

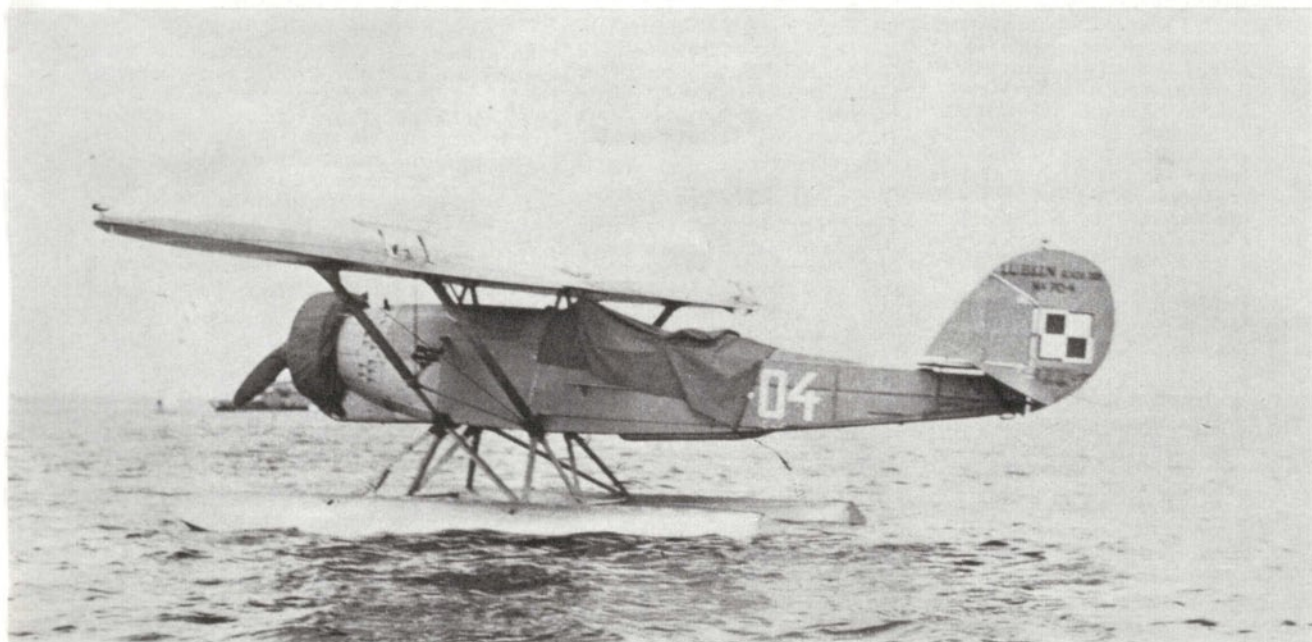
AIRCRAFT PROFILE

231

Lublin R.XIII Variants

by Jerzy B. Cynk

35p





Editorially Speaking No. 5

People are funny! Heading outward bound for the local hostelry one lunchtime recently, our attractive blonde receptionist (indeed, *all* the *Profiles of Windsor* girls are attractive) stopped The Editor with: "A gentleman's been on the 'phone about the Wombat (call it that for the sake of argument) Mark Thirty-three. He says he's done a lot of research and *he* thinks *you* should be interested!"

"Hmmm! that's right, it's not on our short list, Angela. How about a name and address?" A slight frown from the ever efficient receptionist. "Well, you see, he just gave me a 'phone number and extension. But no name. Then he rang off."

The slip of paper changed hands. Two hours and two internal meetings later, the vital evidence had vanished forever. Maybe there's a moral somewhere. How about "Support your local stationery industry and keep our postman employed?"

CHARLES W. CAIN

ABOUT THE AUTHOR

No. 231 Lublin R.XIII Variants

JERZY (GEORGE) B. CYNK left his native Poland soon after World War Two and began what was to be a 25-year unrelenting research into the history of Polish aviation. A monumental 768-page work has recently been published bearing his name, *Polish Aircraft 1893-1939* (Putnam, London, £7.50). Who better then, to prepare a *Profile* on the Polish Air Force's Lublin R.XIII?

Considering the problems associated with discovering suitable photographs of what is a little-publicised front-line aircraft, George Cynk has come up trumps. Not least, however, the admirable text and photos are complemented by four pages of fascinating colour drawings by that old master, Peter Endsleigh Castle, AR.AeS. Fellow artists will admire the finished results which have been made possible by the close collaboration of Waclaw B. Klepacki (*Profile No. 216: Pe-2 variants*) whose meticulous engineering drawings formed the basis for what are probably Peter Castle's best-ever interpretations.

YOUR COMMENTS

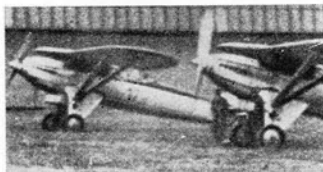
Komet comment

Congratulations on magnificent *Profile No. 225*, the Me 163 by Richard P. Bateson. *Profiles* get better and better!

One small historical point in the *Komet* text. Talking about gliders and sailplanes, the *Sperber-Spezial* was not designed as stated by Espenlaub but by Hans Jacob (*The Editor and his associated Gremlins must bear the blame!*). He developed it in 1936 specially for Hanna Reitsch from the D.F.S. *Sperber*. *Flugkapitän* Reitsch flew the Jacob's sailplane in the 1936 *Rhön-Wettbewerb* with the competition no. 61 (fuselage civil identity D-SPERBER-JUNIOR) and was placed 5th. In 1939, the *Sperber-Spezial* (or -Junior) had the civil registration D-11-48. ARMAND VAN ISHOVEN, Antwerp, Belgium.

EDITORIALLY SPEAKING... Mr Van Ishoven is a well-known Belgian aviation historian and writer who also possesses an affinity for glider and sailplanes—with around 90 different types in his logbook. He sent the photograph of Belgian Renard R.31s in the hope that readers might help him locate additional illustrations of the Renard "family".

Hanna Reitsch, writes Richard P. Bateson, is still active today.



She was winner of the First Helicopter World Championships, September 16-19, 1971, held at the German Army Helicopter Training School, Bückeburg. She flew a Hughes 300 and her crew member was Dorothea Schrimp.

Yes and No!

Just a word to say I am happy with *Profiles* especially when they are a little outside the usual line... such as Walrus, Pe-2, F-105 and Bü 131. Also I do appreciate *Editorially Speaking*...

ROLAND POEHLMANN,

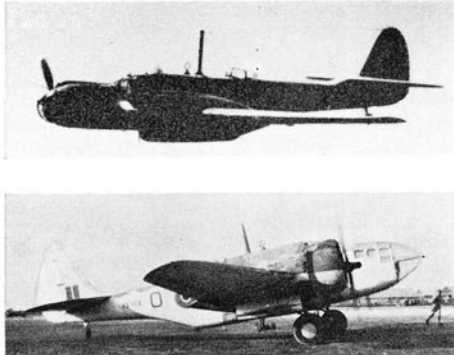
Erlangen, W. Germany.

The correspondence page, may we not have an extra page of main text in place of this?

DICK CRONIN,

Twycross, Atherstone, Warwickshire.

EDITORIALLY SPEAKING... The idea of the cover four pages is to protect the valuable 24 pages therein. The eyes have it; *Profilers* like this communications outlet.



Your next AIRCRAFT PROFILE

No. 232 Martin Maryland and Baltimore variants

We last met Christopher F. Shores doing justice to the *Brewster Buffalo variants* (*Profile No. 217*). Once again he tackles a difficult subject—two in fact—in the Martin Maryland and Baltimore bombers. Essentially, these were "export" bombers and have allowed Chris Shores full rein in the research area he enjoys most, "campaign" histories. Unlike most front-line bombers of World War Two, neither the Martin 167 Maryland or the Martin 187 Baltimore have been given the full treatment. At least, until now!

New Men & Machines series

Famous Fighter Squadrons of the R.A.F. : Volume One

By James J. Halley

Hylton Lacy Publishers Ltd., Coburg House, Sheet Street, Windsor SL4 1EB. 80-pages, 16 in colour. Price in U.K.: £2.50.

About to join the attractive "landscape" (8x10in. wide) original "Men & Machines" series devoted to the combat aircraft of World War Two, is the first of a complementary series with the accent more on the "Men" than the "Machines". This is an important international series which will be devoted to the famous combat units of the world's air forces.

The first volume, devoted to R.A.F. fighter squadrons (Nos. 1, 23, 29, 54 and 111) is by the noted R.A.F. units' authority, James J. Halley who, for many years now, has been the Senior Military Editor of *Air-Britain*. Vol. 1 contains more than 30,000 words, 10 pages of squadron aircraft in full colour artwork side views plus pages in colour devoted to squadron badges, standards and operational bases 1914-18 and 1939-45. This is most definitely a highly original series of laminated hard cover books. Another "first" from *Profiles and Hylton Lacy of Windsor*.

Letters - brief and constructive to

Editorially speaking...
Aircraft Profiles,
Profile Publications Ltd.,
Coburg House, Sheet Street,
Windsor, Berks SL4 1EB, England.

Aircraft Profiles

This new series of Aircraft Profiles commenced with No. 205 and continues the pattern of the complete history of the Aircraft of the World established by the early Aircraft Profiles numbered 1 to 204.

The series is edited by Charles W. Cain, for many years Editor of *The Aeroplane Spotter* of World War Two and beyond, and many well-known names have appeared among the authors and artists contributing to the series.

The continuing interest in and support of the Aircraft Profiles series has encouraged the Publishers to enlarge the contents of the Profiles. From No. 216 onwards there are 28 pages in all aircraft Profiles. There are 4 pages in colour—which allows the presentation of additional side views, badges, symbols, etc.

New series

- | | | | |
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| 205 | Boeing B-17G Flying Fortress | 224 | Supermarine Walrus & Seagull variants |
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| 212 | Fairey Swordfish | 231 | Lublin R.XIII variants |
| 213 | Kawanishi N1K Shiden 'George' | 232 | Martin Maryland & Baltimore variants |
| 214 | Grumman TBF/Eastern TBM Avenger variants | 233 | Kawanishi 4-Motor Flying-Boats (H6K 'Mavis' & H8K 'Emily') |
| 215 | Arado Ar 234 Blitz | 234 | Heinkel He 177 Der Greif |
| 216 | Petlyakov Pe-2 variants | 235 | Avro Lancaster Mk II |
| 217 | Brewster Buffalo variants | 236 | Mitsubishi A6M5 Zero-Sen ('Zeke 52') |
| 218 | Bristol Blenheim Mark IV | 237 | Fairey Barracuda Marks I-V |
| 219 | Heinkel He 219 Uhu | 238 | Mikoyan MiG-21 ('Fishbed') variants |
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Whilst every effort will be made to maintain this programme, the Publishers reserve the right to change the sequence.

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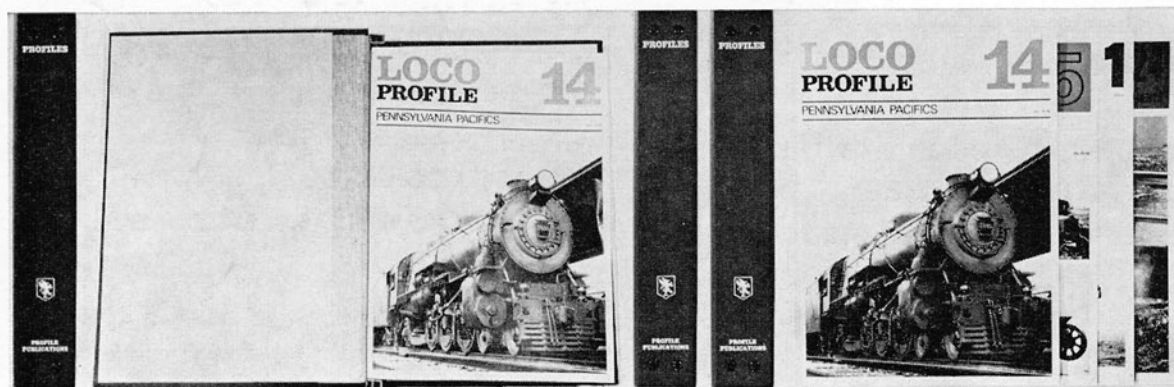
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The first prototype Lublin R-X, c/n 52.1, soon after completion, with wing panels detached and tailplane and elevators folded up alongside the vertical tail surfaces, in which form the aircraft could be towed behind a car. (Photo: W. B. Klepacki)

Lublin R-XIII variants

by Jerzy B. Cynk

THE Lublin R-XIII belongs among the least-known combat aircraft of World War Two. Few people outside Poland are aware that it was ever in existence. Yet the design in its many variants was produced in substantial quantities and in the middle 1930s constituted a fifth of the entire first-line strength of the Polish *Lotnictwo Wojskowe* (or Military Aviation) and was the principal equipment of the *Morski Dyon Lotniczy* (or Naval Aviation Wing). Although its operational potential was rather limited right from the outset—and practically non-existent by the outbreak of war—nevertheless the R-XIII played a substantial part in the Polish September Campaign of 1939 not only as an important and all-too-often only means of communications between scattered units of the Polish Army, but also in undertaking daring reconnaissance missions for which it was never intended.

The Lublin R-XIII had had its roots in the previous decade of the 1920s. With the establishment of Marshal Pilsudski's regime in the summer of 1926, the young Polish aviation industry was given an eagerly awaited green light for the development of original designs. The *Lotnictwo Wojskowe*, equipped in the first years of its existence entirely with models of foreign origin, began to look forward to rearmament with nationally-designed aircraft.

As the Polish Military Aviation was regarded only as an auxiliary service to the land forces, the main emphasis of its build-up was on army-support aircraft. Thus, one of the first requirements of the Department of Aeronautics, which was announced to the industry in 1927, called for a liaison/observation design with advanced training capability. The aircraft was to be evolved around the 220 h.p. Wright J-5 Whirlwind nine-cylinder air-cooled radial engine manufactured under licence by

the Polish Skoda Works of Warsaw. The successful design was envisaged as the replacement for the French-built Morane-Saulnier 35EP2 monoplane which had been used by the *Lotnictwo Wojskowe* in a similar capacity in the mid-1920s. Three companies, E. Plage & T. Laskiewicz Engineering Establishments, P.W.S. and the newly-created P.Z.L., each submitted proposals. All three designs, the Lublin R-X, the P.W.S.7 (later redesignated P.W.S.5) and the P.Z.L. L.2, received development contracts. The R-XIII was to be a progressive development of the R-X.

ORIGINS OF THE LUBLIN MONOPLANE LINE—THE R-X

E. Plage & T. Laskiewicz Engineering Establishments were founded in Lublin in 1864. Their Aviation Division, formed early in 1920, became the first Polish factory to begin large-scale manufacture of aircraft. Initially they licence-built the Italian Ansaldo A.300-2 reconnaissance and the Balilla fighter biplanes. Later, followed various French Potez models and the Dutch Fokker F.VIIB/3m passenger and bomber monoplanes.

The company started consistent development of original models towards the end of 1926 and Jerzy S. Rudlicki* (born of Polish parentage in Russia and who began design activities as a youth in Odessa in 1909, graduating eventually at the *Ecole Supérieure de l'Aéronautique* in Paris in 1922), was appointed as a

* The author wishes to express his gratitude to Jerzy S. Rudlicki, the Chief Designer of the Lublin factory, and to Leszek Komuda, a leading Polish aviation historian and archivist, for all the help given in compiling this *Profile* of the Lublin R-XIII series of monoplanes. Equally, special thanks to Waclaw B. Klepacki for his patient industry in researching and preparing master drawings for the colour artwork.—JBC

Chief Designer of the Lublin office. The Lublin R-X, the tenth powered design in Rudlicki's personal sequence, was his third study to be evolved at Lublin, after the R-VIII bomber and R-IX passenger transport single-engine biplanes. The R-X was a fully-aerobatic, high-wing braced parasol monoplane with elliptical wings of a modified Clark Y aerofoil section. It displayed pleasant and aerodynamically clean lines and, in addition to its military applications, the R-X was also envisaged as a potential postal and high-performance touring aircraft.

With the Department's contract for two R-X prototypes and a static-test specimen, followed by a pre-production order for five examples, work on the project progressed quickly and construction of the aircraft started in the spring of 1928. The first prototype (c/n. 52.1)* and the static airframe were completed in December. Initial structural tests were carried out on 18th of that month and the final series of test on January 31, 1929—a safety factor of 10.5 being achieved. Meanwhile the prototype, having a normal loaded weight of 1.150 kg (2,535 lb), was prepared for flight trials. With its wheels replaced by skis, the aircraft took-off from the snow-covered factory airfield for the first time on February 8, 1929. Manufacturer's tests, during which the aircraft indicated excellent handling characteristics, were finished with flying colours within a matter of weeks. Late in March, the prototype was delivered to the I.B.T.L. (Institute of Aviation Technical Research) in Warsaw for trials.

The production prototype, (c/n. 52.2) flew in the spring of 1929. The aircraft, featuring shorter exhaust pipes and painted in the standard *Lotnictwo Wojskowe* finish (olive-green with sky-blue undersurfaces), joined the first one in the I.B.T.L. trials, and in the later stages of these both prototypes were fitted experimentally with Lublin-designed Townend rings, thus becoming the first Polish aircraft to incorporate this advanced aerodynamic feature. The final I.B.T.L. evaluation and service acceptance trials were eventually completed by the R-X (c/n. 52.3) on November 14, 1929. Tested during the trials at various loaded weights and with wooden and metal propellers of different makes, the aircraft recorded maximum speeds from 161 km/h (100 mph) to 176 km/h (109.3 mph) at sea level and attained heights of up to 4,000 m (13,123 ft).

In contrast to the first unarmed prototype, the five following airframes, c/ns. 52.2 to 52.6 inclusive, were provided with detachable mountings for single guns over the modified rear cockpits. They began to reach



The first prototype Lublin R-X, displaying natural finish and dark-blue trim and bearing the P.A.F. chessboard insignia, after its first roll-out at the end of January 1928. (Photo: Malcolm Passingham)

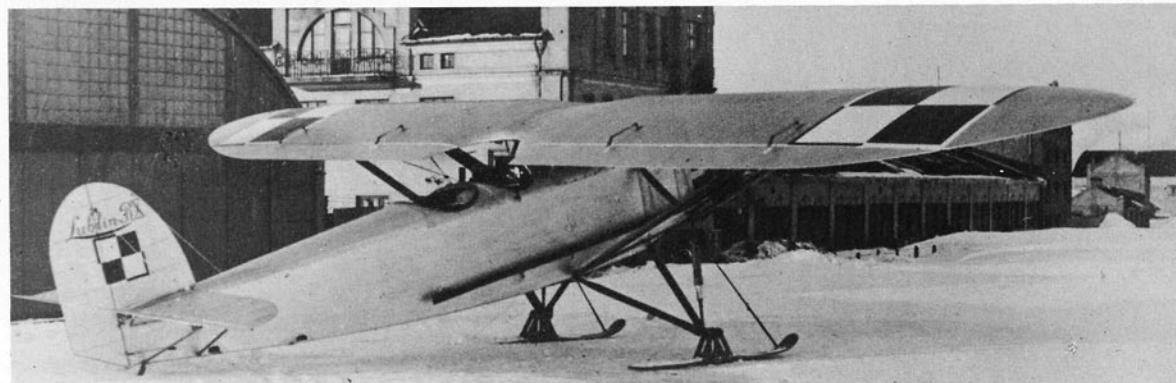
the *Lotnictwo Wojskowe* in the autumn of 1929 and went to the commands of air regiments to be used as liaison and VIP aircraft, one R-X becoming the personal mount of Major Tadeusz Wereszczyński, C.O. of the 2nd Air Regiment based at Kraków-Rakowice airfield. Later R-Xs were operated by the Deblin Military Aviation Training Centre. The last pre-production example (c/n. 52.7) was completed as a civil long-range aircraft and was designated R-Xa—being allotted the civil registration letters SP-ABW. This aircraft embodied a number of structural modifications and reinforcements, which adapted it for long-range flights and permitted installation of additional tanks increasing total fuel capacity to 1,000 litres (219.9 Imp. gal.) and endurance to 18 hours. Other but minor changes included the introduction of separate exhaust pipes for each cylinder in place of collector rings used on all preceding R-Xs. Empty and loaded weights of the R-Xa increased to 900 kg (1,984 lb) and 1,366 kg (3,012 lb) respectively.

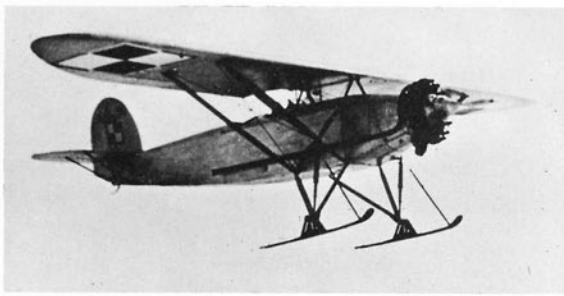
The first test of R-Xa's capabilities came, in August 1929, when the aircraft flew non-stop across Europe, from Poznań in Poland to Barcelona in Spain. The flight was sponsored jointly by the organizers of the Xth Poznań National Universal Exhibition (a predecessor of what is now internationally known as the Poznań Fairs) and the Department of Aeronautics, and the R-Xa carried Polish good-will messages to Barcelona

* *Lotnictwo Wojskowe* serials were used by the Lublin factory also as construction numbers. The serials comprised two groups of figures: the first group indicated the service model (in this case 52. signified the R-X) and the second, the consecutive airframe built.

A rear view of the same aircraft, after its wheels were replaced by skis.

(Photo: Malcolm Passingham)





The ski-equipped first prototype R-X, seen here during its initial flight from the manufacturer's airfield on February 8, 1929.

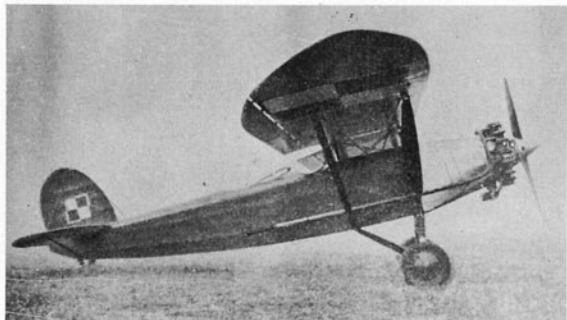
(Photo: Musée de l'Air)

International Exhibition, which coincided with the Poznań event. Sporting a poster of the Poznań Exhibition on the starboard fuselage side, the aircraft left Poznań-Lawica airfield with Major Waclaw Makowski as the pilot and Lance Corporal Boleslaw Wieman in the passenger seat on August 25, at dawn, and reached Barcelona 12 hours 15 min later, covering the distance of just over 1.700 km (1,056 miles) at an average speed of 140 km/h (87 mph). The small Barcelona airfield did not permit the aircraft to take-off at the fully loaded weight and the homeward journey had to be made in two stages, with a landing at Paris. The R-Xa, displaying the Barcelona Exhibition poster next to the Poznań one, returned to Poznań on September 3, and then flew to Warsaw.

In 1931 the R-Xa was chosen by Captain Stanislaw Karpiński for his proposed Middle East flight. To assess the suitability of the design for this ambitious venture, the aircraft was involved in protracted trials which included three tours round Poland and a five-day tour of Europe. The domestic tours, carried out respectively by Sergeant Karniowski, Colonel Spychala and Captain Karpiński, accounted for a total of almost 4.000 km (2,485 miles), the last one covering 1.650 km (1,025 miles) non-stop. The European tour, flown by Captain Karpiński in six stages over the route Warsaw-Bucharest-Istanbul-Rome-Turin-London-Warsaw, added further 6.450 km (4,008 miles) to the R-Xa's impressive cross-country flights record.

Later SP-ABW went back to the Lublin works for a major overhaul and modifications in preparation for the real thing, Karpiński's flight to Afghanistan. Apart from aerodynamic refinements, such as the better streamlining of bracing struts and the introduction of a Townend ring and spatted wheels, some structural improvements were embodied in the airframe, the

One of five pre-production R-Xs in the standard P.A.F. service finish of the period which was olive-green, with light-blue undersurfaces and bare metal forward fuselage panels.



undercarriage was reinforced and fuel installation revised. The modified aircraft, sometimes referred to as the R-Xbis, re-emerged in the summer of 1932 sporting a silver finish with dark-blue trim, and white and red flashes on the upper and lower surfaces of the wing. A silhouette of an "Afghan antelope" by Janusz Lange, greetings in Arabic characters and details of previous long-range flights inscribed on sides of the fuselage, completed the decor.

The flight to Kabul, capital of Afghanistan, situated at an elevation of 1.800 m (5,900 ft), proved a tremendous success. Piloted by Captain Stanislaw Karpiński and with Wiktor Rogalski in the passenger seat, the R-Xbis left Warsaw on October 2, 1932. It covered 14.390 km (8,942 miles) in 108 hours 50 min. flying time, with an overall average speed of 132.4 km/h (82.2 mph), and arrived back in Warsaw three weeks later, on October 24. The tour, during which 15 landings were made in Bulgaria, Turkey, Syria, Iraq, Iran, Afghanistan, Egypt and Palestine, and which involved very difficult flights in heavy turbulence, sand storms and fogs, over deserts and most forbidding mountain ranges, was completed without a hitch, proving an outstanding reliability and endurance of the nationally developed airframe and Polish-built powerplant.

Overall dimensions of the R-X included a span of 13,5 m (44 ft 3 in), a length of 8,33 m (27 ft 4 in), a height of 2,98 m (9 ft 9 in) and a gross wing area of 25,96 m² (279.4 sq ft). Normal empty and loaded weights of the standard model were 820 kg (1,768 lb) and 1.300 kg (2,866 lb) respectively and performance included a maximum speed of 180 km/h (111.8 mph) at sea level and a service ceiling of 6,000 m (19,685 ft).

DEVELOPMENT OF THE LUBLIN R-XIII

In view of the great promise showed by the Lublin R-X, Rudlicki began studies for progressive developments of the basic design. Excellent properties of the R-X wing prompted him to use lifting surfaces of the similar shape and aerofoil section on his R-XI light five-seat feederliner and R-XII cabin tourer, while the direct successor to the R-X took the form of the R-XIV and R-XV, the "unlucky" number XIII being omitted initially from the designation sequence. The latter two designs, conceived at the end of 1928, employed an improved and higher loaded elliptical wing and incorporated a number of structural refinements. The R-XIV was unarmed and aimed to meet the *Lotnictwo Wojskowe* requirement for an advanced and aerobatic trainer and

A pre-production R-X monoplane as operated by the 2nd Air Regiment, Kraków-Rakowice base, in the early 1930s. (Photo: S. Meus)





The solitary civil R-Xa SP-ABW, c/n 52.7, after its successful Barcelona trip, with exhibition posters on the fuselage, photographed in early September 1929.

the R-XV, armed with a 7.7 mm. flexible machine-gun in the observer's cockpit, was to fulfil the existing need for liaison/observation aircraft. As the Polish Navy evinced interest in the similar class of aircraft, a proposal for a twin-float version of the R-XV was also evolved.

In November 1929, E. Plage & T. Laskiewicz submitted initial tenders for manufacture of 15 R-XIV and 15 R-XV monoplanes, but the Department of Aeronautics, rejecting the idea of having two different types in production, turned down the R-XV and placed a contract for 15 R-XIVs. Construction numbers 54.1 to 54.15 inclusive were allocated to the batch and, because the aircraft was basically a superior edition of the proven R-X, no prototype was to be built. In the outcome of further discussions, the Department instructed the factory to develop an armed liaison variant of the R-XIV in place of the proposed R-XV, and it was agreed that the last aircraft from the batch (c/n. 54.15) should be adapted to carry a gun-ring mounting over the second cockpit to serve as the development and evaluation machine for the liaison/observation model.

In December 1929, Rudlicki's design was selected in principle as future equipment of Military Aviation

units in preference to the competitive P.W.S.5 and P.Z.L. L.2, thus becoming the second nationally-evolved project, after the Bartel M.4 primary trainer, to be approved for quantity production. The first R-XIV (c/n. 54.1), powered by a 220 h.p. Wright/Skoda nine-cylinder radial engine driving a Szomański two-blade wooden propeller, made its initial flight at the beginning of June 1930. After brief factory tests, the 54.1 was despatched to the I.B.T.L. for certification and service acceptance trials. These were completed with very satisfactory results early in the following month. Meanwhile, other aircraft from the production batch of 15 took the air during July and, on August 9, first five R-XIV advanced trainers (c/ns. 54.1-54.5) entered service with the *Lotnictwo Wojskowe*.

Fitted with an unbalanced gun-ring Type TO-7 for a single Vickers F gun and provided with a message pick-up gear under the fuselage, the airframe c/n. 54.15 left the assembly lines on August 1, 1930, and went to the I.B.T.L. for official service trials on the 15th of that month. These trials, conducted mainly by Colonel Jerzy Kossowski, ended in a mishap which indicated remarkable stability and "hands-off" flying capabilities of the

Close-up of the posters of the Barcelona International Exhibition (forward) and the Xth Poznań National Universal Exhibition (aft) on the fuselage of the R-Xa. (Photo: Jerzy S. Rudlicki)



A close-up of the R-Xbis fuselage decor: a dark-blue silhouette of an "Afghan antelope", greetings in Arabic and a record of all long-range flights made by the aircraft. (Photo: Jerzy S. Rudlicki)





The R-Xa at the time of its long-range proving flights, with Capt. Stanisław Karpiński at the controls, in the late summer of 1931.

design. As a result of a vigorous movement of the controls, while putting the aircraft through its paces in lively aerobatic manoeuvres, Kossowski sheared off the control column locking-pin head and his mount went out of control. The pilot, being at a low altitude and not realizing what had gone wrong, quickly baled-out. The pilotless R-XIV then righted itself in the air, made a perfect landing in an open field, and after rolling for a considerable distance, met its end in a ditch.

In the meantime, the Department of Aeronautics asked the manufacturer for the introduction of various minor modifications to the design to make it more adaptable for service use. This new demand led to the development of an improved version of the aircraft which possessed a revised rear fuselage—lacking the deep top decking of the standard R-XIV—and which employed tail surfaces of reduced area. Encouraged by the fact that the *Lotnictwo Wojskowe* was already firmly committed to this new model, the designer braved superstition and assigned to it the designation R-XIII. The reluctantly-used number XIII brought Rudlicki luck, for this became the most famous and successful of his creations and was manufactured in larger quantities than any other type built by the Lublin factory.

THE R-XIII: INITIAL VARIANTS AND PRODUCTION MODELS

A Government contract for a single R-XIII prototype (c/n. 56.1), was followed by the production agreement No. 33/31—for 50 R-XIIIB liaison/observation monoplanes (c/ns. 56.2 to 56.51 inclusive)—which was signed on July 21, 1931. The prototype, powered by a 220 h.p. Wright/Skoda radial, began trials in the summer of 1931, flying initially with a universal gun mounting in the rear cockpit. The aircraft successfully completed the official I.B.T.L. test programme in September.

Karpiński's R-Xbis in its Afghanistan-flight configuration. (Photo: Skrzydlata Polska)

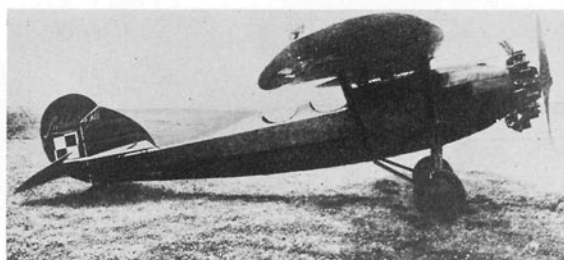


With the introduction of various small alterations—which included the addition of a gun-ring mounting and a shallow rounded decking over the rear fuselage which smoothed the air-flow behind the ring—it conformed to the standards of the R-XIIIA, initial production model. Work on the first production airframe, (c/n. 56.2) started on September 17, 1931, and the aircraft was accepted by the *Lotnictwo Wojskowe* on June 7 of the following year.

Manufacture progressed at the rate of one airframe per week, the delivery of the whole batch of 50 being completed on March 15, 1933. Although the production contract called for the delivery of 50 R-XIIIBs with Rudlicki's unbalanced gun-ring Type R-2, the first 30 of this batch received old, Government-surplus gun-rings Type TO-7, and in this form the aircraft were known as the R-XIIAs (and were recorded as such in a number of contemporary pilots' log books). Later a quantity of the TO-7 gun-rings were brought up to the R-2 standards by the Lublin factory. Two late-production R-XIIIB airframes (c/ns. 56.48 and 56.51) were completed, in contrast to their counterparts, with passenger cockpits, without gun-ring installations, and were allotted the civil registrations SP-AKK and SP-AJT respectively. Three early R-XIIIs (c/ns. 56.12, 56.13 and 56.20) were similarly modified, their respective civil registrations being SP-AFE, SP-AND and SP-ANF.

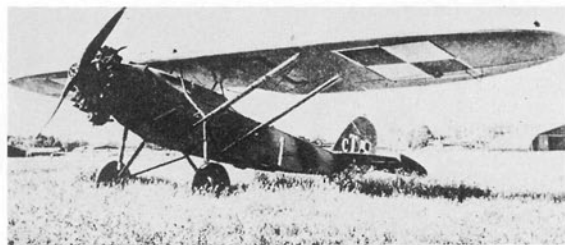
The Polish Navy began to show interest in Rudlicki's monoplane early in 1930. Thus, on April 30 of that year, the Lublin company submitted to the Combat Navy Headquarters preliminary proposals for the Wright/Skoda-powered R-XV liaison monoplane with a convertible wheel/float undercarriage. During subsequent discussions with the Navy it was decided to drop the R-XV project altogether in favour of the twin-float seaplane version of the R-XIII. Because of the substantial *Lotnictwo Wojskowe* order for the basic model,

The first production Lublin R-XIV advanced trainer, c/n. 54.1, during official trials. (Photo: T. Zychiewicz)





A production R-XIV monoplane, photographed in the early autumn of 1930, soon after the delivery to the Kraków Advanced Flying School at the 2nd Air Regiment.



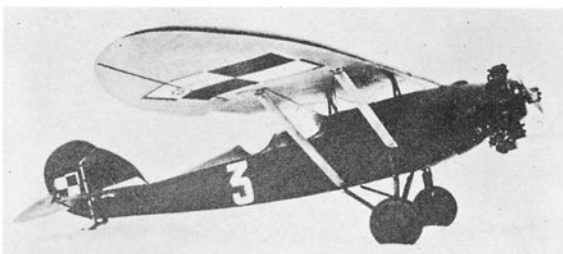
The prototype Lublin R-XIII, c/n. 56.1, seen here at Warsaw-Mokotów aerodrome during the service evaluation trials.

this version would be cheaper to produce and maintain. With the agreement of the Department of Aeronautics, the original R-XIII prototype (c/n. 56.1) was experimentally converted to the seaplane configuration, receiving the designation R-XIIIbis and naval serial 700. Provided with two flat-bottomed wooden floats and generally adjusted to meet the naval requirement, the aircraft went to the Naval Aviation Base at Puck for trials, which were conducted in the winter of 1931–2.

In view of a good progress of the naval evaluation trials, the Navy awarded E. Plage & T. Laskiewicz an initial production order for three Lublin R-XIIIbis monoplanes. The contract 144/31, issued on January 9, 1932, requested that the aircraft be supplied with similar wooden floats and three sets of replacement land undercarriages incorporating P.Z.L. oleo-pneumatic shock-absorbers and including skis interchangeable with wheels. Also, in addition to specified naval equipment, contract 144/31 called for the fitting of wheel controls—in place of conventional control columns—and modified TO-7 gun-rings. The aircraft were assigned the naval serials 701, 702 and 703, which also became their construction numbers. They entered service with the *Morski Dyon Lotniczy* towards the end of 1932.

In the meantime, the prototype 56.1 was returned to the factory to be overhauled and brought up to the latest *Lotnictwo Wojskowe* standards. Consequently it underwent a further transformation. Among various developments of the basic R-XIII design proposed by the Lublin project office in the early 1930s, a version incorporating the unique Rudlicki V-tail, designated R-XIX, was most noteworthy and outstanding. Some years earlier, while searching for solutions on how to improve the gunner's chances of defending the aircraft from the rear, Rudlicki conceived a revolutionary concept of a novel empennage consisting of two inclined elements in place of a conventional tail. In the course of investigations of the Rudlicki tail system, V, A, W and M forms were studied. Eventually the V layout was selected

An R-XIV advanced trainer of the Central Training Squadron of the 1st Air Regiment, Warsaw-Mokotów base, circa 1933.



for full-scale experiments. In the first half of 1931, a Polish-built Hanriot HD 14 trainer biplane (c/n. 30.83) was converted to incorporate the Rudlicki V-tail and took the air for the first time with this new empennage in the early summer of that year; thus becoming the first aircraft in the world to fly with what is now generally known as the "butterfly" tail. Greatly impressed by excellent results of the flight trials and by widespread international interest created by the Rudlicki's invention, Zygmunt Zakrzewski, managing director of the Lublin factory, approved the proposals for the Rudlicki-tail development of the R-XIII, the R-XIX. As the Department of Aeronautics dismissed the project, E. Plage & T. Laskiewicz decided to construct the R-XIX on the private venture basis, using for that purpose the 56.1 prototype airframe.

After comprehensive wind-tunnel tests with V-tail and A-tail R-XIX scale-models—conducted at the Warsaw Aerodynamic Institute—the former configuration was selected for the full-size aircraft. The unconventional R-XIX flew in the summer of 1932. Flight trials, conducted mainly by a factory's test pilot Władysław Szulczewski, were completely trouble-free and proved the aircraft rather superior from the handling and performance viewpoints to the standard R-XIII. Proud of its new model, the Lublin management sent the R-XIX on a surprise visit to the I.B.T.L. in Warsaw, where the unconventional aircraft arose understandable interest. Colonel Jerzy Kossowski, who was present at the airfield, expressed his wish to try the aircraft out. After a convincing demonstration of its aerobatic capabilities, he voiced an enthusiastic opinion about it.

The Department of Aeronautics soon found out about the unauthorized demonstration of the R-XIX at the I.B.T.L. and became furious. Kossowski was strongly reprimanded for flying the aircraft without official Department permission and for expressing his favourable views, which hurt the vanity of Department's heads. Zakrzewski was also summoned to be told of the authorities' disapproval of the company's initiative in building the R-XIX, and the Lublin firm received a "punishment" in the form of a fine for a failure to deliver the overhauled 56.1 to the *Lotnictwo Wojskowe* on time. On the Department's order, the disagreeable tail was sawn off in Warsaw and the tailless aircraft returned to Lublin by rail. In this way the career of the very promising and progressive R-XIX came to the brutal and most unexpected end. The astonishing story of the R-XIX reflected sadly upon conditions in which Polish engineers had to work. All too frequently courageous and pioneering ideas were dismissed lightly by the Department of Aeronautics, whose personnel, often lacking necessary qualifications and foresight, failed to



The original R-XIII prototype, c/n. 56.1, after the conversion to the R-XIX configuration, in the summer of 1932. The R-XIX was the world's second aircraft to fly with Rudlicki V-tail. (Photo: Jerzy S. Rudlicki)

comprehend the advantages and implications of possibly far-reaching inventions. Having dictatorial powers over the home aviation industries, the Department, wise in its own conceit, regarded itself as an infallible authority on technical matters. Determined attempts to convince it about the soundness of ideas not approved by it—as exemplified by the R-XIX—inevitably ended in failures and only antagonized its heads against “disobedient” visionaries, who dared to challenge the Department’s judgements.

THE R-XIII: PROGRESSIVE IMPROVEMENTS AND MAJOR PRODUCTION MODELS

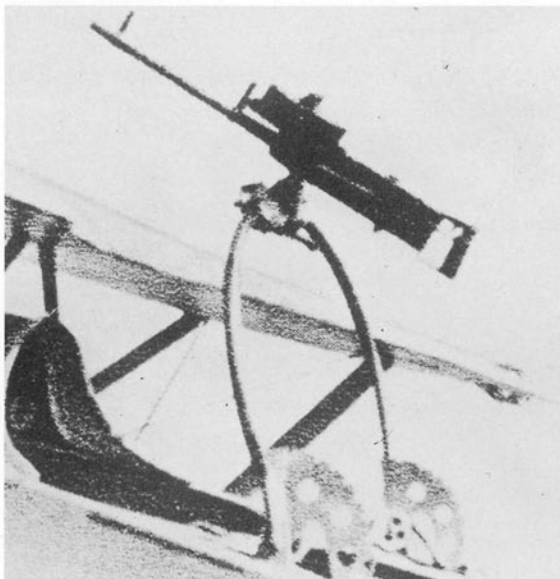
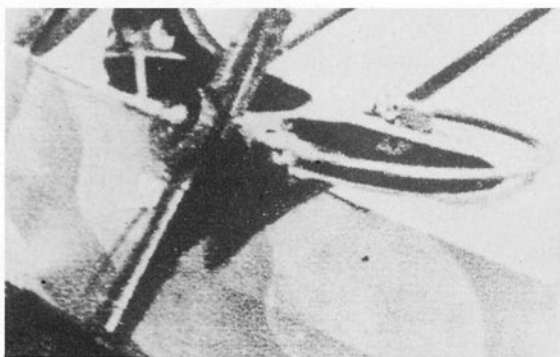
In 1932, Rudlicki submitted proposals for an aerodynamically improved land version of the R-XIII. This would possess an engine enclosed in a narrow-chord ring (and provided with a low-drag head-plate with adjustable cooling louvres), a faired-over oil cooler blending with cleaned-up forward fuselage, modified exhaust system and faired main undercarriage

legs. The new model, designated R-XIIID, stemmed from an experimentally modified R-XIIIbis seaplane, which, fitted with a Townend ring for comparison trials, showed superior overall performance. Quantity manufacture of the R-XIIID was called for in a follow-on order for 120 R-XIII observation monoplanes for the *Lotnictwo Wojskowe*, awarded to E. Plage & T. Laškiewicz on September 19, 1931. This contract, No. 112/32, required delivery of: (1) 48 examples of the 220 h.p. Wright/Skoda-powered R-XIIIC (c/ns. 56.52 to 56.99) which was an improved edition of the R-XIIIB with a much cleaner message pick-up gear and better service equipment; (2) two development aircraft adapted for more powerful 300–400 h.p. engines (the R-XIIIE, c/n. 56.100, with 360 h.p. Gnome-Rhone 7K Titan Major seven-cylinder radial, and the R-XIIIF, c/n. 56.101, with the nationally-evolved 340 h.p. Polish Skoda Works G.1620 Mors nine-cylinder radial; and (3) 70 examples of the 220 h.p. Wright/Skoda-powered “new type” R-XIIID (c/ns. 56.102 to 56.171).

The R-XIIIC and D followed the R-XIIIB into

A newly completed R-XIIIB, equipped with a Lublin-produced R-2 gun-ring, before entering service with one of the observation platoons.





A universal gun mounting as initially fitted over the observer's cockpit of the R-XIII prototype. (Photo: A. Glass)

Key to colour illustrations

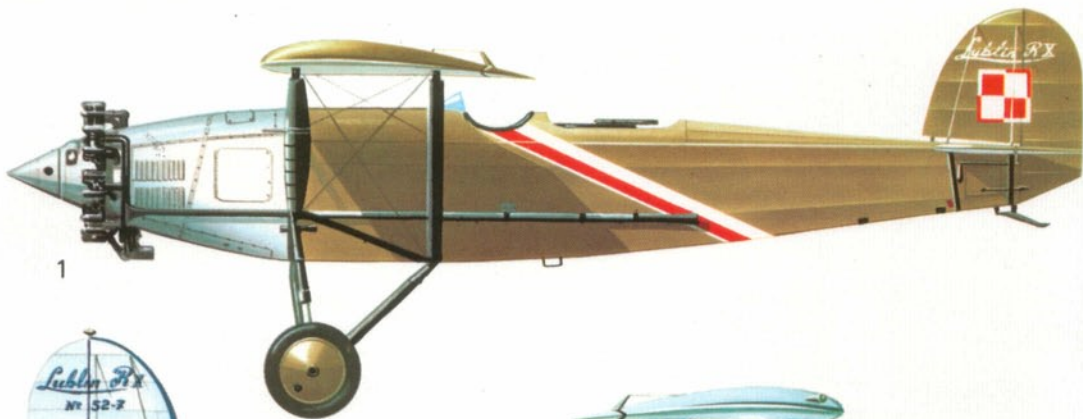
- 1 Lublin R-X, personal aircraft of Major Tadeusz Wereszczyński, Commanding Officer of the 2nd Air Regiment, Kraków-Rakowice base, 1930.
- 2 R-Xbis, long-range aircraft, Captain Karpiński's Afghanistan Flight, October 1932.
- 3 R-XIV advanced trainer, Central Training Squadron of the 1st Air Regiment, Warsaw-Mokotów base, 1932.
- 4 R-XIIIB observation/liasion monoplane of the *Lotnictwo Wojskowe* (Polish Military Aviation), 1932.
- 5 R-XIIIDr *Niebieski Ptak* (Blue Bird) long-range aircraft, Major Karpiński's Australian Flight, October 1935.

production and the last of the batch of 48 R-XIIICs was accepted by the *Lotnictwo Wojskowe* in January 1934. The first aircraft of the D series (56.102) was delivered for evaluation trials on February 28, 1933, and this and the next five R-XIIIDs, manufactured in front of the main R-XIIIC batch, were specially finished as show-piece aircraft in preparation for an official *Lotnictwo Wojskowe* return visit to the Soviet Union. The six special R-XIIIDs, led by C-in-C *Lotnictwo Wojskowe*, Colonel Ludomil Rayski, left Warsaw on November 3, 1933. But, because of impossible weather conditions, they were unable to proceed beyond Minsk, and the Polish party had to continue to Moscow by train.

In the early months of 1933, the Polish Navy drafted a detailed specification for a twin-float version of the R-XIIID, designated R-XIIIDter/hydro, and on May 5, 1933, issued contract 19/33, which called for 10 such seaplanes. These were allocated naval serials 704 to 713 inclusive. Contract 19/33 also called for five sets of land undercarriages and one two-blade adjustable-pitch

An early production R-XIIIA liaison/observation monoplane, finished in burnt umber, green and yellow ocher camouflage, with light-blue undersurfaces. (Photo: A. Glass)





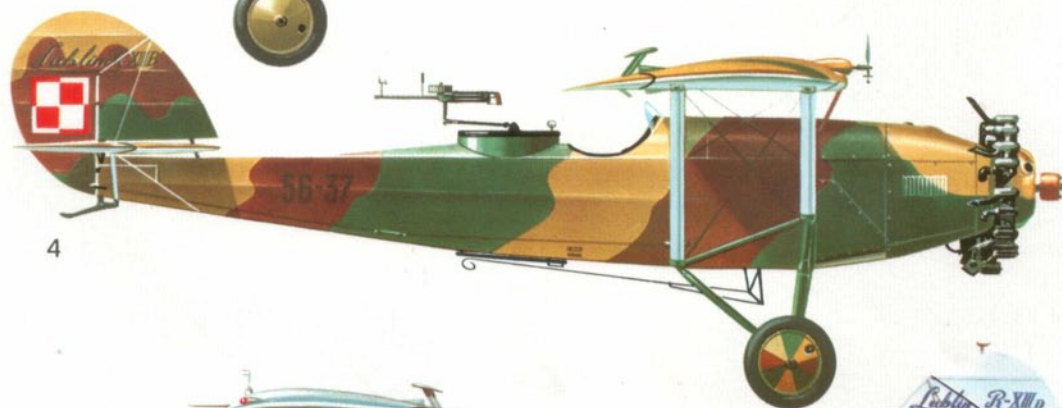
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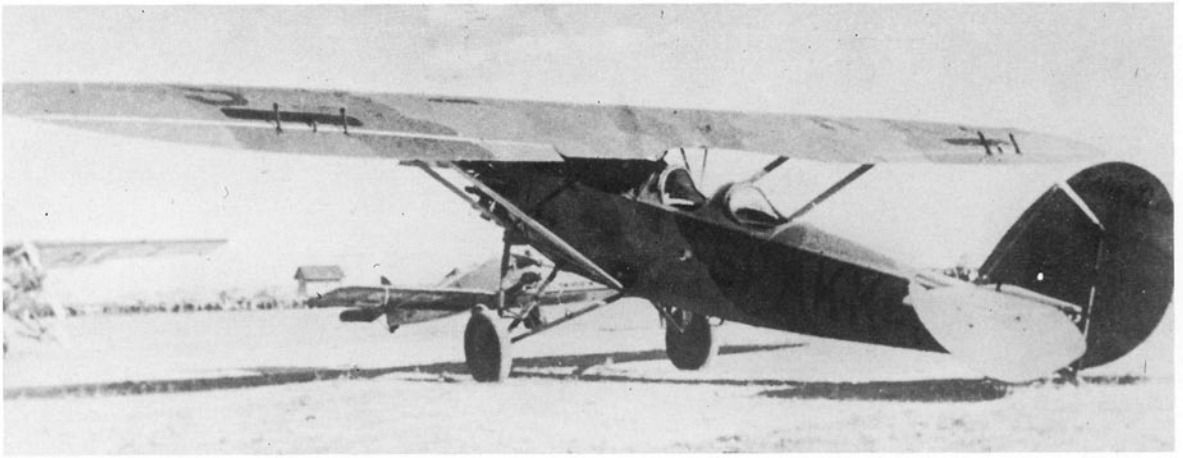
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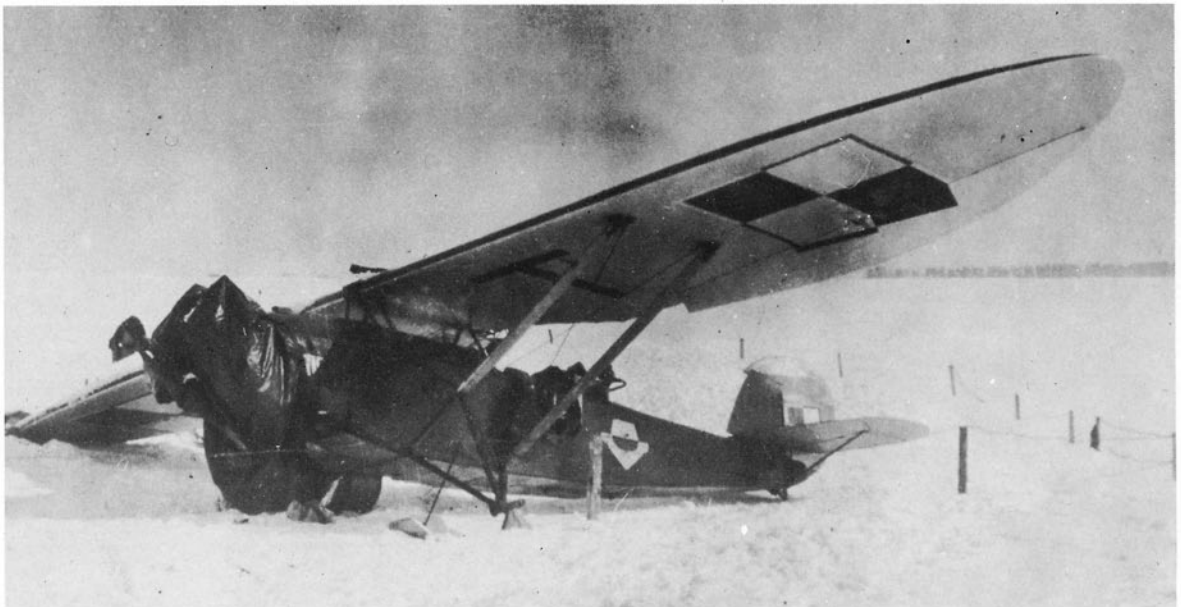


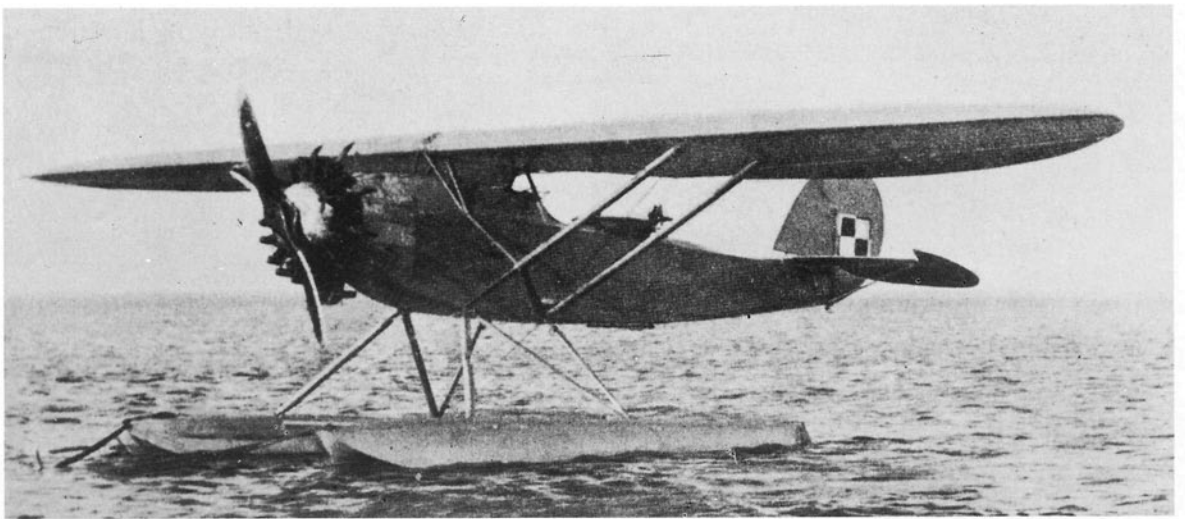
*One of the last aircraft of the first batch of 50, c/n. 56.48, completed without a gun-ring. The machine received the civil registration SP-*AKK* and was later repainted in silver with red trim. (Photo: A. Glass)*



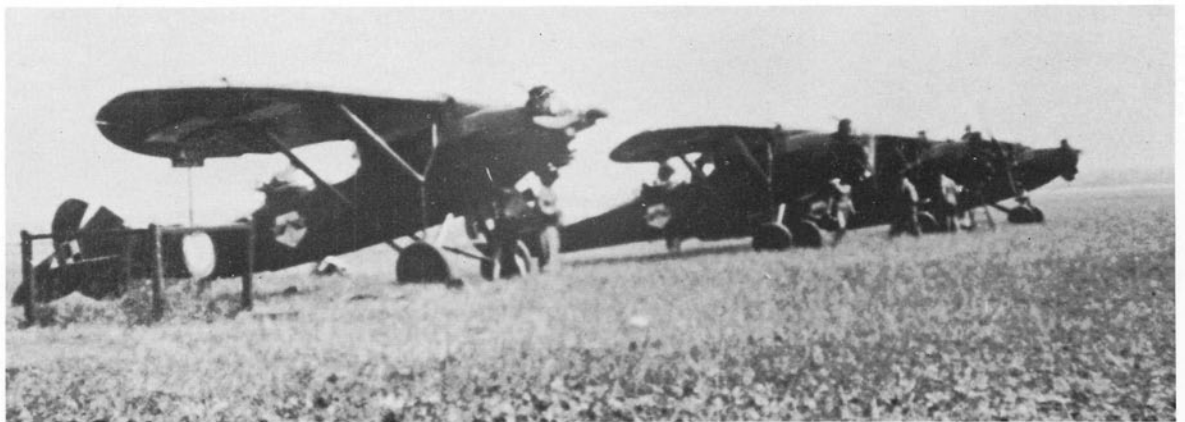
One of the three production R-XIIIbis naval monoplanes, serial 703, fitted with the land undercarriage. (Photo: A. Glass)

A damaged ski-equipped R-XIIIC of No. 43 Observation Squadron of the 4th Air Regiment. Note the difference in the colour of the unit insignia as compared with the next photograph.





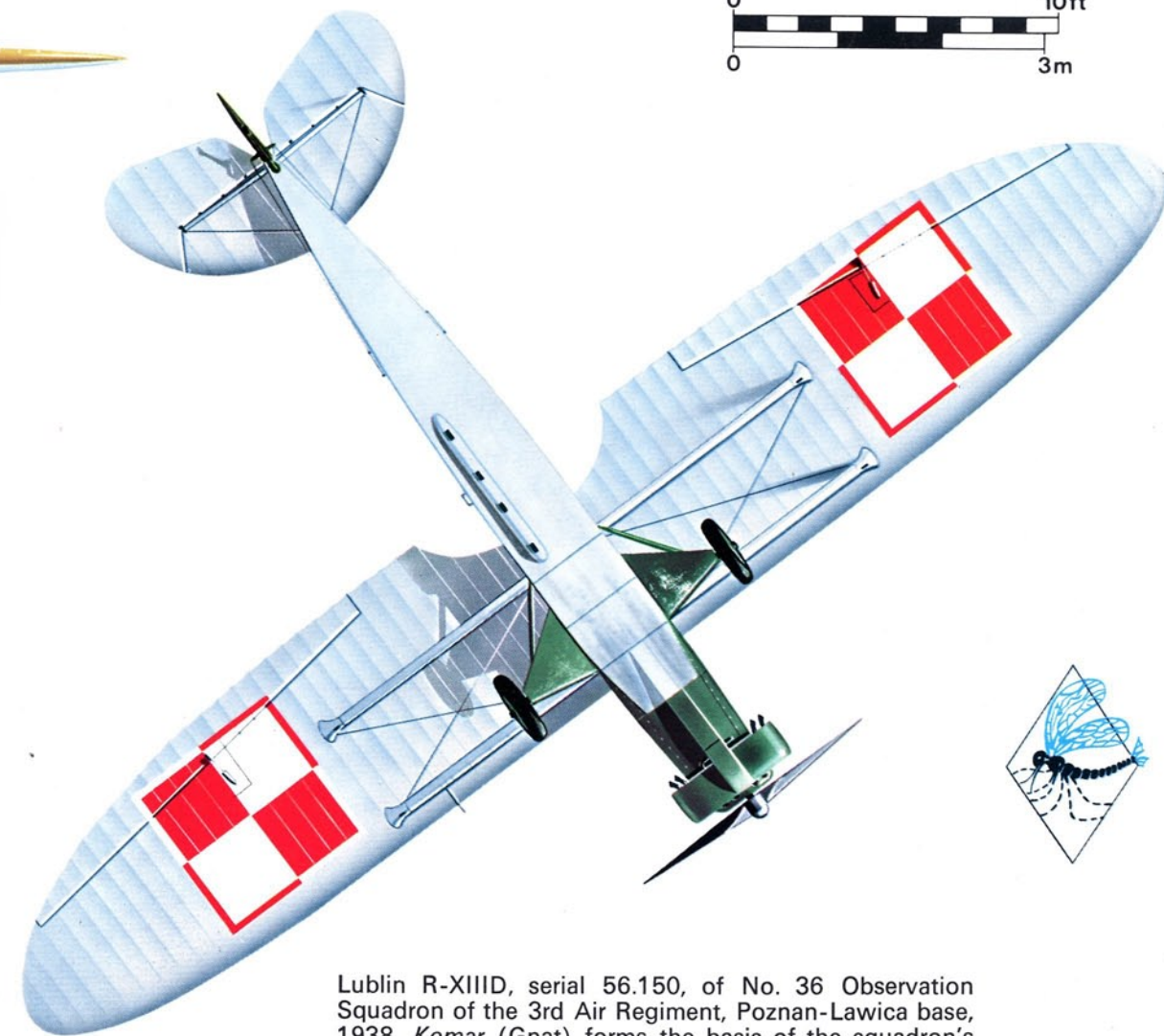
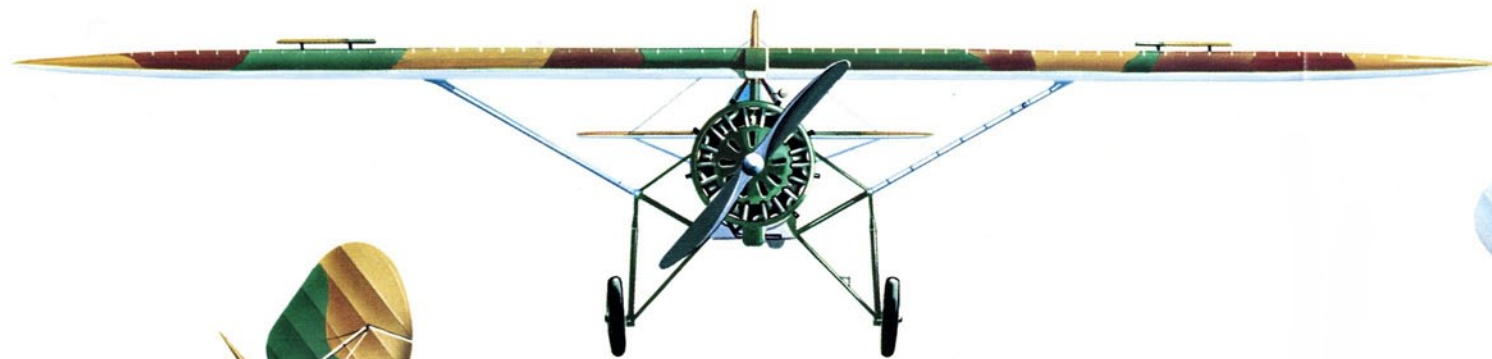
The first R-XIII seaplane, the adaptation of the R-XIII prototype for the R-XIIIbis configuration, during naval trials in the winter of 1931-2.



A line-up of the improved R-XIIICs of No. 46 Observation Squadron of the 4th Air Regiment, based at Toruń.

A hybrid R-XIIIC of No. 43 Observation Squadron, featuring a Townend ring engine cowling. The aircraft, call-number 52-T (which appeared on the wing undersurfaces), was otherwise similar to the standard C series and did not possess the head-plate cowling associated with the later D series model. (Photo: A. Glass)





Lublin R-XIIID, serial 56.150, of No. 36 Observation Squadron of the 3rd Air Regiment, Poznan-Lawica base, 1938. *Komar* (Gnat) forms the basis of the squadron's badge.

P. Endsleigh Castle, ARAeS © Profile Publications Ltd.





One of the Warsaw-based R-XIII glider-tugs, with a white-and-red shield markings of an unidentified unit on the fuselage. Trains of up to three gliders had been towed by R-XIIIs since 1935, and a complete RWD 8 trainer, less propeller, was towed by an R-XIII tug on a few occasions.

Standard Steel metal propeller for evaluation purposes. The R-XIIIter/hydro naval liaison/observation monoplanes were to incorporate the R-XIIID-type engine cowlings, new, balanced gun-rings Type KZA (as used on R-XIIID), superior float-chassis, all-metal sea-type Short floats interchangeable with flat-bottomed wooden floats of the earlier R-XIIIBis seaplanes and, also, a number of adjustments facilitating maintenance and servicing of the floatplanes on the water, such as the addition of laced fabric covering and steps and hand grips on the float struts and fuselage. The R-XIIIter/hydros were delivered to the base of the *Morski Dyon Lotniczy* at Puck in 1934.

Development of the R-XIIIE/F series was met with little enthusiasm on the part of Rudlicki. The official request for the straight-forward adaptation of the R-XIII airframe for the power plant almost double the output of the engine originally installed, led to a conflict between the Department of Aeronautics and the designer who argued that to make the proper use of additional power, the airframe should be completely reworked and in fact a new design needs to be devised on the basis of R-XIII. A preliminary study for such a design, with the specified Mors engine, a rounded fuselage and considerable aerodynamic improvements, had been conceived by Rudlicki in December 1932 under the designation R-XXI, and was later entered for the design contest for a R-XIII replacement, competing with the RWD 14 and two P.W.S. proposals.

However, the Department of Aeronautics, unwilling to meet the cost of development of a new project,

A military R-XIIIC V.I.P./liaison monoplane without a gun-ring installation in the second cockpit.



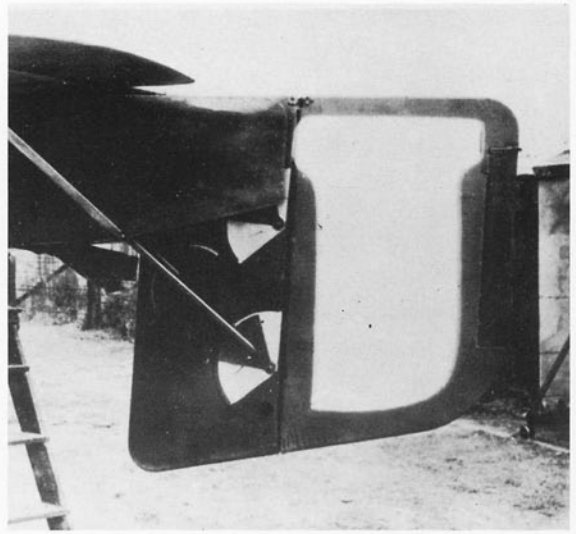
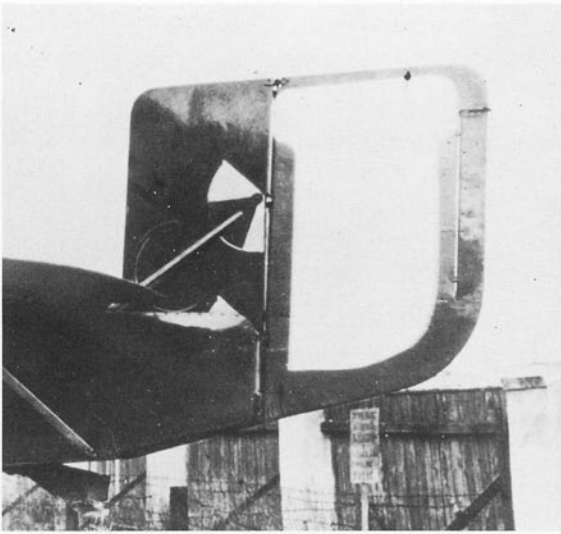
insisted firmly upon the direct modification of the existing R-XIII design for the selected engines, and in the consequence, except for the restressing of the engine-bearing structure and certain other vital elements, the R-XIIIE and R-XIIIF airframes were virtually the same as the R-XIIID. Work on the construction of these aircraft started in July 1933 and the R-XIIIE, powered by a 360 h.p. Gnome-Rhone 7K Titan Major seven-cylinder radial driving the Gnome-Rhone No. 93 metal propeller, was finished only on January 24, 1934, or almost four months later than scheduled, while the R-XIIIF, using a 340 h.p. Polish Skoda Works G.1620 Mors nine-cylinder radial driving the Letov H.A. No. 212 metal propeller, left the Lublin assembly shop on November 3, 1933.

By then the nationally-produced Mors radial engine had already proved itself and it was apparent that the Gnome-Rhone-powered R-XIIIE would not be built in quantity, and later in 1934 the sole R-XIIIE was sent to the P.W.S. factory at Biala Podlaska to be used as the development aircraft for movable vertical tail surfaces, which could be lowered below the fuselage to provide the gunner with an unrestricted field of fire towards the rear. The lowering device, invented and patented by Jerzy Teisseyre (who developed the idea jointly with Augustyn Bobek-Zdaniewski in the years 1932 to 1934, both engineers being members of the design staff of P.W.S.) was installed in the R-XIIIE by the P.W.S. works and showed its practicability during the subsequent comprehensive flight trials. The trials, conducted by P.W.S. and I.B.T.L. in 1935 and 1936, yielded promising results and later, when Teisseyre went to L.W.S., a similar tail assembly was evolved for the L.W.S.3 Mewa army-reconnaissance monoplane and fitted to the second prototype of that aircraft for evaluation purposes.

In view of various difficulties and problems delaying the selection and development of a suitable successor to the R-XIII, the Department of Aeronautics decided to increase the quantity of aircraft originally ordered under the contract No. 112/32 from 120 to 170. The amendment No. 1, issued on February 5, 1934, requested that the additional 50 should comprise 25 examples of the Wright/Skoda-powered R-XIIID—this bringing the total number of the D series monoplanes on order to 95 (c/ns. 56.102 to 56.196)—and 25 examples of the superior Mors-powered R-XIIIF. At about the same time 50 340-420 h.p. G.1620A Mors A supercharged nine-cylinder radial engines were ordered for the latter. As compared with the original prototype (c/n. 56.101), the production F model incorporated several improvements common to those of the abandoned R-XXI, including the rounded rear fuselage, but its Mors engine, driving new smaller-diameter Szomański two-

The first R-XIII of the D series, c/n. 56.102, photographed during its early trials in March 1933.

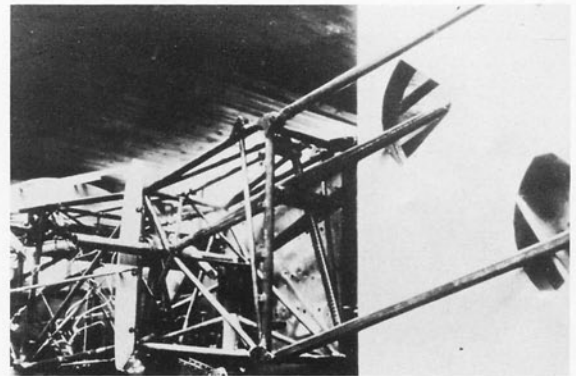




Experimental lowering of vertical tail surfaces. The photographs of the P.W.S.-converted Lublin R-XIIIE show the fin and rudder in the normal and fully lowered positions. (Photos: A. Zdaniewski)

blade wooden airscrew, was not provided with Townend ring. Because of these rather substantial changes, the R-XIIIFs received c/ns. of a new series, beginning with 58.1. A new follow-on *Lotnictwo Wojskowe* contract, No. 92/34, for 50 more Mors-powered R-XIIIFs was discussed in 1934; being signed, presumably, in the autumn of that year.

Early in 1934 the Polish Navy decided to increase its existing orders for R-XIII seaplanes and on May 23, 1934, the Combat Navy Headquarters issued contract 56/34 for six improved 220 h.p. Wright/Skoda-powered floatplanes of the R-XIIIG version, naval serials 714 to 719 inclusive. Provided with metal Short floats—which were interchangeable with the floats of the earlier R-XIII seaplanes—the R-XIIIG/hydros were provided with normal control columns, differing in this respect from all previous Lublin naval monoplanes featuring wheel controls, and were equipped with new, balanced gun-rings designated Type SS-32bis. In addition the Lublin company agreed to supply the Navy with one R-XIIIG landplane (believed to be given the serial 720) in lieu of the unfulfilled work on the fourth R-VIIIbis seaplane, which instead of being rebuilt as originally planned, was retained by the Navy for spares.



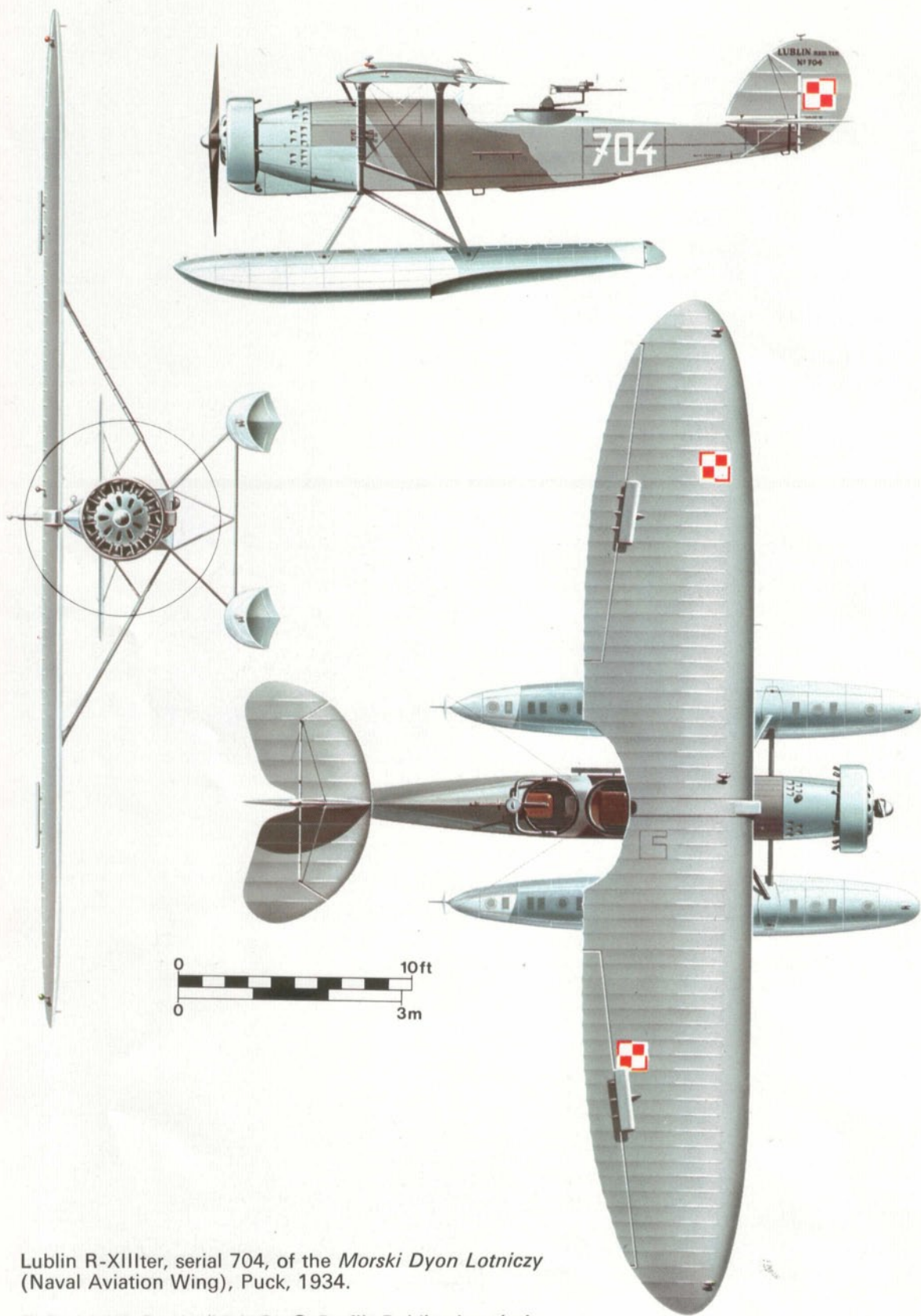
Close-up of the lowering mechanism operating the vertical tail surfaces of the R-XIIIE. (Photo: A. Zdaniewski)

These new contracts brought the overall total of Lublin R-XIII monoplanes to be ordered from E. Plage & T. Laskiewicz to 291:271 for the *Lotnictwo Wojskowe* and 20 for the Navy.

Besides the versions mentioned above, a number of variations of basic models appeared. Some aircraft were

Line-up of standard production R-XIIID liaison/observation monoplanes, with c/n. 56.120 nearest and c/n. 58.118 immediately behind.





Lublin R-XIIIter, serial 704, of the *Morski Dyon Lotniczy* (Naval Aviation Wing), Puck, 1934.



R-XIIIDs belonging to No. 23 Observation Squadron of the 2nd Air Regiment, during army exercises.

completed without gun-ring mounting and message pick-up gear, to be used as staff aircraft by high-ranking officers, or as civil aeroplanes, for various international flights. In addition to the civil early series R-XIIIs already mentioned before, at least three R-XIIIDs were given civil registrations, these being SP-AMG (c/n. 56.127), SP-ANE (c/n. 56.145) and SP-ANG (c/n. 56.148), the last mentioned retaining its gun-ring while carrying a cream-and-red finish.

Early in 1934 six R-XIIIBs (c/ns. 56.34, 56.35, 56.37, 56.41, 56.44 and 56.47) were converted for blind-flying and navigational training work to help the Polish National Team crews to train for the forthcoming 1934 *Challenge de Tourisme International*. Known in this form as the R-XIIIt, these aircraft had their front cockpits completely faired into a deep decking on the upper fuselage and fitted with sideways-sliding solid covers, while the rear cockpits, for the instructors, were raised to the top level of these deckings. The aircraft were received by the Team training centre at Warsaw aerodrome, and at the beginning of June 1934, they covered thirteen 1.200 km. (745 miles) routes putting on average 7-8 flying hours per day. Towards the end of the month the R-XIIIt trainers, adapted for long-range flying by the installation of additional fuel tanks, made a number of non-stop trips from Warsaw

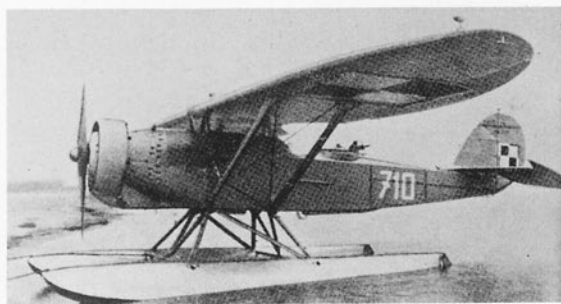
to Paris and vice versa. Later the R-XIIIt trainers returned to military service and at least two more early R-XIIIs, (56.10 and 56.22) were converted in a similar manner in the autumn of 1934.

During major overhauls many R-XIIIs of earlier marks were brought up to the R-XIIID standards. The D model embodied minor improvements. These were introduced gradually as production progressed and included the employment of superior ailerons without auxiliary balancing surfaces, better, balanced gun-rings Type SS-32bis in place of the KZA rings on the earlier R-XIIIDs, and the use of modern P.Z.L.-type wheels.

In 1935 the civil SP-AJT underwent considerable modifications in preparation for Karpiński's flight from Warsaw to Melbourne, which was sponsored by L.M.K. (Naval and Colonial League). The aircraft, although generally similar to the D model, featured a long-chord Townend ring, much cleaner, rounded fuselage, spatted wheels and revised fuel installation incorporating long-range tanks, which increased maximum endurance to 25 hours and range to 4.500 km (2,796 miles). The converted aircraft, initially known as the R-XIIIDr and later designated R-XXIII, bore an attractive finish in various shades of blue and the silhouette of a swallow on the fuselage, and was named the *Niebieski Ptak* (*Blue Bird*). The aircraft, with Stanislaw Karpiński (by then promoted to Major) at the controls and Wiktor Rogalski in the second seat, took off on the challenging Australian flight from Warsaw on October 21, 1935. The *Niebieski Ptak* followed the route Bucharest-Istanbul-Aleppo-Baghdad-Bushire-Jodhpur-Allahabad-Calcutta-Akyab-Rangoon-Bangkok and made excellent initial progress. However, on November 10, after departing from Bangkok, the aircraft ran into impossible weather and heavy turbulence, and eventually crashed while landing in a violent storm on the waterlogged airfield at Brahuab in Thailand (Sir Charles Kingsford Smith's Lockheed Altair was lost in the area at that time), after covering 11.138 km (6,920 miles). The crew escaped with cuts and bruises,

R-XIIIDs of No. 36 Observation Squadron of the 3rd Air Regiment, taking part in a military aviation display at Warsaw-Okecie airfield in the summer of 1938. A late production D, c/n. 56.150, with P.Z.L.-type wheels, is nearest to the camera.





A standard production R-XIIIter, serial 710, of the Morski Dyon Lotniczy.
(Photo: W. B. Klepacki)

An R-XIIID, call-number N-27, visible on the wing undersurfaces, of an unidentified unit, during a message pick-up display.
(Photo: A Glass)

but the aircraft had to be written-off because of repairs and spares difficulties.

Production of the R-XIIID terminated early in 1935. The last aircraft of the series (56.196), started on August 24, 1934, was received by the *Lotnictwo Wojskowe* on March 2, 1935. On September 5, 1934, the Lublin works began construction of the first production R-XIIIF (58.1). Following completion, it was accepted on July 22, 1935. Altogether seven R-XIIIFs (58.1 to 58.7) out of the 75 on order reached the military aviation units by the autumn of 1935, before E. Plage & T. Laškiewicz was forced into liquidation, this bringing the total of R-XIIIs delivered by the Lublin factory to 223 (including 20 for the Navy).

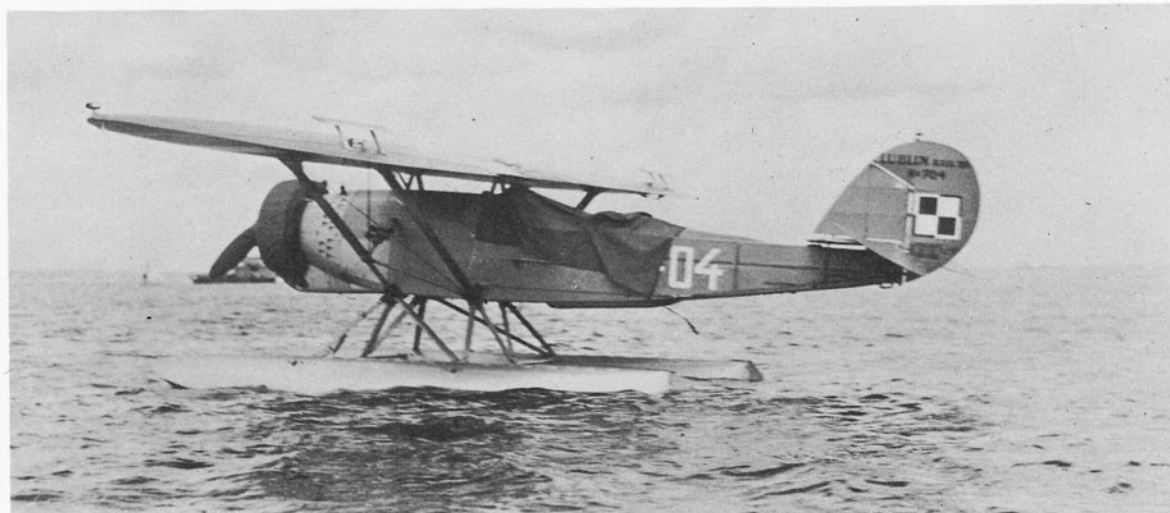
The first R-XIIIFs were evaluated under operational conditions during the big summer army manoeuvres in August and early September 1935 and some points

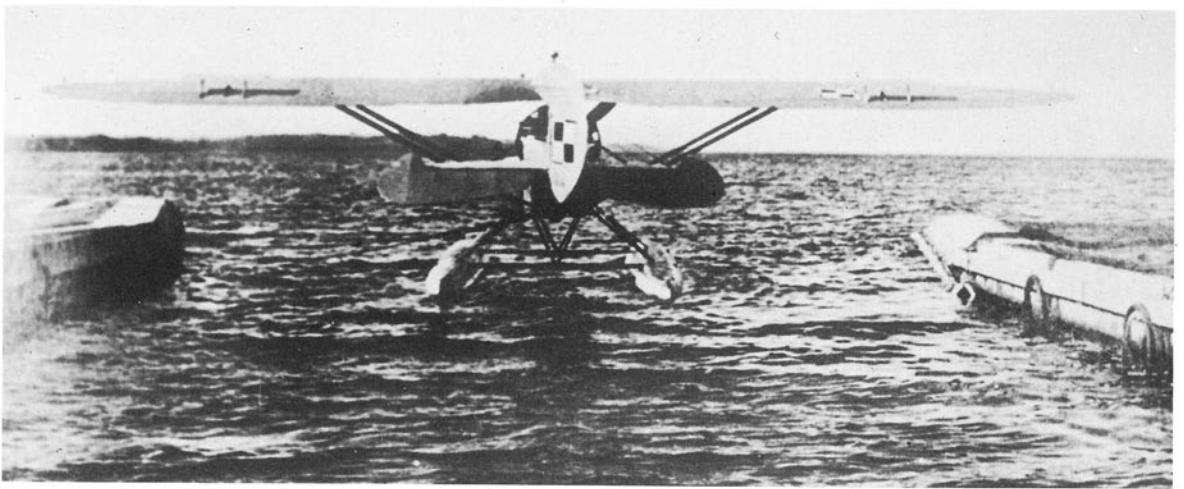
raised by the Military Aviation technical commission with the regard to the message pick-up gear and the suitability of the aircraft for the message pick-up role in general served the Department of Aeronautics as an excuse to bring about the collapse of the Lublin firm. The Department began to work towards the nationalization of the entire Polish aviation industry and liquidation of private companies in the late 1920s. The first to fall was the Samolot factory of Poznań, and later, in the autumn of 1932, the P.W.S. company was forced into bankruptcy by a deliberate policy of the Department, who eventually took over the whole factory for a token sum of 10 zloty (some 40 pence). E. Plage & T. Laškiewicz was to share the similar fate in 1935.

At the end of September 1935, when all the detailed parts of the R-XIIIFs were manufactured and the

The first production R-XIIIter, serial 704, during a visit to Denmark.

(Photo: Royal Danish Air Force)





A full rear view of one of the Navy's R-XIIIter observation floatplanes.



An R-XIIIter, serial 712, photographed at Puck in December 1934.

(Photo: Z. Luranc)

A trio of R-XIIIIG/hydro floatplanes, serials 714, nearest, and 715 in the lead, soon after formation take-off.

(Photo: A. Glass)





The last R-XIIIG/hydro to be built, serial 719, in service with the Navy.

remaining 18 airframes of the first batch of 25 were almost completed, the Department declared the aircraft "unsuitable" and cancelled the order. With no other work on hand except for some small naval contracts, and the semi-complete R-XIIIF, production of which was financed from advanced Government payments, at scrap value, the factory could not survive the blow and was taken over by the State. The Lublin establishment was quickly reformed by the Department as the state-controlled L.W.S. company and the new firm was immediately instructed to finish and deliver the R-XIIIFs, which became suddenly "suitable". It is thought that L.W.S. was restored contract No. 92/34 for 50 Mors-powered R-XIIIFs and in addition to the 18 airframes abandoned by E. Plage & T. Łaskiewicz, that they (L.W.S.) completed 32 more of this series from the parts and assemblies left by its predecessor. Deliveries were continued up to the end of 1938*. It would appear therefore that altogether some 273 R-XIII monoplanes of all marks were eventually completed and delivered; what must be considered quite a sizeable production run by contemporary standards.

THE R-XIII IN SERVICE

Following the R-XIV advanced trainers—the first five of which went into service with the Kraków Advanced Flying School at the 2nd Air Regiment on August 9, 1930 and the remainder to various other training units—the R-XIII liaison/observation monoplanes began to reach the *Lotnictwo Wojskowe* in June 1932. The R-XIIIs

* A surviving report, prepared by the Independent Experimental *Dyon* in Warsaw, records that two R-XIIIFs (58.47 and 58.46) were test-flown by *Dyon* pilots on August 10, 1938.

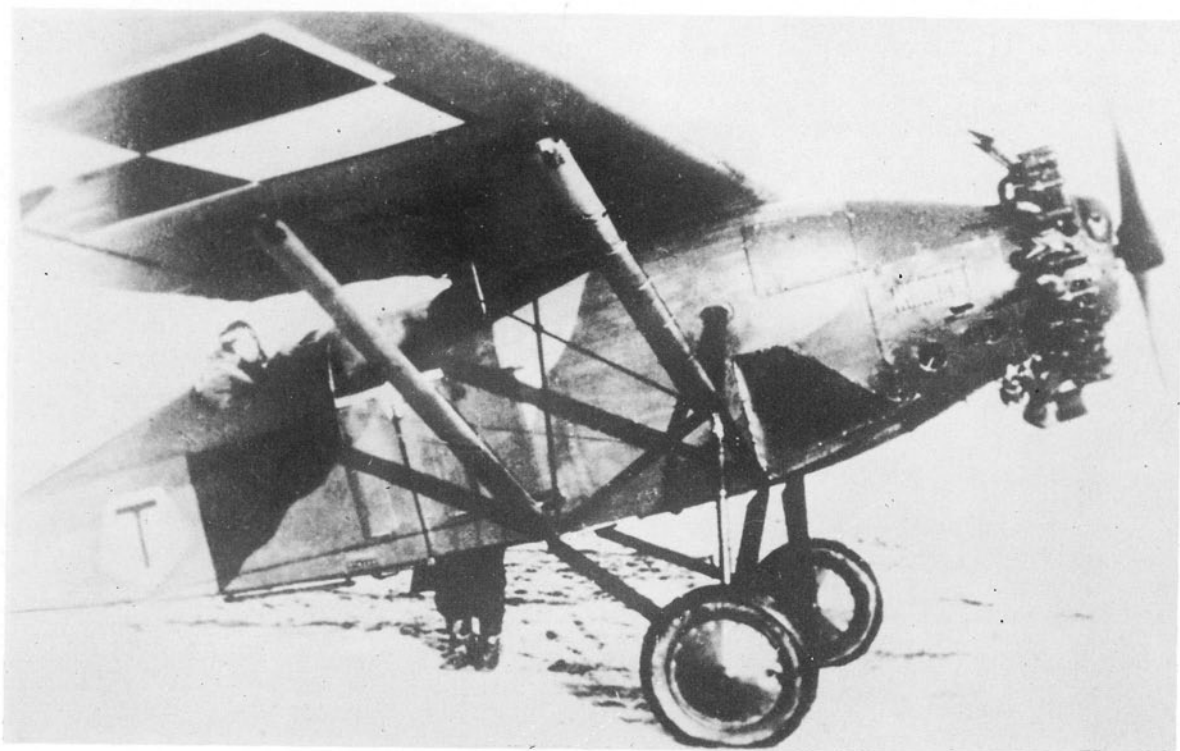
SP-AJT, c/n. 56.51, in its final configuration, as the R-XXIII *Niebieski Ptak*, before its transcontinental flight to Australia.



were formed into liaison/observation platoons, consisting of three aircraft each. As the number of these platoons increased with deliveries of the new model, so they were attached one each to various *Dyons* (a *Dyon*, roughly equivalent to a Wing, was composed of two, or sometimes three, squadrons). The improved R-XIIIC and D gradually replaced the initial production variant in service, and by the middle of 1936 33 first-line liaison platoons, equipped with a total of 99 machines of these two marks, were in existence.

During a limited reorganization of the *Lotnictwo Wojskowe* in the autumn of 1937 the R-XIII platoons were reformed into observation squadrons, each squadron comprising the C.O.'s aircraft and two platoons, a total of seven R-XIIIs, and one observation *Dyon*, consisting of two observation squadrons, was established in each of the six Polish Air Regiments. The 12 R-XIII observation squadrons were as follows: Nos. 13 and 16, the 1st Air Regiment, Warsaw; Nos. 23 and 26, the 2nd Air Regiment, Kraków; Nos. 33 and 36, the 3rd Air Regiment, Poznań; Nos. 43 and 46, the 4th Air Regiment, Toruń; Nos. 53 and 56, the 5th Air Regiment, Lida; and Nos. 63 and 66, the 6th Air Regiment, Lwów. In addition, some R-XIIIs were attached singly to various commands and other units in an auxiliary capacity as liaison and V.I.P. aircraft. Special, luxuriously-finished and equipped R-XIIIDs, called "Generals' aircraft", were formed into a special liaison squadron, which served the General Staff of the Polish Armed Forces. Several R-XIIIs were engaged in advanced and special training, operating with the Deblin and other military aviation training establishments and units. According to available information, all the Mors-powered R-XIIIFs were used in this manner, presumably because by the time they became available in quantity, the first-line observation squadrons were about to receive more advanced RWD 14 *Czaplas* and later in 1939 much superior L.W.S.3 *Mewa*. (By the end of 1939 all observation squadrons whose unit number ended with 3 were to receive *Czaplas*, while those ending with 6 were to be provided with *Mewas*).

In 1939 225 R-XIIIs of all marks were on the inventory of the *Lotnictwo Wojskowe*. At the outbreak of war seven combat observation squadrons, Nos. 16, 26, 36, 43, 46, 56 and 66, were still flying the aircraft, the other five converting to *Czaplas* earlier in 1939, but in addition



*An R-13III with a blind drawn over the first cockpit. Note the "T" on the pentagon background marking, indicating a training unit of the 4th Air Regiment.
(Photo: A. Glass)*

One of the six R-13III blind-flying trainers of the 1934 Polish Challenge Team. The second (instructor's) cockpit, raised above the fuselage, brings to mind similar cockpit configurations seen several years later on some trainer conversions of World War Two fighters.



*An early R-13III, c/n. 56.27, brought up to the standard of the D version, in the colours of No. 66 Observation Squadron of the 6th Air Regiment, based at Lwów.
(Photo: A. Glass)*



to this statutory operational force of 49 R-XIIICs and Ds, several more machines of this type were used in the September Campaign for various auxiliary duties and as replacement aircraft. The R-XIIIs attached to armies in the field were operated by their crews in the exceedingly difficult conditions of the September Campaign with great devotion to duty and complete disregard for their own safety, the aircraft constituting on many occasions the only means of communication between besieged and scattered Polish army units and their commands.

Almost defenceless, very slow and operating at low altitudes, the R-XIIIs were never intended to cross enemy lines, yet, in view of a tragic shortage of flying equipment, they were frequently called upon to perform reconnaissance tasks over the German-held territories. No. 56 Squadron of the Army Karpaty, operating from Mrowla over the Carpathian Mountains, distinguished itself in particular, flying daring reconnaissance missions into the heart of Slovakia and even carrying out strafing attacks, which confused unsuspecting enemy troops marching through mountain passes. Unfortunately, the brave Lublin monoplane crews suffered greatly not only from the enemy, but also from a continuous fire from their own ground forces who failed to distinguish between friend and foe. Consequently, they sustained shattering losses, especially when coming in to land or picking up messages. According to statistics, some 70 per cent. of the R-XIIIs destroyed in action fell to the guns of Polish troops. Towards the end of the September Campaign several R-XIIIs were evacuated to Rumania and 17 of them were later impressed into service with the Romanian Air Force.

Three R-XIIIBis seaplanes were delivered to the *Morski Dyon Lotniczy* at Puck towards the end of 1932, and these were followed by ten improved R-XIIIt/ hydros in the spring and summer of 1934 and six R-XIIIG/hydros some six months later. Meanwhile, in 1934, the three early R-XIIIBis seaplanes with flat-bottomed river-type floats were detailed for the River Seaplane Platoon of the Polish river fleet, operating from Pińsk on the river Prypeć, which protected the vast marsh-lands on the central sector of the Russo-Polish border. At the end of 1937 this seaplane unit was disbanded and its aircraft returned to Puck to be scrapped.

The Navy's Order of Battle, September 1, 1939, included 16 R-XIII seaplanes on the strength of the *Morski Dyon Lotniczy* based on the Baltic coast: ten (together with two R-VIIIBis biplane seaplanes) forming the equipment of the naval co-operation squadron; five, the equipment of the training squadron; and one supplementing the three RWD 8 landplanes of the liaison platoon. The naval R-XIIIs carried out some reconnaissance sorties, the last and most adventurous combat flight being carried out on the evening of September 7. On this occasion an R-XIII (reportedly the R-XIIIG serial 714) took-off to locate the Schleswig-Holstein cruiser which was shelling Westerplatte the Polish stronghold, near Gdańsk. However, Westerplatte had fallen shortly before and the aircraft was unable to find the cruiser. Returning over Gdańsk, its crew noticed a German victory parade moving along illuminated streets of the town and the naval flyers decided to spoil the German festivities. They made repeated low-level passes over the confused German troops, strafing them with the observer's gun.

Although performancewise not spectacular, from the pilot's standpoint the Lublin R-XIII had few equals among its contemporaries. Loved by its crews, it possessed an extraordinary docility and resistance to mishandling, and its durability was equally outstanding. These qualities, its popularity and considerable production figures, ensure the shapely Lublin monoplane a lasting place among the best Polish aircraft designs of the pre-war era.

THE R-XIII: TECHNICAL DESCRIPTION

The R-XIII was a two-seat light liaison/observation braced high-wing monoplane of composite construction.

The wing, of modified Clark Y aerofoil section, was an elliptical two-spar wooden structure with plywood leading-edge, covered with fabric. Built in two halves, it was carried above the fuselage on inverted Vee cabanes and braced with one pair of parallel streamlined duralumin struts on either side, each cross-braced with streamlined wires. The front struts were attached to the apex of the tripod on each side of the fuselage, and the rear struts to the fuselage lower longerons. Long, narrow-chord ailerons, which on the early R-XIIIs (including early production R-XIIIDs) featured auxiliary balancing surfaces above, were mounted on ball-bearings.

The fuselage was a rectangular-section structure of welded-steel tubes of which the wing-carrying cabane and the lateral tripods formed an integral part. The forward portion was rigidly braced, while the rear portion was cross-braced with piano wire. The fuselage was covered mainly with fabric, except for the forward section and the cockpit decking, which were of smooth metal, and the rounded top rear fuselage decking, which was of plywood. Two open cockpits were situated in tandem, the rear (observer's) one was provided with a detachable control column and was normally equipped with a gun-ring mounting for a single Vickers K gun. The rear cockpit had provision for the installation of an R/T radio, although this was fitted only to some R-XIIIs because of shortage of the radio sets. The message pick-up gear, fitted beneath the fuselage, was provided as standard.

The tail unit was a braced steel tube structure covered with fabric. The tailplane was adjustable in flight, and rudder and elevators were horn-balanced.

The divided undercarriage incorporated two short vertical compression legs comprising P.Z.L. oleo-pneumatic suspension units, the top ends of which were attached to the apex of the tripod on each side of the fuselage, with the lower ends hinged to the fuselage bottom longerons by steel-tube half-axles and radius rods. The wheels were interchangeable with skis, and incorporated provision for Bendix brakes. P.Z.L.-type wheels were used on the late production R-XIIIDs and the R-XIIIFs. The castoring tailskid, with a replaceable rubbing shoe, was provided with rubber springing.

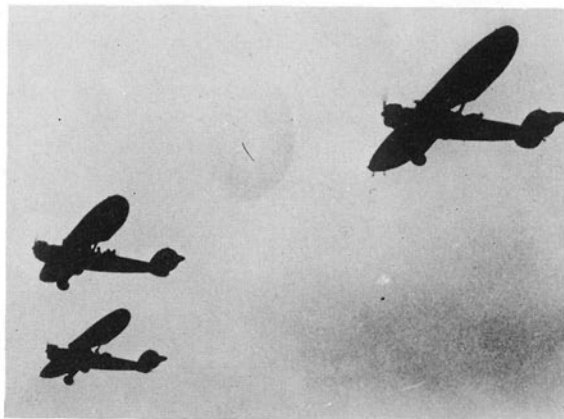
Two types of powerplants, either the 220 h.p. Polish Skoda Works-built Wright J-5 Whirlwind air-cooled nine-cylinder radial engine (R-XIIIA/B, R-XIIIBis, R-XIIIC, R-XIIID, R-XIIIt and R-XIIIG), or the 340-420 h.p. Polish Skoda Works/P.Z.L. G.1620A Mors A air-cooled supercharged nine-cylinder radial engine



The only known photograph of the Mors A-powered production R-XIIIF. The aircraft carries a call-number 02-R on the wing undersurfaces, number 02 on the fuselage, and, near the tail, the "Winged Morion" badge of the Deblin Cadet-Officers' Flying School.

(Photo: K. Stembrowicz)

A flight of R-XIIID observation monoplanes of the Lotnictwo Wojskowe during a Warsaw aviation display in 1938.



Some of R-XIIIs were provided with twin observer's guns, but the great majority of Lublin observation monoplanes carried only a single Vickers K gun. This particular R-XIII, presumably of D series, is equipped with a balanced KZA gun-ring.





Marshal Edward Rydz-Śmigły, Commander-in-Chief Polish Armed Forces, with General Kasprzycki on the right, receiving a message from an R-XIII aircrew during the summer army manoeuvres in 1936. Note the highly-polished R-XIIID behind. (Photo: A. Morgala)

(R-XIIIF), were installed as standard and drove a Szomański two-blade fixed-pitch wooden propeller. The engines were carried on a detachable steel-tube mounting which also accommodated all the engine accessories. A jettisonable fuel tank, of riveted duralumin, with a standard capacity (R-XIIIB, C and D) of 200 litres (43.9 Imp. gal.), was housed in the forward fuselage.

R-XIII SPECIFICATION

	R-XIIIA/B	R-XIII ter/hydro	R-XIIID
Span	13.25 m (43 ft 6 in)	13.20 m (43 ft 4 in)	13.20 m (43 ft 4 in)
Length	8.20 m (26 ft 11 in)	9.13 m (29 ft 11 1/2 in)	8.457 m (27 ft 9 1/4 in)
Height	2.76 m (9 ft 0 3/4 in)	3.076 m (10 ft 1 1/2 in)	2.76 m (9 ft 0 3/4 in)
Wing area	24.5 m ² (263.7 sq ft)	24.5 m ² (263.7 sq ft)	24.5 m ² (263.7 sq ft)
Empty weight	891 kg (1,964 lb)	1,031 kg (2,273 lb)	887 kg (1,956 lb)
Loaded weight	1,290 kg (2,844 lb)	1,425 kg (3,141 lb)	1,330 kg (2,932 lb)
Power loading	5.9 kg/hp (13.0 lb/hp)	6.5 kg/hp (14.3 lb/hp)	6.0 kg/hp (13.3 lb/hp)
Max. speed at 0 ft	177 km/h (110.0 mph)	175 km/h (108.7 mph)	195 km/h (121.1 mph)
Climb to 3,000 m (9,842 ft)	22 min. 35 sec.	24 min. 0 sec.	15 min 50 sec.
Service ceiling	4,100 m (13,451 ft)	3,800 m (12,467 ft)	4,450 m (14,599 ft)
Range	600 km (373 miles)	—	600 km (373 miles)

Series Editor: CHARLES W. CAIN

R-XIII PRODUCTION: 1931-1938*

Model	Quantity	Serials (c/ns.)	Beginning of construction (first, or first and last of the batch)	Completion or delivery (first, or first and last of the batch)	Remarks
R-XIII (prototype)	1	56.1	early 1931	the summer of 1931	The autumn of 1931, converted to the R-XIIIbis seaplane (serial 700); 1932, converted to the R-XIX.
R-XIIIA/B	50	56.2-56.51	17.9.31-24.11.32	7.6.32-15.5.33	Known civil registrations: SP-AFE, -AJT (1935, converted to the R-XXIII), -AKK, -AND, -ANF; 1934, at least 8 converted to R-XIIIt; several converted to the D standards.
R-XIIIbis	3	701-703 (naval)	early 1932	late 1932	Some converted to the D standards.
R-XIIIC	48	56.52-56.99	6.2.33-13.11.33	18.5.33-10.1.34	
R-XIIID	95	56.102-56.196	1.9.32-24.8.34	28.2.33-2.3.35	Known civil registrations: SP-AMG, -ANE, -ANG.
R-XIIIter	10	704-713 (naval)	middle 1933	middle 1934	Converted by P.W.S. as the test-bed for movable vertical tail surfaces.
R-XIIIE (experimental)	1	56.100	26.7.33	24.1.34	
R-XIIIF (prototype)	1	56.101	8.7.33	3.11.33	58.1 to 58.7 delivered by the Lublin factory in July-September 1935 the remaining 50 completed by L.W.S. in 1936-38.
R-XIIIF	7 + 50	58.1-58.57	5.9.34	22.7.35-the end of 1938	
R-XIIIG	7	714-720 (naval)	middle 1934	the end of 1934	6 R-XIIIG/hydro seaplanes and one R-XIIIG landplane.

* Day/month/year style of date abbreviation.