



FIAT CR 32

By JACK SWIFT . . . This Italian biplane fighter debuted in 1932, and remained in service until the outbreak of WW-II. The model is powered by an O.S. four-stroke, and was scaled from Pete Westburg drawings.

• The Fiat CR 32 was a pugnacious biplane fighter produced in Italy from 1932, finishing its career at the very beginning of World War II. Technically a sesquiplane (1-1/2 wings), it saw service in Spain during the Civil War and was quite plentiful in different *gruppos* (groups) and *squadriglia* (squadrons). The V12 engine had to have a special mix of fuel which was not readily available, and this was one of the factors which led to its demise. Ruggedly constructed, it was easily maintained in the field and was a pilot's airplane. It went where it was pointed, and did as it was told. Warren truss struts gave girder-like strength to the wings.

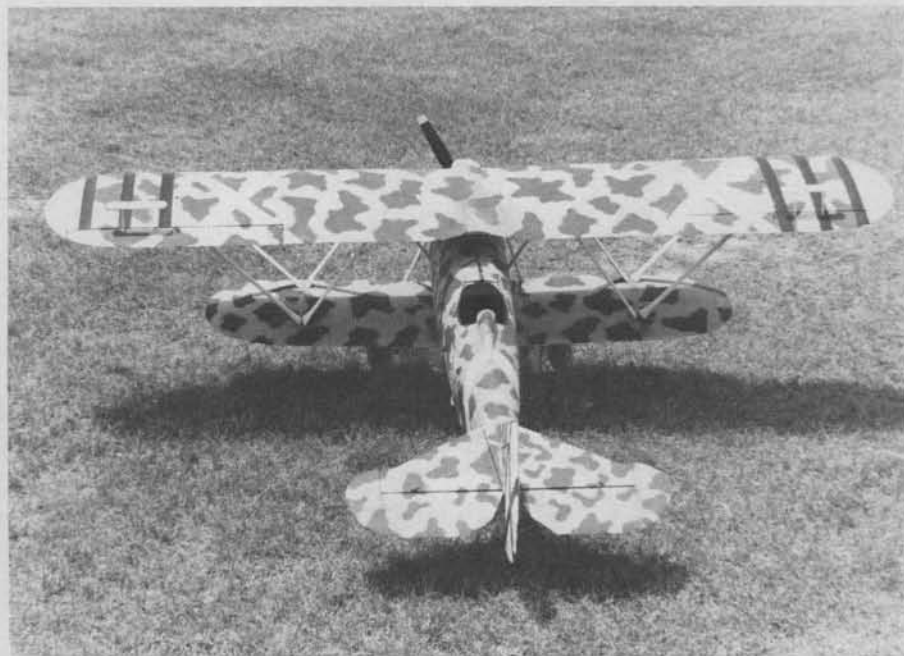
The model was on my list of things to build for about 9 years, during which time I collected all the data I could relative to the prototype. The catalyst was the acquisition of a 120 four-stroke with its beautiful exhaust sound. A 1/5th scale model seemed good, the engine could be fully cowled and other benefits would be easier radio installation and a more realistic flying model. The plans were scaled from Westburg drawings and as much construction as could be designed into the model done at that time. Wire trailing edges were detailed and construction started so the gray areas could be finalized.

CONSTRUCTION

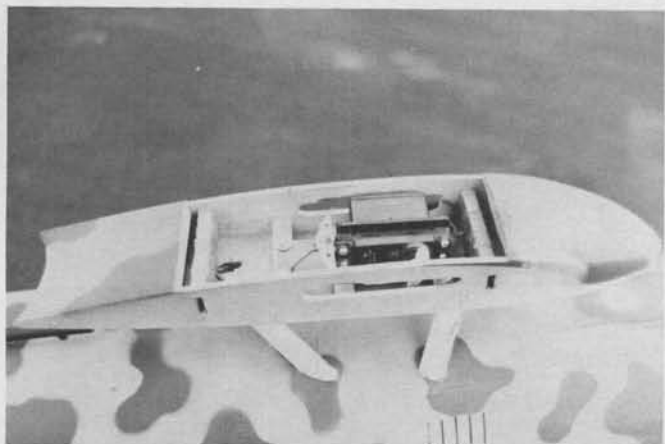
The fuselage is the old-fashioned, built-

up box with formers added to give the shape. Build two fuse sides using 1/4-inch sq. spruce. When dry, place upside down on a flat surface and add the spacers. Former F1 is cut from 1/8-inch ply and glued in

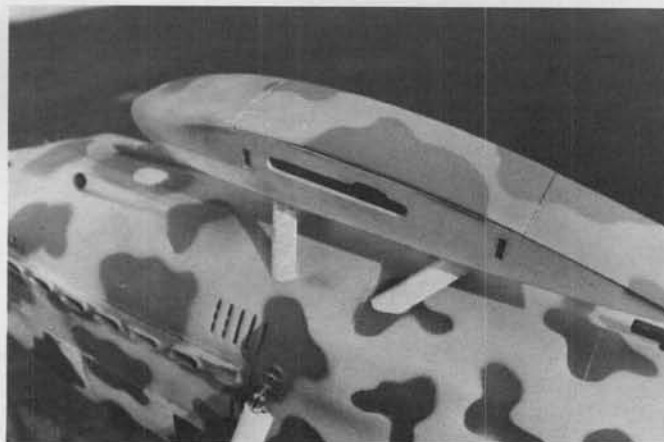
place on the upper longerons. The bottom longerons should be held by clamps to ensure they don't pull away from the spacers. Rubber bands are looped around the front ends of the bottom longerons and a solu-



The Fiat was covered with Sig Coverall, with the camouflage colors (sand and spinach) added by use of an airbrush. Photo: A. Sulkowski.



Upper wing fairing with cover off to show servo installation.



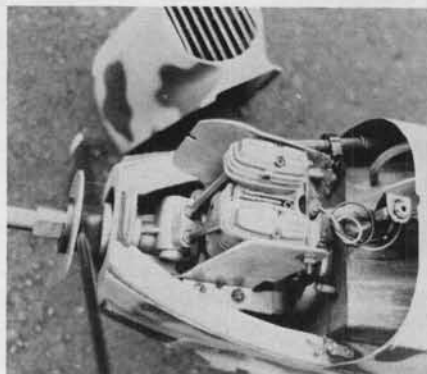
Upper wing fairing cover in place.

tion of ammonia and water painted where the bend is. Keep wetting this area and maybe add more rubber bands until the longerons bend into the cutouts on former #1 where they are glued and gusseted in place. The cabane is made of 1/8-inch welding rod. Bind with copper wire and solder together. This unit is then bound and glued to the top of top longeron at the sta #0. A piece of 3/16-inch steel tube (brake line) is

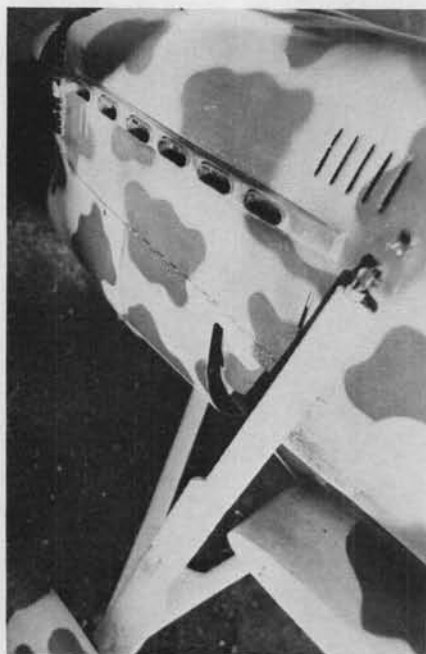
bound and glued below the cabane to the underside of the longerons. Use gussets to give rigidity to this area. The rear cabane is bent and fastened in place on the top longerons, bind and solder to the front cabane.

The 1/4-inch birch ply firewall is built in place using 1/8-inch birch ply sides and gusseted. The 1/4-inch ply u/c keel is cut and securely glued using epoxy. Then 1/8-inch ply is glued to each side of keel at the

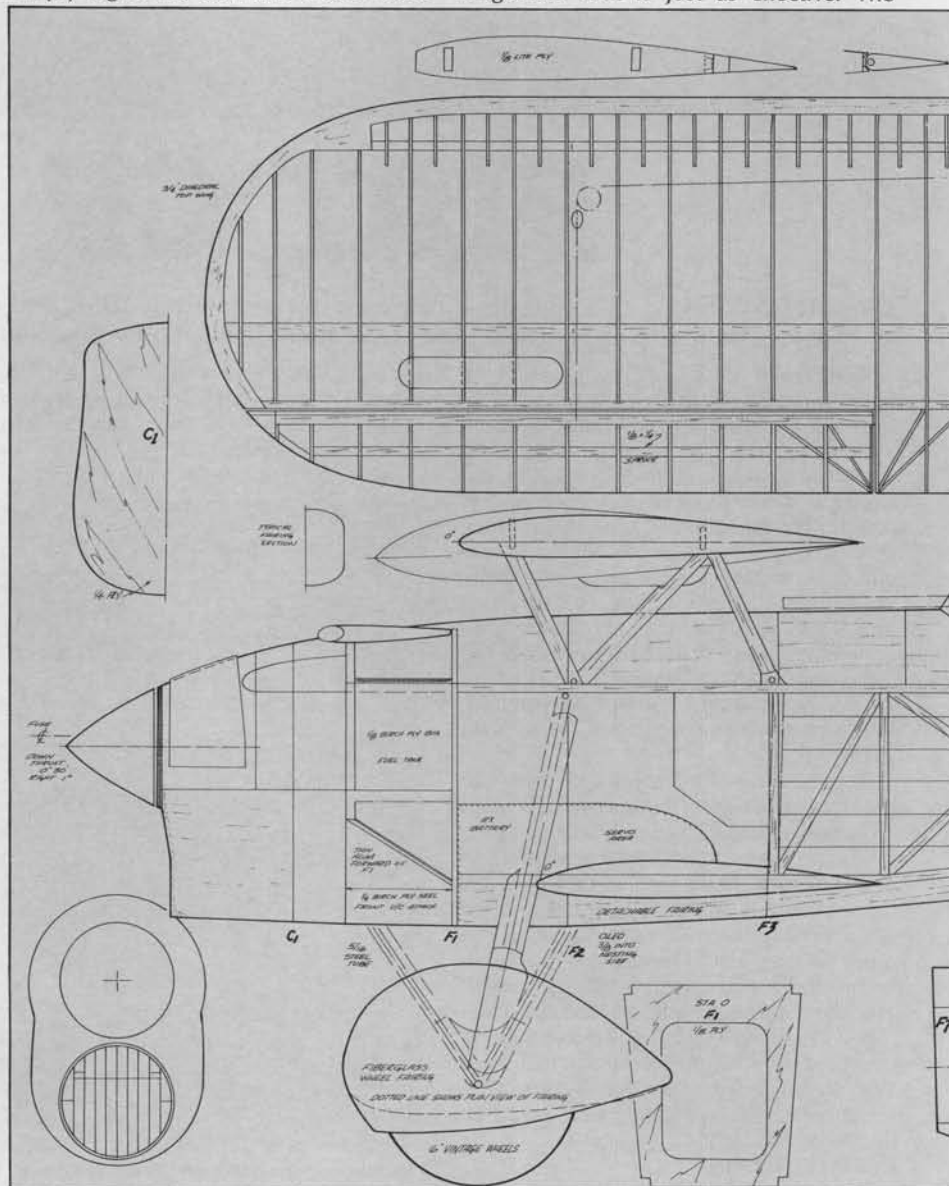
angle shown in the side view. This helps to get the warm air out of the cowl. The 1/8-inch ply top is added later. The u/c is bent now and assembled. The main leg slides into a 3/16-inch steel tube and the vees are fastened to the keel and F2. Do not fasten them in place yet. The tailwheel can be assembled and installed. I don't use a steerable tailwheel, rather a semi-castering arrangement that is just as effective. The



The O.S. 1.20 FS with baffles. Front cowl fastener uses one screw. Rear cowl fastener is spring-loaded.



Landing gear attaches to working oleos. Engine exhaust can be seen peeking through the cooling outlet.





Rudder control and tailwheel detail of the Fiat.

formers can now be added to give shape and stringers 1/16 by 1/4-inch spruce glued in place.

The planking is next, and care must be taken around the cabane. The vent area is sheeted using 1/16-inch ply—cut the ply oversize and stick in place using C/A. The wire cabane is faired and a servo extension cord run inside one of the fairings.

The wings are built in one piece and the

aileron servo mounted in the top wing center section fairing. The dihedral should be built-in as per the drawing.

The wire T.E. is easier than a regular T.E. The tip bows are laminated using 1/16 x 1/4-inch basswood, and ribs cut out of medium, 3/32-inch balsa.

Slide the ribs onto the spars; make sure everything is square, then glue. The aileron spar continues to the center section but



The CR 32 ready for a flight. Total weight of the author's model was 10-1/2 pounds. This plane has made 80 successful flights to date.

changes shape at the inboard end of the aileron. Add the leading edge. Cut enough 1/16-inch dia. aluminum tube 3/32-inch long to glue one on each rib T.E. Reinforce with a piece of thread then glue bracing strips as shown to rib T.E. where wire ends. *Do not leave out.* U-control cable is then threaded through the tubes and secured

will be available prebuilt or in kit form, and it's really well done.

This is the design the Russians flew in the 13th World Aerobic Championships for 1986. Observers comments of the full-size Sukhoi's ranged from "Good show!" to "I / man, did you see that / climb?"

The full-scale design doesn't have any dihedral but does have a little L.E. sweep. Although "O" dihedral models typically are not groovy in smaller models, the larger designs which damp better and are easier to see, work well. •

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firmly at each end, with just enough tension to keep the cable straight. Install tip bows and wing mounting blocks.

Ailerons are built with a 1/8-inch x 1/4-foot spruce strip glued in place as shown. The T.E. is added as before. Hinging is with Robart steel pin hinge points. Connect servo drive with pushrods and bell cranks. Sixteen pieces of 1/4-inch brass are cut and drilled to clear 2-56 screws at one end, and 1/16-inch at the other. These are strut attachments and are bolted to the spars which should be reinforced locally.

When wings are complete, fit to fuselage and glue in mounting hardware. Fasten both wings in place and rig ready to make the struts.

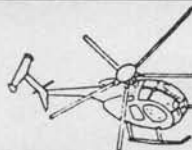
Using 1/16-inch wire, bend on end at 90 degrees and fit in 1/16-inch hole in brass. Cut wire to approximate length. Attach a

solder clevis to the mating brass strip, cut wire to final length and solder clevis in place on wire. The bent end is secured with a Snap-R-Keeper. All struts are made this way then faired with streamline tubing. The wire should be supported inside tube using balsa strip. Streamline tubing should be cut so the fastenings can be made, the cuffs will

cover the ends when in place. Covering supports should be glued where strut attachments enter wing.

TAIL SURFACES

Tail surfaces are built next and are straight forward except for the different T.E. Fit in place and connect servo drives to control surface. Do not glue in place until covered.



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ENGINE MOUNTING

The engine and cowl are attended to by mounting the engine to the firewall using blind nuts and an aluminum mount. Place the tank behind firewall and install the plumbing and throttle drive, then the top of the box can be glued in place. A circle of 1/8-inch ply is slid loosely onto prop driver then a piece of ply fastened onto crankshaft to hold the circle in place. The upper cowl is built onto front of fuselage using whatever balsa scrap or block is needed. Next, remove engine and build the lower cowl. Sand the cowl to shape, then part lower cowl and carve out to clear engine and give good air flow. The exhaust is ducted out through the air vent using an extension. Make sure this is secure. Believe me, the exhaust can burn a hole if it hits the fuselage.

COVERING AND PAINTING

Covering is done using SIG Coverall. The fuselage is covered in the normal manner. The wing panels are covered in one piece from L.E. to L.E. The tips are tailored, and the covering stuck down. Wherever wire T.E.s are used, cover as above. Shrink using a heat gun—use only enough heat to get out all the wrinkles. Give two coats of non-shrink dope. Three layers of masking tape are applied where the covering meets planking (stick on Coverall), then prime and finish the planked area. After sanding, remove the masking tape and you will have a finished panel line. This method can be used to simulate other panels. Rivets are made using Wilhold 56 glue applied with a toothpick.

The paint job was sprayed on using butyrate dope. All the underside is light gray; camouflage is sand and spinach. Spray the sand over all the surfaces not painted gray; when dry, apply the green blotches. Insignia goes on last, then the whole airplane is given a coat of clear butyrate with flattener added.

FLYING THE FIAT

Flying is no problem; make sure balance is correct and control movements right. Ballast was not needed on the original and the weight came in at 10-1/2 lbs. To date, the plane has made 80 flights, and flown in some winds I would not recommend. I could go on, but you'll have to find out for yourself. It seems to be a better plane than the pilot, no matter how good the pilot. •