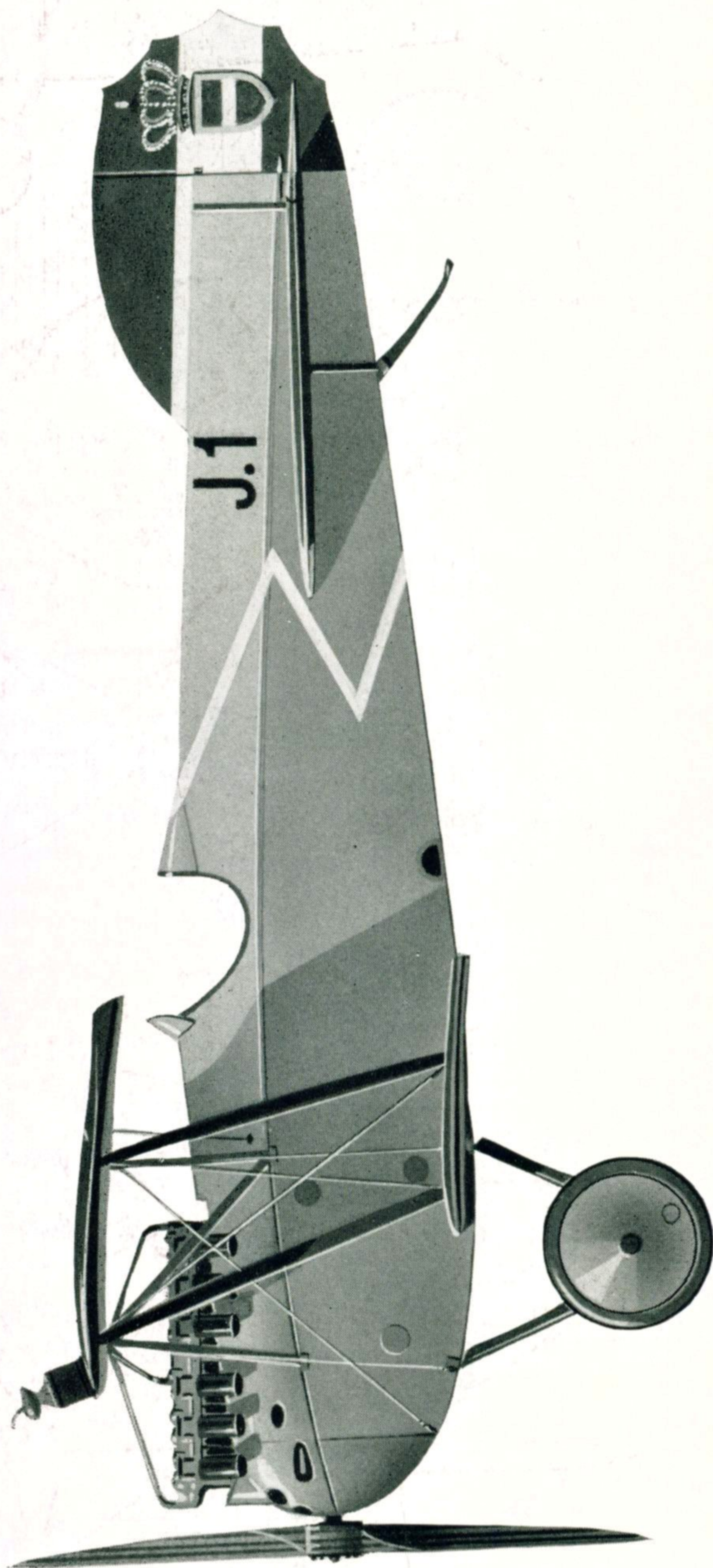


**PROFILE
PUBLICATIONS**

The
Phönix
Scouts

NUMBER

175





PHÖNIX D.I (200 h.p.Hiero) of the K.u.K. Kriegsmarine, captured by Italian forces on July 19th, 1918.

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The Phönix Scout

by George Haddow

Phönix D.II's of Flik. 55J lined up on a forward airfield. The nearest machine in the right-hand row is believed to have been that flown by the unit commander, Jozsef Meier. (Unless otherwise stated, all photos. are supplied by the author)

The *Phönix Flugzeugwerke A.G.* came into being in June 1914 when the Austro-Hungarian financier Camillio Castiglioni took over the Austrian branch of the German Albatros company. A few weeks later Castiglioni bought the controlling interest in the German firm *Brandenburgische Flugzeugwerke G.m.b.H.* With the outbreak of war agreement was reached between the German and Austro-Hungarian ministries to the effect that the production potential of the Brandenburg works would be at the disposal of the German Naval Air Service, but that the Brandenburg design team, headed by the then little known Ernst Heinkel, would develop and produce prototypes to the requirements of the *K.u.K. Flieger Arsenal*, for manufacture at Castiglioni's Austro-Hungarian companies, namely Phönix in Vienna, and U.F.A.G. in Budapest.

During the first two years of war, while the Phönix works were engaged in the production of Albatros and Brandenburg two-seater general-purpose aircraft, the works director Dipl. Ing. Gabriel built up a small but competent team of design engineers and directed their energies to the improvement of the types already in production. Foremost among these men was Ing. Kirste, one-time technical assistant to Prof. R. Knoller at the *Technische Hochschule* in Vienna.

By 1916, aerial warfare had demonstrated the dire need for single-seat fighters on the Austro-Hungarian fronts, and an order was placed with Phönix to produce the Brandenburg KD (D.I) "Starstrutter", series 28. (For explanation of Austro-Hungarian series, see *Profile* No. 151, "The Ö. Aviatik (Berg) D.I".) After some fifty machines had been constructed the Phönix engineers successfully improved the design by modifying the rudder and adding a fixed tailfin, and this change was incorporated on all subsequent KD's built by Phönix and its sister company U.F.A.G.

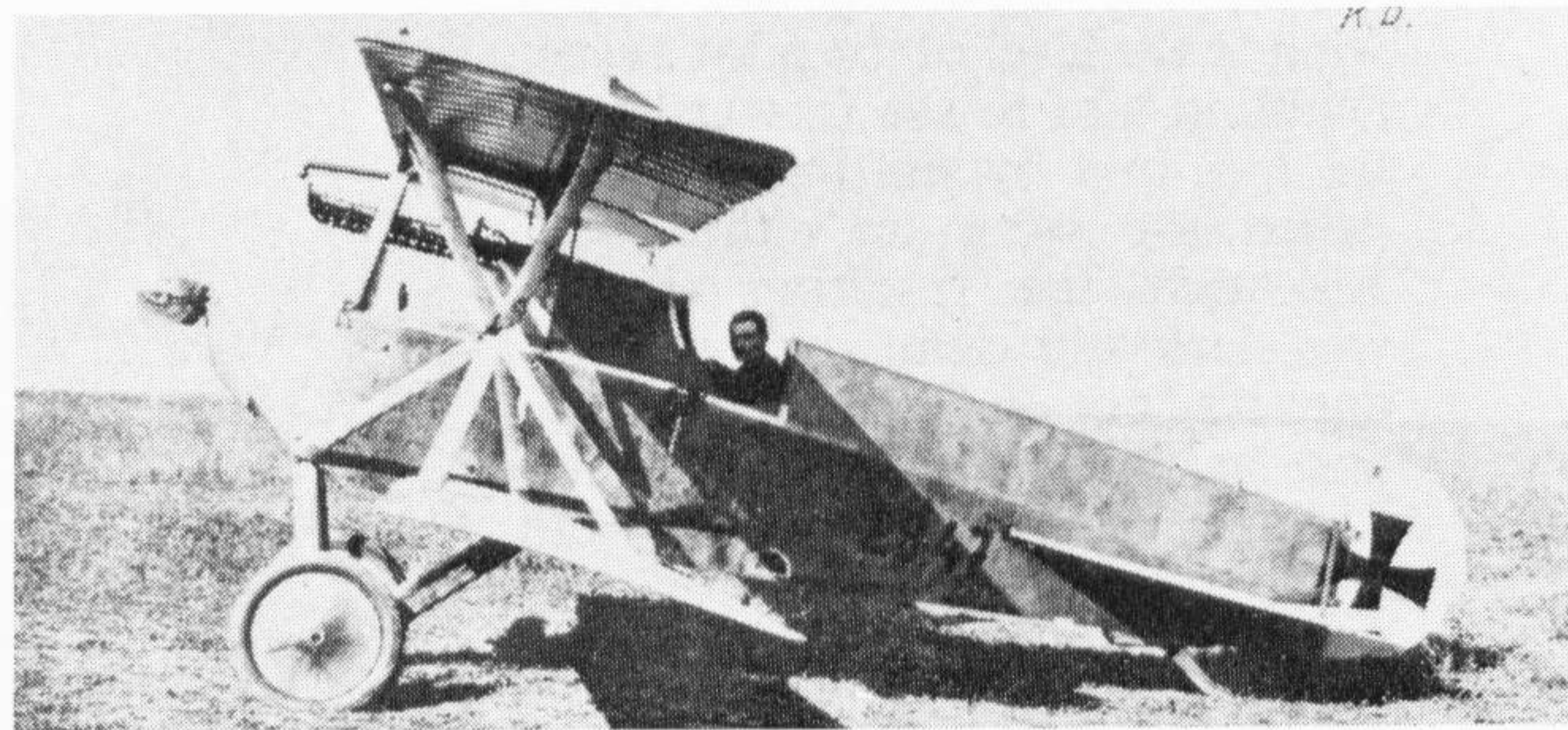
Meanwhile Brandenburg, along with most other aircraft constructors in Germany, was requested by the authorities, who had been much impressed by the success of the French Nieuport on the Western Front, to explore the possibilities of the Nieuport configuration. Heinkel's response to this was the Brandenburg L.14, powered by a 200 h.p. Hiero engine built by Eissler, Warschalowski & Co. of Vienna. (Engines produced by this company bore the name of

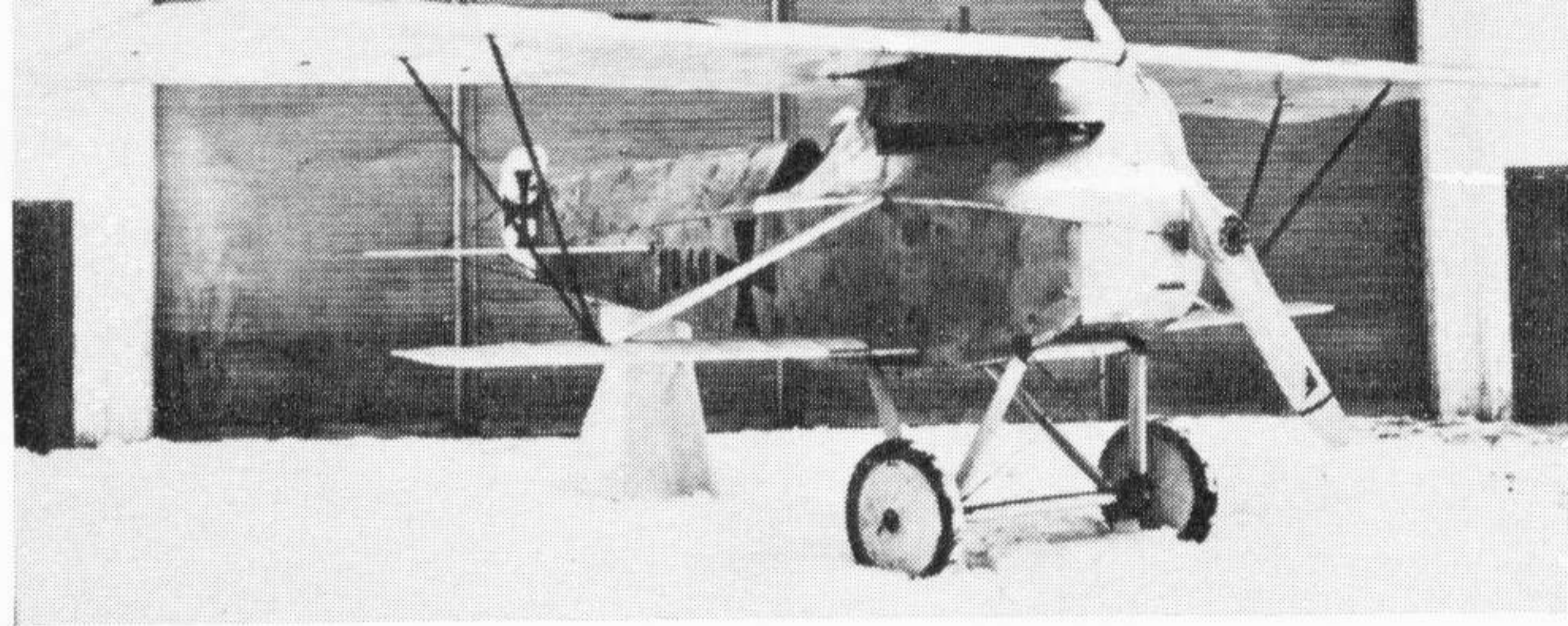
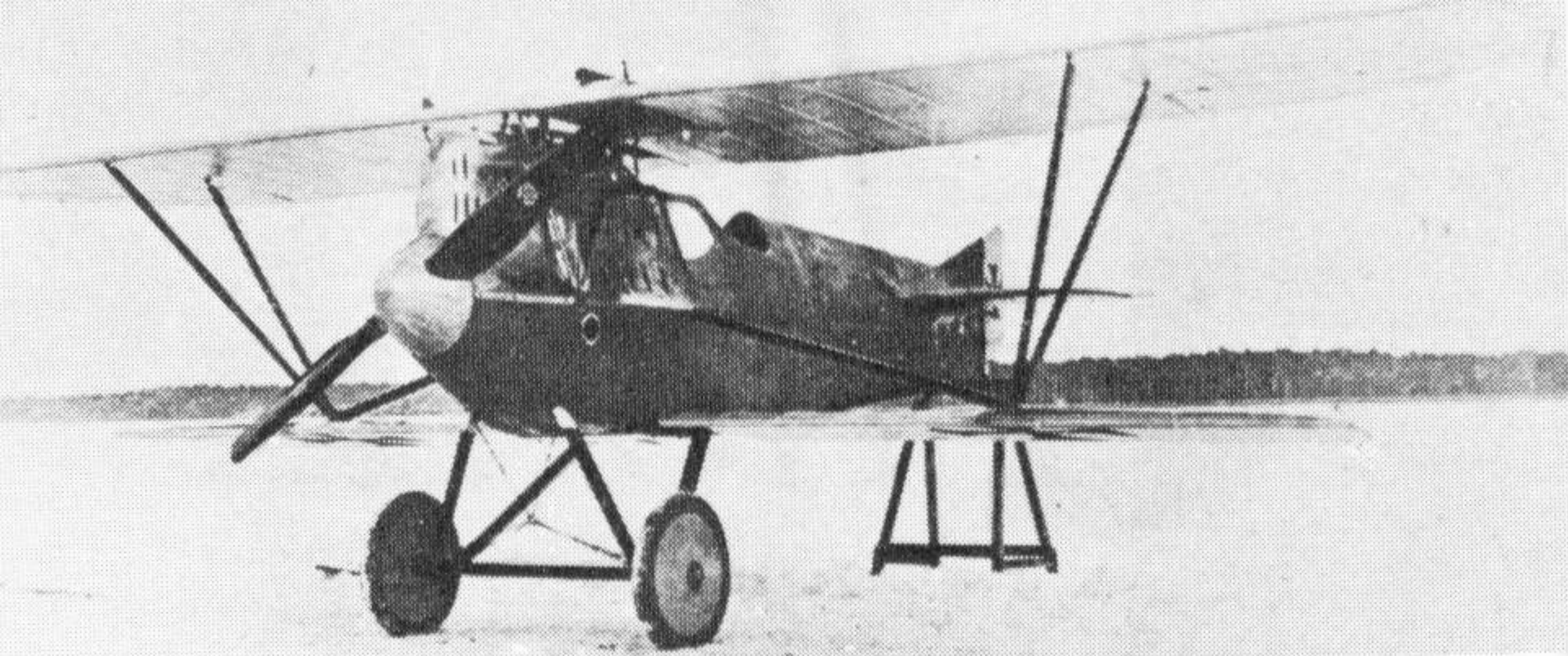
their designer Hieronimus.) The L.14 utilised the Nieuport style sesquiplane wing cellule with vee struts, but there the resemblance ended. Heinkel was at that time looking into the possible exclusion of all external rigging wires, and in their place the L.14 wings were braced diagonally by an additional strut from the bottom of the vee to the top fuselage longeron. After flight test the machine underwent considerable modification, which included a new tail unit and redesigned wings, also the repositioning of the bracing strut to run from the vee base to the upper centre section.

There was close liaison between the Brandenburg design team and their fellows at Phönix. Heinkel was in fact chief designer for the whole Castiglioni group. One aspect of this liaison was that when Brandenburg began construction of the L.14, the Phönix team likewise became involved in a similar but separate line of development of the same theme. A production Brandenburg KD, serial 28.48, was fitted with Phönix-designed sesquiplane wings with identical strut arrangement to the L.14; also, the entire gap between the fuselage and the upper wing was faired in by raising the front cowling panels. Enough promise was shown by the converted 28.48 for a decision to be made to go ahead and build an experimental prototype, serial 20.14. Power was provided by a 185 h.p. Austro-Daimler, the wings were identical to 28.48, but the rigging was reinforced on each side by a strut from the front spar of the upper wing to the front engine bulkhead.

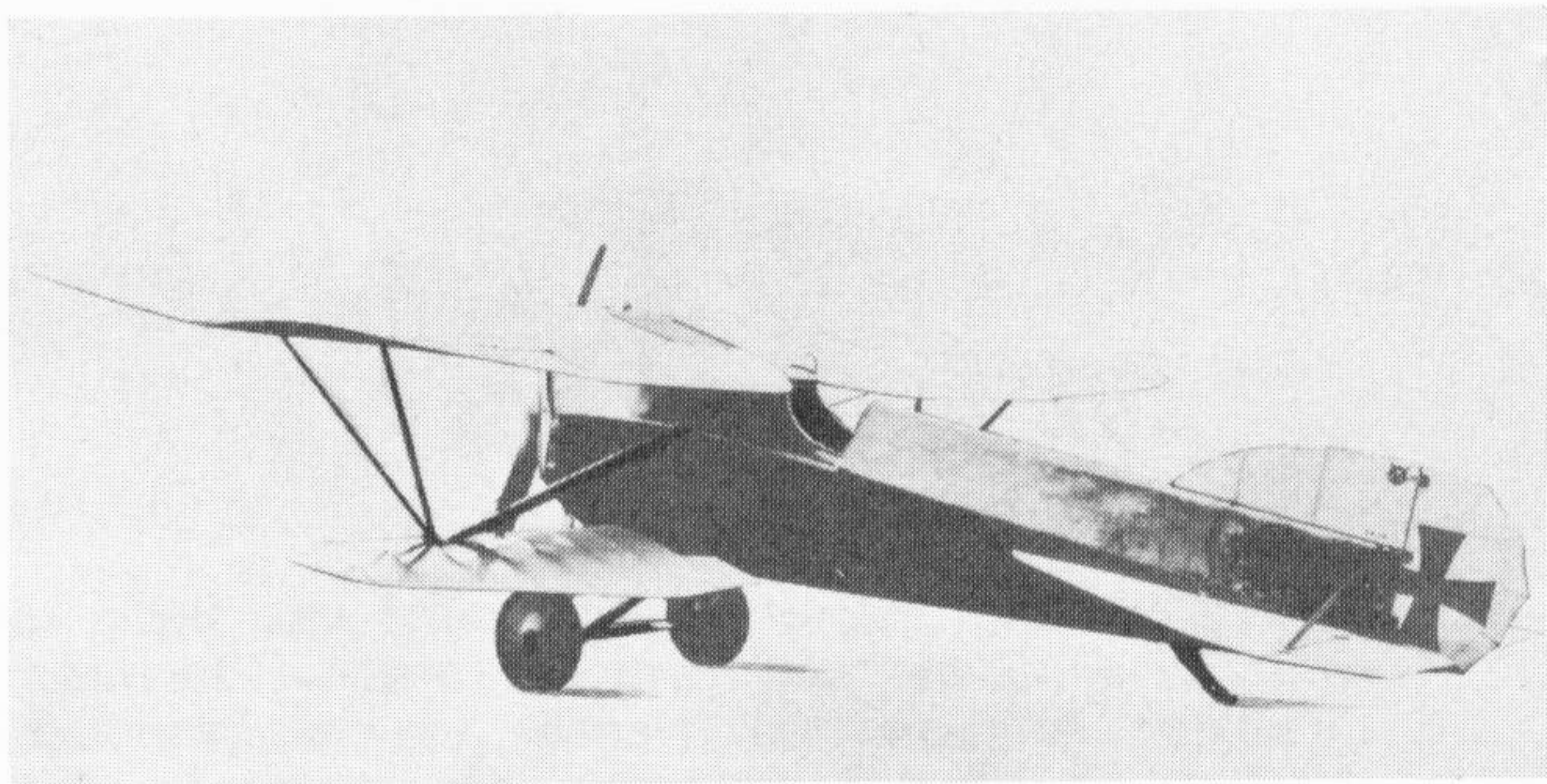
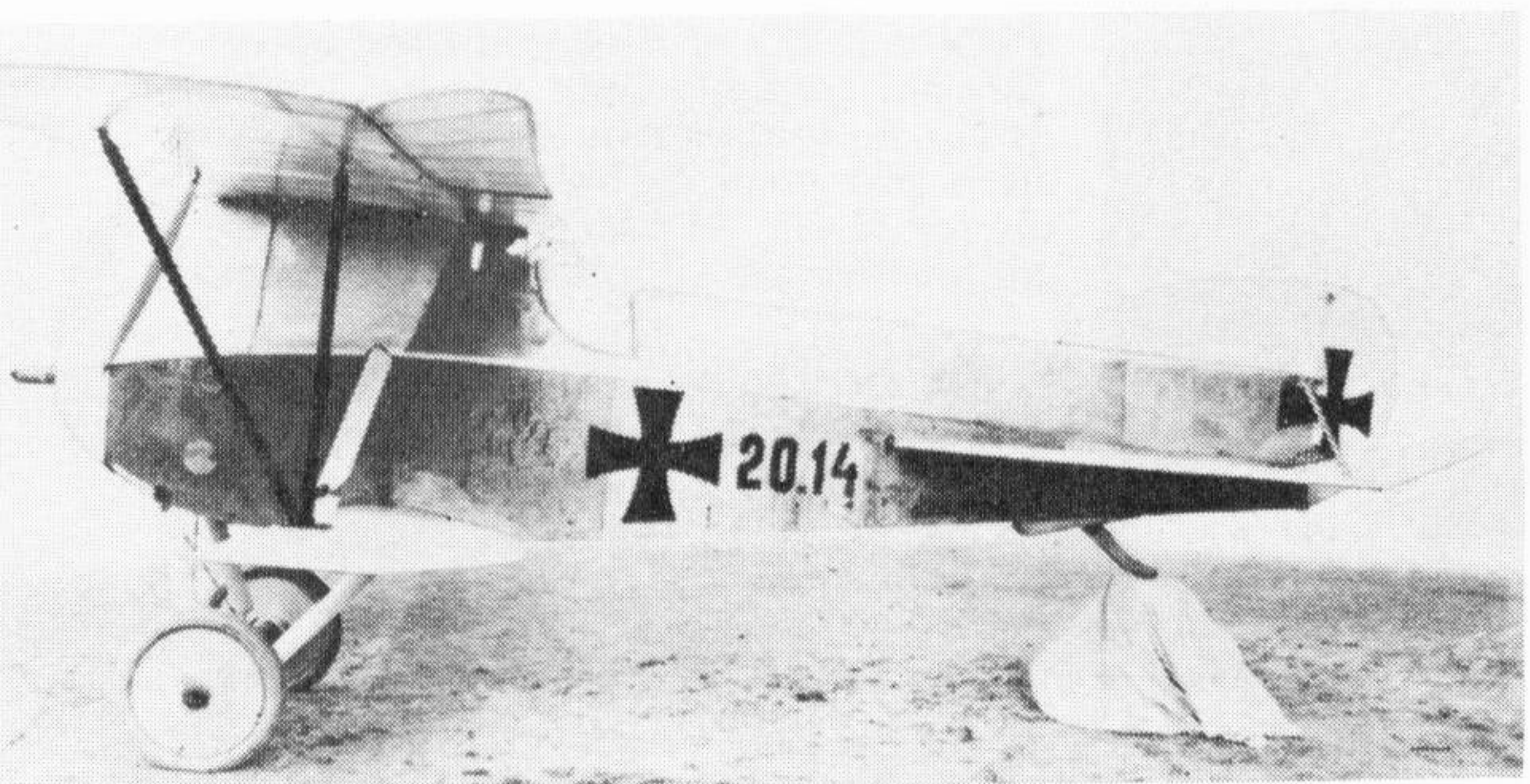
The flight tests of the modified Brandenburg L.14 at Briestly, and those of the Phönix 20.14 at Aspern, are believed to have been undertaken at about the same period. These were not very encouraging and

Brandenburg KD, 28.47, the first Phönix-built KD to be fitted with the Phönix-designed fin and rudder.





(Left) The Brandenburg L.14 (200 h.p. Hiero engine), an experimental machine built in Germany for evaluation by the K.u.K. Flieger Arsenal with an eye to possible production in Austria by the Phönix Flugzeugwerke. (Photo: Heinz J. Nowarra). (Right) The first Phönix experimental fighter (185 h.p. Austro-Daimler), serialled 28.48, featured a similar tail unit to the KD.



(Left) Developed from 28.48, this aircraft, 20.14 (185 h.p. Austro-Daimler), had a modified tail unit and extra wing struts. (Right) Last of the Phönix experimental aircraft to feature a wing layout based on that of the Brandenburg L.14 was 20.16, shown here in its original form. (Photo: Peter M. Grosz)

showed up several defects in the configuration. Brandenburg decided to do nothing more with the design, particularly as by then, the summer of 1917, the Brandenburg works were fully engaged in the production and development of seaplanes for the German Navy, and it was becoming increasingly difficult for them to honour the agreement to supply new designs for the Austro-Hungarian companies. Fortunately, the Phönix company's own designers were ready and able to take over in this field, and as can be seen, had for some time been moving towards this.

Despite the Brandenburg decision the Phönix works proceeded to build yet another version incorporating the best features of both aircraft. This was given the experimental serial number 20.16; it was powered by a 185 h.p. Austro-Daimler, and cooling, as on the earlier models, was provided by a Teeves & Braun radiator set flush within the section of the upper wing. The wings followed the design of the L.14, being stronger than those of 20.14, but the strut arrangement was that of the latter machine. The flight tests had shown that the pilot's view to the front was severely limited. To remedy this, 20.16 had the gap reduced by lowering the upper wing to the level of the pilot's eyes, enabling him to see forward over the top, and by shifting his gaze, below the wing on either side. Although the resulting aircraft was sleek and clean, its performance was not up to its appearance; and as by the time it flew the Phönix team, led by Kirste, were

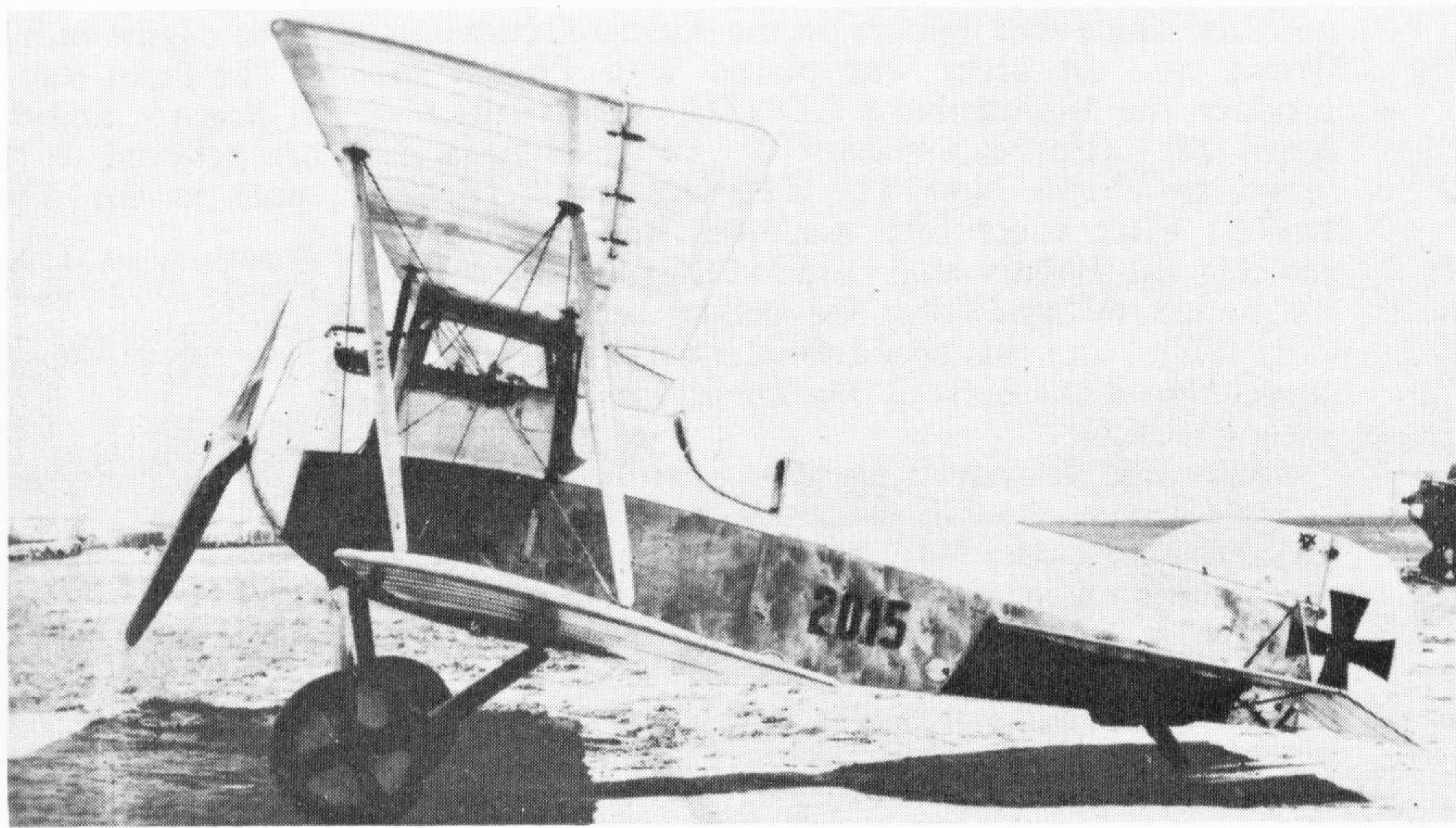
engaged in the design of a more conventional fighter, further development was abandoned. After removal of the wings, the remainder of the aircraft was utilised in the construction of the prototype for the new model, which having the same fuselage retained the 20.16 serial number.

THE PHÖNIX D.I.

The re-built 20.16, prototype of the D.I, stemmed from an earlier experimental machine, serial 20.15, which had consisted of a standard KD airframe with the characteristic star-strut arrangement replaced by a simple, two-strut, single bay wing cellule braced by cables. Apart from being powered by a 200 h.p. Austro-Daimler and some difference in the centre-section strut arrangement, the 20.16 was in all respects similar to the production version of the D.I.

In the autumn of 1917, Phönix received orders from the K.u.K. Flieger Arsenal to produce three series of

Seen here on the airfield at Aspern, the Phönix 20.15 (200 h.p. Austro-Daimler) was the forerunner of the D.I.





Phönix 20.16 (185 h.p. Austro-Daimler) seen, after rebuilding as the D.I prototype, fitted with strengthened wings.

(Photo: Peter M. Grosz)

the D.I, each of fifty machines; Series 128, powered by the Eissler, Warschalowski built 200 h.p. Hiero; 228 powered by the 200 h.p. Hiero(Fi), the same engine built by *Austro-Fiat Werke*; and 328 with the 200 h.p. Hiero(Bd) built by Breitfield, Danek & Co. of Prague. The installation of the Hiero increased the length by a few inches, and the uncowed cylinders altered the nose contours, but apart from this the fuselage was the same as that of the KD, and was built up of timber frames and longerons with plywood covering.

Wood was also employed for the simple two spar wing structure, and this was wire braced and fabric covered. A wire trailing-edge gave the well-known scalloped effect when the fabric covering was applied, the wing-tips being markedly rounded with the greatest curve to the front. The upper wing was of larger span and chord, and was constructed in three parts—a centre-section, on the leading-edge of which was mounted the wide “Hifa” honeycomb radiator, and two outer panels on which the ailerons were fitted. These were operated by means of a torque-tube within the wing structure, running from the aileron hinge to a lever in the centre-section, which was attached to a rod leading down through the fuselage decking to the cockpit controls. The wings were staggered and rigged with a slight dihedral. A distinguishing feature of the D.I was that the interplane struts sloped inwards from the bottom plane. Bracing was by the usual crossed cables, and there was a drag wire from the top of the rear interplane strut to the front fuselage bulkhead.

Armament consisted of two stripped-down Schwarzlose machine guns, each with 300 rounds of

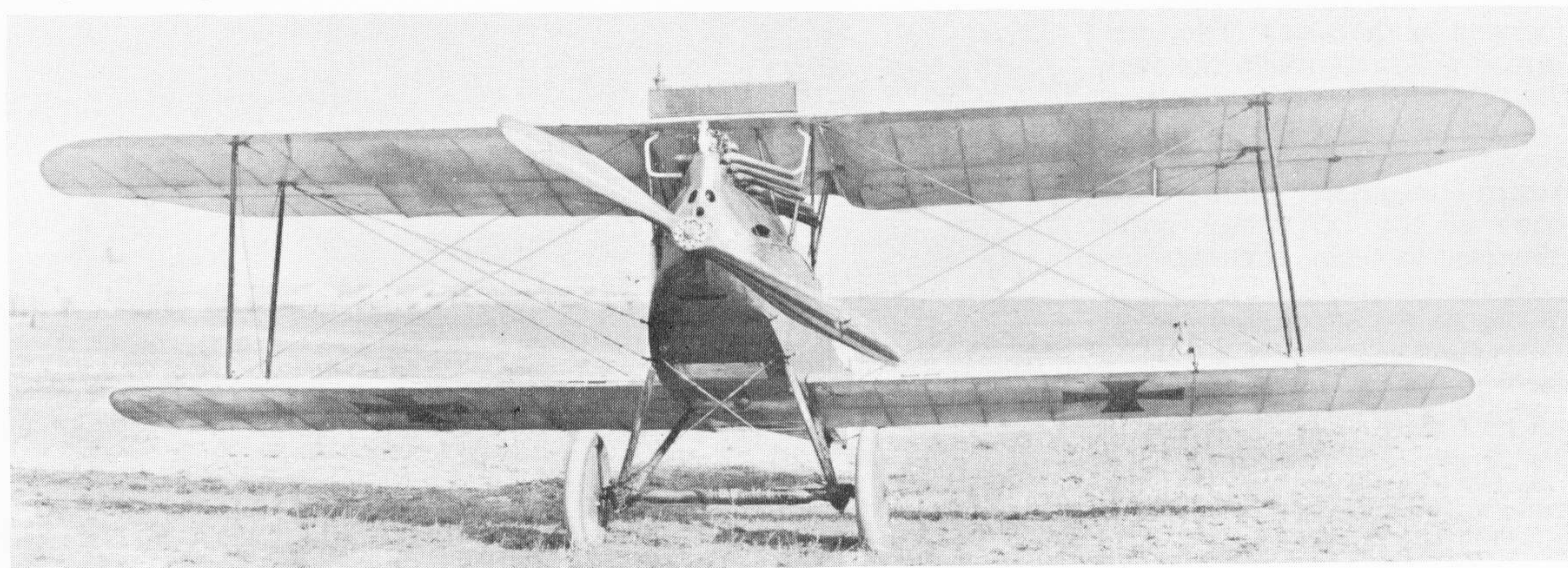
ammunition. The guns were mounted well forward, one each side of the engine crankcase, that on the starboard side being located on a slightly higher level. They were completely enclosed, and the only external evidence of their position were the apertures cut in the cowling panels at the extreme nose of the aircraft through which they fired. The guns were timed to fire between the propeller blades by a “Zapanka” synchronising mechanism; this operated the triggers with a contact cam fitted to a shaft driven through bevel-gears from the rear of the engine camshaft. Below the bevel-gear there was a clutch, and the guns were fired by engaging the clutch which was manipulated by a cable from the control column.

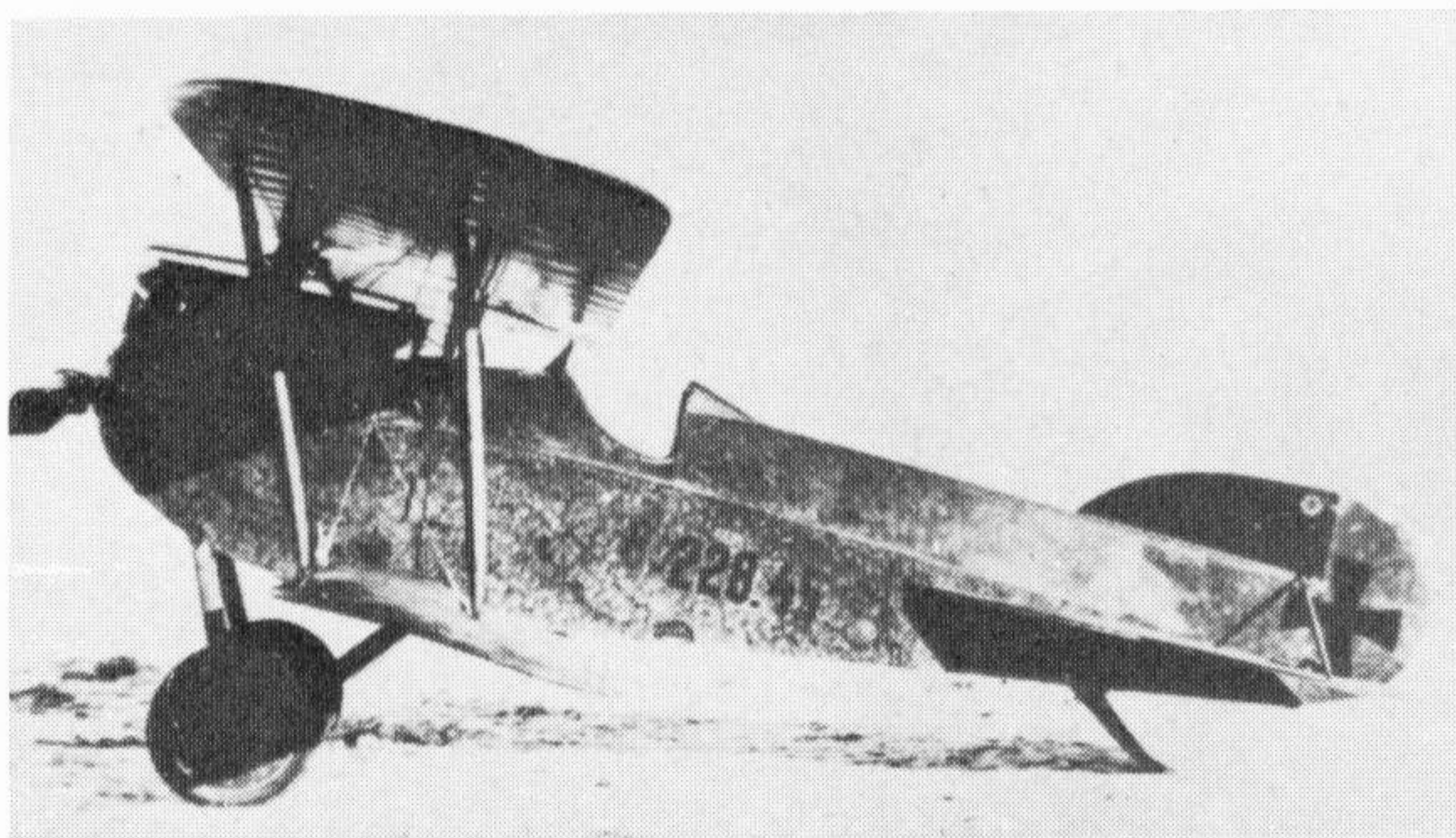
The first Phönix D.I's reached the front during February-March 1918. Their debut was inauspicious; trouble was experienced with wing failures due to structural weakness. Strengthened wings were hurriedly tried out on the prototype at Aspern; these proved satisfactory and the fault disappeared when the service aircraft were so fitted out.

For the defence of the vital Austro-Hungarian ports of Pola and Trieste from increasing Allied air attacks, the *K.u.K.* Naval Air Service took delivery of 40 D.I's, series 128, to augment the single-seat flyingboat fighters, in which up to that time they had placed their reliance. The naval Phönix D.I's were given the classification letter ‘J’ and numbered 1 to 40. (J.1, the first of the series, was forced down on Italian territory on 19th July 1918, and forms the subject of our five-view colour drawing.) They were operational from early summer until the end of the war, their principal opponents being allied flyingboats

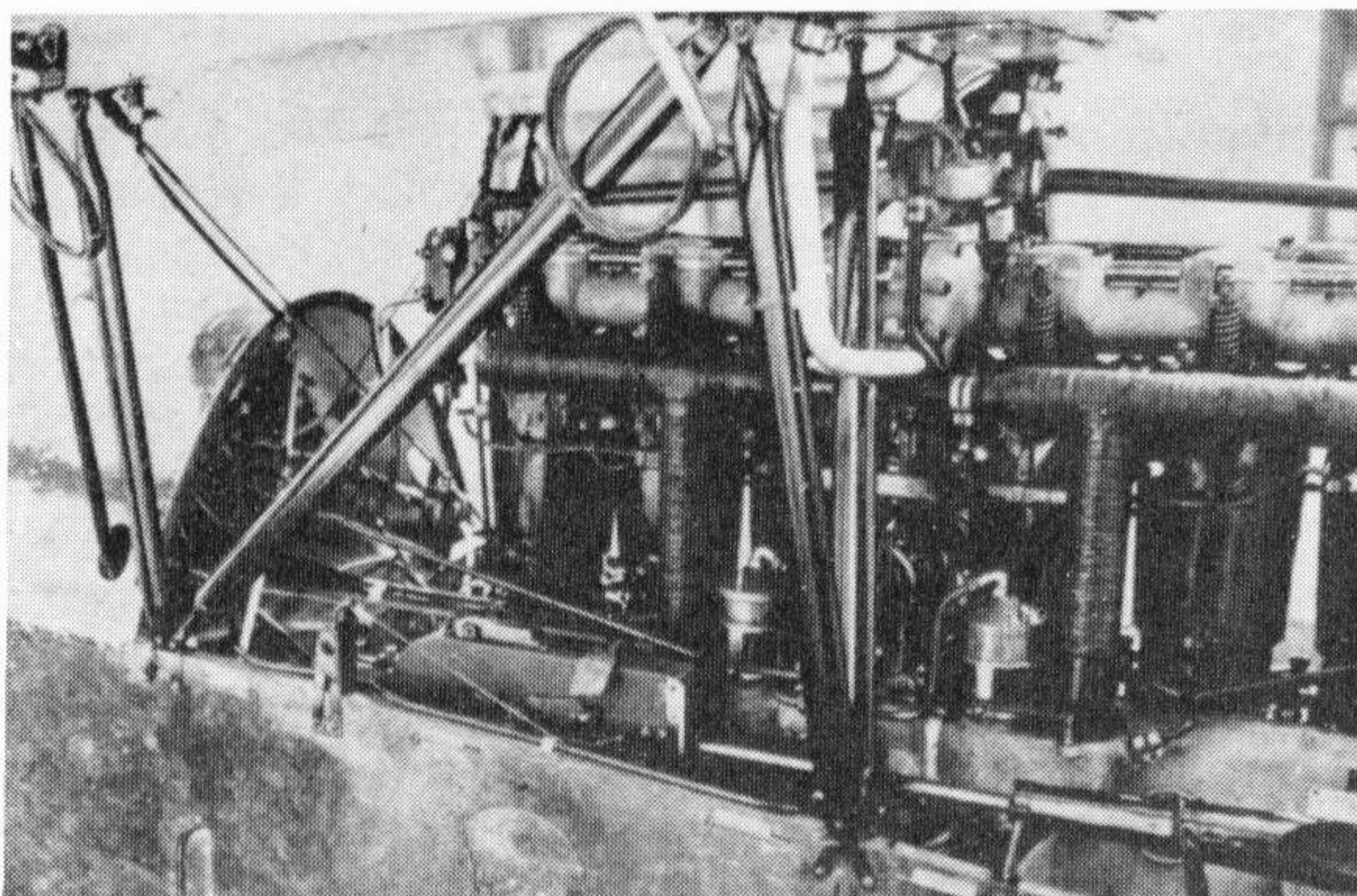
Early production Phönix D.I. The early machines had five ribs in the upper wing between the centre-section and the aileron; in the strengthened wings that replaced them the number was increased to six.

(Photo: Peter M. Grosz)





Phönix D.I, 228.45, powered by a 200 h.p. Hiero (Fi) engine.



A 200 h.p. Hiero engine and starboard machine-gun as fitted to the Phönix D I. Note the aileron control-rod located behind the rear centre-section strut.

and Caproni bombers. Apart from a report that J.25, flown by a naval pilot named Plancher, scored a victory on 6th September 1918, little is known in detail of their activities.

With regards to performance the Phönix D.I was superior to anything then in service with the *K.u.K. Luftfahrtruppen*, and could match the best of the Allied equipment on the Italian Front. Allied pilots reported them as being fast, and they could outclimb the Sopwith Camel with which the British fighter squadrons were equipped. One criticism was that they were perhaps a little too stable. They were initially issued to selected *Feldfliegerkompagnien* to provide fighter escort for general-purpose aircraft, and also for fast intruder reconnaissance duties. (An Italian report claims that some were fitted with cameras in the belly of the fuselage which could be remotely operated by the pilot.) They performed well, and unlike the Berg D.I, once the early structural fault was remedied they were well received and popular with the Austro-Hungarian pilots, and many of the top fighter pilots converted to them. During May 1918, the Phönix fighters began to appear in the specialised fighter units (*Jagdkompagnien*), at first in one's and two's in formation with Albatros D.III-(Oef)'s and Berg

Oblt. Frank Linke-Crawford, C.O. of Flik. 60J. In the background can be seen the Phönix D.I he was reputed to have been flying when he was shot down on 31st July 1918.

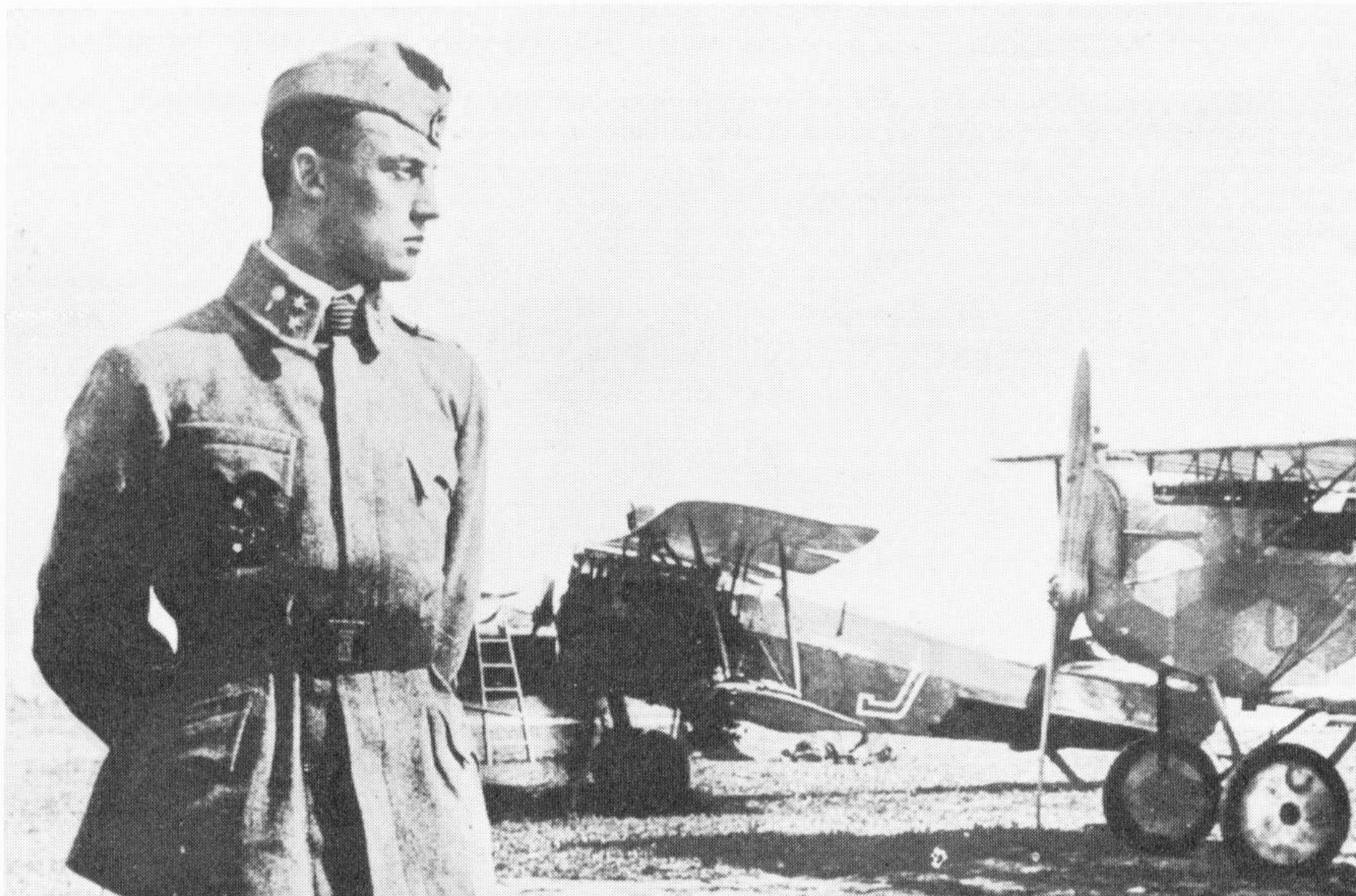
D.I's; as the number available increased they later formed the sole equipment of several *Jagdkompagnien*.

Unfortunately very little has emerged as to the service record of the Phönix from the Austrian side. What documentary accounts do exist are primarily from Allied combat reports, and these are of necessity one-sided in that they invariably deal with Allied victories, without mention of the many successes the Phönix obtained over its British and Italian counterparts. Also these reports do not figure the Phönix prominently, as victories over them were not readily obtained, and for the first few months after they arrived at the front Allied Intelligence had scant knowledge of them, and Allied pilots, who soon learned to recognize and respect their new adversary in the aerial arena, referred to it as an unknown type in their combat reports.

Typical of the actions mentioned in these reports is that of 8th June 1918, when Lt. C. E. Howell of No. 45 Sqdn. R.A.F., while leading a patrol of three Sopwith Camels west of Feltre, spotted a formation of six enemy fighters, consisting of two Albatrosses, three Berg D.I's, and one of unknown type (Phönix), escorting a two-seater reconnaissance machine. Howell, having the advantage of altitude and surprise, singled-out the unknown type for his initial attack, and shot it down with an accurate burst of machine gun fire. In the *melée* that followed he also managed to down one of the Bergs, and one of his companions accounted for a second Berg.

The Italian ace *Tenente* Silvio Scaroni, whilst on patrol with Sgt. Ticoni over Assiago on 7th July 1918, both flying Hanriot HD.1s, attacked a Phönix fighter and forced it to earth between the Italian 1st and 2nd Lines for his twenty-fifth victory. Scaroni was himself shot down and badly wounded a few days later on the 12th July, when he went to the assistance of Capt. Howell and Lt. Rice-Oxley of No. 45 Sqdn., who were heavily engaged in combat with a mixed formation of ten enemy fighters in the vicinity of Mount Tomba. Howell had succeeded in shooting a Phönix down in flames, but was in dire straits himself from the attentions of a Berg. Scaroni shot this aircraft off the Camel's tail, but was himself attacked by a Phönix and badly shot-up, barely escaping with his life, to spend the remainder of the war in hospital.

Perhaps the most renowned of the Austro-Hungarian aces who flew the Phönix D.I was Oblt. Frank





Phönix test-pilot Edmund Sparmann chatting to a Swedish Army officer prior to demonstrating J.41 at Stockholm. Since Austria was by this time a republic, the crown was removed from the rudder crest. (Photo: Peter M. Grosz)

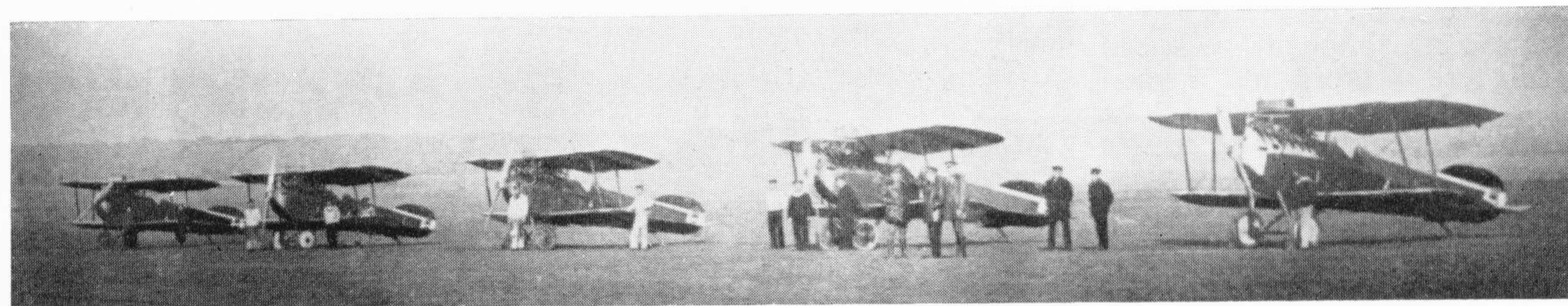
Linke-Crawford, the C.O. of *Flik. 60J*, who was killed when his Phönix D.I crashed at Guia on the Piave Front at 09.00 hrs. on 31st July 1918. Although there has been much dispute as to who actually shot him down, there can be little doubt that he fell in combat with Lt. Cottle of No. 45 Sqdn. R.A.F. On that particular morning at that precise time, Cottle was leading a patrol of three Camels; three enemy aircraft of a new type were spotted between Feltre and Grappa. The Austro-Hungarian aircraft immediately attacked, at which Lt. Cottle climbed into the sun towards Montello, the enemy climbing in a parallel direction but gaining height faster than the Camels. Near S. Pietro the enemy again dived and attacked; turning towards them, Lt. Cottle fired at the leading aircraft which fell away. Cottle got onto its tail and fired short bursts at close range until it disintegrated over Fontane. Lt. Cottle reported the machine he shot down as being marked with an octagonal C, and two long stripes down the fuselage, one green and the other red. This is not quite an accurate description of Linke-Crawford's aircraft, but it is near enough for little doubt to exist as to his victim's identity. It must be remembered that Cottle at the time was in the midst of an air combat, and no doubt the cataloguing of his adversary's markings was not the uppermost thought in his mind; under the circumstances his description is amazingly good.

THE PHÖNIX D.II & D.IIa

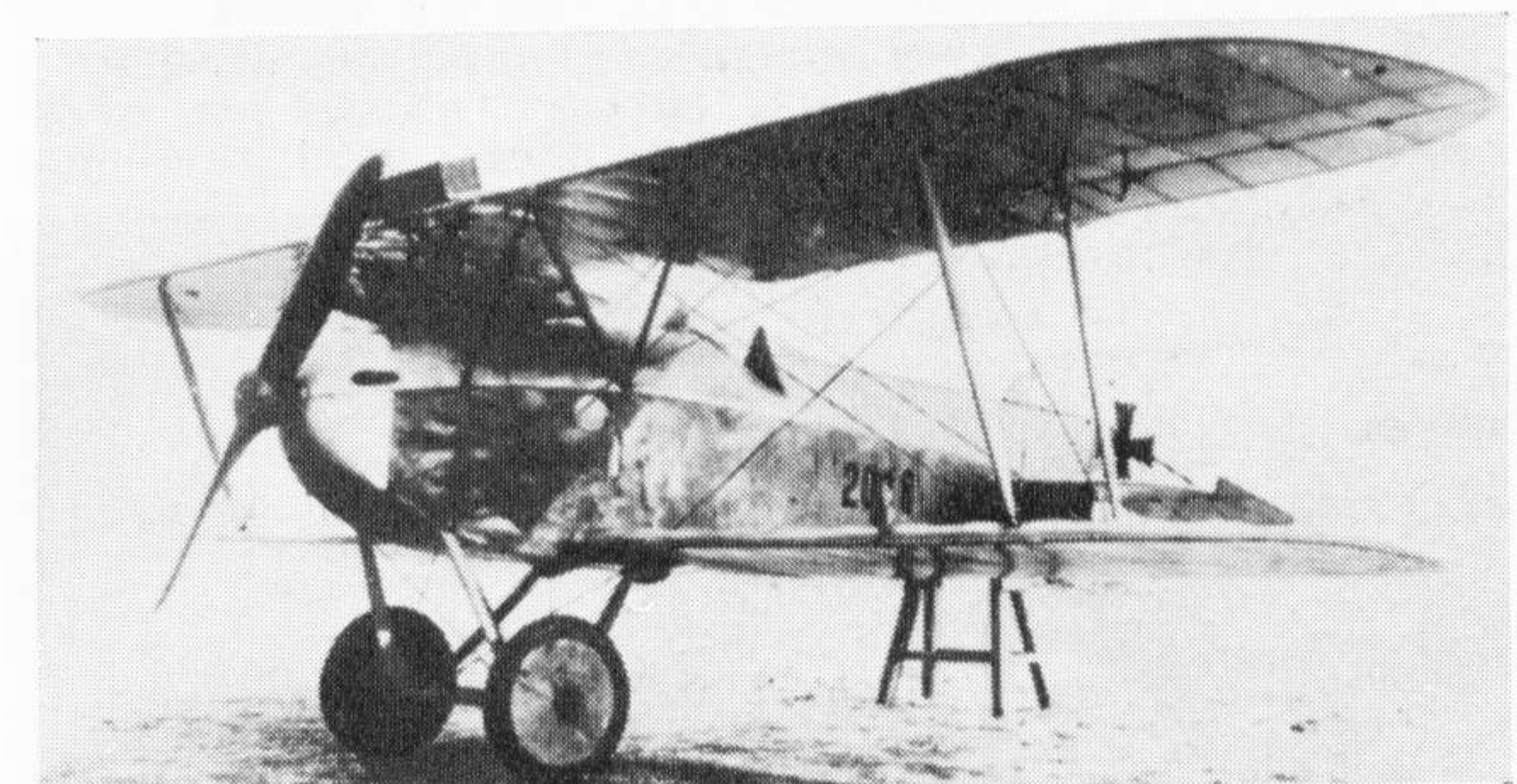
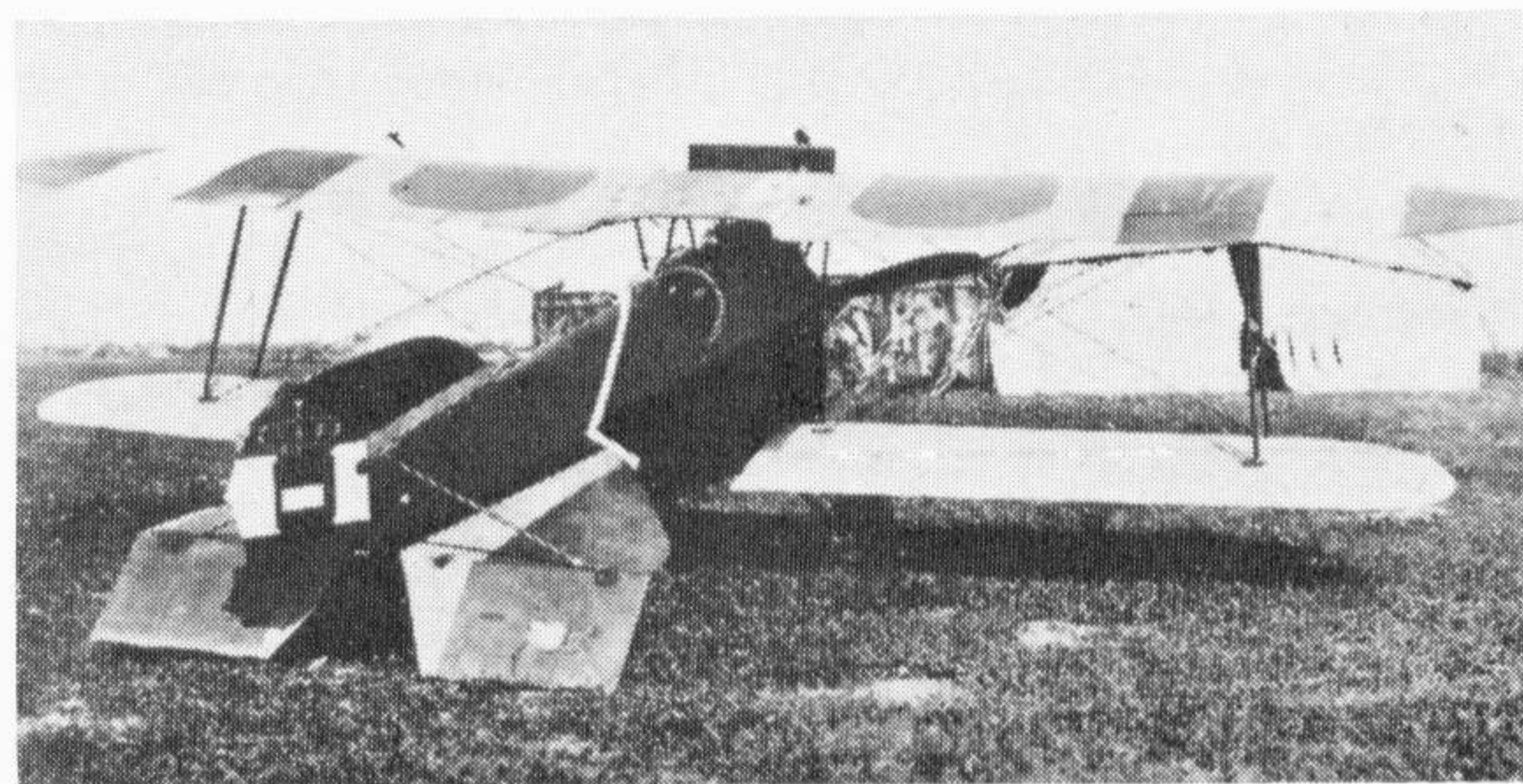
At the Phönix works, production of the D.I terminated with the fulfilment of the original orders, and production was switched to the improved D.II, also ordered in three series (122, 222 and 322) the only

K.u.K. Marine personnel and Phönix D.I's of a port defence flight lined up on an airfield in the Upper Adriatic Zone.

(Photo: Heinz J. Nowarra)

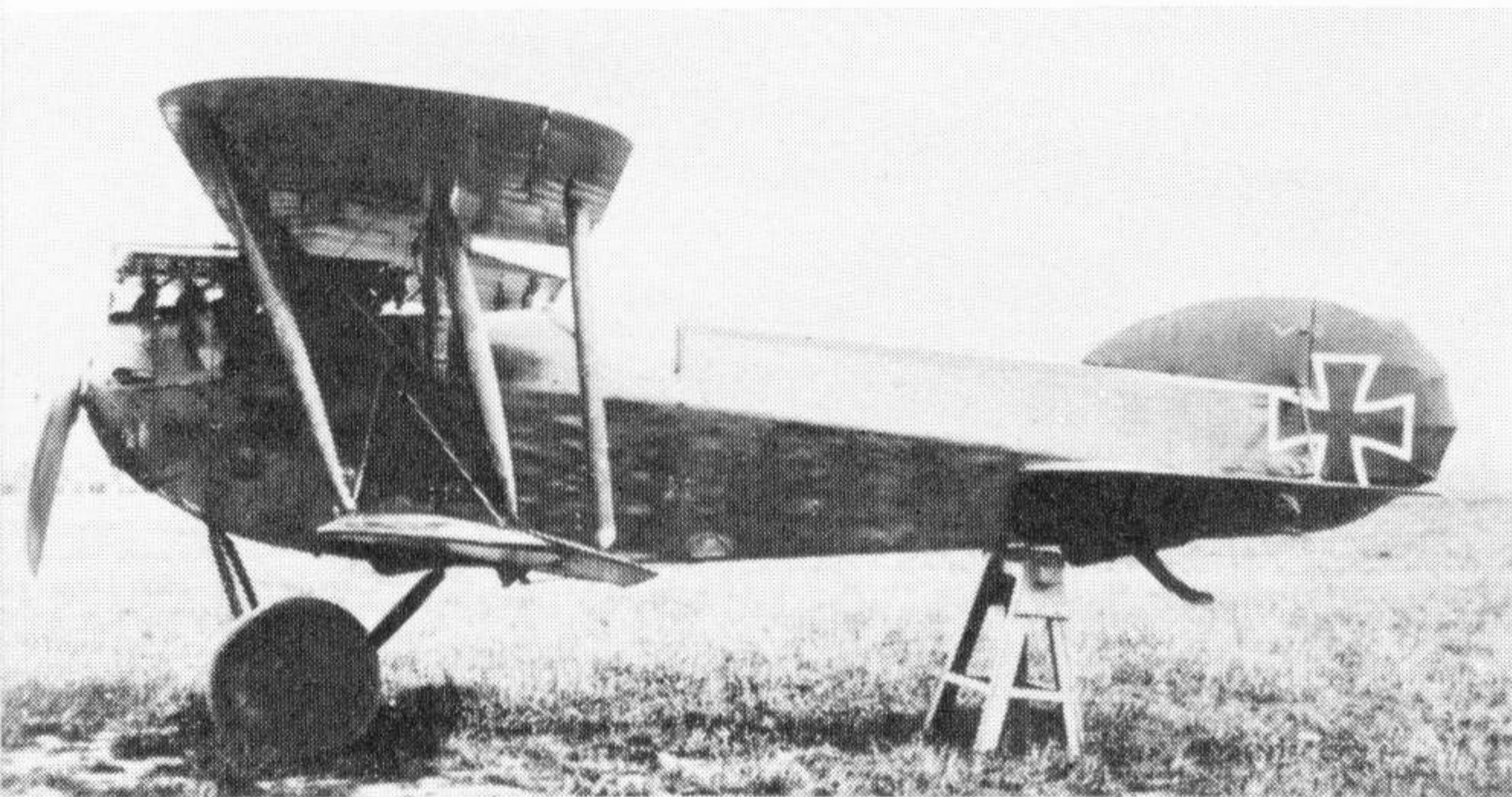


Two views of a Phönix D.I of the K.u.K. Marine captured intact by the Italians on 19th July 1918. Souvenir hunters cut out the upper wing crosses; the fabric patches replacing them can be seen in the view from the rear.



Phönix 20.18 (200 h.p. Hiero), prototype for the Phönix D.II. Unlike production D.II's, the prototype retained the pilot's headrest of the D.I. (Photo: Peter M. Grosz)

difference between the series being the manufacturers of the 200 h.p. Hiero engine, as on the D.I. The wing span of the D.II was increased slightly by widening the centre-section, and to accommodate the extra width the centre-section struts were splayed out to a greater degree. One effect of this larger centre portion was to bring the interplane struts to a vertical position when viewed from the front of the aircraft. Simple horn levers and cables were used to operate the ailerons, replacing the torque tube method used on the D.I. The D.II also featured a completely redesigned tailplane with balanced elevators. Minor changes in the design were the disappearance of the pilot's headrest, and a fairing for the tailskid. Phönix D.II's began to reach the front-line units in May 1918, sprinkled among the *Jagd* and *Feldfliegerkompagnien*;



Phönix D.IIa, 422.23 (230 h.p. Hiero)—note balanced lower ailerons.



Two views of J.41, the prototype D.III (230 h.p. Hiero). Initial production of the D.III was earmarked for the Austro-Hungarian Navy and this aircraft carried late-style crosses and naval serial and markings. (Photo above: Peter M. Grosz)



by late summer at least one unit (*Flik. 55J*) was wholly equipped with the D.II.

There was a further refinement of the design with the 230 h.p. Hiero-powered Phönix D.IIa; this differed by having ailerons on all four wings, with the lower ailerons incorporating overhanging balancing areas. The upper and lower ailerons were connected by struts and these form an easily recognizable feature of the D.IIa. A single order for fifty machines, series 422, was placed in production concurrently with the D.II, and the first of them reached the front about the same time.

THE PHÖNIX D.III

The D.I and D.II had proved to be excellent machines, but competition in the air war was keen and demanded constant improvement; operational experience had shown that the D.I, although it possessed a fair turn of speed and a good rate of climb, was too stable to be really manoeuvrable, and in this respect was at a disadvantage

The improved armament arrangement of the Phönix D.III, showing to advantage the guns extending back into the cockpit above the dashboard.

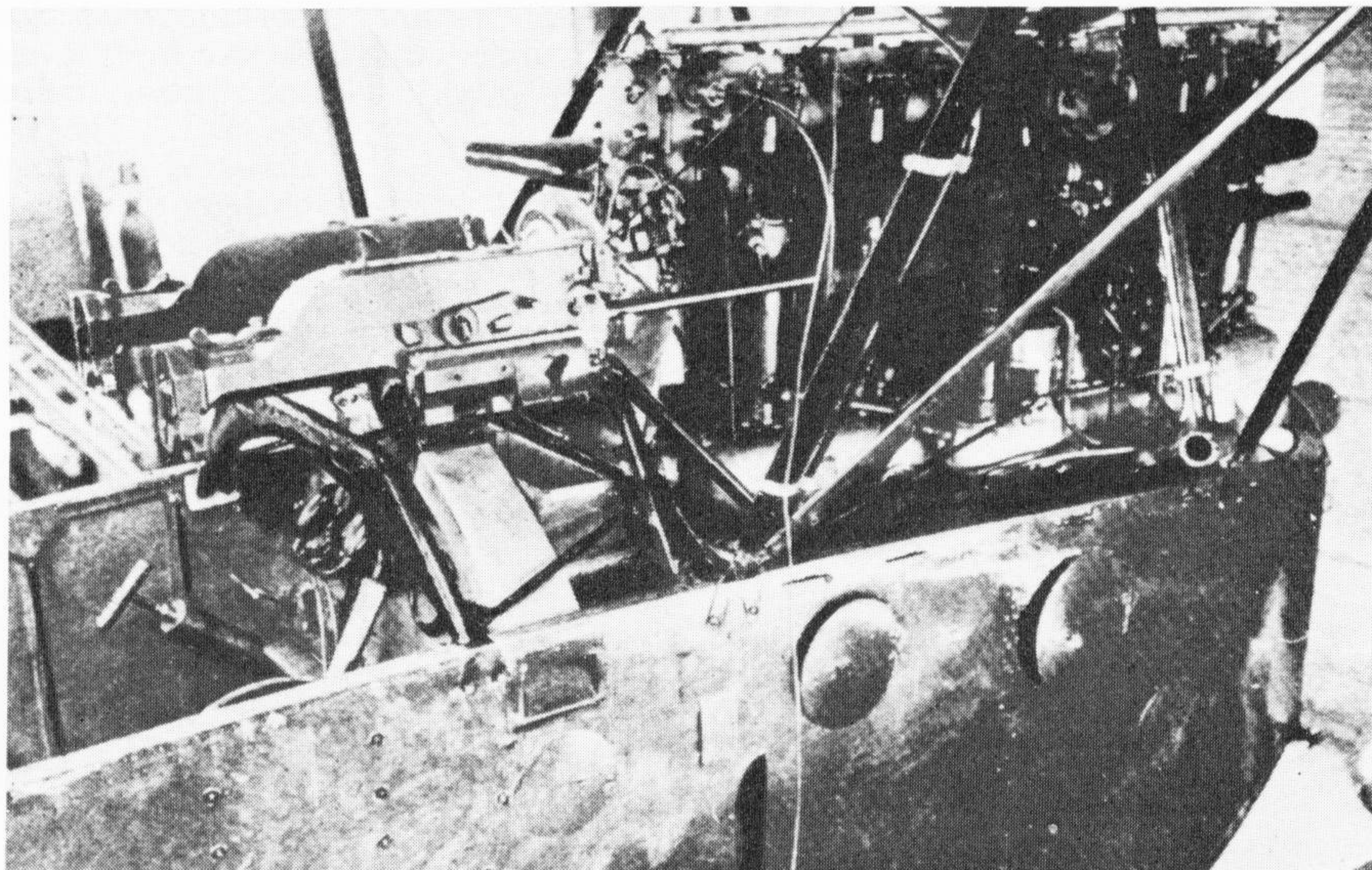
when opposed by the Sopwith Camel and the Hanriot. The changes made in the design that resulted in the D.II had to some measure remedied this but still left something to be desired. The other main drawback was the armament layout. The guns, positioned so far forward, were completely out of reach of the pilot, and in the event of a stoppage occurring he was completely powerless to take any remedial action.

Bearing in mind these shortcomings, Kirste produced the D.III (Phönix type 9). Powered by a 230 h.p. Hiero, the Phönix D.III can be said to be the culmination of a development that began with the Brandenburg KD. To improve manoeuvrability the D.III retained the four-aileron configuration of the D.IIa, but without balancing areas, and a cable replaced the strut connecting the upper and lower units. The individual areas of the ailerons were cut down a little by a change in the wing-tip contour, this being a reversal of the earlier shape and having the largest curve towards the trailing-edge. Further sensitivity to aileron control was achieved by rigging the wings without dihedral. An improvement in the armament was provided by mounting the machine guns just in front of the pilot's position, with the breaches inside the cockpit. To lessen the fire risk the guns fired through flame tubes extending forward past the engine. The new armament arrangement necessitated some lowering of the forward fuselage decking, but apart from this the fuselage and the tail-unit were identical to that of the D.II.

Initial production of the D.III was earmarked to replace the hard-pressed D.I's that had been in service with the *K.u.K. Marine* defence units throughout the summer and autumn months. The prototype was allocated the naval serial number J.41, and was finished in naval livery with late-type crosses on fuselage and wings, with the imperial crest and colours painted on the rudder. Production had commenced before the cessation of hostilities, but none had been delivered to the armed services; J.41 was still awaiting the fitting of its armament when the war ended.

THE PHÖNIX D.IV

Ing. Kirste's final design for the Phönix company was the D.IV (Phönix type 12). This was a completely new design, which although it bore a family resemblance, owed little to the earlier Phönix fighters.



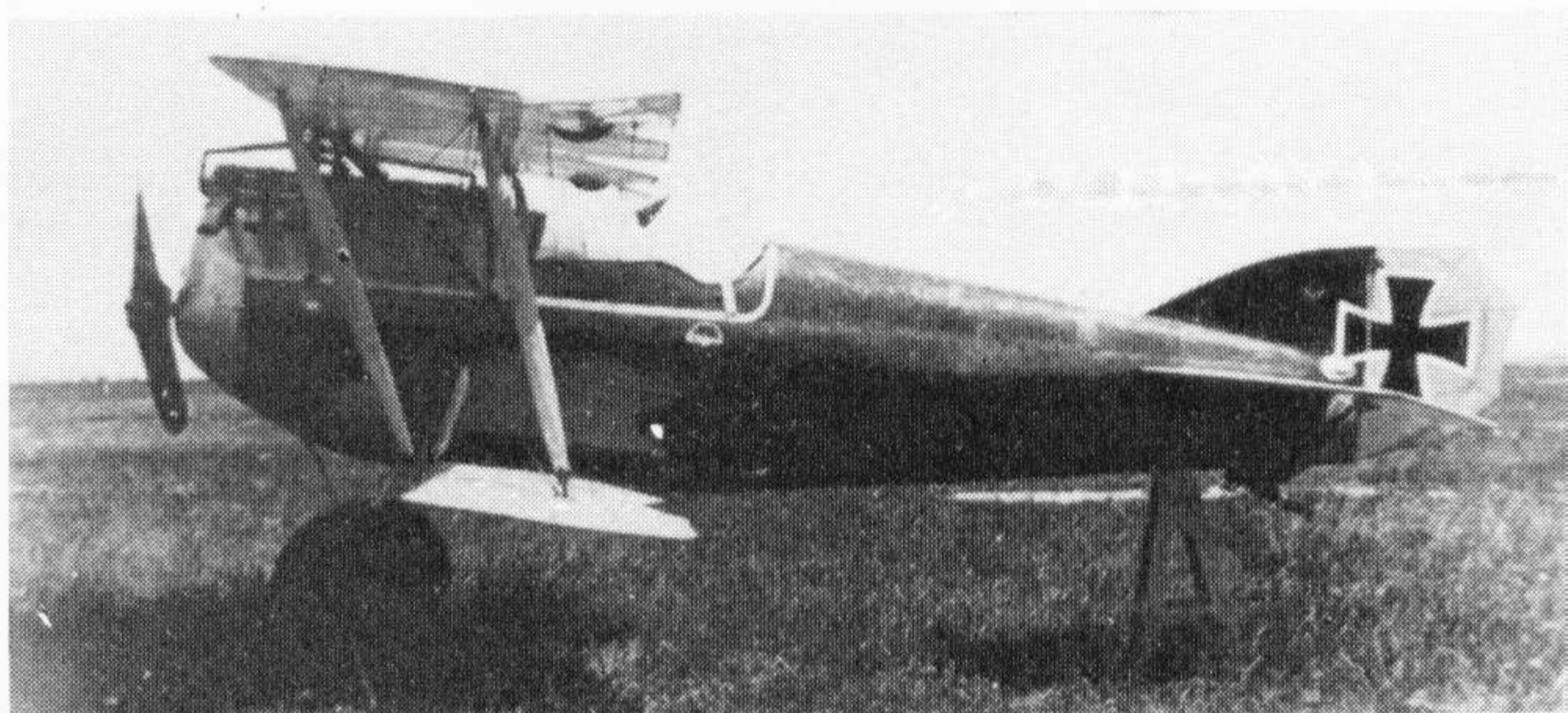
Known losses of K.u.K. Luftfahrtruppen Phönix 'D' types.

	D.I	D.II	D.IIa
Feb. 1918	128.04 128.08 328.12 328.18	nil	nil
Mar. 1918	228.06 228.36	nil	nil
Apr. 1918	228.24	nil	nil
May 1918	228.28 228.42 328.18	nil	422.10
June 1918	228.05 228.39 228.41 328.20	222.02 222.08 322.15	422.13
July 1918	128.06 128.19 228.12 228.45 228.50	122.08 122.09 122.18 122.22	422.28
Aug. 1918	128.11 128.12 128.22 128.71 228.16 328.05 328.33	122.01 222.12	nil
Sept./Oct. 1918	Not known	Not known	Not known

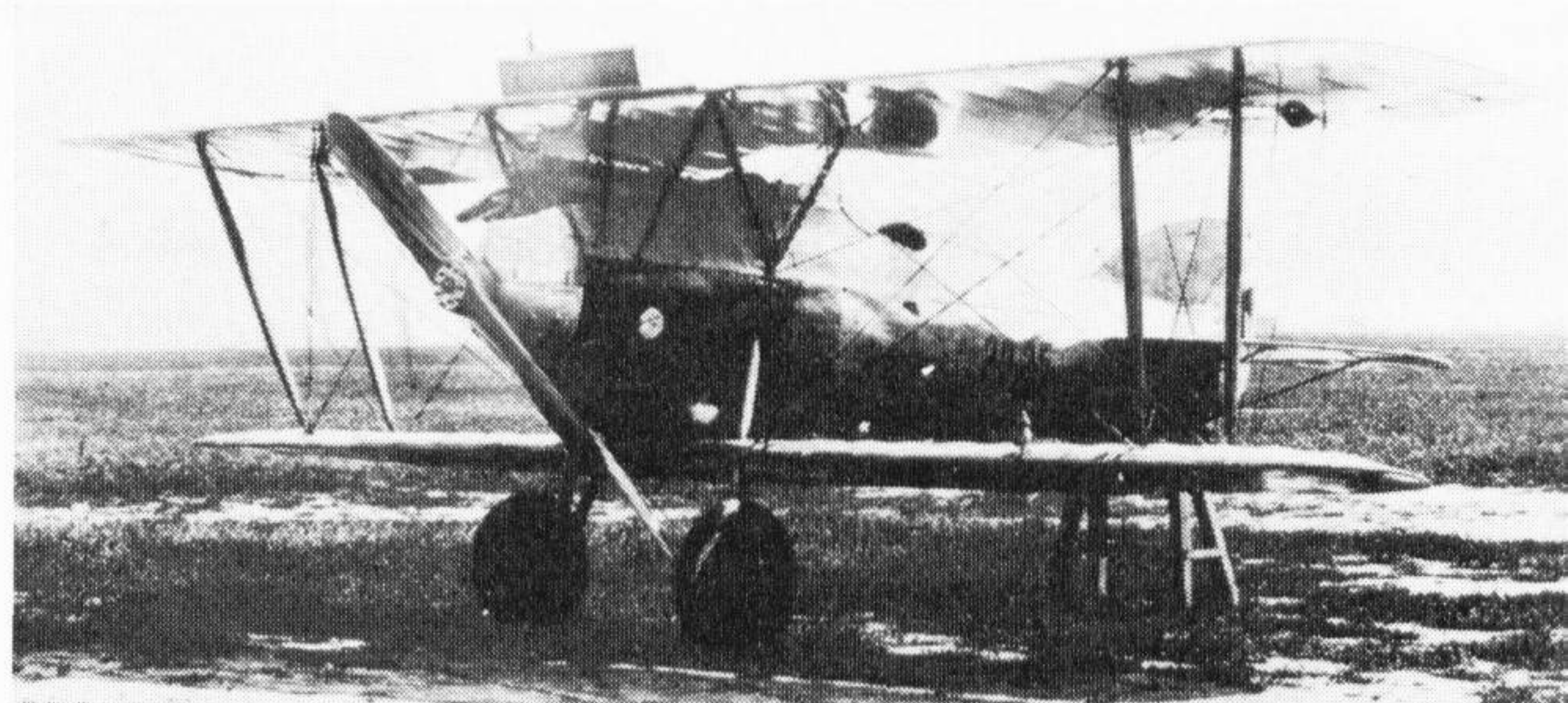
In appearance the D.IV was a fine compact machine, in the design of which Kirste had blended the latest in technology with proven front-line requirements.

A complete break was made from previous Phönix practice in that the fuselage of the D.IV was a semi-monocoque structure, having an oval section somewhat pointed at the bottom to form a fairly sharp keeled underbelly. The wings were unusual in that both upper and lower planes were constructed in three parts, the lower centre-section being joined to the fuselage keel and braced on either side by struts. Ailerons were balanced and fitted to the top wings only, and were operated by cables that passed down to and through the lower wings. The front struts of the undercarriage both met at the same attachment point under the forward fuselage, forming an inverted vee; those at the rear were joined to the front spar of the lower wing centre-section. Although of different contours, the tail-unit was similar in most respects to the earlier models. Armament was identical to that of the D.III.

Two prototypes were completed, 20.24 powered by a 230 h.p. Hiero, and 20.25 with the 230 h.p. Austro-Daimler. Nothing is known of the behaviour of the D.IV under flight test, or if there were any plans to



The experimental prototype Phönix D.IV 20.24 (230 h.p. Hiero engine). (Photo: Heinz J. Nowarra)



The last fighter design to emerge from the Phönix works, the D.IV 20.25 (230 h.p. Austro-Daimler).

produce the type in quantity. For some reason the K.u.K. Flieger Arsenal does not seem to have shown the same interest in the D.IV as in the contemporary rival designs of the W.K.F. and Ö. Aviatik concerns, both of which received orders for production. However, the end of the war for Austria-Hungary was already in sight, and none of this new generation of fighter aircraft was destined to reach the front.

THE PHÖNIX IN SWEDEN

With the surrender of Austria-Hungary on 2nd November 1918, all contracts for military aircraft became automatically valueless. Apart from other types and material, Phönix had on their hands the finished J.41 and a quantity of D.II's and D.III's in various stages of completion. A skeleton staff was retained to continue work on the partially built aircraft, whilst the Phönix directors sought a market for their product. Eventually a prospective buyer was found in Sweden, and it was decided in 1919 to fly the single-seat J.41, along with the two-seater Phönix C.I, from Vienna to Sweden in order to demonstrate the two aircraft to the Swedish Army.

The well-known Phönix test pilot Edmund Sparmann was to fly the J.41; the pilot of the C.I was Capt. Max Perini, and his passenger the Arctic explorer Dr. König. Their route was Vienna to Berlin, then on to Copenhagen, and from there to Stockholm. For such a flight it was necessary to equip the small J.41 with auxiliary

One of the original imported D.III's, 967 was part of the flight commanded by Lt. Gardin that won a formation flying contest held at Gothenburg, Sweden, on 5th August 1923. In the background of this photograph, taken at Torshälla, are two Fokker D.VII's of the Royal Netherlands Air Force.

(Photo: Bo Widfeldt)





After the formation of the Flygvapnet on 1st July 1926, Phönix fighters served with the F3 Wing at Malmen until 1928. Here is a Swedish-built machine of F3. (Photo: Bo Widfeldt)

long-range petrol tanks, and these were fitted above the lower wings alongside the fuselage. The two machines completed their rather hazardous journey without undue incident, a point probably not lost on the Swedish selection committee. For the flight, and throughout the subsequent trials, both aircraft retained unaltered their Austrian service markings and serials, with the sole exception that since Austria had become a republic, the crest on the tail of J.41 had had the Imperial Crown painted out.

At Stockholm, Sparmann and Perini put the two aircraft through their paces for the benefit of the Swedes, and later the Swedish pilots were given the opportunity to try out the aircraft for themselves. They were favourably impressed and the outcome was that Sweden decided to purchase a number of D.III's, plus the C.I that was already in Sweden, and to build both types under licence at the Swedish Army Aircraft Factory at Malmen.

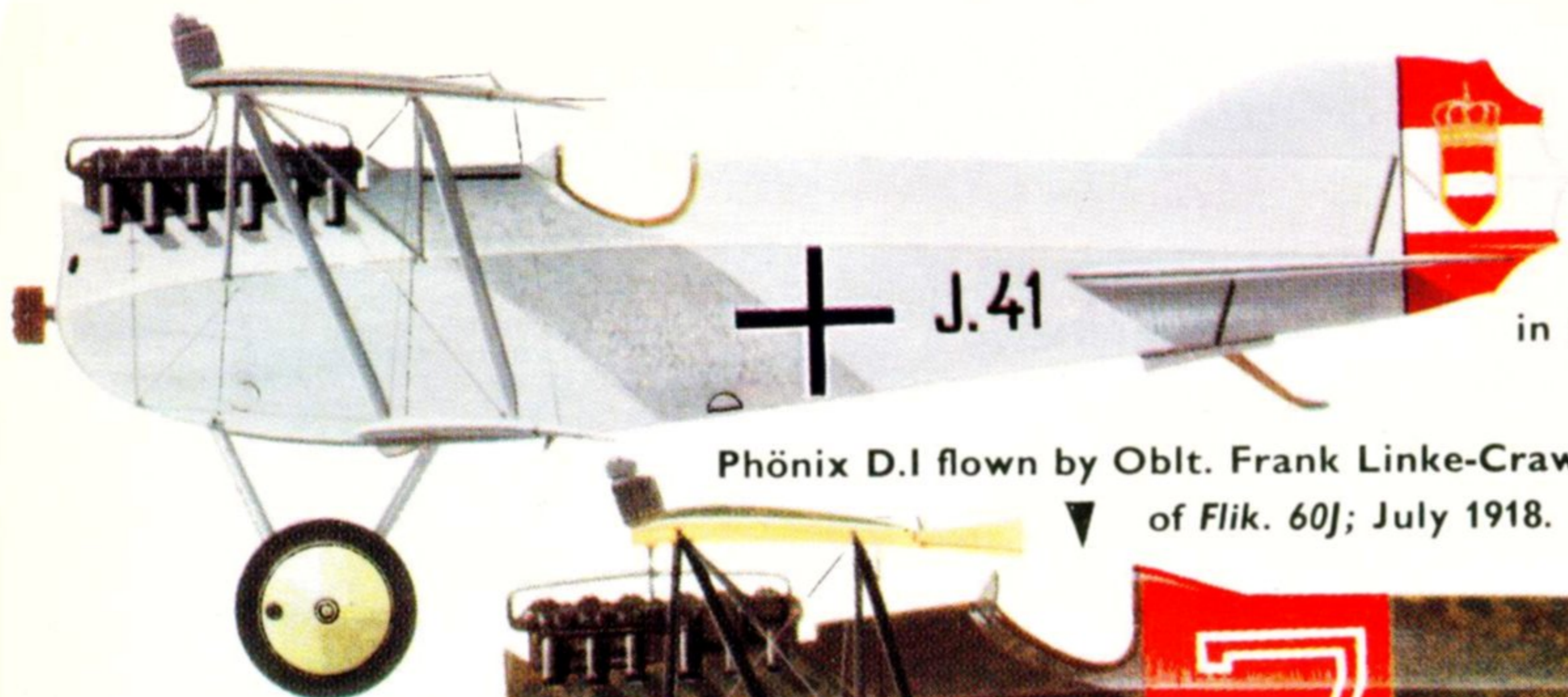
All told, a total of seventeen D.III's were exported to Sweden from the Phönix factory. However, things did not auger well for the aircraft industry in post-war Austria, and late in 1919 the Phönix company went into liquidation, their premises being taken over by a furniture manufacturer. The following year the Inter-Allied Control Commission put into effect the decision to confiscate or destroy all Austro-Hungarian combat aircraft and aero engines, also the plant used to produce such equipment. Only seven aircraft were discovered by the Commission at the old Phönix factory, and these were sent to Aspern, where others in the area were collected; apart from a few reserved for the Allies, all were destroyed.

The last Swedish-built aircraft was serialled 5149, but after modifications this was changed to 3149. Traces of the original serial are visible by the national insignia.

During its long and distinguished career in Sweden, the Phönix D.III was known as the Phönix 122, the most probable explanation for this being that partially built airframes of the D.II series 122 that were in the Phönix workshops at the end of the war, were completed as D.III's and sent to Sweden. In 1924, a further ten modified D.III's were constructed in Sweden, and as by that time Hiero engines were unavailable, these licence-built aircraft were powered by ex-German 185 h.p. B.M.W. engines. In July 1926, the Swedish *Flygvapnet* came into being, and as its first standard fighter the Phönix 122, under the service's new system of type numbering, became the J.1. The J.1 remained as a first-line fighter until the late twenties, by which time it was superseded by Swedish designs, and the J.1 was relegated to communications and training duties. As late as 1936, one was still actively in service with the meteorological branch of the *Flygvapnet*.

Over the years the Phönix J.1 underwent considerable modification. This included the fitting of two long range fuel tanks, in the shape of a thickened aerofoil section, on the upper wings just outboard of



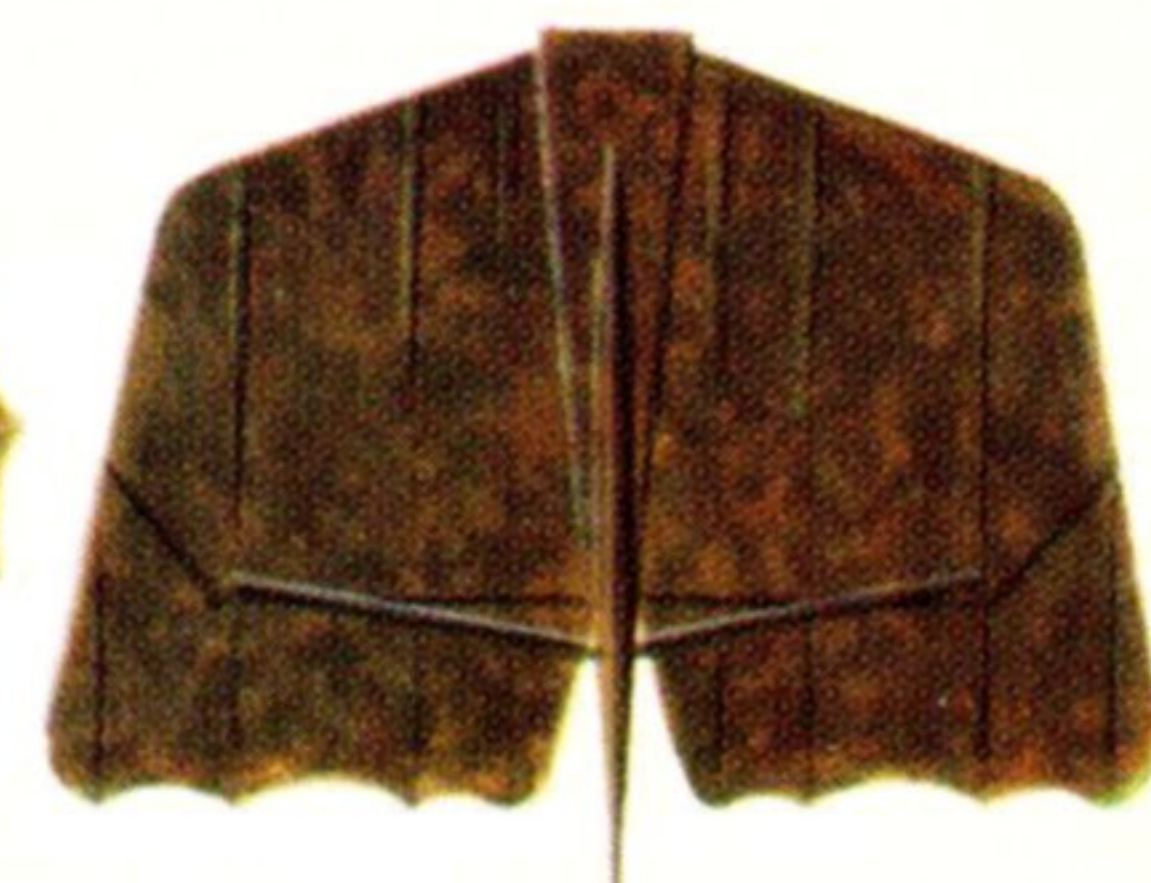


Phönix Type 9
(D.III prototype)
in K.u.K. Marine markings.

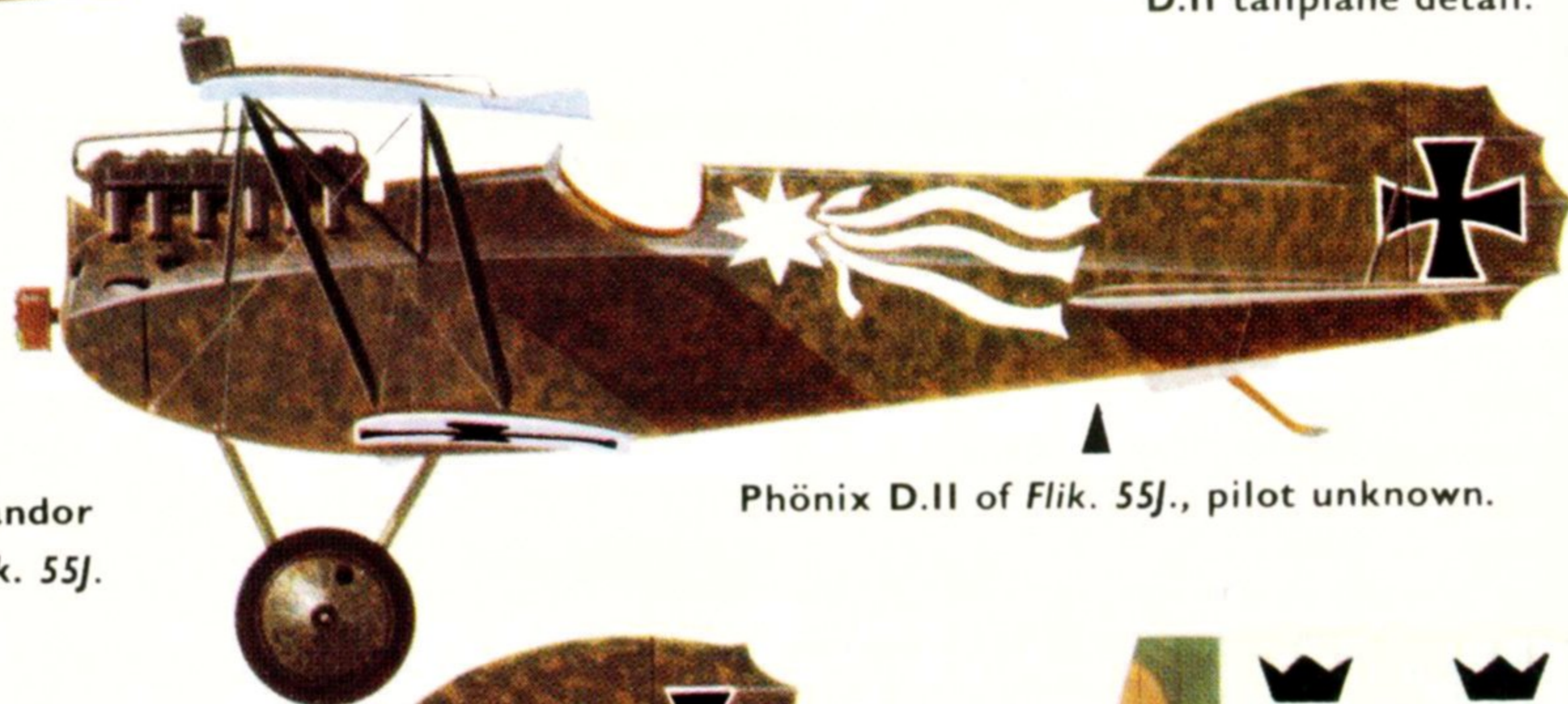


Wing marking
detail of J.41.

Phönix D.I flown by Oblt. Frank Linke-Crawford, C.O.
of *Flik. 60J*; July 1918.



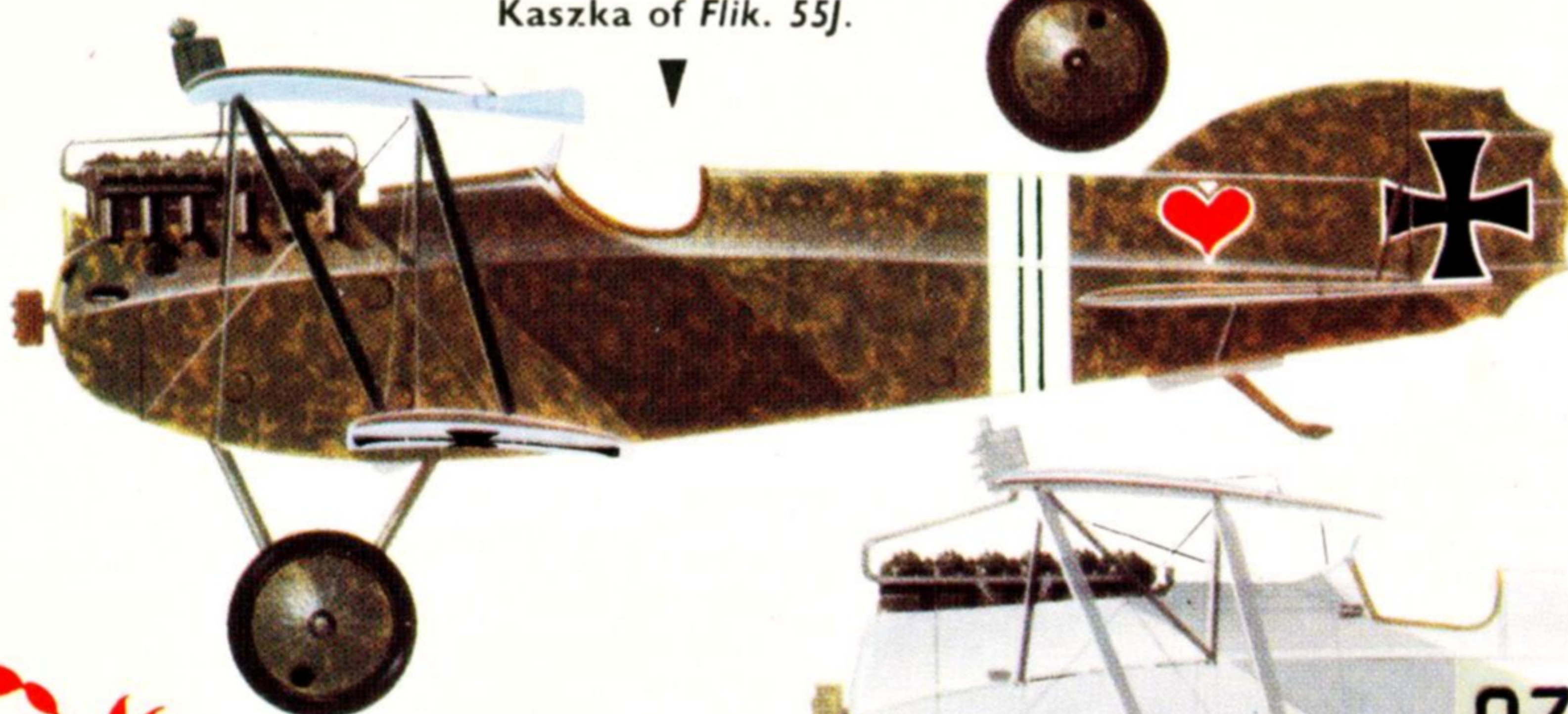
D.II tailplane detail.



Phönix D.II of *Flik. 55J.*, pilot unknown.



Phönix D.II flown by Feldwebel Sandor
Kaszka of *Flik. 55J.*



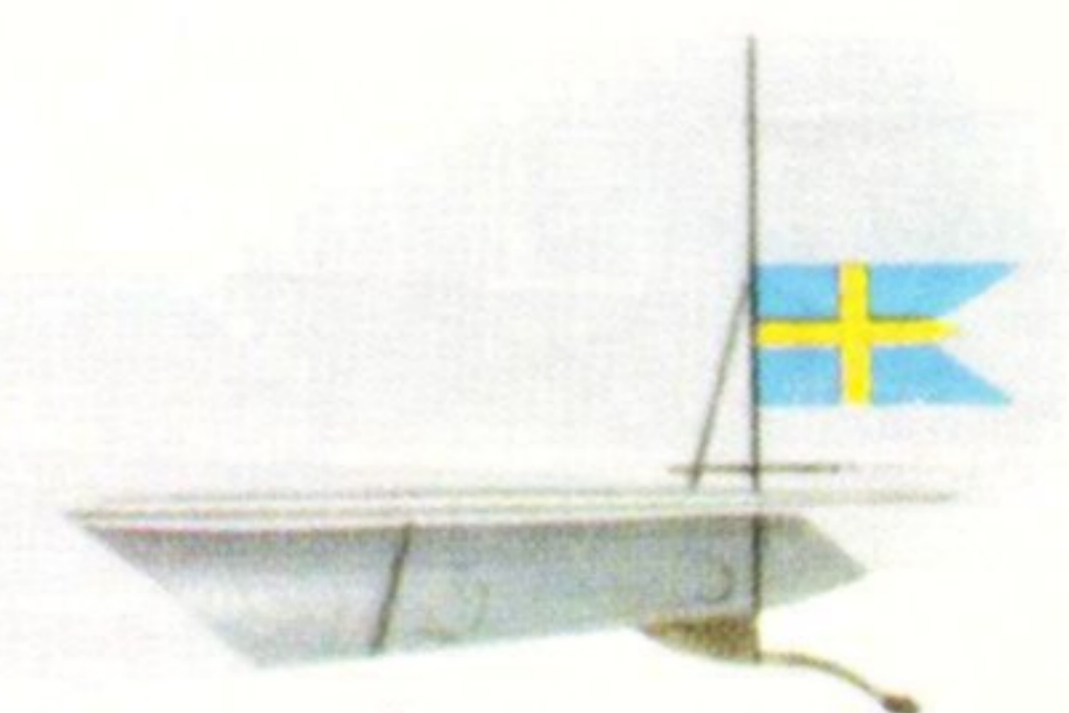
Wing marking style of Swedish J1, '955'.
Fuselage style as '935' below.



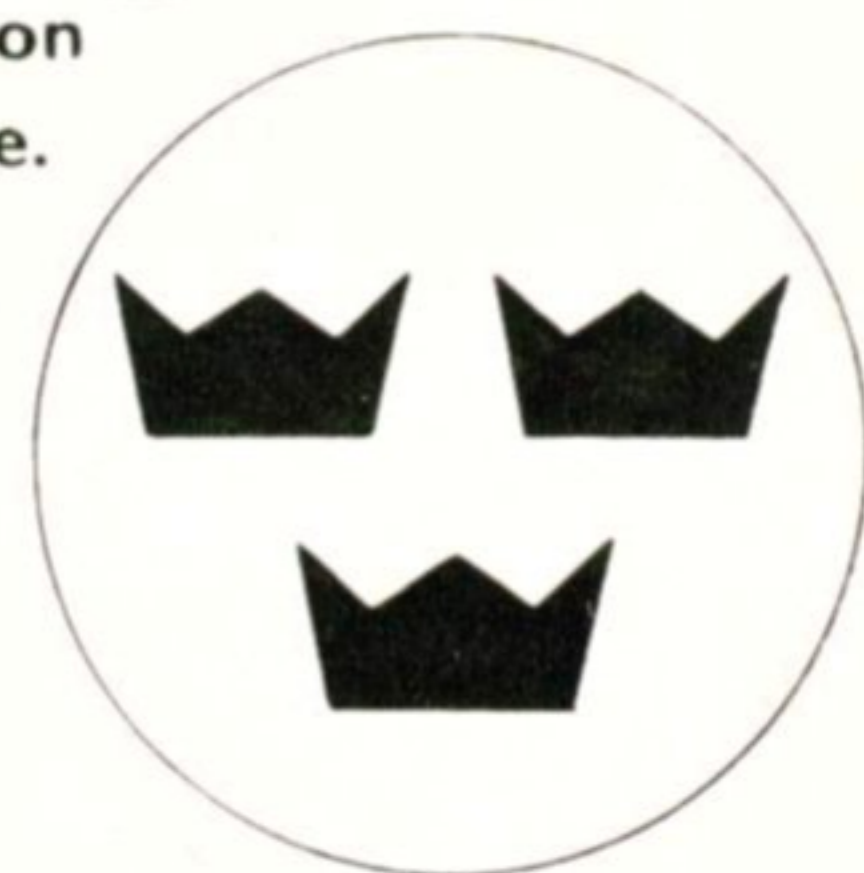
J1 of Swedish Air Force
in manoeuvre markings.
Roundel carried in four
wing positions.



J1, original demonstration
aircraft, Swedish Air Force.

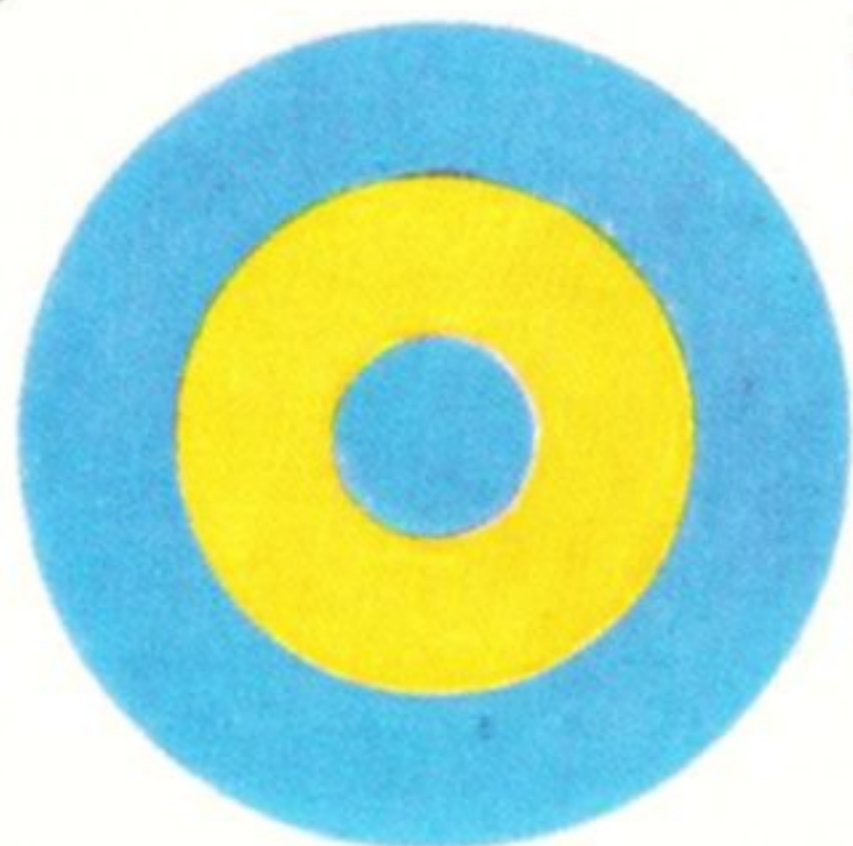


Sweden,
six positions.

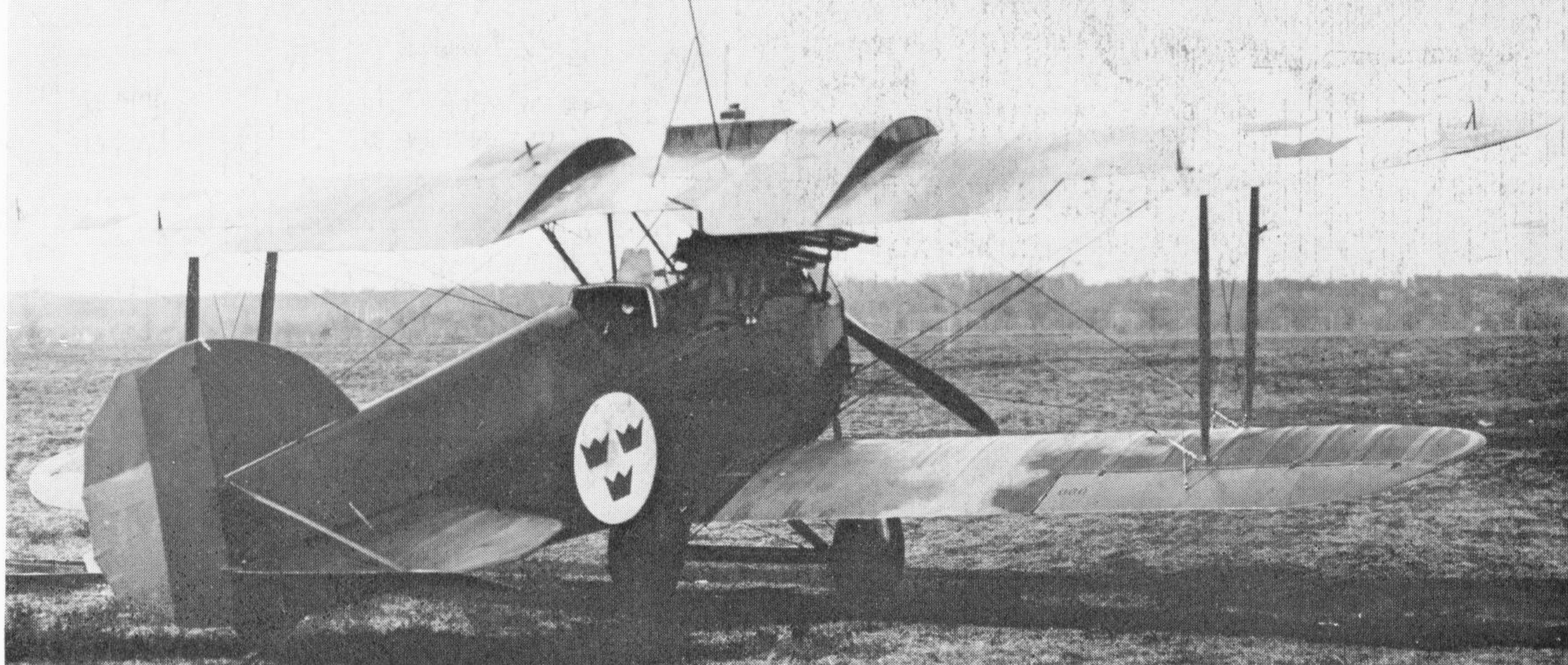


Sweden, six positions.

Sweden, rudder.



J1 of F3 Wing, Swedish Air Force.



One of ten Swedish-built Phönix Scouts showing the enlarged fin and rudder and the two extra fuel tanks mounted on the upper surface of the top wing. This particular aircraft of F3 Wing was fitted with a radio set for trials purposes; the aerial mast can be seen above the centre-section. (Photo: Bo Widfeldt)

the centre section. Machines with this modification also had enlarged fins and rudders. Some of the J.1's that remained in service up to the 'thirties were equipped with Handley Page slots fitted to the upper wings. During winter months the wheels of the J.1's were replaced by sprung skis to facilitate their landing on snow covered airfields.

In the Swedish Air Force Museum at Malmslätt one of the original Austrian-built Phönix 122's, bearing the Swedish serial 947, exists to this day.

PHÖNIX FIGHTER PRODUCTION

Owing to the lack of records it is impossible to ascertain an accurate production total for the Phönix fighters. The three series of the D.I are believed to have been for fifty aircraft each, and these totals, plus the forty naval machines added to the series 128, make a total for the D.I of 190 aircraft. The D.II was also ordered in three series of fifty aircraft each, plus

the single series of the D.IIa; just over half of these are believed to have been built by the end of the war, roughly 110 machines. Some nine or ten experimental D types were built, plus the J.41, and sixteen other D.III's were delivered to Sweden, giving a probable grand total of 327 aircraft. This does not include those built in Sweden.

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Swedish Phönix Scouts

Serial Nos. of imported machines:

935 (demonstrator), 941, 947, 949, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977 and 979.

Serial Nos. of aircraft built at the Army Service workshop at Malmen:

5131, 5133, 5135, 5137, 5139, 5141, 5143, 5145, 5147 and 5149.

Note:—Some of the Swedish-built aircraft had their serials changed after modification, e.g. 5135 to 3135, 5149 to 3149, etc.

After the formation of the *Flygvapnet*, aircraft serving with F3 Wing at Malmen carried serials corresponding to their originals but with the first figure replaced by the number 3. Nine aircraft were originally taken over in 1926 and the seven remaining were serialised 060-066 (later 560-566) when serving with F5 Wing at Ljungbyhed as trainers from 1928-30.

SPECIFICATION

Manufacturer: Phönix-Flugzeugwerke A.G., Vienna-Stadlau

Type	20.14 Exp.	D.I	D.II	D.IIa	D.III	D.IV	J.1 Swedish
Engine	185 h.p. Austro-Daimler	200 h.p. Hiero	200 h.p. Hiero	230 h.p. Hiero	230 h.p. Hiero	230 h.p. Hiero or 230 h.p. Austro-Daimler	185 h.p. B.M.W.
Span, upper	10.2 m. (33 ft. 5½ in.)	—	9.8 m. (32 ft. 2 in.)	9.8 m. (32 ft. 2 in.)	9.8 m. (32 ft. 2 in.)	8.5 m. (27 ft. 10 in.)	9.8 m. (32 ft. 2 in.)
Span, lower	—	9.0 m. (29 ft. 6½ in.)	9.0 m. (29 ft. 6½ in.)	9.0 m. (29 ft. 6½ in.)	9.0 m. (29 ft. 6½ in.)	7.5 m. (24 ft. 7 in.)	9.0 m. (29 ft. 6½ in.)
Chord, upper	—	—	—	—	1.7 m. (5 ft. 7 in.)	1.8 m. (5 ft. 10½ in.)	1.7 m. (5 ft. 7 in.)
Chord, lower	—	—	—	—	1.2 m. (3 ft. 11 in.)	1.3 m. (4 ft. 3 in.)	1.2 m. (3 ft. 11 in.)
Gap	—	—	—	—	1.5 m. (4 ft. 11 in.)	1.65 m. (5 ft. 5 in.)	1.5 m. (4 ft. 11 in.)
Length	7.35 m. (24 ft. 1½ in.)	6.618 m. (21 ft. 7½ in.)	6.618 m. (21 ft. 7½ in.)	6.618 m. (21 ft. 7½ in.)	6.618 m. (21 ft. 7½ in.)	6.6 m. (21 ft. 7¼ in.)	6.85 m. (22 ft. 6 in.)
Height	2.8 m. (9 ft. 2½ in.)	2.79 m. (9 ft. 2 in.)	2.79 m. (9 ft. 2 in.)	2.79 m. (9 ft. 2 in.)	2.79 m. (9 ft. 2 in.)	2.9 m. (9 ft. 6 in.)	2.79 m. (9 ft. 2 in.)
Propeller diameter	—	—	—	—	2.66 m. (8 ft. 8 in.)	2.7 m. (8 ft. 9½ in.)	2.66 m. (8 ft. 8 in.)
Wing area	25.5 sq.m.	—	25 sq.m.	25 sq.m.	25 sq.m.	23.5 sq.m.	25 sq.m.
Weight, empty	720 kg. (1,588 lb.)	665 kg. (1,466 lb.)	665 kg. (1,466 lb.)	—	685 kg. (1,510 lb.)	665 kg. (1,466 lb.)	660 kg. (1,455 lb.)
Weight, loaded... ..	920 kg. (2,029 lb.)	805 kg. (1,775 lb.)	805 kg. (1,775 lb.)	—	951 kg. (2,098 lb.)	950 kg. (2,096 lb.)	960 kg. (2,117 lb.)
Maximum speed	175 km./h. (109 m.p.h.)	180 km./h. (112 m.p.h.)	180 km./h. (112 m.p.h.)	185 km./h. (115 m.p.h.)	195 km./h. (120 m.p.h.)	195 km./h. (120 m.p.h.)	170 km./h. (106 m.p.h.)
Climb to 1,000 m.	—	3 min. 0 sec.	3 min. 0 sec.	—	2 min. 30 sec.	2 min. 10 sec.	—
Climb to 2,000 m.	—	7 min. 0 sec.	7 min. 0 sec.	—	—	—	—
Climb to 3,000 m.	—	12 min. 0 sec.	12 min. 0 sec.	—	12 min. 0 sec.	—	—
Climb to 5,000 m.	—	—	—	—	—	18 min. 0 sec.	—
Ceiling	5,000 m. (16,404 ft.)	6,000 m. (19,685 ft.)	6,000 m. (19,685 ft.)	—	6,800 m. (22,310 ft.)	7,500 m. (24,607 ft.)	—
Endurance	—	—	—	—	2 hrs.	—	3 hrs.