posed in front of the LFG-Roland assembly sheds at Adlershof. Note the rounded turn-over pylon ahead of the cockpit.

It is a sad commentary on our civilization that war or threat of war has been a powerful motivating force in the advancement of technology. No concept seems too far-fetched if it promises even a slight "edge" over the enemy. In World War I this was amply demonstrated by the hundreds of aircraft types proposed and built, many of them pre-ordained failures. Yet scattered here and there among the proliferation of types were noteworthy examples of engineering excellence. To this select group belongs the Roland C.II *Walfisch* (Whale). Indeed, aircraft of such impeccable design were a rarity in 1914-1918 and perhaps even today. Far above its 1915 contemporaries in streamlining and attention to detail, the *Walfisch* had considerable influence on aircraft design in Germany; particularly noteworthy was its finely streamlined fuselage.

The company that designed the *Walfisch*, the *Luftfahrzeug-Gesellschaft m.b.H.* (LFG), was founded in 1908 in Berlin to build non-rigid airships and balloons based on the Parseval concepts. In 1909, the *Flugmaschine Wright Gesellschaft* was formed to exploit the Wright Brothers' patents in Germany. Some years later the patents were declared void by German courts. The company, forced to liquidate, sold its assets to LFG. In 1912, using the *Wright* plant facilities, a new *Abteilung Luftfahrt* was formed by LFG to construct aircraft primarily of steel tubing. It was intended that these aircraft would be particularly suited for service in Germany's African colonies. This undertaking was crowned by an LFG *Stahldoppeldecker* capturing the world's endurance record in 1914 (14 hours on 3rd February 1914). To avoid confusion with other aircraft manufacturers, especially LVG, the trademark "Roland" was adopted for all LFG aircraft. The famous statue of Roland* in Bremen was chosen as a symbol of strength and reliability. Contrary to wartime French literature and more recent articles, there never was a man named Roland on the LFG engineering staff.

In early 1915, LFG-Roland was awarded military contracts to build the Albatros B.II(Rol) and C.I(Rol) two-seater biplanes under license. After producing a number of these machines, Roland engineers, concerned with the high drag of a rectangular cross-section fuselage and the attendant maze of wires and struts which characterized the majority of the aircraft of those days, began to study ways of building aerodynamically superior aircraft. The man responsible was chief engineer Dipl.-Ing. Tantzen (a student of the famous aerodynamicist Prof. Prandl) who was ably assisted by Ober-Ing. Cämmerer and Ing. Richter. Approaching the problem with great thoroughness, they produced a solution which stands as a brilliant technical achievement.

DESIGN FEATURES

Since engines of higher horsepower were not yet available, brute force had to stand aside for initiative and imagination. The fuselage and wing bracing offered the most promising possibilities for drag reduction. The wing configuration was more or less fixed: profile, chord and span were derived from the well-known Eiffel formulas and results of recent wind tunnel studies at Göttingen. The low-drag advantages of the cantilever wing, at the time under investigation by Junkers, were still virtually unknown.

The most prominent feature of the new design was its near-oval, tear-drop fuselage which completely filled the gap between top and bottom wings. Because the fish-shaped fuselage reminded one of a whale, the aircraft was nicknamed *Walfisch*, one of the few German aeroplanes to have a name in World War I. The low-drag shape was determined after many scale-model tests (1:15 scale) in the wind-tunnel at Göttingen, performed under the direction of Ober-Ing. Cämmerer. The realization of the final structure

* *Roland*, in medieval European literature the paragon of noble courage, was said to have commanded the rear-guard of Charlemagne's army and to have fallen after a heroic last stand in the Pass of Roncevalles.



Fuselage and completed airframe of the C.II prototype. In these Roland brochure pictures the single window of the prototype can be seen to have been fitted at a late stage; it provided illumination in the deep fuselage and an emergency exit in case of a crash. No crash pylon was fitted to the prototype.



was the contribution of Ing. Richter. On 7th October 1915, he was granted a patent for the *Walfisch* design. After much experimentation Roland engineers devised a clever method for fabricating the difficult shape out of wood. The result was a semi-monocoque structure formed of several layers of plywood veneer strip wrapped diagonally around a light wooden framework which consisted of ten light bulkheads and six longerons. The layers of strip were laid at an angle to each other and were then glued, nailed and covered with fabric.

It was the first semi-monocoque structure to be mass produced in the war. Not only did this ingenious technique make it possible to form smooth compound curves, but it produced a structure with a very high strength-to-weight ratio. Such structures were very popular with aircrews. They held up better in crashes, unlike conventional strut and wire fuselages which had an unpleasant habit of simply collapsing around the crew, even in light crashes. The same monocoque construction technique was used in the early Roland fighters and subsequently introduced to the Pfalz company when the Roland D.I (Pfalz) was built under licence. Pfalz used it with great success throughout the war whereas Roland later shifted to a curious clinker construction method; but that is another story. The wrapped monocoque fuselage was unfortunately rather expensive and the high cost in man-hours was perhaps one reason why more *Walfische* were not seen at the Front.

In other aspects too, the *Walfisch* was put together in an exemplary manner. The wing roots were finely moulded into the fuselage to avoid drag-producing vortices. The greatly simplified wing assembly consisted of a single I-strut, a built-up structure supported by a minimum of bracing wires. Wings were of orthodox construction based on two hollow box-spars, the rear spar being located at approximately mid-chord, with three steel tube compression members to each panel. The main plywood ribs were inter-spaced with false ribs which extended right back to the rear spar. All four wing panels were of the same span and chord with angularly raked tips. Ailerons of inverse taper were mounted on the top wing only; these were fabricated from steel tubing. The procedure for erecting the wings was extremely simple, an important asset for front-line aircraft. First the bottom wings were attached and held to the fuselage by the landing wires. Then the struts were mounted on the bottom wings (attached by cup and ball joints),

the top wings attached and the flying wires pulled taut. The tail surfaces were of composite construction, all fixed surfaces being of wood and the unbalanced control surfaces of welded steel tube.

The seats were placed deep in the fuselage, completely shielding the crew from the slipstream. They enjoyed a fine view over the top wing and the observer commanded a magnificent field of fire at the cockpit level. Roland engineers overlooked nothing in their quest for streamlined perfection. The exhaust stack was a specially designed low-drag shape; the neatly installed Mercedes engine was almost completely buried in the nose; the control wires were placed inside the fuselage; the landing gear axle was faired and even the "ear" radiators were smoothly contoured and slanted back from the slipstream. The radiators were later criticized by *Idflieg* experts



Oberleutnant Ritter von Schleich of Feld Flieger Abteilung 2b in his *Walfisch*: note the rear view mirror on the crash pylon and the "pilot fish" on the anemometer airspeed indicator strut. In the close-up can be seen the Roland trade-mark under the forward window, the foot step cover (not a window) in the centre of the cross insignia, and the restriction of forward vision by the ear-type radiators.



for being placed too close to the fuselage which reduced cooling efficiency. Had wing-mounted airfoil radiators been available, these would have been the ideal solution.

In October 1915, the sleek *Walfisch* prototype flew for the first time; an event cut short by engine failure shortly after take-off. One wing was destroyed when the prototype ran into an obstruction during the emergency landing. Subsequent flight tests showed that the *Walfisch*, powered by a 160 h.p. Mercedes D.III engine, had a speed some 30 km./h. (18.75 m.p.h.) greater than those of existing German aircraft. Series production was slow in getting started and it was not until almost five months later (on 7th March 1916) that the first five production models were accepted by the *Fliegertruppe*. The Roland C.II had been acceptance tested by the *Prüfanstalt und Werft* (Test Establishment and Workshops of the Air Service) during February 1916 but comprehensive tests were not completed until August that year. It is believed that the production delay resulted from two causes: time required to perfect large-scale production of the fuselage and problems encountered in the static tests of the wing.

The *Walfisch* was the smallest C-type aircraft in the German air service. With a comparatively high wing loading of 45.7 kg./sq.m. (9.36 lbs./sq. ft.) and a power loading of 7.9 kg./h.p. (16.4 lbs./h.p.), the performance was excellent and showed a vast improvement over existing types. But the outer wing surfaces required reinforcing to minimize vibration and aerodynamic twisting. One must consider the difficulties encountered in designing a heavy, single-strutted aircraft with such a thin wing section, to fully appreciate the cleverness of the designers in avoiding complaints from the Front. What could have been improved was the depth of the gap. It measured only 84.5% of the chord and an increase in gap would have offered some improvement of flight characteristics.

Nevertheless the performance of the *Walfisch* was



Although heavily retouched, this view of a front-line modification of a captured Lewis gun mounted over the crash pylon shows an interesting early attempt to obtain forward fire power.



Hoping to develop a correlation with the many hours of wind-tunnel testing, the makers tested a full-scale production *Walfisch* on a high-speed railroad track: results were unfortunately inconclusive.

superb and surpassed design specifications set for it. In speed, it was equal to the Allied Nieuport 11 and Sopwith Pup single-seat fighters it would soon meet in combat. With a full military load of 515 kg. (1,136 lbs.), the *Walfisch* could climb to 1,000 metres (3,281 ft.) in 7 minutes; 2,000 metres (6,562 ft.) in 16 minutes and 3,000 metres (9,843 ft.) in 30 minutes, surpassing the specified times of 9, 22 and 43 minutes respectively.

DELIVERY AND LICENSE PRODUCTION

Roland C.II's were issued to squadrons in March-April 1916 and remained at the Front until June 1917 (see chart). One must imagine the awe and astonishment that greeted these resplendent grey machines as they flew in to join their squadrons for the first time. Nothing like them had been seen before. The first *Walfische* were issued to *Kampfgeschwader* (Battle Wings) attached to the Fifth *Armee*, which at the time was heavily engaged in the frightful holocaust of Verdun. Allied pilots reported formations of four to ten *Walfische*; their speed made it impossible to fly in formation with the slower Rumpler, Albatros and LVG types at the Front. The French had an



This photograph, taken on 25th April, 1916, shows the clean uncluttered lines of an early production *Walfisch*, remarkable for its day. (Photo: A. Imrie)

Roland-built *Walfische* of *Kampfgeschwader 1*, *Staffel 6* at Mont airfield in spring 1916.

(Photo: W. Puglisi)





Ready for action; a Roland C.II of Kampfgeschwader I, Staffel 6 at Mont near Verdun. The type first saw combat above the horror of Verdun, armed at that time only with an LMG 14 Parabellum in the observer's position.

opportunity to inspect a badly wrecked *Walfisch* that had crash landed behind the lines due to poor weather. This happened on 24th March 1916, a bare two weeks after the first *Walfische* had been delivered to the *Fliegertruppe*. Curiously this *Walfisch* was armed with a Lewis machine gun for the observer.

In the autumn of 1916, *Linke-Hofmann Werke A.G.* of Breslau began to construct the Roland C.II(Li) under license. This was in keeping with air service policy to bring firms with extensive woodworking experience and facilities into the aircraft production programme. *Linke-Hofmann*, like *Hannover* and *Gotha*, was a manufacturer of railway cars and rolling stock. Some references state that *Linke-Hofmann*-built *Walfische* were all designated as C.IIa but this has not been confirmed. It is known that both *Roland* and *Linke-Hofmann* built the C.IIa which first appeared at the Front in August 1916. According to available documents, the C.IIa differed only slightly from the C.II; namely in having a modified wing spar section, a changed wing strut location, a wooden strip on the trailing edge instead of wire, some slight dimensional changes and external racks for four 12.5 kg. (27.6 lbs.) bombs. While conclusive proof is still lacking, a study of photographs makes it reasonably certain that the chief characteristic of the C.IIa was the addition of a fixed forward-firing machine gun for the pilot. The *Linke-Hofmann*-built *Walfisch* was type-tested (i.e.: *Typenprüfung*—approved for service) in November 1916 at which time the *Walfisch* was already being phased out of front-line squadrons. It is interesting to note that the Roland C.II(Li) was initially known as the Li-Ho C.I but with the rapid increase of license production, the old designation system became cumbersome and was changed in late 1916.

The first Roland C.II's were armed with a single flexible LMG 04 *Parabellum* light machine gun for the observer. The serious lack of forward fire power was soon rectified by the installation of a fixed MG 08/15 *Spandau* for the pilot. This necessitated a re-designed crash pylon of rectangular shape.

Brand-new Walfisch at the Front; the streamlining of the cowling and exhaust stack are typical of the meticulous design work that went into this remarkable aircraft.



The next major modification was the replacement of the aileron cables in the lower wing by a combination pivot and cable linkage running through the upper wing, which gave more positive control. The last *Walfische* to leave the production line had an enlarged tail and rudder that reduced slipping in turns and lessened the tendency to spin.

Most aircraft were equipped with a 250 watt *Telefunken* Type C wireless transmitter operating on 150, 200 and 250 meter bands and weighing some 15 kg. (33 lbs.). The retractable antenna was winched in by an internally mounted drum. Some *Walfische* were equipped with an aerial camera mounted behind the observer for high-speed reconnaissance work.

HANDLING CHARACTERISTICS

It is amply evident from wartime literature that the *Walfisch* was a difficult aircraft to fly, although in the



Above: a *Walfisch* prepares to take off; note how deep in the fuselage the crew are seated and the pilot's restricted forward vision of airfield terrain. Below: a close-up showing neat cowling, streamlined exhaust stack and claw brake on undercarriage axle: this photograph is dated April, 1916.





Left: A Roland C.II in training service; the downward-sliding windows are unique. Right: Roland C.IIa 1624/16; on the original print a letter A can be distinguished beneath the Roman numeral II, possibly an indication that the suffix "A" was applied to aircraft with two gun armament. (Photo: W. Puglisi)



Left: Some C.II's were fitted with a wire gun deflector between the cockpits, to prevent the observer accidentally cracking the pilot's skull or shooting his ear off in the heat of combat. Right: The first major external modification was to mount a fixed forward-firing MG 08/15 Spandau machine gun; this necessitated a redesigned square crash pylon.

hands of a skilful pilot it was a potent adversary. Nevertheless, it was received with mixed feelings as these excerpts from contemporary accounts show. In his book *"Im Flug über ein halbes Jahrhundert"*, Richard Dietrich, a pilot with *Flieger Abteilung 24* which had received the *Walfisch* in June 1916, had this to say:

"... it was difficult to land it on small airfields. I was master of it immediately and was happy to finally have a fast kite... as fast and as useful as the *Walfisch* was for long-range reconnaissance, it was not suitable for combat. Everyone who had flown the type said this. The fault lay in the round and comparatively short fuselage which offered no resistance in a steep curve. Its tendency to spin was also probably due to this characteristic."

Rudolf Stark, later C.O. of *Jasta 35*, flew the *Walfisch* as a trainer. He considered it an excellent aircraft but difficult to land. Lt. von Hippel enjoyed flying the *Walfisch* in *Beobachterschule Köln* (Cologne Observers' School). Once aloft with Paul Bäumer at the controls, the engine failed and the *Walfisch* side-

slipped into the ground. The intact condition of the fuselage is noteworthy and the strength of it probably saved the crew's life in the crash.

One design goal had been to achieve a wide field of view for the pilot and this had been accomplished with the exception of the view forwards and downwards, but the problem was not discovered until much later. The flight testing had taken place on the expansive flat airfields around Berlin where landing was more or less a routine manoeuvre. Once the *Walfisch* had to use small, rough and irregular operational airfields near the Front, the problems manifested themselves. The pilot actually had a very restricted view of the immediate terrain during the landing approach. The view was blocked by the top wing, the high fuselage and the "ear" radiators. It was difficult to see obstructions in time and this resulted in many crashes. Furthermore, the high wing loading gave the *Walfisch* a relatively high sink rate and this added to the landing difficulties, particularly in the case of inexperienced pilots.

Neumann, in his *"Die deutschen Luftstreitkräfte*

Admiring squadron personnel gather round a newly-delivered *Walfisch*; curtains painted on the inside of the Cellon windows were a popular, (if incongruous, touch).





A Walfisch of the Cologne Observers' School, with the airfield's telephone number marked under the serial to enable rescuers to notify the base commander in case of mishaps during cross-country flights; the legend reads "Fernsprecher A8880".

im Weltkrieg" commented on the landing problem as follows: "Actually the landing problem was not discovered during the design or testing stage but only after the type had reached the Front". It is important to remember that very few aircraft designers were pilots in those days. They were prone to make errors that a person with flying experience would have avoided. Later in the war, full-scale mock-ups were introduced which did a great deal to alleviate these predicaments.

Hauptmann Köhl, the Atlantic flyer, wrote about his experiences with the Walfisch when he was in Kampfstaffel 22 (then part of Kagohl 4):

"... in the Walfisch we had poor visibility and every pilot was in a sweat about the coming landing."

This was further amplified by Schlendstedt who wrote in "Vollgas":

"The Walfisch put much fear into the enemy and where he appeared the enemy sought his safety in escape. Actually it was not a particularly flight-worthy aircraft. It was acknowledged beforehand that every pilot after his first flight in the machine would crash on landing. Thus I realized that in war the psychic effect of an aircraft on the pilot was of utmost importance. The Walfisch had a slim brother, called Haifisch (Shark) which was so difficult to fly in turns that it was soon withdrawn from the Front."

Hptm. Arthur Pflieger, an observer with Flieger Abteilung 5b wrote in "Franz im Feuer" that the Walfisch was fast and showed a phenomenal rate of climb in comparison to other aircraft but that it was tricky to fly. Pflieger crashed twice during landing approaches, the Walfisch's "Achilles Heel". His regular pilot, an experienced flyer who had practiced handling the new Walfisch, completely wiped it out on return from their first combat mission in the machine. About a month later, Pflieger repeated the performance when a fledgling pilot flew a Walfisch into the ground while coming in for a landing.

The second major external modification of the "Whale" was the replacement of lower wing aileron control cables by a combination torque tube/cable arrangement in the upper wing.



In late 1916 the light grey upper surfaces were repainted with a scheme of dark green or dark green and dark lilac camouflage, which proved most effective.



Roland C.II 1644/16 in training service with the Beobachter Schule Köln; probably photographed late in 1917, the machine has been repainted in new-style national markings and dark colour scheme. The large numbers provided quick identification on busy training fields.

Another problem not discovered until the Walfisch reached the Front was the restricted view below the aircraft due to the high fuselage and also to the sides where the visibility was partially blocked by the upper wing and the broad I-struts. The British ace Captain Albert Ball seems to have made excellent use of this shortcoming by often attacking from below. He would deliver his attacks "from a position close under the adversary with his Lewis gun pulled back to fire nearly vertically". Considering their high speed, Ball no doubt dived under the Walfische also to gain speed for the attack.

Even so, the Walfisch was an effective foe in combat. According to his biographer (Kiernan), Ball more than once had to flee from counter-attacking Rolands. The best Allied fighters of the day were the Nieuport 11 and the Sopwith Pup, and with top speeds of 156 km./h. (96 m.p.h.) and 169 km./h. (105 m.p.h.) respectively, they had no speed advantage over the Roland C.II. With an experienced pilot at the controls and an alert observer at the guns, the Walfisch was no easy mark unless attacked from below.





Leutnant von Hippel with his Roland C.IIa(Li). Note circular Linke-Hofmann trademark beneath, and the aileron control rod behind, the radiator. Racks for four 12.5 kg. bombs can be seen under the centre-section. (Photo: von Hippel)



Comparison between Roland C.IIa(Li) 3652/16 and the Fokker D.II on the right emphasizes the fact that the Roland was the smallest German two-seater at the Front. The bomb racks have been removed from this machine and dual controls fitted.

With the opening of the Somme offensive in the summer of 1916, British pilots began to encounter *Walfische* in squadron strength as forces were shifted from the Verdun sector and the best aircraft transferred to meet the British threat. Allied aces Dorme, Guynemer, Boyau, Rees and others added *Walfische* to their bag. During the Verdun and Somme battles several squadrons were equipped solely with the *Walfisch*. However this state of affairs did not last long since the *Walfisch* was not really a general purpose aircraft and in addition was difficult to fly. Pilots with experience were in short supply. Two-seater squadrons were intended to support the ground armies; therefore as the war progressed it became usual for German squadrons to have two or more different two-seater types available, each serving a particular function. It was soon very obvious that

"Mixed bag" of *Walfische* at the Front; the first and last two in the line are Roland-built; the conventional exhaust stacks identify the other machines as Linke-Hofmann products.



the *Walfisch's* high speed made it an excellent long-range reconnaissance machine, difficult to intercept. It became customary to have one or two included in the squadron complement for this purpose.

Köhl achieved good results with the Roland C.II in night bombing attacks. His biggest success was the destruction of the large French munitions depot at Cerisy during the night of 6th/7th November 1916. Perhaps the most unusual adventure in which a *Walfisch* participated was the destruction of the rail line running to the fortified Russian city of Rowno. Due to the famous Russian "General Mud", the Rowno-Brody rail line was the only secure method of communication. In June 1916, *Flieger Abteilung 62* was transferred to the Russian Front and stationed at Perespa. In the fall of 1916, *Oblt.* Maximilian von Cossel and his pilot Rudolf Windisch (later a fighter ace with 22 victories) were convinced they could destroy the line by flying in explosives and blowing up the tracks at night. They reconnoitered a suitable landing field some 100 km. (62 miles) behind the Russian lines. For the mission they flew a *Walfisch* which "... was not liked by everybody because of its nose heaviness." All extra weight was eliminated and a sliding counter-weight was installed to shift the centre of gravity towards the tail after von Cossel and the explosives had been unloaded. In early morning of 2nd October 1916, Windisch landed the *Walfisch* in Russian territory and von Cossel, disguised as a peasant, jumped out and made his way towards the tracks. Windisch flew home and returned to successfully retrieve von Cossel at a pre-arranged time the next day. A timed charge destroyed the tracks, halting all traffic on the Rowno line for some time.

On 6th September 1916, the Roland factory at Adlershof burned to the ground. Lost in the fire were six or seven completed aircraft, among them the C.II successor and ten fuselages, but most of the aircraft were saved as well as the patterns, dies and construction jigs. Within twenty-four hours, in a masterpiece of improvisation and organization, *Oberst* Siegert, chief of staff to the commanding general of the air services, had production underway in the spacious new automobile exhibition hall located in the centre of Berlin. By the end of the month Roland C.II's were being delivered from this new factory. Officially the fire was attributed to carelessness and although sabotage was categorically denied, rumours were that Allied saboteurs had struck.

It is difficult to determine the exact numbers of Roland C.II's built. We can partially reconstruct the



German two-seater squadrons were usually equipped for general purpose missions, as demonstrated by the variety of types making up the strength of Flieger Abteilung (A)292 in May, 1917. The small size of the Walfisch is immediately apparent. From left to right: AEG C.IV 6657/16; Roland C.II 2700/16 series; LVG C.IV; Roland C.II; DFW C.V; and Albatros C.V.

production quantities from existing records and serial numbers and arrive at a reasonably accurate guess. Known serial blocks are the following: 4415 to 4449/15; 1000 to 1023/16; 1600 to 1699/16 and 2700 to 2739/16. The Roland company stated that it built several hundred *Walfische* and two hundred seems a reasonable estimate. Linke-Hofmann built some of the above machines (in the 1600 block) and the following: 1850 to 1863/16 and 3645 to 3652/16; and it is estimated that about 50 to 75 Roland C.II(Li) and C.IIa(Li) were built.

PRODUCTION ENDS

On 15th October 1916, official documents stated that since the *Walfisch* was outdated and could not be fitted with heavier (i.e., more powerful) engines, it would be dropped from production. As late as May 1917, we read that the *Walfisch* was not suitable as a trainer; that its climb was now insufficient but that it had been highly regarded in combat. Official opinions to the contrary, the *Walfisch* continued to be used as a trainer in fairly large numbers, one reason being that most of the Linke-Hofmann production machines came too late to be sent to the Front. *Jagdstaffel Schule Famars*, *Flieger Beobachter Schule Köln* and other advanced training schools used the type. The shortage of school aircraft was so acute at the time that all obsolete or outdated aircraft were pressed into service, even "hot and tricky" machines like the Roland C.II.

The *Walfisch* was unique in that a 1:15 scale model had been extensively tested in the Göttingen wind tunnel during the design stages. Naturally a great deal of model test data had been recorded. It would be valuable for engineers and designers to have some guidelines to compare model data with full-scale results. At the time there were no full-scale wind tunnels in Germany, but there was a high-speed

experimental military railroad track between Zossen and Jüterbog outside of Berlin. In the summer of 1915, the *Deutsche Versuchsanstalt für Luftfahrt* (DVL) began adapting this track for high-speed testing of aircraft. The first and possibly only aircraft tested was a production Roland C.II mounted about 30 feet above a large flatcar on a simple steel framework. The flatcar was towed by a steam engine at about twice the top speed attained in conventional express service. Unfortunately, the track conditions did not permit higher speeds nor was adequate instrumentation or time available to measure results with sufficient precision. Although full-scale tests were inconclusive, the track was used for investigations of propellers with propeller-driven test cars and also new concepts of light-metal railroad construction techniques were developed.

In comparison to other German C-types, the front-line complement of the *Walfisch* was relatively small. At the height of its popularity (December 1916) only 64 Roland C.II's were at the Front; equal to only 4.3% of the total C-type complement of 1,508



Looking more like a shark than a whale, this Roland has curtains on the "office" windows.

Landing the *Walfisch* was always tricky, due to the high sink-rate and poor forward visibility. This crash demonstrates the value of the Cellon window as an escape hatch.





LFG Roland trademark, usually painted below forward fuselage window.



Roland C.II prototype powered by 160 h.p. Mercedes D.III engine; October 1915.



Early production Roland C.II flown by Oblt. Ritter von Schleich of Feld Flieger Abteilung 2h.

Roland C.II, 4423/15, flown as trainer by Rudolf Stark, later C.O. of Jasta 35.



Linke-Hofman Werke A.G. trademark, painted below radiator and on underside of aileron.



Roland C.II, 4437/15, flown by Lt. von Hippel at Jagdstaffelschule Fomars in January 1917. Note grey paint smeared over basic blue-grey finish and white ground of national insignia. The national insignia on the wing surfaces were left untouched.



Roland C.II of unknown operational unit; Western Front, 1916-17. Note painted "curtains".



Roland C.II of unknown operational unit; Western Front, 1916-17. Note painted "curtains".



Roland C.II, 2701/16, with enlarged fin and rudder fitted to late-production aircraft.





A fine study of Roland C.II 2701/16 with enlarged fin and rudder. This last modification was an attempt to eliminate side-slipping and spinning tendencies. (Photo: A. Imrie)

aircraft. The comparison with other types that month is as follows: Albatros C.III (320 a/c—21.2%); Albatros C.VII (249 a/c—16.5%); Rumpler C.I (190 a/c—12.6%); LVG C.II (155 a/c—10.3%) and Aviatik C.I (110 a/c—7.3%).

It was the boldness of its conception and the beauty of its line that gave the *Walfisch* fame and distinction out of all proportion to the small quantities actually in squadron service.

© Peter M. Grosz, 1967.

Operational and Training Squadrons known to have used the Walfisch.

Feld Flieger Abteilung 1b, 2b, 5b, 18, 23, 24, 25, 62.

Flieger Abteilung (A) 227, 235, 245, 252.

Kampfgeschwader I, Staffel 6.

Kampfgeschwader III, Staffel 18.

Kampfgeschwader IV, Staffel 22.

Kampfgeschwader VI, Staffel 33.

Flieger Ersatz Abteilung 12.

Geschwader Schule Paderborn.

Jagdstaffel Schule Farners.

Beobachter Schule Köln.



This view shows more details of the Linke-Hofmann exhaust stack characteristics.

The author would like to express his gratitude for the willing assistance and thoughtful criticism given by Rudolf Stark, Egon Krüger, A. E. Ferko, H. J. von Hippel, W. R. Puglisi, Gustav Ewald and Peter L. Gray.

Number of Roland C.II and C.IIa at the Front

Year	1916					1917			
	30th Apr.	30th June	31st Aug.	31st Oct.	31st Dec.	28th Feb.	30th Apr.	30th June	31st Aug.
C.II	17	35	37	45	40	53	42	1	1
C.IIa	—	—	13	11	24	—	—	12	—

SPECIFICATIONS

	C.II	C.IIa	C.IIa(Li)
Wing Span—upper	10.33 (m.)	10.23	10.23
—lower	10.03 (m.)	9.96	9.28
Length	7.52 (m.)	—	7.55
Height	2.89 (m.)	—	—
Wing Area	27.96 (sq. m.)	29.00	28.76
Weights—empty	789 (kg.)	714	831
—load	520 (kg.)	500	515
—full	1309 (kg.)	1214	1331
Climb to 1,000 m.	7 (min.)	6	—
2,000 m.	14 (min.)	14.5	—
3,000 m.	26 (min.)	29.5	—
Duration	4 (hrs.)	4	4
Speed	165 (km./h.)	165	165
Aileron length	2.6 (m.)	—	1.92
Fuselage length	6.44 (m.)	—	6.55
Chord—upper	1.56 (m.)	—	1.55
—lower	1.55 (m.)	—	1.55
Gap	1.32 (m.)	—	1.30
Stabilizer area	3.60 (sq. m.)	—	4.08
Fin and Rudder area	1.10 (sq. m.)	—	1.38

Note: In original test documents a variety of dimensions are recorded, possibly reflecting minor changes in succeeding production batches. The figures recorded here are from records that are the most complete.

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