

PROFILE PUBLICATIONS

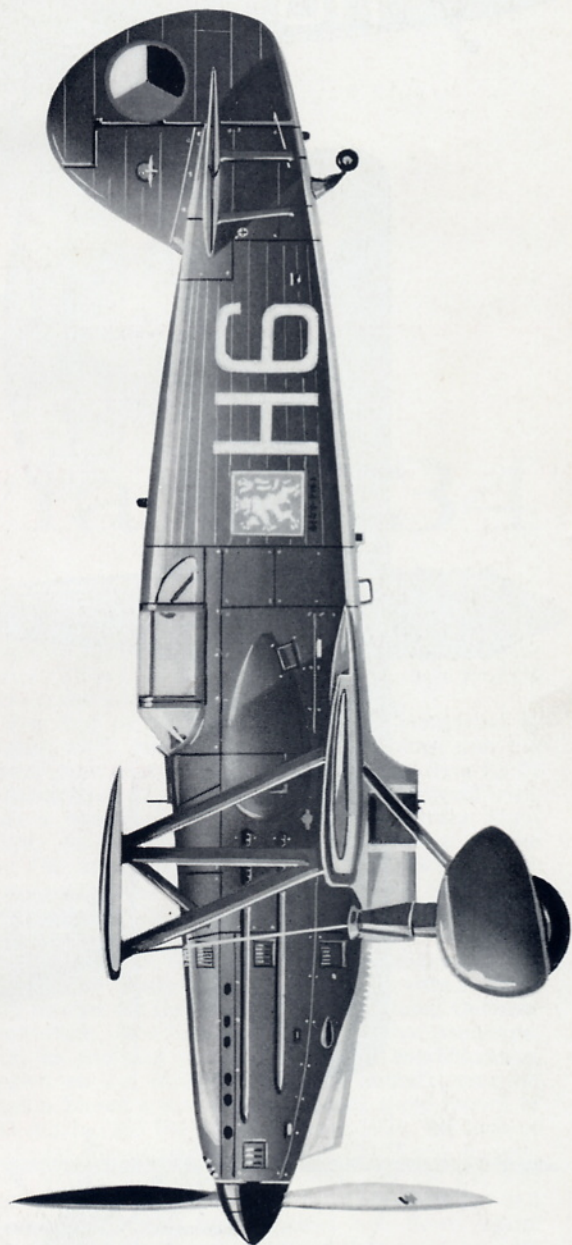
The Avia B.534

NUMBER 152

RETAIL PRICE

UNITED KINGDOM TWO SHILLINGS

UNITED STATES AND CANADA 50 CENTS

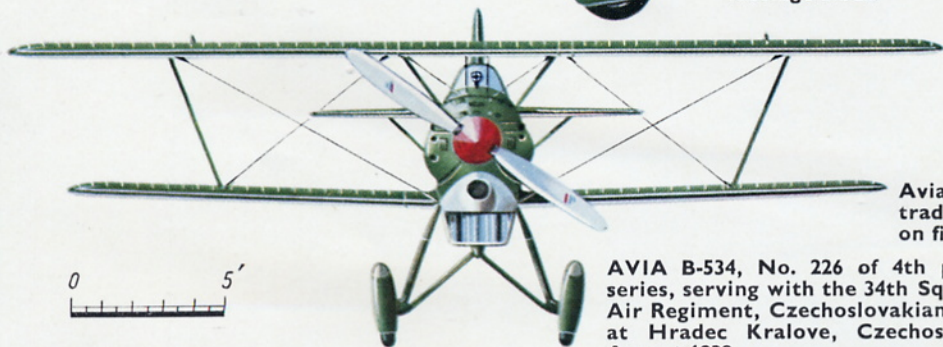




1st Air Regt. insignia and type/serial stencil on fuselage sides.



B534.226



Avia trademark on fin.



AVIA B-534, No. 226 of 4th production series, serving with the 34th Squadron, 1st Air Regiment, Czechoslovakian Air Force at Hradec Kralove, Czechoslovakia in August 1938.

Avia B-534, III Series, of 42nd Squadron, 4th Air Regiment, Czechoslovakian Air Force; Hradec Králové, 1938.

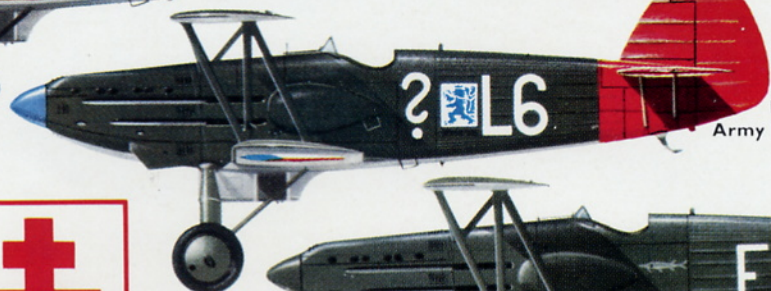


Czech Air Police.

4th Air Regt.



Avia B-534, II Srs., of 32nd Sqn., 4th Air Regt.; Hradec Králové. Flown by Por. F. Danda during Czechoslovak Army Exercises, 1937.



2nd Air Regt.



Avia B-534, II Srs., of 35th Sqn., 2nd Air Regt.; Olomouc, 1938.

3rd Air Regt.



35th Sqn.

Slovak Air Force.

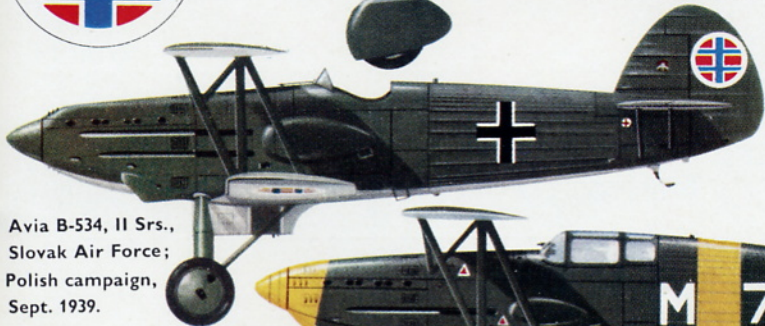


Avia B-534, IV Srs., Czechoslovakian Air Police.



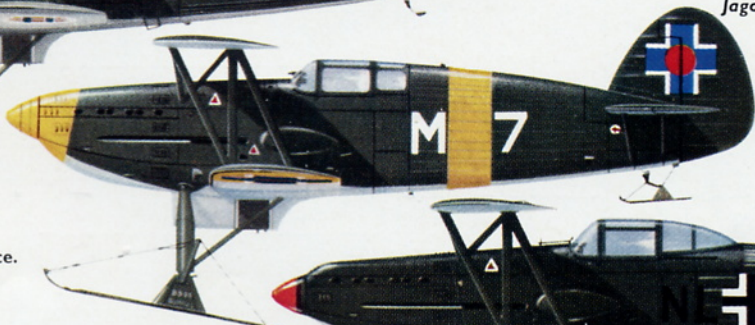
Avia B-534, III Srs., Jagdschulegeschwader 71, Luftwaffe.

Avia B-534, II Srs., Slovak Air Force; Polish campaign, Sept. 1939.



Avia Bk-534 of Slovak Air Force; Kiev area, Russian Front, autumn 1941.

Combined Squadron, Slovak Insurgent Air Force.



Avia B-534, I Srs. Modified, Luftwaffe.



Slovak Air Force, Russian Front.



Avia trademark, on fin.



A ski-undersurface Bk-534 at Trenčin before delivery to the Slovak Air Force elements in Russia during the winter of 1941. Note olive-painted undersurface of top wing, and German-style markings on yellow tips of the lower wing. (Photo: Ing. S. Androvic)

The Avia B.534

by Josef Krybus

Created from part of the Austro-Hungarian Empire after the 1914-18 War, Czechoslovakia established itself as the leading industrial nation of Eastern Europe. The Czech armaments industry showed itself the equal of any in Europe in terms of efficiency and modernity of thought. Foremost among the aircraft companies was the Avia concern founded shortly after the 1914-18 War and responsible for a successful line of sporting and fighter aircraft. This was mainly due to the efforts of the engineers Ing. Pavel Beneš and Ing. Miroslav Hajn, both of whom, regrettably, left the firm in 1929. By the 1930's, the firm was part of the well-known Skoda concern occupying a modern factory employing nearly 900 workmen at Prague-Letnany.

The first aircraft in the series culminating in the B-534 was the Avia B-34; design work on this type commenced in 1931, led by Ing. František Novotný. The B-34 was a single-seat fighter biplane of all-metal structure with fabric covering powered by a 650 h.p. Avia-built Hispano-Suiza Vr 36. Factory test pilot Vaclav Kočí made the initial test flights in 1932, and after a short test programme, the prototype was re-modelled as the B-34/I. This aircraft, considered to be the second prototype, was transferred to the Military Air Study Institute to undertake official trials for the Ministry of National Defence. The B-34/I was flown with the marking "S11" on standard military camouflage. As a result of official trials, a series of 12 B-34 aircraft was constructed; these differed from the prototype, embodying minor changes suggested during the trials.

In the meantime, Ing. Novotný continued development of the design giving special consideration to the use of alternative engines. Several alternatives were projected: the B-134 powered by the 700 h.p. Walter Mistral 14 Kbs engine; the B-234 with the 580 h.p. Avia Rr 29; the B-334 with a 490 h.p. Armstrong Siddeley Jaguar; the B-434 powered by a 650 h.p.

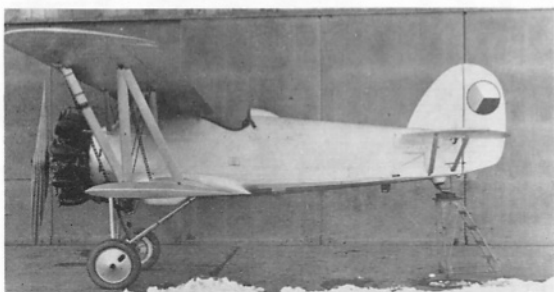
Hispano-Suiza Xbrs; and the B-534 with the Hispano-Suiza 12 Ybrs. In the event only two of these projects were constructed.

The first of these, the B-234, was completed in August 1932, but such were the difficulties with the power-plant that it was never flown. The Avia Rr 29 suffered from so much vibration during ground trials that it was plainly impossible to undertake flight trials. As a result, the aircraft was modified to take the 750 h.p. Hispano-Suiza 12 Ybrs No. 485028. The design work and actual conversion took place during the first half of 1933, and during August 1933, the first prototype B-534/I was flown. On 8th September 1933, the aircraft was transferred to the Military Air Study Institute where trials were successfully carried out for the Ministry of National Defence. Meanwhile, Avia had completed a further prototype, with an enclosed cockpit and minor modifications, known as the B-534/II. In this aircraft test-pilot Kočí achieved a new Czech national speed record of 227 m.p.h. (365.744 km./h.) during 1934. In June of that year, the second prototype B-534/II was successfully demonstrated in Yugoslavia, but on the way back to Czechoslovakia the aircraft was damaged in a crash; however, it was repaired and flown again. The first prototype was damaged in a crash on 12th July 1934, just four days before the second prototype's demise! In this accident, at Letnany, the first prototype was heavily damaged, but the pilot, Sergeant Holubec escaped without injury and the aircraft was repaired and flown again. The first prototype ended its career on 17th September 1935, when it was totally destroyed in an accident at Hradec Králové.

July 1934 was not as unhappy a month for the Avia B-534 as it would seem. On 17th July, the Ministry of



The Avia B-34 prototype; (below) the fourth of twelve B-34's constructed; and (bottom) the unsuccessful B-234 prototype, powered by an Avia Rr 29 radial. (Photos: Avia)



National Defence placed an order with Avia for 100 aircraft. This was soon increased by a further 37 B-534 machines ordered from Letov and 10 from Aero; however, these two organisations were unable to undertake production and the total order of 147 was placed with Avia. The Czechoslovak Air Force took delivery of the first machines in the latter half of 1935 and they entered service with the 4th Air Regiment and the pursuit squadrons of the 1st, 2nd and 3rd Air Regiments. Four aircraft were attached to the Air School at Prostějov.

The first prototype B-534, with headrest and short cooler; and (right) the second prototype, with the designer, Frantisek Novotny, on right wearing bowler hat. (Photos: Military Air Study Institute and Avia)



The first production series, aircraft Nos. 2-100, were almost identical to the second prototype B-534/II with the exception of the pilot's cockpit, which was open. The armament comprised two 7.7 mm. Model 30 machine-guns, one on each side of the forward fuselage; there was provision for a machine-gun in each wing, but they were only fitted to some aircraft and by 1937 even these had had their wing-guns removed. The reason for this was that the fuselage-guns were much more accurate for shooting than the wing-guns; a further contributory factor was that maintenance of the wing-guns was rather difficult. The aircraft of the second series, Nos. 101-147, featured an armament of four 7.7 mm. machine-guns, two on each side of the forward fuselage, enclosed by a common cover. The pilot's cockpit remained open.

This order of 147 aircraft was further supplemented until a grand total of 445 B-534 aircraft was ordered. Besides these, the Czechoslovak Air Force received 54 Bk-534 aircraft, a version intended to carry a 20 mm. Oerlikon FFS cannon firing between the engine cylinder banks. When first completed, these aircraft were actually armed with three 7.7 mm. guns, as the 20 mm. cannon were not available. (The third gun was fitted between the engine cylinder banks in place of the cannon.)

Aircraft of the third series, Nos. 148-173, were fitted with aerodynamic covers for the main undercarriage wheels and the engine cowlings were slightly modified. The armament and pilot's cockpit remained the same as those of the second series. The fourth and final series, Nos. 174-445, were fitted with an enclosed cockpit and a metal propeller. The sliding cockpit cover was of 4 mm. plexiglass and could be fixed in the open, half-closed, or closed position. This improvement raised the maximum speed of the 4th series aircraft to 252 m.p.h. (405 km./h.). In practice, the undercarriage fairings of the 3rd and 4th series aircraft were usually removed as they caused trouble on unprepared grass landing fields.

A refined version of the design, the B-634, with a spatted cantilever undercarriage was designed and built in 1936. The machine-guns were placed on top of the fuselage decking and a 20 mm. *moteur-canon* was fitted, development of this weapon having been successfully completed. The performance of the B-634 was not sufficiently superior to that of the B-534 to warrant production of the type, and, furthermore, the B-35 fighter monoplane design promised an excellent performance. (A promise fulfilled by the 307 m.p.h. (494 km./h.) maximum speed of the first prototype.)





(Top left & right) The Avia B-534 in the first, second, (middle left & right) third and fourth production series configurations; (bottom left) the Bk-534, with a third 7.7 mm. gun between the cylinder banks; and (right) the B-634 of 1936 with cantilever undercarriage. (Photos: Avia)

THE AVIA B-534 DESCRIBED

The Avia B-534 4th Series was a single-seat unequal span single-bay fighter biplane. The centre-section was carried above the fuselage by "N" struts, with one "N" type interplane strut on each side of the fuselage. The wing structure was of riveted steel with fabric covering, and balanced ailerons were fitted on the upper wings. The fuselage structure was basically a rectangular structure of steel-tubes riveted and bolted together and braced with streamline wires. The forward part of the fuselage was covered with detachable metal panels and the rear with fabric. The tailplane was of monoplane type, constructed of steel and covered with fabric, as were the fin and rudder. The rudder and elevator were aerodynamically and statically balanced. The split-type undercarriage was oleo sprung and consisted of two side Vees with two half-axes attached to each Vee. The Dunlop wheels were fitted with brakes and enclosed in streamlined fairings; skis could be fitted for winter operations.

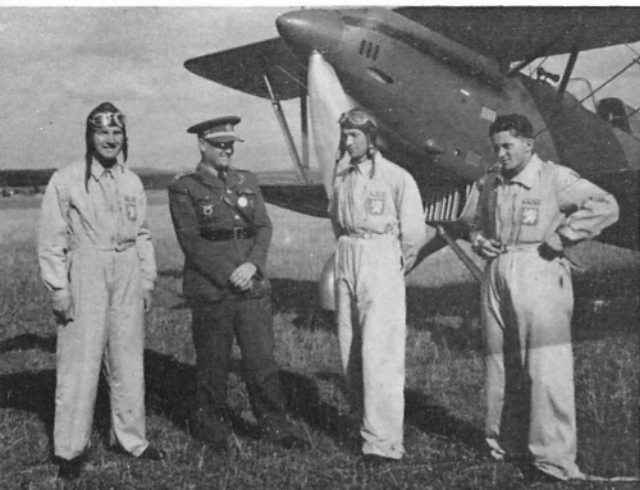
All production aircraft were fitted with the Avia-built Hispano-Suiza 12 Ydrs twelve-cylinder Vee water-cooled engine, rated at 850 h.p. maximum power. Total petrol capacity was 70 gallons (320 litres) including 11 gallons (50 litres) in a gravity tank in the centre-section. A combined oil tank and cooler

was fitted below the fuselage and the water radiator was below the engine. The pilot was seated behind the trailing-edge of the wing with an adjustable cockpit cover, and cockpit equipment included an adjustable seat, wireless, oxygen equipment, an engine-starter and automatic fire-fighting equipment. Provision was made for the pilot to wear a back-type parachute. All aircraft of the third and fourth series were equipped with four 7.7 mm. Model 30 machine-guns with 300 rounds per gun. Six 44 lb. (20 kg.) bombs could be carried beneath the wings.

The handling qualities of the B-534 were said to be excellent and most pilots liked the type. The public in general had an opportunity to admire the type at the 1937 International Air Meeting at Zurich. In the climb competition the Avia was placed 3rd, 4th and 5th and in the cruise over 228 ml. (367 km.) the type came 2nd, 3rd and 4th after the Bf 109, a much more modern and powerful aircraft. The competing B-534 aircraft had the machine-guns, ammunition equipment and oxygen apparatus removed. The engines were "boosted" and new cowlings were fabricated, without channels for the machine-guns, to increase streamlining.

SERVICE—AT HOME AND ABROAD

In 1935-6, the Avia B-534 shared pursuit duties with

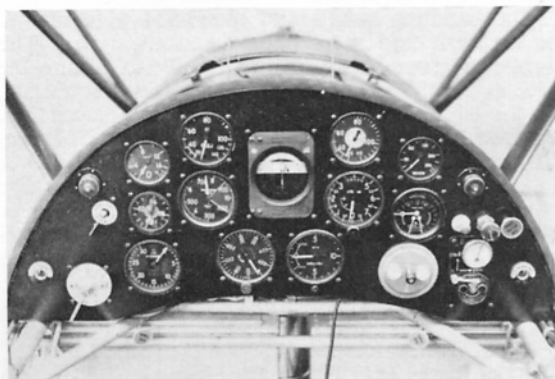


At the Zurich International Air Meeting in 1937, the B-534 put up a particularly good showing; in the cruise event over 228 miles, the Avias took second, third and fourth places after the Messerschmitt Bf 109. The team were (from the left) 2nd Lt. Schnobl, Maj. Ambruz, Lt. Hlado and Sgt. Perina. (Photo: Avia)

the Avia Ba-33L and Letov S-31, but by 1938 the B-534 was the only pursuit type in service with the Czechoslovak Air Force. The other two types were relegated to advanced training duties. On 10th November 1938, there were 370 B-534 and 54 Bk-534 aircraft in service; up to that date 53 B-534 aircraft had been written off. The Avias were allocated as in the table on page 12.

The Czechoslovak Air Force Avias were camouflaged in the standard fashion—all upper surfaces were sprayed with khaki and the lower surfaces with silver. The last 69 aircraft (of the fourth series, Nos. 377–445, had pale-grey undersurfaces. The Czechoslovak national marking was displayed above the upper and below the lower wings and on the vertical tail surfaces. Aircraft serving with the Air Regiments carried the emblem of the regiment on both sides of the fuselage in a rectangle 16×20 in. (40×50 cm.). A letter and number marking on the fuselage side indicated the squadron and the number of the plane in the squadron. At the time of mobilisation, in September 1938, the regimental emblems were removed and all aircraft were painted pale-grey on the undersurfaces. Some aircraft in the police service were flown with greyish-green upper surfaces.

Instrument panel, and underwing 20 kg. bombs on Pantof mountings.

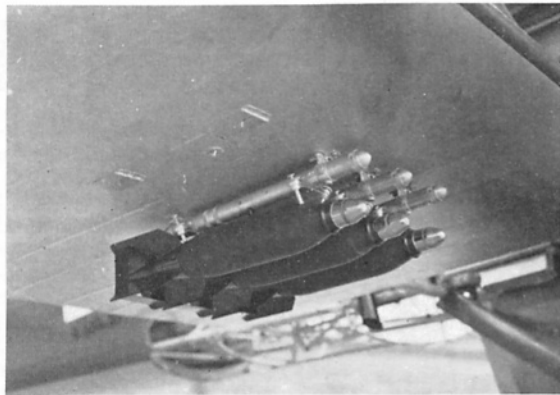


A photograph taken secretly on Olomouc airfield, showing a Luftwaffe B-534 with modified canopy. (Photo: Zdenek Titz)

In 1937, three or four Avia B-534 aircraft were delivered to Greece. (Surviving records do not indicate which of these totals is correct.) Fourteen were supplied in that year to Yugoslavia and some still served at the time of the German invasion in 1941. Both batches were aircraft similar to the third series.

As Hitler's demands on behalf of the Sudeten Germans grew more menacing, so the political situation in Czechoslovakia, and Europe as a whole, deteriorated. The Czechoslovak Government ordered mobilisation in September 1938, fully intending to fight for their rights. The Munich Agreement deprived them of their freedom of action and the Czechoslovak Air Force could only watch as the Germans occupied the Sudetenland. As a result, the exodus of Czech flying personnel began. The majority of these determined men made their way to France and fought valiantly in defence of that country in 1940. With the collapse of French resistance, the survivors made for Britain and made a name for themselves fighting alongside their R.A.F. allies. Two men who are particularly well-remembered are Karel Kuttelwascher, who left Czechoslovakia in 1938, and Josef Frantisek. Kuttelwascher reached the French *Armée de l'Air* via the Foreign Legion, and later achieved impressive results with R.A.F. No. 1 Squadron flying night interception sorties in the Hawker Hurricane IIc (see *Profile* No. 24) scoring 18 victories in three months. Josef Frantisek was flying Avia B-534 fighters when the Germans marched in; although ordered not to fight, he nevertheless took off and machine-gunned the advancing columns. He then escaped to Poland and flew PZL P-11 fighters with the Polish Air Force in 1939 (see *Profile* No. 75). He escaped from Poland and made his way to Syria, via Rumania, where he joined the *Armée de l'Air* in

(Photos: Avia)





A B-534 of the 43rd Sqn., 4th Air Regiment taking off for target-firing practice at Malacky airfield; note camera on lower wing leading edge. (Photo: The 4th Regt.)

1940. After the fall of France, he was the top-scoring R.A.F. pilot in the Battle of Britain (from the 8th August 1940). He flew with No. 303 (Polish) Squadron and had scored 28 victories (17 with the R.A.F.) when he was killed in a landing accident at Northolt on 8th October 1940.

Although they had occupied the Sudetenland, the German demands were still not satisfied and Britain and France allowed the Germans to occupy Bohemia and Moravia. On 15th March 1939, the Czechoslovak Republic was dissolved and the aircraft of the Czechoslovak Air Force fell into German hands. Large quantities of B-534 aircraft and spares were seized.

The *Luftwaffe* made widespread use of the B-534; the most obvious use being as a fighter-trainer, at

the *Jagdfliegerschule* (Fighter Pilot Schools) and also with JG 71, a fighter group which acted as an operational training unit. The other important use of the type was as a glider- and target-tug, the aircraft being equipped with cable- and release-gear for towing DFS 230 troop-carrying gliders and airborne targets. Three B-534's were equipped with arresters-hooks and structurally strengthened for tests to evaluate their suitability for use as carrier-based fighters. The aircraft-carrier *Graf Zeppelin* was not completed and so the Avia's naval career was terminated. The Avia also had a career as a film-star! In 1940, the Germans made a film "*Kampfgeschwader*

SPECIFICATION

The Avia B-534 1st Series and 4th Series in *italics*.

Type: Single-seat fighter.

Power Plant: One 650 h.p. Avia-built Hispano-Suiza 12Y

brs, 850 h.p. Avia-built Hispano-Suiza 12Y drs.

Armament: Two, four, 7.7 mm. Model 30 machine-guns in the forward-fuselage sides.

Dimensions: Span, upper wing, 30 ft. 10 in. (9.4 m.);

lower wing, 27 ft. 5 in. (8.35 m.); length, 26 ft. 7 in.

(8.1 m.), 26 ft. 11 in. (8.2 m.); height, 10 ft. 2 in. (3.1 m.);

wing area, 300.5 sq. ft. (23.5 sq. m.).

Weights: Empty, 3,057 lb. (1,387 kg.); Normal loaded,

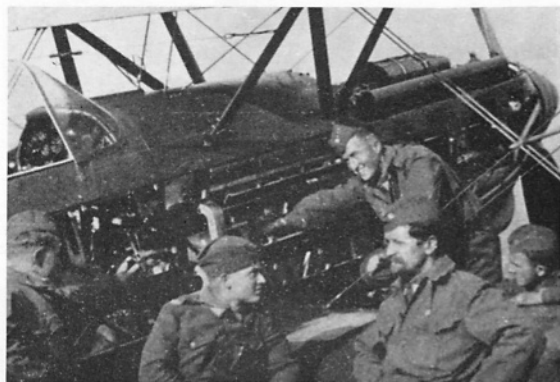
4,376 lb. (1,985 kg.).

Performance: Maximum speed at 14,760 ft., 225 m.p.h.

(363 km./h.), 252 m.p.h. (406 km./h.); climb rate, 5 min.

to 16,400 ft. (5,000 m.); service ceiling, 36,100 ft. (11,000

m.); normal range, 373 ml. (600 km.).

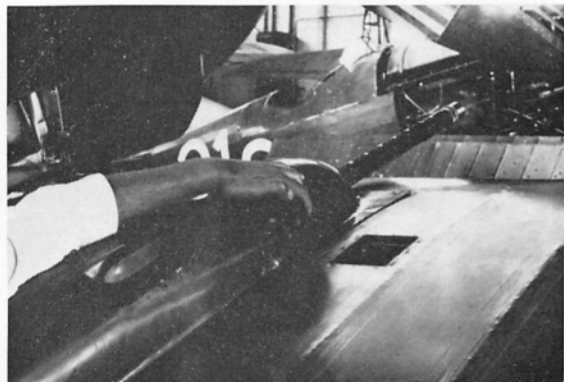
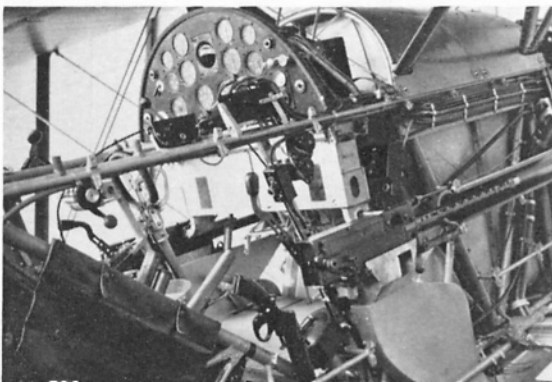


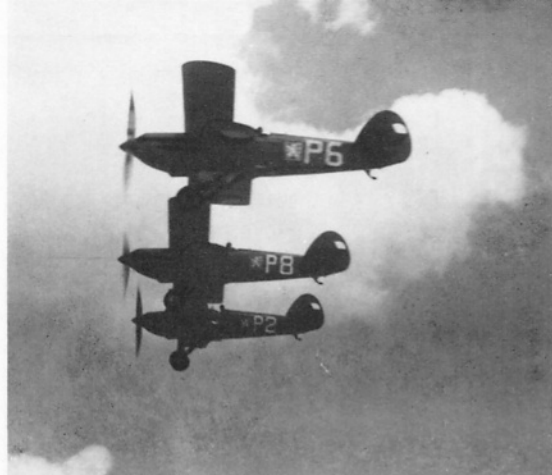
Servicing a 4th Series machine at Uzhorod.

(Photo: V. Martinek)

(Left) Fuselage details with side panels removed. (Right) Servicing the wing gun of a Series I aircraft.

(Photos: Avia)





A section of Avias from the 31st Sqn., 1st Air Regt. in flight. By 1938 the B-534 was the only fighter aircraft in service with the Czech Air Force. (Photo: The 1st Regt.)



Infantrymen of the Wehrmacht cluster round a Slovak Air Force B-534 on Tarnopol airfield in Russia during the autumn advances of 1941. (Photo: Ing. S. Androvic)



Mishap on landing by a machine of the 32nd Sqn., 1st Regt. on the fighter training field at Cheb. (Photo: V. Martinek)

Lützow" (Bomber Group Lützow) dealing with the air war over Poland. In the film, masquerading as Polish PZL P-11 fighters, were a number of Avia B-534's painted with Polish national markings and emblems. Oddly enough, the B-534 had fought over Poland, as will be seen.

The Avias on duty with the 3rd Air Regiment of the Czechoslovak Air Force in March 1939 became the property of the Slovak State and these aircraft, about 65 in number, became the fighter equipment of the newly-formed Slovak Air Force. They soon found themselves in action. The Hungarian government began to lay claim to Czechoslovak territory after Munich and their efforts did not cease after the dissolution of Czechoslovakia and the setting-up of the Slovak State. The Hungarians were able to annexe Carpatho-Ruthenia in the spring of 1939, and in the weeks following this there were a number of air "incidents". Hungarian Fiat C.R.32 fighters (see *Profile* No. 22) apparently shot down nine Slovak aircraft, including B-534's, without loss, although a Slovak report stated that the Avia B-534 was faster and had a better climb rate than the Fiat C.R.32, which was, apparently, just as manoeuvrable. The personnel of the Slovak Air Force were drawn from ex-members of the Czechoslovak Air Force and trained by the *Luftwaffe*. Operational training was undertaken by the German-Slovak *Luftwaffe* mission under General Kayser at Pressburg.

B-534's of various series are visible in this view of the 31st Sqn., 1st Air Regt. lined up at Uzhorod during the general mobilisation of the Czech Air Force in September 1938. Regimental emblems have been overpainted. (Photo: V. Martinek)





B-534/195 of the Czechoslovak Air Police.

(Photo: Avia)

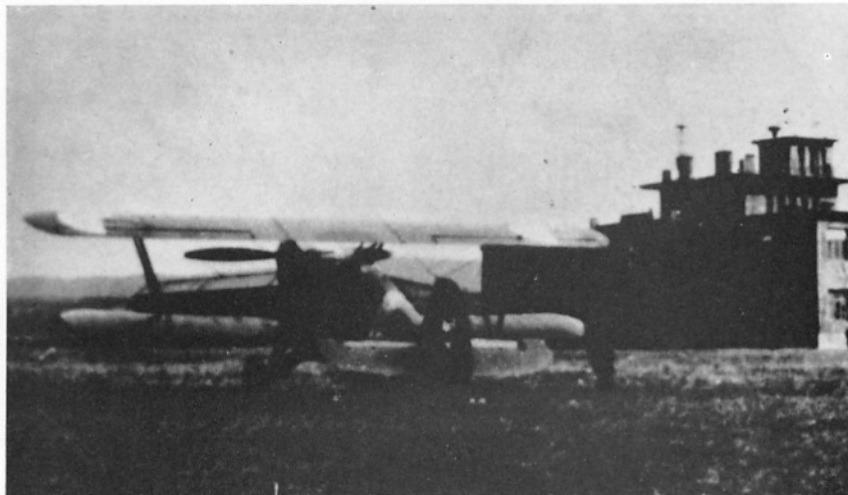
One squadron of the Slovak Air Force took part in the Polish campaign alongside their German allies, and a number of Slovak personnel served in the *Luftwaffe*. By the end of 1940, the Slovak Air Force had three fighter squadrons, all equipped with the Avia B-534. These were Nos. 11 and 13 Squadrons at Piestany and No. 12 Squadron at Spisska Nova Ves for the defence of Bratislava, capital of Slovakia. At the end of July 1941, all operational units of the Slovak Air Force were transferred to the Russian Front to assist the *Luftwaffe*. The three fighter squadrons were operated in the Ukraine in the Kiev sector; morale among the pilots was not very high and they did not achieve any significant success. Indeed, morale became so poor that several pilots deserted to the Russians. In October 1942, the 11th and 12th Squadrons were withdrawn from operations and re-equipped with the Messerschmitt Bf 109E, but the 13th Squadron fought on with their Avias as far as the Caucasus. Finally, in the summer of 1943, this latter squadron was re-equipped with the Bf 109. The B-534 continued to serve in the Slovak Air Force on second-line duties in Slovakia.

On 29th August 1944, the people of Slovakia rose up against the German-controlled government, no doubt inspired by the approach of Russian forces. Only a weak collection of obsolete aircraft was available to the insurgents, mainly the Combined Squadron at Tri Duby ("Three Oaks") near Zvolen. Among the 57 aircraft initially available were two Avia B-534 and one Bk-534 aircraft. At last, in the Slovak National Uprising, the B-534 was able to fight for Czechoslovakia, but regrettably, by this time, the type was hopelessly obsolete for air combat. The pilot Cyprich did manage to shoot down a Hungarian Ju 52/3m whilst flying a B-534. One B-534 survived until the insurgents left Tri Duby and took to the hills, finally being abandoned in a damaged condition on 25th October.

Germany sold a number of annexed Avias to her allies (at 40% of their original cost). Bulgaria signed the Tripartite Pact on 1st March 1941 and, although

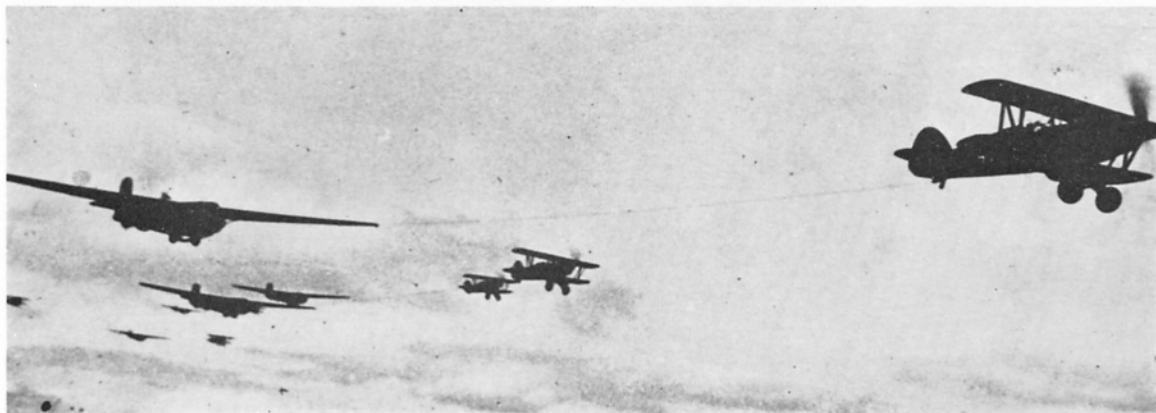
One of the three Avias operated by the Combined Squadron from Tri Duby, near Zvolen, during the Slovak National Uprising in September 1944. Note that the white segment of the national marking was to the left on both port and starboard wings.

(Photo: Zdenek Titz)





Early Slovak tail markings displayed by the squadron which fought beside the Luftwaffe in the Polish campaign of September 1939 seen here at Tri Duby airfield. (Photo: Ing. S. Androvic)



Rare study of Luftwaffe B-534's towing DFS-230 troop gliders.

(Photo: H. J. Nowarra)

the Bulgarians did not declare war on the Russians until 1944, they did actively assist the Germans in the East. The Germans supplied 48 B-534 aircraft to Bulgaria, where they were known by the name *Dogan*. They saw little use as first-line fighters, soon being replaced by the Bf 109E (see *Profile* No. 40) and the D.520 (see *Profile* No. 135).

The Croatian Air Force was established by the Germans in 1941, after the conquest of Yugoslavia. The Avia B-534 was supplied to Croatia by the Germans, although the exact total is not known. Only a small number were sent and a few of the aircraft supplied to Yugoslavia from Czechoslovakia in 1937 still remained. They were employed for training and liaison duties.

In October 1940 a few Avias fought with the Royal Hellenic Air Force against the invading Italians. As noted earlier, three or four were supplied to Greece

in 1937, but a few seem to have been obtained from Yugoslavia as seven Avias are recorded as having fought for the Greeks.

The fighting career of the B-534 began with the Slovak Air Force in March 1939 and ended with the Slovak National Uprising in 1944. In truth, it cannot be said to have distinguished itself, but in most cases the type was inferior to the opposition. No official records of the Avia's combat performance remain, but the B-534 does seem to have held its own against such opposition as the I-15, I-153 and I-16 (see *Profile* No. 122). It earned its place in aviation history by its status as the best-known and most ubiquitous product of the Czech industry in the decade 1935-45, a period which probably qualifies as the most fertile in the entire development of the fighting aeroplane.

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Slovak Air Force Avias over Russia; Nos. 11, 12 and 13 Sqns. operated in the Ukraine in the late summer and autumn of 1941, but their morale was not high and results were indifferent.

(Photo: Ing. S. Androvic)



ACKNOWLEDGEMENTS

The author would like to express his sincere thanks for assistance rendered by the following organisations and individuals: SPP Kunovice, the Army Historical Institute, the National Technical Museum, all in Czechoslovakia, and Messrs. Martinek, Danda, Simunek, Androvic, Hlado, Engler, Anderle, Nowarra and many others.

A Slovak Air Force machine in Russia, with pilot and mechanic taking their ease in the sunshine. Note apparent combat damage on starboard wing root.

(Photo: the publishers via J. W. Caler)

Unit	Squadron Nos.	Squadron letters	Total number of B-534's	Total number of Bk-534's	Unit	Squadron Nos.	Squadron letters	Total number of B-534's	Total number of Bk-534's	
1st Air Regiment	31	P	30	5	5th Air Regiment	—	—	—	—	
	32	L			6th Air Regiment	Training	—	—	2	—
	34	H			Fighter Group No. 1	—	—	—	9	—
2nd Air Regiment	33	T	44	5	Fighter Group No. 2	—	—	11	—	
	35	F			Fighter Group No. 3	—	—	—	9	—
	36	G			Flying School Prostejov	—	C	—	48	—
	51	T			Military Air Study Institute	—	S	—	3	1
3rd Air Regiment	37	G	57	8	Central Air Stock	—	—	66	27	
	38	H			TOTAL	370	54			
	39	unknown								
	45	unknown								
	49	unknown								
40	A	91	8							
41	B									
42	D									
43	E									
44	F									
46	G									
47	H									
48	J									
50	K									

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