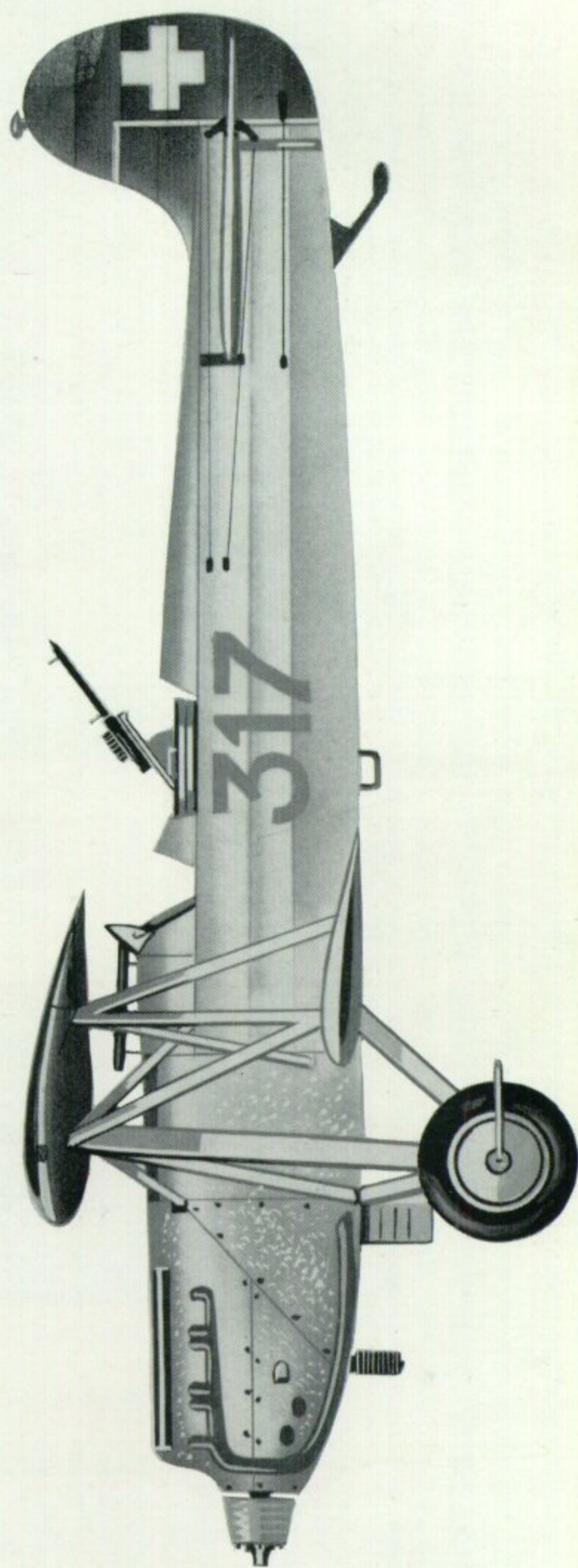
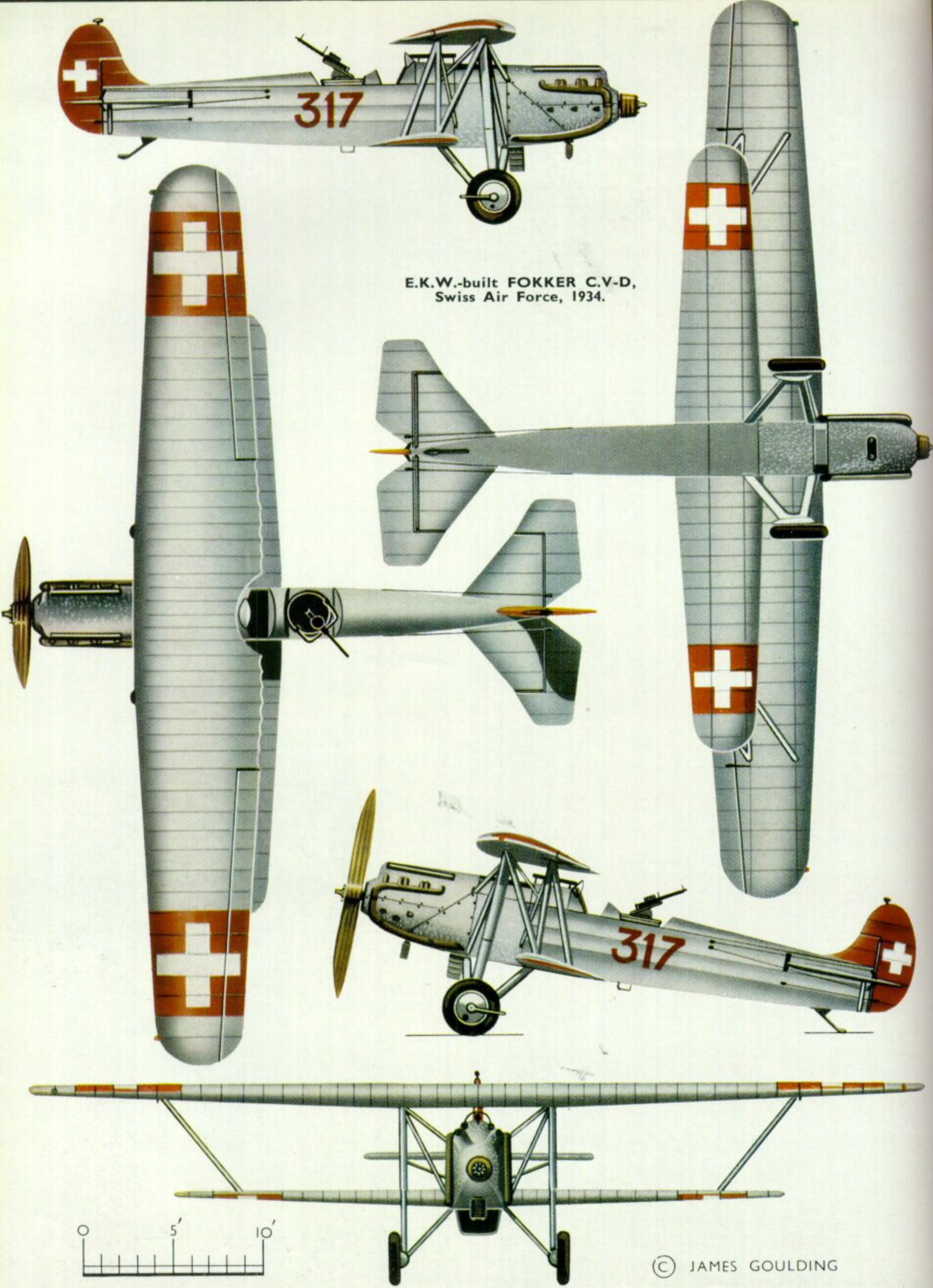


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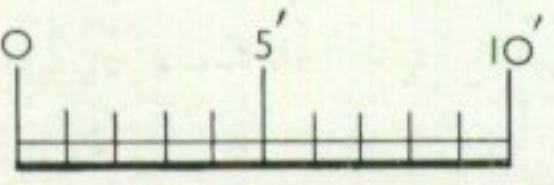
The
Fokker
CV

**NUMBER 87
TWO SHILLINGS**





E.K.W.-built FOKKER C.V-D,
Swiss Air Force, 1934.



The Fokker C V



by G. H. Kamphuis

A patrol of Swedish C.V-Es in flight over typical Scandinavian terrain. Six C.V-Es were purchased from Fokker in 1928, and forty-five were licence-built by the Swedish State Aircraft factory. (Photo: Fokker)

In 1924, a new reconnaissance aircraft design appeared from the offices of Anthony Fokker's team; as the logical successor to his earlier C.IV, it bore the designation Fokker C.V, and the first prototype flew in May 1924. From this beginning grew one of the most popular and progressive reconnaissance types of the pre-war years, and one of the most widely-acclaimed designs ever to join the Fokker "stable". Accepted as a "standard" by several foreign air forces and widely built abroad under licence, the C.V became the most-used of all Fokker's military designs, in several operational rôles.

A cantilever-wing two-seat biplane of fabric-skinned tubular-construction fuselage, the C.V was basically identical to the earlier C.IV, with a fined-down fuselage and fuel-tanks installed in the upper wing. During design, Fokker wished to evolve a machine which would meet a wide variety of military requirements with maximum efficiency; and this aim was achieved by the novel measure of designing and producing several different sets of wings, which could be changed in less than one hour. Great emphasis was also placed on interchangeability of power plant, and engines ranging in power from 250 h.p. to 500 h.p. could be mounted or changed in about an hour by a skilled team. This scheme gave the C.V the ability to serve as a tactical or strategic reconnaissance machine or a light bomber, according to the needs of the moment.

Over the period of its early use, three distinct variants of the C.V appeared, designated C.V-A, -B and -C respectively. Wing areas were 37.5 sq. m., 40.8 sq. m., and 46.1 sq. m. The performance figures of these versions were obviously dependent on the power plant installed, which included engines by Lorraine-Dietrich, BMW, and Hispano-Suiza. The C.V-A was a tactical reconnaissance type with one or

two fixed and two ring-mounted machine guns. Besides the Dutch Army Air Corps, several foreign air arms purchased examples of this type. The Bolivian Air Force acquired a batch of C.V-Cs and operated them in the reconnaissance and light bombing rôles; these machines were fitted with 600-h.p. Hispano-Suiza engines. Among the interesting modifications of the basic design produced at this time was an American version with a small cockpit and side-panels, and an experimental floatplane version which was built in



BMW-engined Fokker C.V-A.

(Photo: Fokker)

Hispano-Suiza powerplant installed in a C.V-A; in this case the H.S. 51 II engine is shown.





A civil C.V registered in the Netherlands. (Photo: Fokker)



Two of the original machines ordered by Denmark in 1926.

Holland in 1925. Experiments were carried out with shock-absorbers incorporated in the float-struts, but these were short-lived. In Holland the floatplane project was never developed with any success; the aircraft manifesting a tendency to stand on its nose during landing. More successful was the Swedish floatplane modification, designated S-6H, with a new rudder and enlarged, strengthened undercarriage members with streamlined struts from the undercarriage to the underside of the upper wing.

The next version of the design to appear was the C.V-D, differing from the previous variants in that it featured tapering wings, as opposed to the straight wings and extended ailerons of the first three versions. The C.V-D and -E sub-types were sesquiplanes, needing only two sets of wings to cover the whole range of military requirements. They were also suit-

able as reconnaissance fighters and as training machines. The two types could be distinguished easily by their strut layout, the -D having "V" interplane struts and the -E having "N"-struts. From January 1926 onwards, the C.V was only delivered with -D or -E type wings, of an area of 28.8 sq. m. and 39.3 sq. m. respectively. The standardisation of fuselage allowed the installation of all-liquid or air-cooled engines in the 350 h.p. to 650 h.p. range; these included the Hispano-Suiza, Napier, Lorraine-Dietrich 400 and 450 h.p., Rolls-Royce F.10, BMW Va and VI, Jupiter, Hornet, Wasp, and Armstrong Siddeley Jaguar. These latter versions were in particular demand in large numbers by Denmark, Hungary, Finland, Sweden, Norway, Italy and Switzerland, and widely built under licence. Finally in 1934 a rejuvenated variant of the C.V-E was produced, powered by a 730-h.p. Bristol Pegasus IIM-2 with Townend ring.

DUTCH MILITARY USE

Logically, the designation C.VI would appertain to the next design in Fokker's series of reconnaissance machines, but in fact this designation refers to a type in the C.V-D group. The Soesterberg establishment of the Dutch Army Air Corps ordered the type, which was simply a C.V-D powered by the 350-h.p. Hispano-Suiza liquid-cooled engine or the Armstrong Siddeley Jaguar (Star) fourteen-cylinder air-cooled radial



C.VI (C.V-D) operated by the Dutch Army Air Corps, with 350-h.p. Hispano-Suiza engine. The machine illustrated is the second in the original order batch. (Photo: Fokker)

The surviving Swedish-built C.V-E, finished in the dubious markings of F.3, seen here in flight during a demonstration. The aircraft is maintained by the Malmen aviation museum. (Photo: Royal Netherlands Air Force)



Dutch Army Air Corps C.V with Rolls-Royce Kestrel engine and ring-mounted machine gun in rear cockpit. Originally a Hispano-powered C.V-D, this machine was re-engined with the rest of its batch in 1936. (Photo: Rolls-Royce Ltd.)



engine. Besides the two fuel tanks normally installed in the lower wing, a third tank was placed asymmetrically in the upper wing. In all, the Army Air Corps (known as the Air Division at that time) received sixty-seven of these machines, and constructed two further aircraft in the Army workshops. (It was in one of these machines that Lt. J. Schott won the *Coupe Echard* during the International Aerial Alpine Meeting at Zürich in August 1927. The success of the type in this and other events had a most favourable effect on export sales.) The first aircraft delivered to the *Luchtvaartafdeling* was a C.VI registered 591. Numbers 590–618 were powered by the 350-h.p. Hispano-Suiza, and numbers 519 and 520 were fitted with the 380-h.p. Jaguar. Besides these thirty-one machines Fokkers delivered two extra fuselages, for which wings were purchased later, these machines carrying the registration 621 and 622. In 1936 the whole batch was re-engined with the 450-h.p. Rolls-Royce Kestrel and on the same occasion the undercarriage was modified, being moved forward and fitted with brakes. The twenty-six C.V-Ds ordered in June 1927 were powered by the 450-h.p. Hispano-Suiza power plant, and the undercarriages fitted with balloon tyres. Nineteen of this latter batch were still in service in the autumn of 1934 and were re-numbered 623–641 after re-engining with the Rolls-Royce Kestrel. The remainder of the L.V.A. machines were numbered 642–651, although number 651 was re-marked 655 in August 1928 to avoid duplication; the three-seater strategic reconnaissance type C.VIII also carried the registration 651.

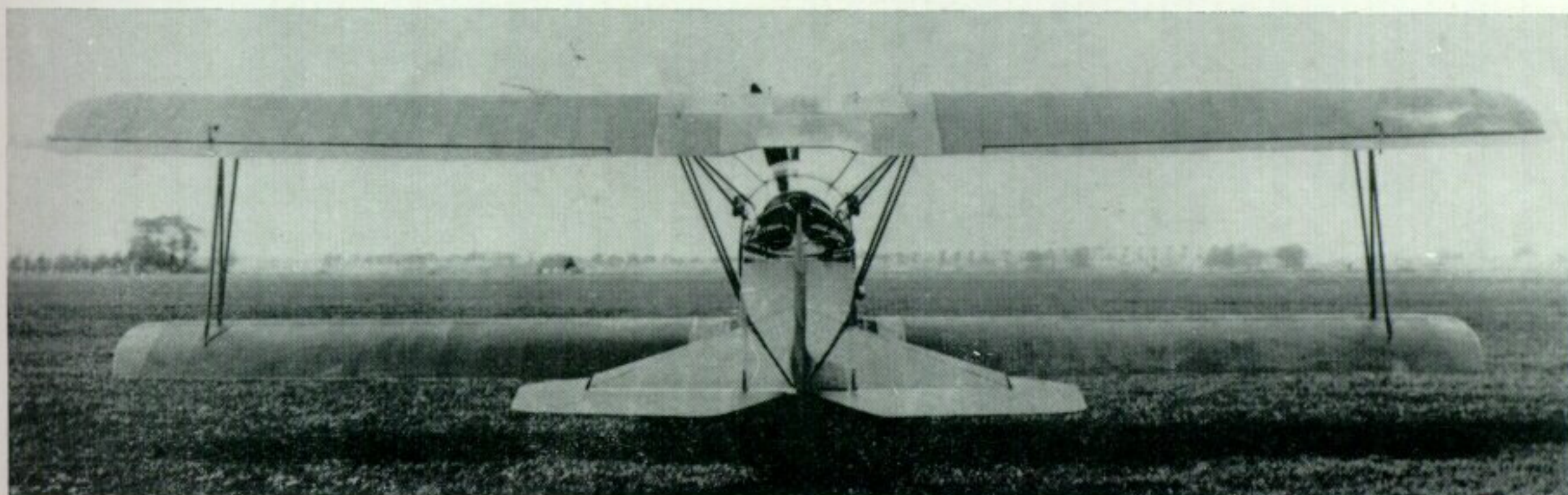


Six C.V-Ws, basically C.V-Cs with float undercarriages, were delivered to the Dutch Naval Air Service in 1925. The variant was not a success, and there were many landing accidents. (Photo: Royal Netherlands Navy)

The Dutch Naval Air Service also used the type; in 1925 six C.V-Cs were delivered, registered Z-1 to Z-6, with float undercarriages. The constant difficulties experienced with this installation resulted in the re-fitting of wheel undercarriages. A second batch numbered Z-7 to Z-24 comprised C.V-Es with conventional wheel undercarriages. The Netherlands Indies Air Division operated twenty C.V-Es powered by the Napier Lion engine, and officially designated FC. Ve-400, this denoting F for Fokker, C.V-E, and the 400-h.p. rating of the power plant.

When the Germans attacked Holland on 10th May 1940, thirty-four machines still served with the Second Air Regiment of the L.V.A. They flew several operational missions during the brief but fierce fighting of the next few days; and the Third Reconnaissance Group, operating twelve of these fifteen-year-old

Rear view of a C.V-A with the 420-h.p. Liberty engine. Interchangeability of powerplant was a major feature of this type.

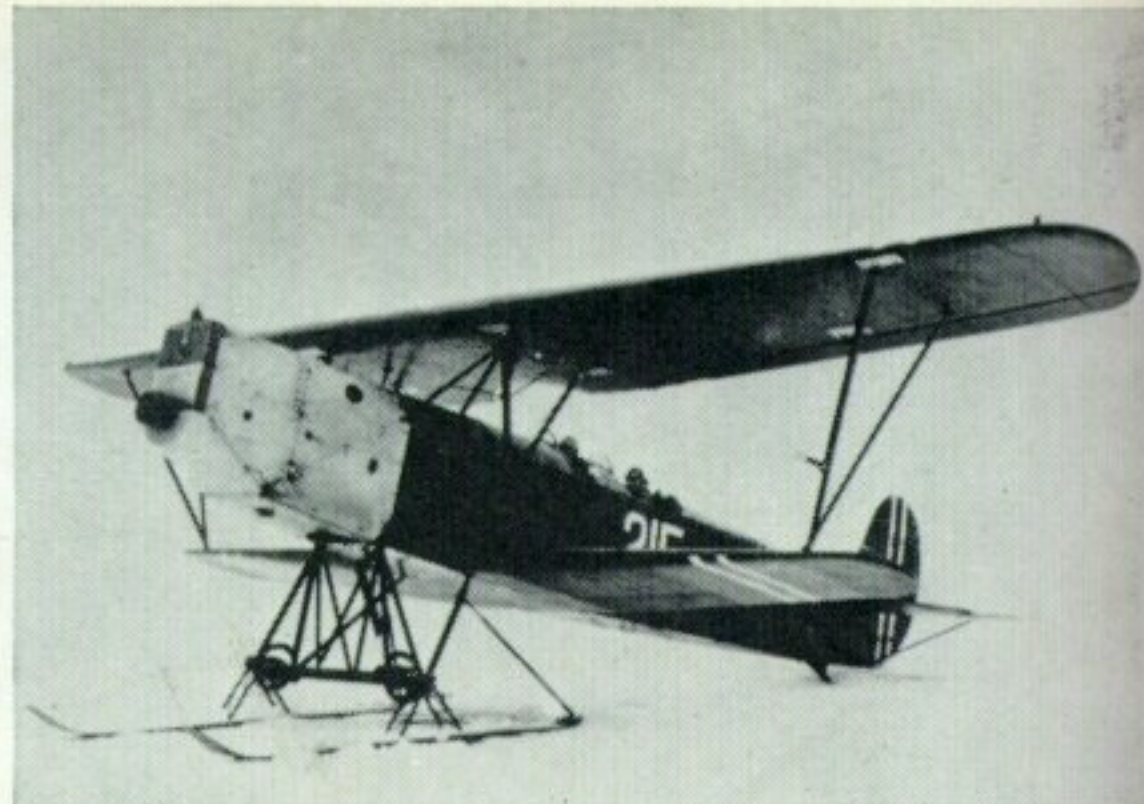




Views of the C.V-Es supplied to the Dutch Naval Air Service. Z-1 appears to be a conventional landplane which received its registration code after the write-off of one of the six floatplanes originally supplied to the naval air element.

(Photos: Royal Netherlands Navy)

sesquiplanes, particularly distinguished itself. The unit was based on Ruigenhoek; five C.Vs were lost during attacks on Valkenburg and Ypenburg airfields after their capture by the enemy, attacks which destroyed several German transports with bombs and machine gun fire. Fourteen of the original thirty-four machines survived when the Netherlands capitulated on 14th May; the greater part of those which had been lost were destroyed on the ground by German raids.



Ski-equipped C.V-D of the Norwegian Army Air Corps. The type saw combat service in Norway during the German invasion of 1940. (Photo: Fokker)

LICENCE PRODUCTION

Denmark. Five C.V-Bs, powered by the Lorraine-Dietrich 12Db.A engine of 400 h.p. and registered R-1 to R-5 were delivered to Copenhagen in 1926. The Danish aviation workshops at Tojhugvoerkslaederne subsequently produced thirteen examples of the type, registered R-6 to R-16. A sample C.V-E, registered R-21, arrived in July 1933; this version was also licence-built in Denmark, thirty aircraft being constructed and registered R-22 to R-52. By 1940 only ten aircraft were still in service with the Danish Aviation Troops. Two, registered R-23 and R-42, were flown by the *Luftwaffe* with the codes 3W+NO and 3W+OD, and the latter machine was returned to Denmark in April 1947, having miraculously survived the war.

Twenty other C.Vs found by the Germans in the hangars of various Danish airfields were renovated, and actually sent to Russia in 1943; their fate is not recorded. Another highlight of the C.V's career with the Danes was the peace-time exploit of Captain Botved, who in March-June 1926 flew from Copenhagen to Tokyo in a C.V. His flight took him east via the former British East Indies and back via Siberia; his return flight of 10,395 km. was accomplished in seventy-two flying hours.

Jupiter-powered C.V-E.





"Fokker C.VI" development of the basic C.V-D, powered by a 380-h.p. Jaguar engine. (Photo: Royal Netherlands Air Force)



Finnish C.V-E equipped with 730-h.p. Bristol Pegasus. This is a Fokker-built machine; several of this version were built in Finland at the State Aircraft Factory at Tampere. (Photo: Fokker)

Swiss-built C.V-E No. 321, with a 475-h.p. Lorraine-Dietrich engine. (Photo: Fokker)





Swedish C.V-E (S-6B) with ski undercarriage. (Photo: Fokker)



One of three Jupiter-C.V-Ds purchased by Switzerland in 1927. (Photo: Fokker)

Finland. The Finnish air ministry purchased several C.Vs, but the exact numbers bought and those built under licence are not recorded. The first machine purchased was a C.V-E delivered in 1927, powered by a Jupiter (Star) air-cooled engine. When the improved C.V-E with the 730-h.p. Bristol Pegasus IIM-2 engine appeared in 1934, several were bought and more were constructed in the State Aircraft Factory at Tampere.

In winter, the Fokkers were fitted with ski undercarriages, as was the normal Finnish procedure.

Hungary. Peace treaties did not allow of the existence of a Hungarian Air Force after W.W.I; but prompted by obvious necessity a secret air arm was founded in 1922. Towards the end of the 1920s, nine C.V-Ds and -Es were purchased; and the former type was later manufactured in quantity by the Weiss (Manfred) Aircraft Factory under licence. They were the backbone of the secret Hungarian Air Force for more than a decade, beginning their service in 1927 with bomber, reconnaissance and training units. Weiss modified the basic design in the early 1930s, producing the "Budapest I" light bomber, and the "Budapest II" reconnaissance machine. Grounded on account of their age in 1937-38, the Fokkers were pulled hastily out of retirement when the international situation grew more threatening in late 1938, and loaded with guns, bombs, wireless and camera equipment to a dangerous extent; even if the pilot coaxed his overweight machine into the air there was a good chance of undercarriage failure on landing. They were in service in the spring of 1939 when the Hungarian Army entered Carpatho-Ruthenia, and served with training units to an even later date. The *Solyom*, last of the C.V-D developments in Hungary, even saw service as a short-range reconnaissance type on the Russian Front in 1941.

Italy. *Officine Terroviarie Meridionale*, a subsidiary of the Romeo automobile organisation, constructed a number of C.V-Es, under the designation Ro.1, at

Fokker-built C.V supplied to Denmark, with Bristol Pegasus powerplant.

(Photo: Fokker)





Danish C.V-E with Jupiter VI engine. The code R-2 appears to be a re-issue; the original R-2 was powered by a Lorraine Dietrich engine, and was a C.V-B of the first order batch.

their Naples plant. These were operated in Tripoli and Italian Somaliland as well as internally; they were powered by licence-built Jupiter engines. Ernesto Breda's Milan factory also constructed some examples of the type. Several record-breaking flights were carried out in the Italian-built version, including the formation flight from Naples to Tripoli in October 1927. In April 1928 a formation of nine machines led by Major Bitossi flew from Rome to Mogadiscio in Somaliland, a distance of more than 10,000 km., and the first occasion on which Italian aircraft arrived for service in this colony under their own power.

Norway. The Norwegian Defence Programme of 1927 called for the expansion of the Army Air Corps (*Haerens Flyvåben*) and it was the C.V-E which was chosen for the bomber elements. Initially five machines

were purchased from Holland, bearing non-consecutive registration numbers between 301 and 309, and all powered by the 450-h.p. Jupiter VIA. At the same time licence rights were taken out by the *Haerens Flyvemaskin Fabrik* plant at Keller, near Lillestrom. At first the Norwegian-built aircraft were powered by Jupiter engines but later in the production programme they were modified to take the 575-h.p. Panther II, while some machines were fitted with D-style wings and B.M.W. engines. The Fokkers formed an important part of the Norwegian Air Corps strength between 1930 and 1940, and when Germany invaded Norway on 9th April 1940 some forty machines were in service, registered between 301 and 393. On 14th April, a formation from the Sixth (Bomber) Wing, each aircraft carrying three 50 kg. bombs, attacked

Danish-built machine with modified cowl-ring and gun mounting in rear cockpit.

(Photo: Fokker)





Hispano-powered C.Vs of the L.V.A.; note differing styles of code numbers. (Photo: Royal Netherlands Air Force)

eleven Junkers Ju 52s in the area of the Harting Lake, and destroyed all but one as they landed. During the final stages of resistance on 9th June, the surviving aircraft flew to Finland. A small number of these were later purchased and used for target-towing by the Swedish firm *Svensk Flugtjänst*; one, originally registered 349, was handed back to the Royal Norwegian Air Force in 1949 bearing the registration SE-ALS, and has since been restored in its 1940 markings and flown at displays.

Sweden. Two Fokker C.V-Ds were purchased by the Swedish Government from the manufacturer in 1927 and were registered S.1 and S.2. In Swedish service they were initially designated J-3 and later S-6A. A year later Fokker delivered six C.V-Es, registered S.3 to S.8, and these also operated under the designation J-3 for a short period, later taking the designation S.6. It was in one of these machines that Lt. H. E. Lundborg saved the life of General Nobile on 24th June 1928 after the latter failed in his attempted North Pole journey in the airship *Italia*. In 1929 the Swedish State Aircraft Factory started the licence-production of the C.V-E. Powered by Jupiter engines and registered 90 to 96, they carried the designations J-3 and S-6. The next production run numbered thirty-nine machines, three of which were exported to Finland in 1939-40.



Thirty-four Fokker C.Vs were still in L.V.A. service when the German invasion of 1940 began, and saw action in the reconnaissance and light-bombing rôles. These photographs show machines of the Second Air Regiment at the time of the invasion.

One of the Swedish-built machines, registered 386, survives and is to be seen in the air museum at Malmen.

(continued on page 12)

Kriegstechnische Abteilung of Thun, Switzerland, developed this Hispano-powered variant of the C.V-E, designated C.35. Note "splinter" camouflage.





C.V-D, Royal Netherlands Army Air Corps.



C.V-D, Swiss Air Force.

C.V-D showing national markings as from October 1939 (see photographs).



Switzerland, wing insignia.



C.V-M/33 (II R), Danish Air Force.



Sweden, wing insignia, position on extreme wingtip.



S 6A, Swedish Air Force.



34 Squadriglia.



C.V-D, Hungarian Air Force. Built under licence by the Weiss Manfred Works as the Budapest I, subsequently modified and modernised as the Solyom short-range reconnaissance aircraft and used on the Russian front in W.W.II.

Romeo Ro.I, 34 Squadriglia O.A. (Osservazione Aerea), 61 Gruppo O.A., Abyssinia, January 1936.



Italy, wing insignia.



Hungary, wing insignia.



C.V-D, Finnish Air Force.



The Ro. 1 was the Italian-built variant of the basic C.V-E, powered by a licence-built Jupiter engine. Here are shown machines of the 38° Squadriglia O.A. in flight over Ethiopia in the spring of 1936. (Photo: G. Cattaneo)

Switzerland. This country purchased three Jupiter-C.V-Ds in 1927, registered 821-823. Four years later three C.V-Es registered 302-304 were delivered and in 1933 it was decided to have fifty of these machines licence-built by E.K.W. at Thun and by Dornier at Altenrhein. These were registered 305 and 311-359. One year later another eight -Es were built, numbered 801-808, and were used as target tugs. The type remained in service until W.W.II, and reached a peak operational strength of sixty machines. One Swiss-built C.V also survives.

© G. H. Kamphuis, 1966.

FOKKER C.V DEVELOPMENTS

Type	Year	Engine	Description
C.V-A	1924	420-h.p. Packard "Liberty"	Two-seat reconnaissance biplane for tactical purposes.
C.V-B	1924-25	250-h.p. BMW IV 450-h.p. Lorr.-Dietrich 450-h.p. Hispano-Suiza	Two-seat reconnaissance biplane. B-wing of 40.8 sq. m.
C.V-C	1925	500-h.p. Hispano-Suiza 51	Two-seat reconnaissance and light bomber. (Bolivian Air Force.)
C.V-C b	1925	400-h.p. Lorr.-Dietrich	Two-seat observation biplane for Netherlands Navy.
C.V-D	1925-27	400-h.p. A.S. "Jaguar" C5 450-h.p. Hispano-Suiza 650-h.p. RR "Kestrel"	Two-seat fighter/reconnaissance sesquiplane.
C.V-E	1925-27	475-h.p. Lorr.-Dietrich 450-h.p. Hispano-Suiza 450-h.p. N. "Lion"	Two-seat reconnaissance/light bomber sesquiplane.
	1934	730-h.p. Bristol "Pegasus" IIM-2	Two-seat observation sesquiplane. Modernised version for reconnaissance and light bomber. (Ski-version also built.)
C.V-W	1925	420-h.p. Packard "Liberty" 500-h.p. Hispano-Suiza 51	Seaplane version of the C.V-C: also with 500-h.p. Hispano-Suiza 51.
C.VI	1925 —	350-h.p. Hispano-Suiza Rolls-Royce	Two-seat light observation sesquiplane version of the C.V-D. U.S. modifications with cabin windows. (Pacific Aera-Bob & Eddie.)

SPECIFICATIONS	C.V-D 520 h.p. Hispano-Suiza	C.V-D 610 h.p. Jupiter VI	C.V-E 450 h.p. Lorraine Dietrich	C.V-E 450 h.p. Napier	C.V with 450 h.p. Hispano-Suiza engine		
					Normal	Small	Large
Span ...	12.5 m.	12.5 m.	15.3 m.	15.3 m.	13.332 m.	12.036 m.	14.628 m.
Length ...	9.53 m.	9.46 m.	9.13 m.	9.25 m.	9.25 m.	9.25 m.	9.35 m.
Height ...	3.3 m.	3.3 m.	3.38 m.	3.38 m.	3.31 m.	3.29 m.	3.38 m.
Wing area ...	28.8 sq. m.	28.8 sq. m.	39.3 sq. m.	39.3 sq. m.	40.7 sq. m.	36.5 sq. m.	46 sq. m.
Weight empty ...	1,315 kgs.	1,125 kgs.	1,390 kgs.	1,420 kgs.	1,430 kgs.	1,380 kgs.	1,480 kgs.
Useful load ...	600 kgs.	600 kgs.	1,000 kgs.	800 kgs.	800 kgs.	600 kgs.	1,000 kgs.
Weight loaded ...	1,915 kgs.	1,725 kgs.	2,390 kgs.	2,220 kgs.	2,230 kgs.	1,980 kgs.	2,480 kgs.
Wing loading ...	66 kg./sq. m.	60 kg./sq. m.	61 kg./sq. m.	56.5 kg./sq. m.	55 kg./sq. m.	54 kg./sq. m.	54 kg./sq. m.
Power loading ...	3 kgs./h.p.	2.8 kgs./h.p.	5 kgs./h.p.	4.4 kgs./h.p.	4.9 kgs./h.p.	4.4 kgs./h.p.	5.5 kgs./h.p.
Speed max. ...	225 km.h.p.	245 km.h.p.	222 km.h.p.	230 km.h.p.	220 km.h.p.	230 km.h.p.	210 km.h.p.
Speed min. ...	95 km.p.h.	90 km.p.h.	95 km.p.h.	90 km.p.h.	—	—	—
Climb to 1,000 m.	2 mins.	1.9 mins.	3.9 mins.	2.8 mins.	—	—	—
Climb to 2,000 m.	4.3 mins.	4.2 mins.	8.9 mins.	6 mins.	—	—	—
Climb to 3,000 m.	7.2 mins.	7 mins.	15.7 mins.	10.2 mins.	10 mins.	8.5 mins.	12 mins.
Climb to 4,000 m.	10.7 mins.	10.5 mins.	26.2 mins.	15.7 mins.	—	—	—
Climb to 5,000 m.	16.5 mins.	15.5 mins.	—	23.8 mins.	25 mins.	20 mins.	32 mins.
Climb to 6,000 m.	26 mins.	23.6 mins.	—	38 mins.	—	—	—
Ceiling ...	7,000 m.	7,300 m.	5,400 m.	7,000 m.	6,200 m.	6,600 m.	5,800 m.

ARMAMENT POSSIBILITIES

- C.V-D (two-seater fighter). Two fixed guns firing forward and twin guns on a flexible mounting over the back cockpit.
- C.V-D (artillery co-operation). One fixed gun firing forward and one gun on a flexible mounting over the back cockpit. Wireless apparatus.
- C.V-D and -E (reconnaissance). One fixed gun firing forward and twin guns on a flexible mounting over the back cockpit.
- C.V-E (day bomber). One fixed gun firing forward and one gun on a flexible mounting over the back cockpit. Bomb-racks.