Super Sport Mk. V

By Mike Ward

Here's a Super Slope Soarer

That's a Great Flier in Light or Heavy Lift!

In 1980, I began building and flying R/C model aircraft. I was living in Omaha, Nebraska at the time. I started flying with a Carl Goldberg "Gentle Lady," with a .049 engine mounted on a wing pylon. I did this because out there, in all the grain fields, there was always a place to fly.

Since this beginning, I have built many different types of R/C gliders. I'm now 38 years old, living in Southern California, and have settled into flying slope gliders, or flying gliders off the slope. I'm a desk jockey at an air conditioning company, supplying customers with replacement parts, and flying slope gets me off my rear and climbing. The exercise is great, and the views are fantastic! In my opinion, it's the best flying experience you can have.

I guess I became jaded and wanted my own creation, so I acquired the following books: *Model Aircraft Design* by Martin Simons, the *1938 Model Aeronautics Yearbook* and *The Model Glider Design* by Frank Zaic.

Reading these books opened my eyes to slow-flying model aircraft. When I was reading the Zaic books people would often ask "Why read books published in 1938 and 1944 to design a new model glider?" My answer to them was that if you know and understand where you have been, you will have a better idea of where you are going ... and, hopefully, you won't make the same mistakes that have occurred in the past. Also, by studying *Model Aircraft Aeronautics*, and by reading the articles published in *RCM*, I was kept up-to-date on current model aircraft flying philosophy.

So, with my 13 years of experience in building and flying, and the knowledge gained through whatever I had been able to read, I went to work.

I fly slope gliders all of the time now. Over the years, I've noticed that with slope flying you can use a floater (like a "Gentle Lady") or you can fly the slope racers. You have two choices of flying: slow or fast. I

SUPER SPORT MK. V
Designed by:
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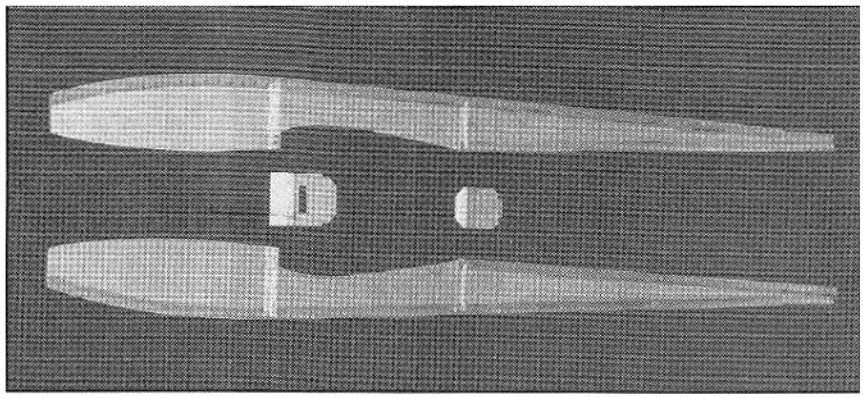
TYPE AIRCRAFT
Slope Soaring Glider
WINGSPAN
60-3/8 Inches
WING CHORD
5-5/8 Inches (Avg.)
TOTAL WING AREA
309 Sq. In. (Approx.)
WING LOCATION
Bottom of Fuselage
AIRFOIL
S 3021
WING PLANFORM
Tapered Leading Edge
DIHEDRAL, EACH TIP
1-3/16 Inches
OVERALL FUSELAGE LENGTH
33-1/4 Inches
RADIO COMPARTMENT SIZE
(L) 6-1/4" x (W) 1-1/2" x (H) 1-1/2"
STABILIZER SPAN
13-3/4 Inches
STABILIZER CHORD (inc. elev.)
2-7/8 Inches (Avg.)
STABILIZER AREA
38 Sq. In. (Approx.)
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
5 Inches
VERTICAL FIN WIDTH (inc. rud.)
4 Inches (Avg.)
REC. ENGINE SIZE
NA
FUEL TANK SIZE
NA
LANDING GEAR
NA
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., Ail.
C.G. (from L.E.)
2-3/8 Inches (at Fuselage)
ELEVATOR THROWS
1/4" up — 1/4" down
AILERON THROWS
3/8" up — 1/4" down
RUDDER THROWS
max — max
SIDETHRUST
none
DOWNTHRUST/UPTHRUST
none
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa & Ply
Wing ..... Balsa, Spruce & Pine
Empennage ..... Balsa & Spruce
Wt. Ready To Fly ... 18 Oz. (1 Lb. 2 Oz.)
Wing Loading ..... 8-12 Oz./Sq. Ft. (with ballast)



Fuselage sides with plywood doublers and tri-stock glued in place.

felt the need for an "in-between" glider, something faster than a floater, something a little slower than a slope racer. The construction had to be as simple and straightforward as possible, I hate over-built model aircraft and this model had to be built of balsa, spruce, and plywood, without any exotic building techniques.

After pages of calculations, many, many drawings, and four different variations, she is ready to share with all of my fellow RC'ers. She is called Super Sport Mark V and has a 60-1/2" single taper wing. It is a low wing design and utilizes built-up balsa, spruce, and plywood construction. Flying weight is 16 to 18 oz., plus up to 8 oz. of ballast to aid in high wind conditions. You trim the bird to be nose heavy and add the ballast at the airplane's Center of Gravity, not the other way around.

CONSTRUCTION

FUSELAGE:

(1) Cut fuselage sides from 3/32" balsa sheet. Cut 1/16" plywood doublers. Cut 3/8" triangle longerons with a razor saw, every 1/2", about 2/3 the way through, the first 7" of each longeron. Remember that you are making a left and right side.

(2) Glue and pin 3/8" triangle longerons into place, as noted on plan.

(3) Epoxy 1/16" plywood fuselage doublers into place.

(4) Glue 3/8" triangle balsa, and 1/8" sq. balsa bulkhead supports, as noted on plans.

(5) Cut and assemble bulkheads, A, A1, B, and B1 from 1/16" plywood. Let dry.

(6) Tack glue fuselage sides together, so you can sand them to a uniform shape. Drill 3/16" holes for wing dowels.

(7) Carefully separate sides.

(8) Position bulkhead "A" into place, then trim the longerons at the tail, so tail comes to 3/16" thick at end.

(9) Glue fuselage at tail, then epoxy bulkhead "A" into place.

(10) While fuselage is drying, cut out nose block according to plans.

(11) Epoxy nose block into place. Then epoxy bulkhead "B" into place.

(12) Glue 1/8" x 1/4" balsa saddle into place.

(13) Sand nose block to shape. Lightly sand fuselage again for a uniform shape.

(14) Cut 1/16" plywood skid, then epoxy into place.

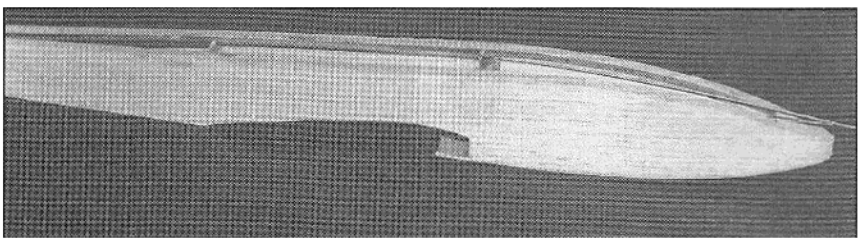
(15) Install pushrods per set-up notes. Support pushrods in fuselage per plans.

(16) Finish sheeting fuselage with 3/32" cross-grain balsa. Reinforce tail and stabilizer area with 1/8" x 1/4" balsa, then fill open area with 3/32" balsa.

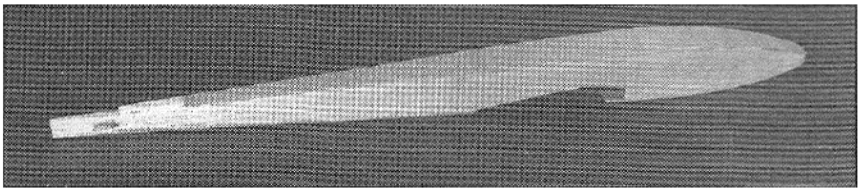
(17) Sand fuselage to shape.

(18) Cut out hatch according to plans. Be careful! You don't want to have to make a new fuselage.

(19) Epoxy a 3/8" sq. balsa block 1 1/16" long to rear portion of fuselage opening for the screw that will hold the hatch down.



The sides are now joined together with nose block and plywood bottom already added. Pushrods are installed prior to installing top sheeting.



Basic fuselage box is completed, ready for shaping and sanding.

Pages 68 and 69 off.

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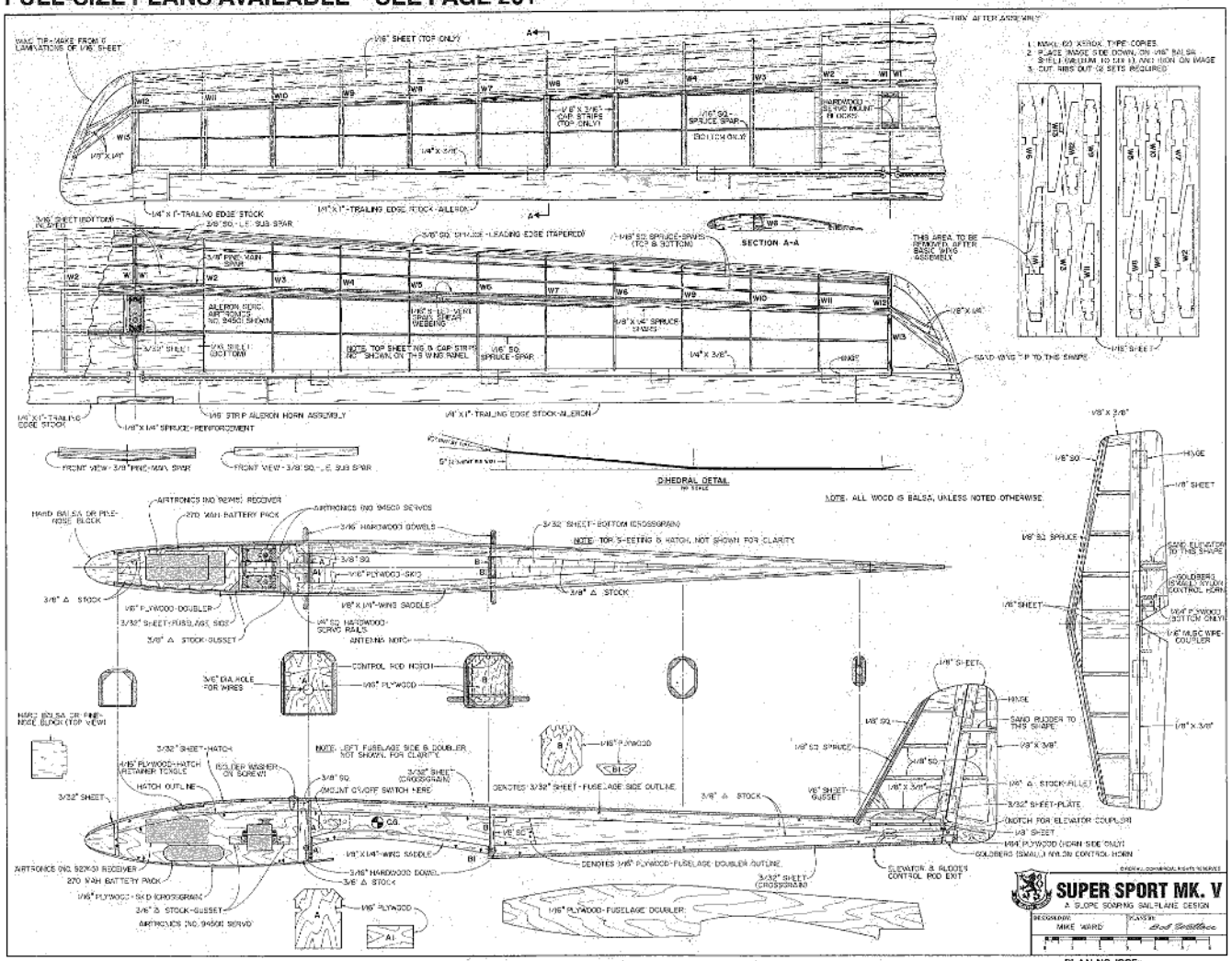
FULL-SIZE PLANS AVAILABLE – SEE PAGE 201



(18) Using 3/32" thick balsa, cut a subspar for the back, bottom wing stringer. Cut 3/32" balsa sides for servo box. Fit everything together, then Zap into place. Cut and Zap sheeting to wing, leaving a 1/8" overhang at rib W2.

(19) Using 5 min. epoxy, glue the center (torque rod) trailing edge assemblies into place. Make sure the clearance is okay. Make sure that you have enough clearance for the wingtip pieces too.

(20) Sand everything smooth with a block sander. Cut sheeting from top of wing for servo bay.

(21) Cover with a favorite covering material. Install ailerons with a dab of silicone adhesive on the torque rod arms, and a "skosh" in the holes. Use tape to hold ailerons stationary until the silicone cures.

SET-UP NOTES

(1) Center of Gravity, at rear edge of wing spar. Move C.G. farther back as you become more familiar with flying the bird.

(2) Pushrods are a combination of Sullivan Gold-N-Rods, using No. 508, and the outer pushrod housing from No. 503. The No. 503, red outer housing, is used from bulkhead "B" aft to tail exit. The No. 508 outer housing is epoxied to fuselage sides.

(3) Mount aileron servo as low as possible into wing. Use hard wood for servo rails.

(4) Suggested control travel settings: Ailerons: 3/8" up — 1/4" down. Elevators: 1/4" up — 1/4" down. Rudder: all you can get without hitting the elevator.

FLYING NOTES

Before you throw the bird off into space, double check everything to make sure it's straight.

Turn the rx and tx on. Wiggle the controls and make sure everything works and goes in the right direction, then heave! Give immediate down elevator to gain airspeed, and to get out to good air. Trim as you normally would. First trim ailerons, then rudder. Elevator trim is questionable. You will have to pick a happy medium, because when flying slope, you are always in changing wind conditions, and you will constantly change elevator trim settings.

Do not fly in winds less than 10 mph. In wind 15 to 20 mph, you should start adding ballast, 2 to 4 oz. For 20 mph and up, 4 to 8 oz. of ballast should be added, or to however you feel most comfortable flying. I have found that Super Sport Mk. V flies best with a wing loading of 10 oz./sq. ft. and up.

Use little rudder while turning. The ailerons will do most of the work. Too much rudder and aileron at the same time will cause a spin ... but do not worry. This bird will not spin for long. She quickly regains flight. The only time you should use heavy rudder is inside a thermal. You have very high lift occurring. The glider will assume a nose down attitude. You use heavy rudder to turn inside the thermal. This keeps the wings as flat as possible, taking advantage of every ounce of lift. I never had a problem of going into a spin while flying in thermal conditions.

My brother and I have been flying the Super Sport for two years now, and we are still a long way from getting bored with her. On one hand, she can hang in the air with the floater gliders. When you feel like it, hit a little down elevator and proceed to run circles around those floaters. (I only wish my flying skills were as good as the Super Sport Mk. V is flying.) Some people seem concerned about a low-wing design being prone to wing damage upon landing, but remember, you'll be standing on a hill with a grade of at least 4 to 1, or better, Unless you really stall out just before landing, the nose will always take the impact of the landing.

Super Sport Mk. V is at home flying along the cliff edge, slip streaming up over your head, out over the abyss, to top out a