

HEINKEL — HE 51

By Dick Murray

The Luftwaffe was first publically announced in 1936 and the HE 51 equipped many of its early fighter squadrons. JG132 "Richthofen" sqn was based in Doberitz at that time and provides the color scheme used on the subject. The HE 51 was used operationally in Poland in September 1939 in a close

relegated to ground attack duties which they performed successfully throughout the war. They are said to be the forerunners of the Stuka units used so successfully early in the Blitzkrieg, but it is difficult to believe they used similar tactics in weapon delivery.

The romance of "Two wings and

nicest lines of any, plus several attractive color schemes from which to choose, as well as distinctive features like those trumpet exhausts and full span flaps on the lower wing, and a drop tank.

The HE 51 is a big rugged airplane which partly accounts for its success as a dive bomber and a fighter pilot



support role and served as an advanced trainer until 1943. Prior to this they were used extensively in the Spanish Civil War by the Condor Legion as a fighter along with the Fiat CR32, until the arrival of Russian I-15 biplanes and I-16 monoplanes on the Republican side in November 1936.

The HE 51 units soon found themselves outclassed and were

round engines" led me to a search for a subject which would fly well as a model because it had all the right parameters to fly well as a full sized machine. After eliminating those that had often been done, like the beautiful Curtiss biplanes of the 1930s and most of the WW I types, I narrowed it down to a few like the HS123 and the Fiat CR42. I finally decided on the HE 51, a true sesquiplane, because it has the

trainer until 1943. Its 750 hp BMW V12 engine could get it up to 25,000 ft. and to a top speed of 205 mph. It spanned over 36 ft., was 27½ ft. long and weighed 4200 lbs. fully loaded. It was armed with (2) 7.9 MM machine guns and could carry 450 lbs. of bombs. The drop tank had a capacity of 37.5 gallons.

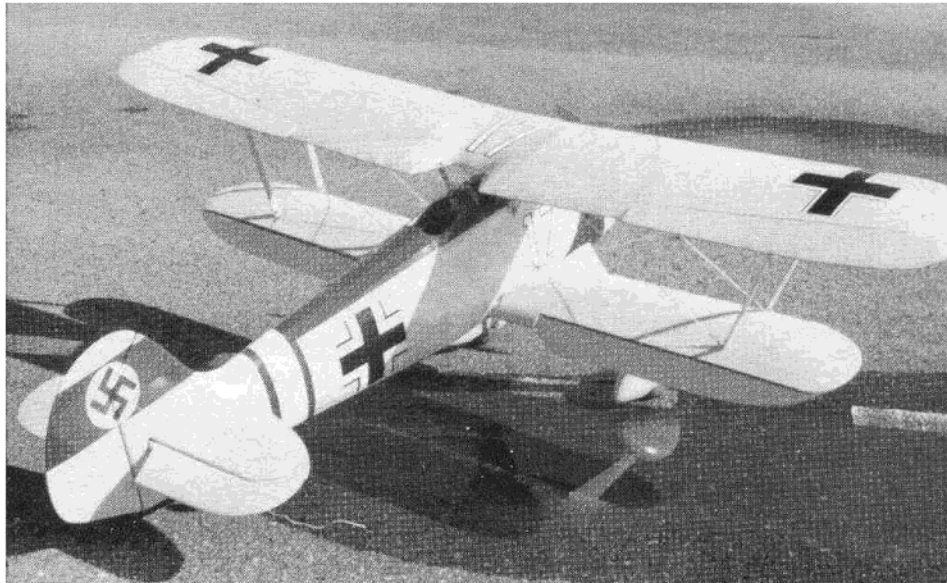
I chose 1/6 scale for many reasons, not the least of which is the ability to

This beautiful 1/6 Stand-Off Scale biplane by Dick Murray can be a satisfying reward in both building and flying the finished product.

transport it in a normal sized car. The 72" top wing and 56" fuselage do not require me to pay off the mortgage of my friendly van dealer. This worked out to a 90 sized model but I chose to go with a geared Webra 60 so I could swing a larger slower turning prop for more scale like performance. The only sacrifice would be a high top speed which this model should not have as 205 mph was the top speed of the real thing.

The only departure from scale I couldn't get away from was the cutouts in the front of the cowl and, as it is, there are no outlets in the cowl for escaping cooling air, this is ducted through the firewall and out through the radiator in the fuselage bottom. This radiator is a venturi and is quite effective. The engine head itself has soft aluminum baffles wired to it to direct all the air to the right place. The tail wheel is scale although only on later examples and the wheel pants can be left off as they were often removed for winter operations.

Actual construction is straightforward with nothing unusual except perhaps the cooling duct which is just a piece of 2" shop vacuum tubing connecting the radiator to the firewall. This necessitates offsetting the fuel tank, but there is ample room. The fuselage is just a box with 3/32" sides reinforced with 1/16" ply and constructed in a jig. The bulkheads are 1/8" balsa except those in the nose area where strength is required for the undercarriage and cabane struts and in the tail where the tail wheel strut is attached. The horizontal stringers are 3/16" sq. and set in diamond fashion rather than flat. No effort was made to notch the bulkheads prior to assembly. Mark stringer points on F5 and F8 and join with a piece of string. Mark those bulkheads in-between, then notch with a razor saw. I used arrow shafts for the elevator and rudder pushrods and nyrod for the tail wheel pushrod as it is less critical and I could keep it out of the way of the other two. The tail wheel has a shock absorbing spring and its tiller is inside the fuselage. The cowling is fiberglass



made on a styrofoam plug, as is the chin back to the firewall. The chin is not detachable as it holds the necessary ballast required to achieve the correct C.G.

The trumpet exhausts are a lot easier than they look. Three sheets of medium balsa are laminated plywood fashion to make a sheet 3/4" thick. The trumpets are cut out on a Dremel saw and sanded to shape. They are then glued and doweled to a piece of 1/16" ply which, when fitted into its recess in the cowling and fuselage, acts as the cowl hold-down. To remove the cowling, simply remove the four bolts holding the stack plate on and lift it off. The cowl of course has positioning pins and holes for alignment.

The radiator is also fiberglass made on a foam plug and since it acts as a venturi, attention should be given to its proper shape. The wheel pants are made the same way. The landing and flying wires are dressmaker's elastic and are nonfunctional.

Wingtips and tail group are laminated shapes. Both wings are constant chord facilitating conventional construction and can easily be done in foam. Bear weight in mind when choosing, as the overengineered prototype weighed 13 1/2 lbs. which gave a wing loading of 26 1/2 oz. per sq. ft. Notice the ribs are



HEINKEL HE 51

Designed By:

Dick Murray

TYPE AIRCRAFT

1:6 Stand-Off

Scale Biplane

WINGSPAN

Top 72 1/2 Inches

Bottom 56 3/4 Inches

WING CHORD

Top 10 1/2 Inches

Bottom 8 1/2 Inches

TOTAL WING AREA

1168 Sq. In.

WING LOCATION

Biplane

AIRFOIL

Clark Y

WING PLANFORM

Constant Chord

DIHEDRAL EACH TIP

Top 2 Inches

Bottom 1 Inch

O.A. FUSELAGE LENGTH

55 Inches

RADIO COMPARTMENT SIZE

(L) 6" x (W) 4" x (H) 3"

STABILIZER SPAN

23 3/4 Inches

STABILIZER CHORD (incl. elev.)

8 1/2 Inches (Avg.)

STABILIZER AREA

163 Sq. In.

STAB. AIRFOIL SECTION

Symmetrical

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

7 1/2 Inches

VERTICAL FIN WIDTH (incl. rud.)

9 1/2 Inches (Avg.)

REC. ENGINE SIZE

90 2-cycle

60 2-cycle (geared); 120 4-cycle

FUEL TANK SIZE

12-16 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

6 (4 Min.)

CONTROL FUNCTIONS

Rud., Elev., Ail., Throt.

(Flaps, Drop Tank, opt.)

BASIC MATERIALS USED IN CONSTRUCTION

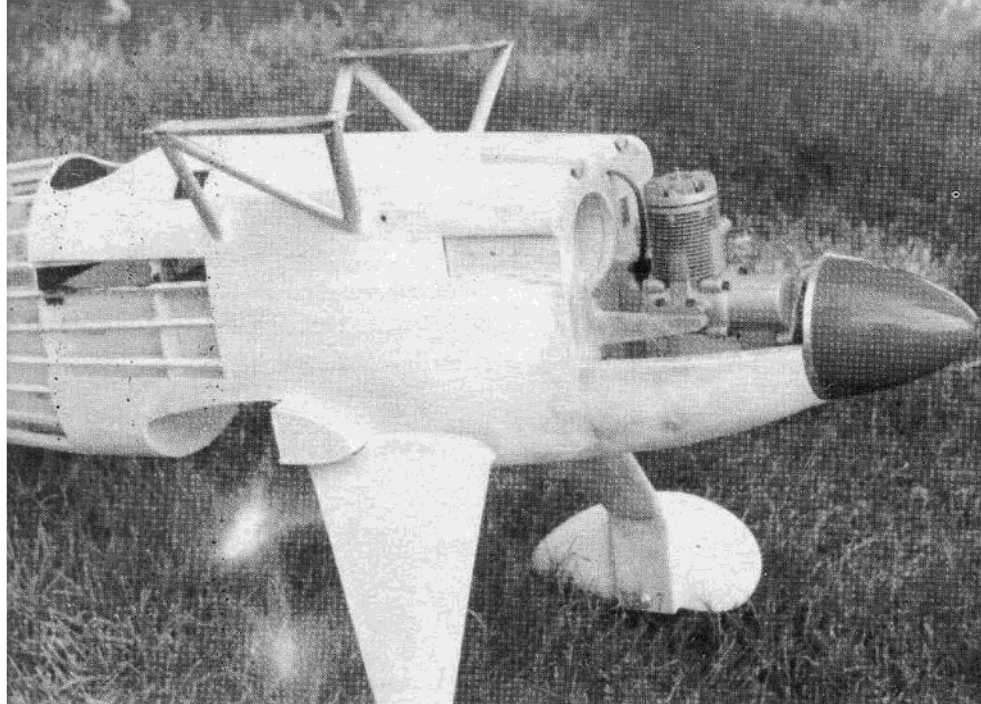
Fuselage Balsa, Ply, Spruce

Wing Balsa, Ply, Pine

Empennage Balsa, & Ply

Wt. Ready To Fly 216 Oz.

Wing Loading 26.6 Oz./Sq. Ft.



Glow plug wire from starting jack also cooling duct exits out bottom.

not evenly spaced in some areas but this is scale as is the spacing in the tail group.

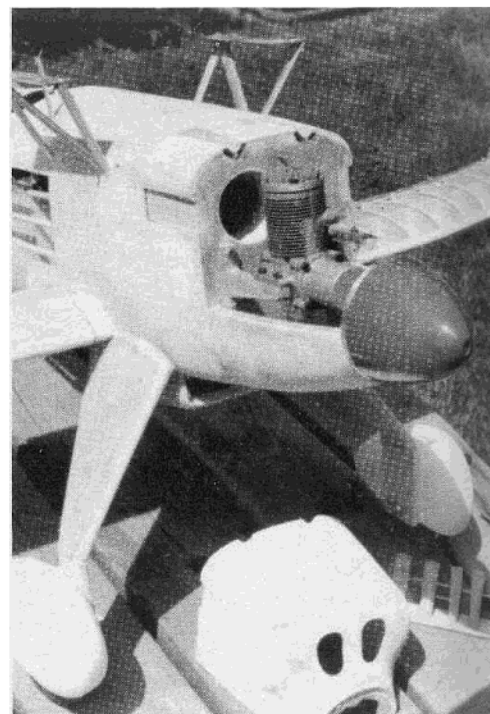
The aileron servo is mounted in the top wing with an extension down through a scale pushrod which extended vertically from the fuselage right side just forward of the windshield to a "system of suitable linkages" (Col. de Vries will love that) in the top wing to drive the ailerons. This rod on the model moves up and down in a silicon sleeve so the connector is hidden for flight.

Lots of aileron differential was built in using 120° bellcranks, at least 3/4" up and 3/8" down. Rudder throws are 1 1/2" each way and lots of elevator throw is required for landing flare

with flaps down, at least 1" each way. This may be excessive but worked out okay for me. Flaps lower 30° although none is used for take-off and flapless landings are easy. The more flap used on landing the more up elevator will be required to flare out.

I used standard servos except for the elevator where a heavy duty one was used because that's where most of the action is, and a mini for a tank release only because it was handy.

The whole airplane is covered with Super Coverite and given two coats of Hobbycoxy primer sanded in-between with 600 grit wet. When ready for the color coats I marked off all the panel lines with 1/32 draftman's tape. I used this to simulate hatches on the



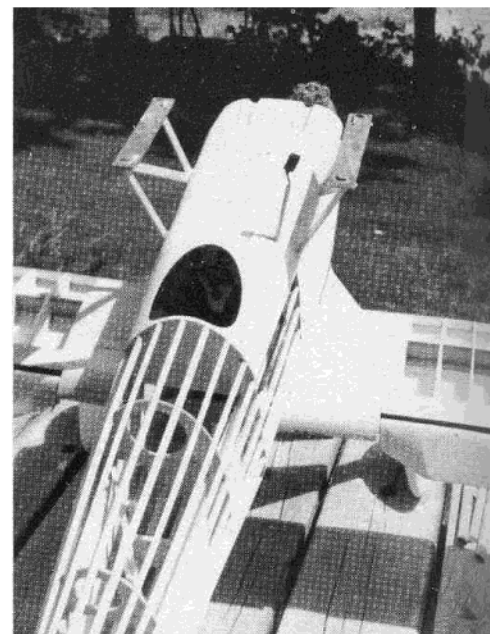
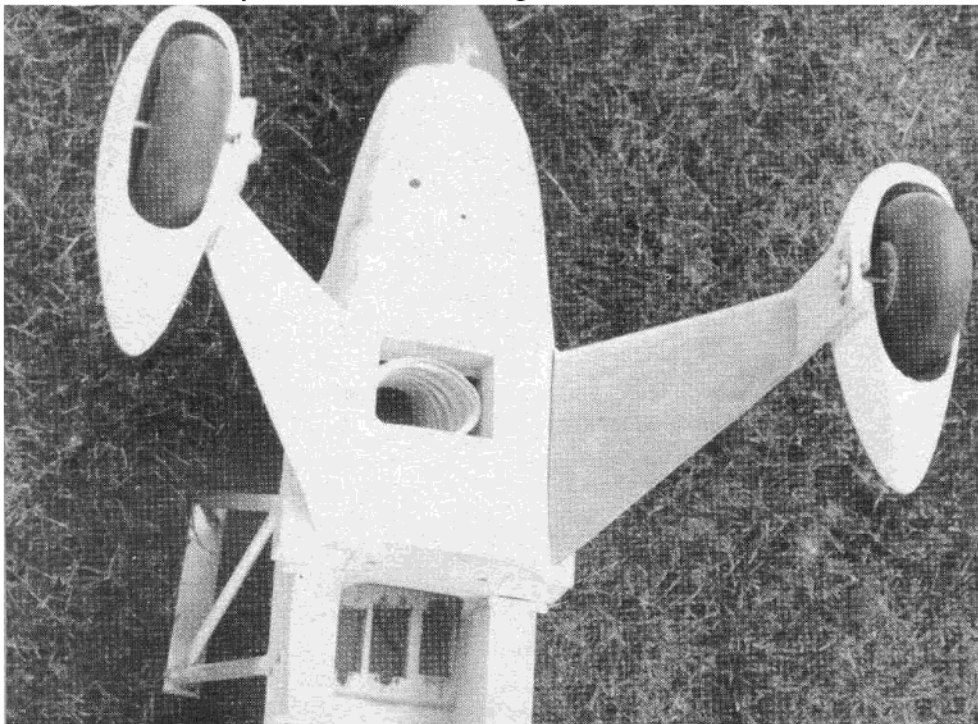
Webra geared 60 makes a neat installation. Muffer is completely hidden.

fuselage and cowling and trim tabs on the tail group and ailerons.

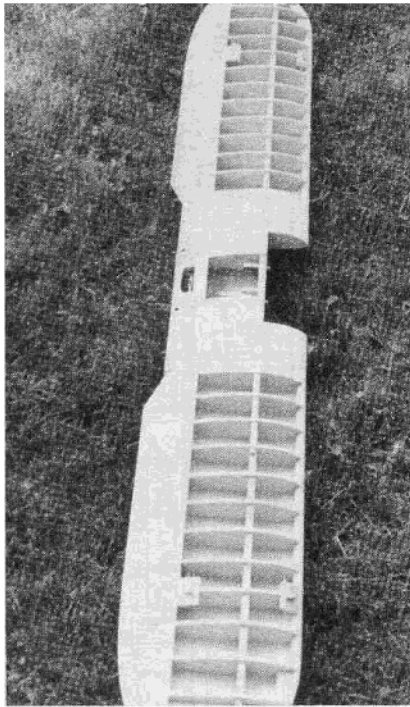
I then sprayed on the first coat of Luftwaffe grey over the whole airplane including the tape. When dry, I lifted the tape and, presto, panel lines and trim tabs. One more light coat of grey before the red and white trim was masked off with shelf paper. The crosses on the fuselage and bottom wing and the swastikas are hobby shop items, only the top wing crosses and numbers are painted on.

The spinner I used is a 3 1/2" CB P51 style as its the closest I could get using

Radiator not yet installed — note cowling air outlet.



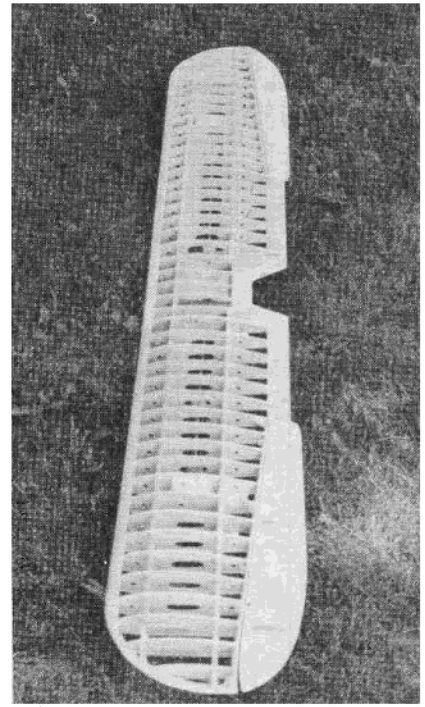
Aileron servo lead exits just forward of cockpit.



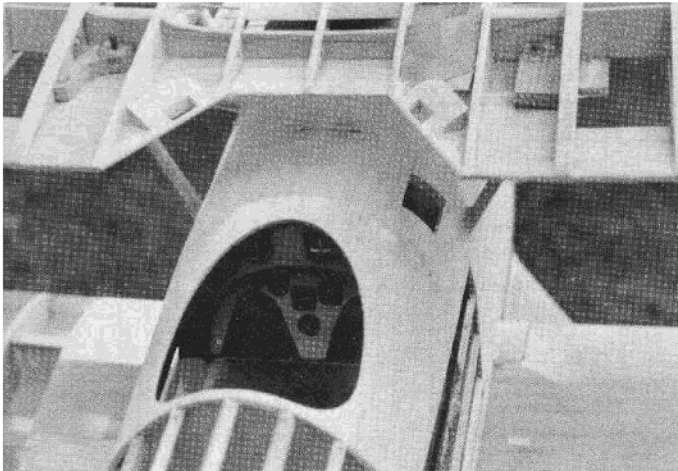
Lower wing with torque rod controlled flaps.

a commercially available one. If you can roll your own so much the better, the correct shape is on the drawings as is the scale prop which is huge.

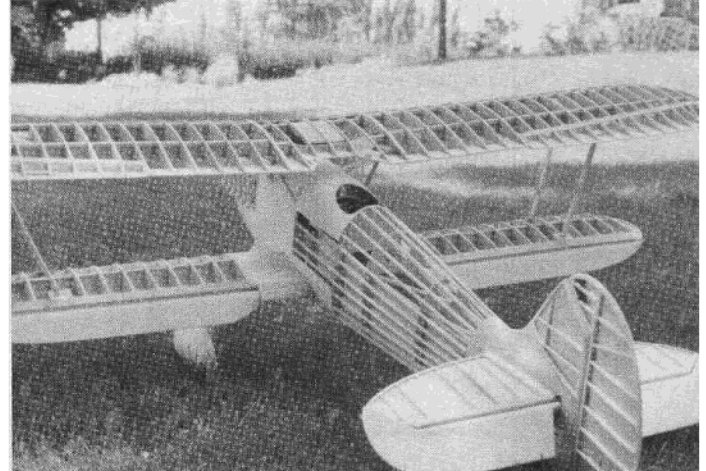
Before I installed the geared Webra 60 I bought all the magazines with articles on it and those that published plans using that engine. I found two such airplanes but neither article gave any engine detail so I was on my own. The Dynamix carb worked well for me after we figured it out. For instance, it must have good muffler pressure to run at all, let alone well. Priming it was a problem as the engine is a rear breather in a tight cowl. I installed a starting jack for the glow plug and I prime the engine by turning it over on my starter with the exhaust hole blocked with a finger and the plug jack disconnected and the throttle wide open. The built-up pressure primes the engine, just plug in the jack, close the throttle to about 1/4 and away it goes. Maybe you can imagine the curses and frustration and blue air before we got that procedure worked out. My thanks to



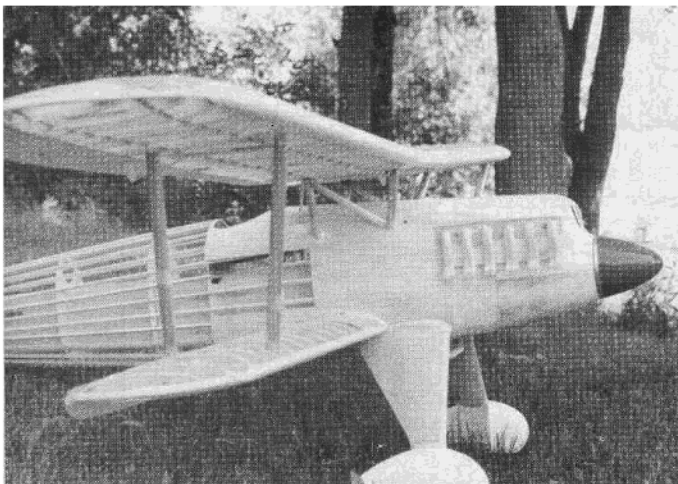
Upper wing with ample ailerons.



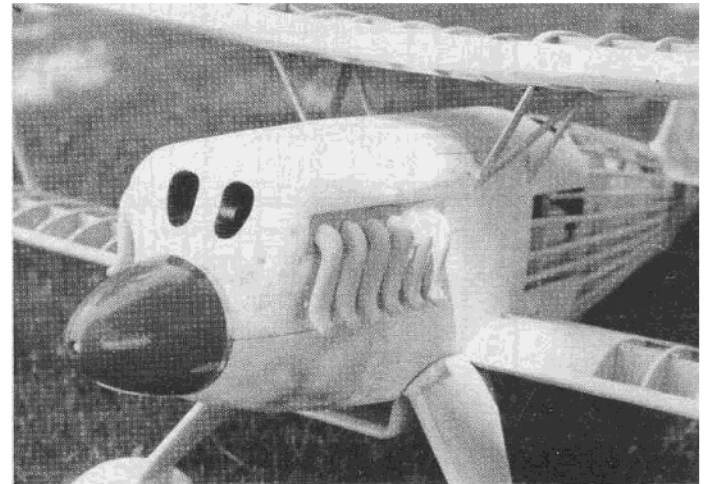
On/off switch is in cockpit. Square hole is for aileron servo lead tube.



1/64" ply under top wing center section cap strips to prevent hangar rash when working on servo installation. Rudder counterbalanced with buckshot and epoxy.



Landing gear legs are covered with 1/64" ply and balsa.



A bit of extra work for the exhaust system but, well worth it for the end results.

John Jeffries and Jack Schroeder.

The model flies well in a majestic scale manner since it is as big as some quarter scalers with chain saw engines. Nice big round loops and a nifty rate of roll with no nasty habits discernible, with 23 flights on it before the snow flew up here. The engine sounds weird as you can hear both the prop moan and the gear whine over the muffled exhaust. I wish the 120 4-cycle engines had been available when I started it as that would have made a great combination.

Get hold of a MAP 3-view, No. 2929, from Bob Holman, P.O. Box 741, San Bernardino, California 92420, as it has all the scale detail I couldn't squeeze onto the drawings.

Other references are:

Hitler's Luftwaffe by Wood and Gunston. Published by Crescent Books. For color schemes used by various units.

Great Fighters Aircraft by Green and Swanborough, also published by Crescent Books of New York.

Spanish Civil War Air Forces by Christopher Shores. Published by Sky Books Press, 48 E. 50th St., New York 10022. □

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