



SUPER SATAN



Flier-designer, Larry Scarinzi achieved what he feels is Combat-must, high speed performance.

Left, interesting profile of the Super Satan in this standing on-end photo of the machine.

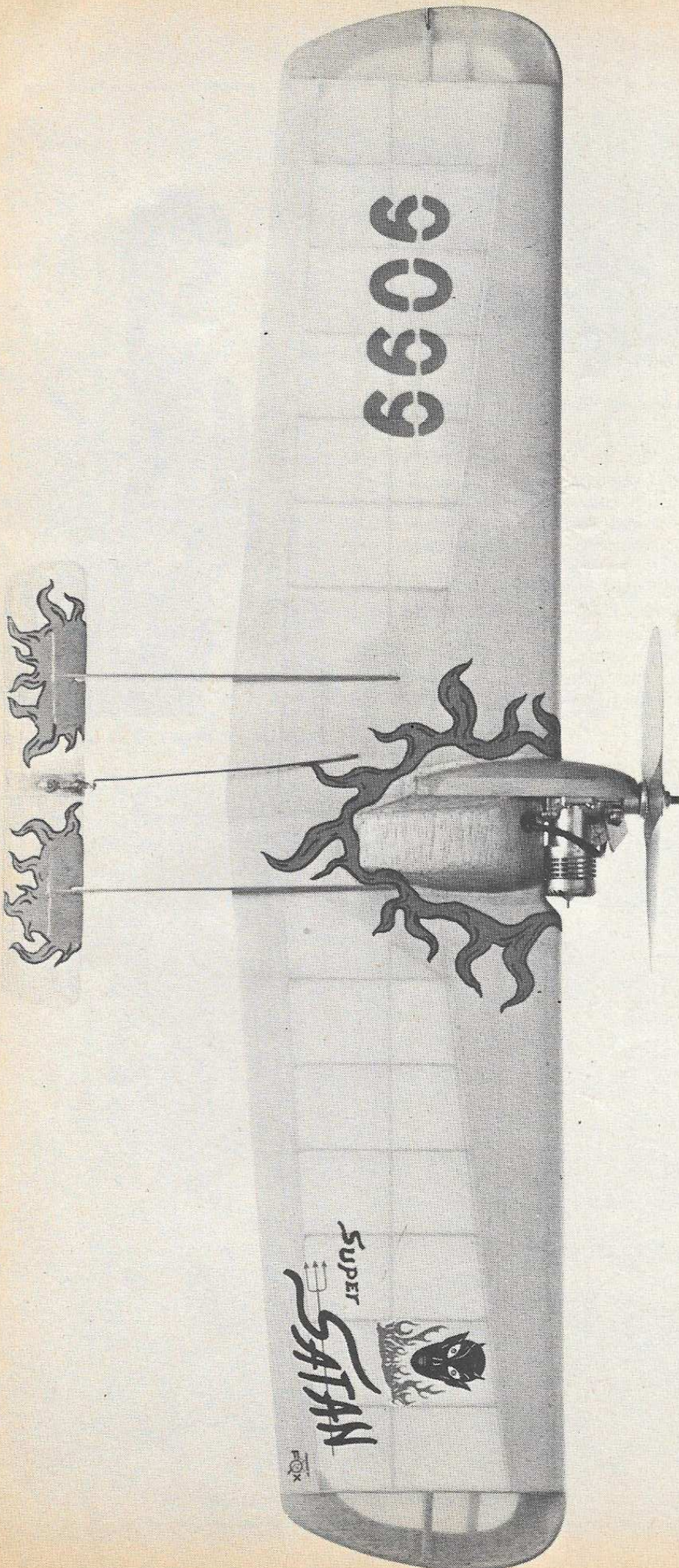
PHOTOS BY RON SCALERA

Our joint design venture couples two of the top names in Combat. This fearsome combination produced a superb machine to put fear in the hearts of our top combat competition.

**By LARRY SCARINZI
& CARL GOLDBERG**

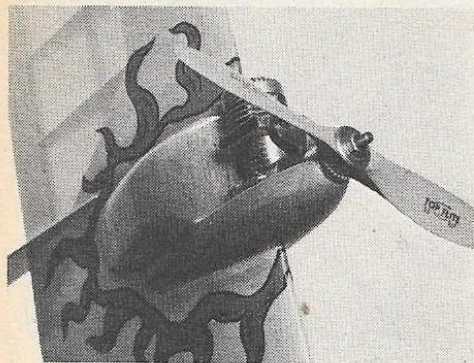
► It was at the 1964 Dallas Nationals that we got together and discussed Combat trends. It was brought out that popular combat models have a maximum span of 36" and an aspect ratio of less than 4 with trends being towards lower spans and aspect ratios in an attempt to reduce weight. In Carl's mind, the competitive flyer was overlooking the fact that lower aspect ratio models are bound to lose speed in tight maneuvers. By going to a higher aspect ratio, the model could take these turns with less loss of speed, a distinct advantage. This higher efficiency could also yield a model with less total wing area and hence more level flight speed. To test these ideas, we agreed to work together in developing as near ultimate a combat machine as possible.

The main criteria for an ultimate combat design are highest possible speed in level flight with the tightest possible turning ability with minimum loss of speed. Also important is the ability to be flown easily and with a feeling of confidence. These criteria are occasionally disputed by a few who claim that quick thinking, *(Continued on next page)*

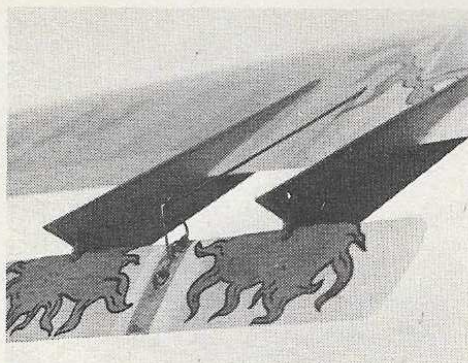




Incredible knife edge profile of the Super Satan is seen in this remarkable photo. Engine and pod, plus propeller offer maximum cross section.



Fuel and engine pod details clearly shown.



Bent wire control horn, note streamer hole in boom.

SUPER SATAN . . . continued

etc., will beat the fast combat model. All other factors being equal, the fast Combat model must then become the full-time aggressor.

Design and development of the Super Satan were aimed at fulfilling this criteria and resulted in an extremely maneuverable combat model capable of 125+mph speeds.

The first test vehicle (SS #1) was built directly from Carl's straight 40"

span layout. Comparison tests of this model versus a Voodoo of equal workmanship showed the SS #1 equal in speed and surpassing the long established Voodoo in maneuverability and smoothness. With this and all further comparison tests, engine and prop were switched from one model to the other to prevent undue advantage.

Now came the long development trail, and many long distance phone discussions between Chicago and Whippany, N.J. To (Continued on page 41)



Our cover girl, Dawn Cosmillo with Super Satan.

(Continued from page 19)

Use of 8-8 props has not been readily accepted on conventional combat designs as they tend to bog down during maneuvers. By comparison, the Super Satan exhibits less drag not only in level flight but through maneuvers as well, making it well suited for use with higher pitch, somewhat unconventional (in combat) props. We hope you will give various 8-8's a fair try; however, a word of caution. Some thin blade 8-8's tend to throw blades at high rpm's. Stress at prop trailing edge,



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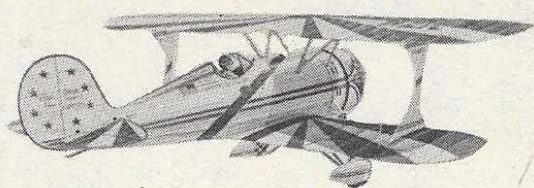
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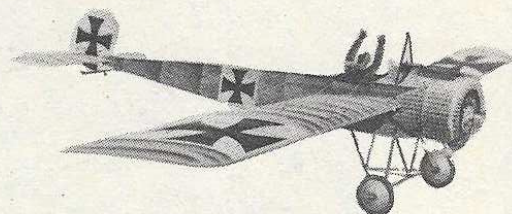
Kit A-23 Fokker

EINDECKER-EIII

Forerunner of Germany's World War I vaunted Fokker fighters, the Eindecker was the first to use propeller-synchronized machine gun fire. Max Immelman (the maneuver still bears his name) piloted this great fighter. Simple lines, large wing area make our scale model a flying beauty.

\$2.49

wing span 25"



where it is clamped by the drive washer, is usually the culprit. We suggest grinding four teeth away on opposite sides of the drive washer to allow a nest for the prop trailing edge to set in. For more details, see pg. 27, Round and Round, M.A.N., 1/65. If you still feel that a 9-7 is a must, Satan's performance with this size has still surpassed that of any current combat design tested.

Combat often necessitates flying with your eyes off the model and also maneuvering in awkward positions in relation to the wind. You will surely appreciate the Super Satan here, as it imparts a feeling of confidence and security to the pilot. It has a firm, steady line tug with no tendency for the outside wing to lift during tight maneuvers, a condition common (in varying degrees) to conventional straight wing combat models.

At this point a lot of claims have been made for the Super Satan. The method used in testing and the best way we know of to evaluate design superiority is to fly competitive models under similar conditions using the same engine, prop, fuel, etc. This should be done on the same day to more nearly assure similar atmospheric conditions.

We suggest you compare this model with your present favorite by switching your best mill back and forth between the models. Do this with several props, Blast and Missile Mist fuel, noting performance.

In our own exhaustive tests comparing this design with numerous competitive combat designs, the Super Satan has always come out clearly on top with visibly sharper maneuverability and speed margins of 8-11 mph when using 9-7 props, and 12-15 mph when using 8-8 props. Most streamers will disintegrate rapidly

under these conditions. This is a problem for contest officials.

It is interesting to note that even relatively crude Super Satans flew extremely well and out-performed better-built brand X competitors.

The design was built by a number of East Coast combat flyers with gratifying results. After attaining speeds of 120-125 mph for their first time, plus tighter maneuvers, it was readily agreed that this is the hottest combat design that they have ever flown. After flying a Satan, one Chicago flyer commented, "That I would PAY to fly!"

Because development was aimed at the model, stock Fox .36X BB's were used as a general rule. However, it is advised that the engine be deburred, lapped if necessary and the ends of the solid wrist pin be contoured to conform to the shape of the cylinder and then polished. Wrist pin work is unnecessary if the piston is equipped with wire snap retainers.

If inexperienced, we suggest leaving engine untouched. The above will not increase speed of engine but will serve to lengthen its life. For more top speed, we suggest that you refer to the Blitz article (M.A.N.), July '64 for engine clean-up details.

Final design of the Super Satan presented here incorporates to a new high degree the qualities sought after by combat flyers—both higher level flight speed and sharper turning radius, with less loss of speed in turns. Its new design features have been thoroughly proven step-by-step, through a large number of test models.

Because of the speed and exceptional maneuverability of this model, we highly recommend use of the "pacifier" fuel system shown to assure more consistent

motor runs during violent maneuvers. However, a metal tank can still be used with reasonable success.

The tapered wing takes a little more building effort than conventional combat wings, but we feel it is well worth it. Building from a kit (kit release date not yet known) will be easier as it eliminates cutting out a number of different ribs, obtaining formed leading edges, etc.

Study plans and pick wood in accordance with wood chart.

The leading edge may be shaped from a formed 3/4" Pactra L.E. (or similar), cut down to proper (3/8") width, or a 1/2 x 3/8" balsa strip. Advise carving leading edge to shape after wing is sheeted. Cement 1/8" birch ply L.E. reinforcement in place. For strength, use white glue here, also on engine and fuel pod and center sheeting. Slide ribs onto 1/4 x 1/8" spar. Pin and glue ribs lightly (to allow alignment when wing is pinned down) to leading edge. Secure bottom trailing edge over shims placed on wing plan. Block up rear edge of leading edge with 9/16 x 3/64 balsa and locate ribs over bottom trailing edge. Secure ribs and bottom trailing edge with pins located to allow positioning of top trailing edge. See plan. Add top trailing edge.

Notch out leading edge to accept engine, add engine mount assembly, controls, tips, formers T1, metal tank (if this is your choice) and all sheeting. Sand leading edge to final shape and add 1/2" balsa engine pod. For pacifier fuel system, cut out leading edge sheeting, assemble pacifier pod taking care to remove all sharp edges and fuelproof inside surfaces. Sand entire model paying attention to streamlined contouring around fuel pod, formers T1 and engine pod. Fiberglass engine and fuel pods.

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Apply two coats of thin clear dope to all wood areas of wing, sand lightly and cover with silk. Dope until silk is tight and well-filled (8-10 coats), as smooth tight silk can only help performance.

Dope rudders and stab and assemble. Secure assembly to wing using several coats of glue and complete model.

Check wing for warps and steam straight if necessary. Steaming techniques are proving successful and will remove any warp.

Check C.G. location. If tail-heavy, add a spinner nut to compensate during initial flights.

The tapered wing ribs require extra time to trace all different ribs. To mass produce five (or more) models at one time, we suggest gluing each rib pattern to a 1/16" x 1" x 9" balsa (or ply) blank. Stack required number of 1 x 9 balsa rib blanks with pattern rib on top and secure stack with pins. Cut stack with band saw. Repeat for all needed ribs, wingtips, rudders, etc., and save patterns for next go around.

We would like to hear of your experiences and any suggestions you may have.