



THE ZENITH

by SAL TAIBI

The old free flight master turns out a ship that won a second in ROW, first Class A in Dallas Nats. Takes .09 displacement engines.



Sal, Modelcraft Trophy. Ship also won San Dimas all-classes ROW.

MODEL AIRPLANE NEWS • February, 1952

► The *Zenith* represents my first successful free flight design since leaving Indiana and moving to the Utopia of model flying, the land of balmy breezes and round the year flying, Southern California.

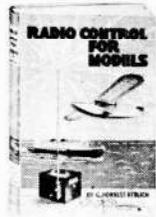
I had long been impressed by the large size of the free flight models flown on the West Coast, and along with some additional personal experience gained before I left Indiana, I've come to the conclusion that the size of the airplane did not determine the angle and rapidity of climb as much as the total weight of the model. I figured that if a model could be kept light in weight it could climb right along with the smaller model and, properly adjusted, could certainly outglide it. The light wing loading of the *Zenith*, approx. four ounces per square foot gives the model a beautiful floating glide with excellent tendencies to pick up thermals low to the ground.

The design experimentation began with an AA model. All rudder and airfoil changes were made on this model and when it seemed that the airplane could take all the power available with no bad power characteristics and could fly well in a high wind, the plans were scaled up to suit the Arden .099. You can substitute any appropriate .09.

The effort was well rewarded when I took the *Zenith* to contests. On July 8, 1951 the *Zenith* being flown in an all-classes-combined, R.O.W. meet at San Dimas, Calif. placed first with a total of 12:41 on a very cloudy, overcast day. Two weeks later at the Nationals at Dallas, Texas it placed second in R.O.W. and the following day the *Zenith* made a total of 27:44 to win first place in class "A".

Obtain the full-size drawing, then study the plans and familiarize yourself with the construction. It is very important that the wood be of fairly light stock, quarter grained if possible. This will (Continued on page 44)

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CONTROL LINE

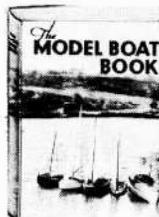
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Double Feature

(Continued from page 34)

tank. A profile tank is mounted flush against the bottom of the fuselage. Eye dropper types may be used but are apt to give mixture-change problems as the fuel is consumed. Timer tanks and/or an engine timer can be used. The *Torp* or *Wasp* attach flush to the firewall assembly in which case wire hooks must be added to the wood for stretching the hold-on rubber bands to the hooks on the sides of the fuselage. Some trim changes should be expected when engines are changed and it may be necessary to adjust for different amounts of torque.

Covering was yellow on the fuselage and orange. *Sky Sail* or *Silkspan* covering can be employed. Wet cover after having doped all surfaces to be covered. As wing and tail surfaces dry, watch for warps and remove them before things set up permanently. Warps can be corrected when doping and even later by steaming the doped surface and holding in the desired position. Give three coats of half dope and half thinner, mixing about six drops of castor to the ounce of dope on the last two coats to prevent excessive paper pull. Grain runs spanwise on flying surfaces, lengthwise on fuselage.

Flying is conventional. Power turn is to the right and the glide to the left. A large amount of tilt—left side high—on the stab is required for tight turns. Avoid use of rudder trim tab if possible. Keep slowing up the glide, adding tilt and you will be amazed at the extremes to which you can go. Thrust adjustments are easy with the detachable nose. Slight down and left may be required.

The Zenith

(Continued from page 17)

help to keep the weight down. The original weighed ten and one quarter ounces.

Cement three pieces of 3/32 x 2" soft balsa together for each side of the fuselage. While these are drying cut out all the fuselage bulkheads; you will find that the bulkhead Nos. 1 and 7 are undercut on the lower sides for the added fuselage stiffeners at the front and rear of the fuselage. Bulkhead No. 7 is 1/16" mahogany plywood. Do not use balsa on No. 7, as this bulkhead acts as the pivot for the stabilizer leading edge when the tail pops up.

Cut out the fuselage sides, sand and then add the fuselage stiffeners at the front and rear. These are made of 3/32" med. hard balsa. When dry, join the fuselage sides using bulkhead Nos. 1, 2, 3, allow to dry and then add bulkhead Nos. 1B, 4, 5, 6, 7, 8. Bulkhead No. 8 is 1/8 sq. 3/4" long. Next cover the top and bottom of the fuselage with 3/32" sheet, balsa running the grain with the width of the fuselage. Cement in firewall No. 1-A. Note that this model has two firewalls, No. 1-B that fits between the fuselage sides and butts up against the front of the fuselage stiffeners, and then No. 1-A which cements on in front of fuselage, thus giving better shock resistance. Add the top fairing bulkheads No. 1-C and side fairings No. 1-D. Allow to dry thoroughly and then sand fuselage all over. Drill holes for the engine mounting and cement nuts to the rear of firewall. Drill 1/8" holes for the front and rear wing dowels and front stag dowel. Cement sub-rudder in place. Note that on this model the rudder trim tab is located on the sub-rudder. Cement the rear stabilizer hook of 1/16" wire into the fuselage and also 1/4" O.D. aluminum tubing to hold the fuse. Cut hole for *Spitfire* timer and cement in place or use screws, if you prefer. Cement front windshield in place, noting that the windshield pattern has dotted lines. If you crease the windshield along these dotted lines it will be much easier to install and a minimum of pins will be required to hold while drying. Cement side windows and dowels in place. Cut out two pieces of 1/32 x 5/16 x 9/16" copper or brass, drill 7/64" hole through as noted on plans and then solder each half of the landing gear to these plates, solder on spreader bar. This type of installation permits mounting the gear on the outside of model and it is easily detachable with the engine. Give fuselage about three coats of clear dope

and follow with two coats of colored, then two coats of fuelproof.

The stabilizer ribs are made of 3/32" stock. Note that the ribs overlap the leading edge about 3/32". The stab is of conventional construction. The leading edge is 1/4" sq. and the trailing edge 3/64" x 3/4" tapered trailing edge stock. Spar is 1/8 x 3/8", the tips very soft 1/4" sheet balsa. Add gussets while stab is still on board. The rudder is made of 3/32" balsa. The cutout in front of the rudder automatically stops the stab at the correct pop-up position, approximately 45 degrees. Sand rudder and then give one coat of dope. Pin it to board while drying. When stab has dried, sand and cover with Jap tissue or comparable covering material, give three coats of clear dope. Cement rudder on stab, then give rudder two more coats of clear dope, sanding lightly between coats, and add the hold down hooks at the front and rear of stab. It is best to key the stab so it will not move. This is easily done by cutting pieces of 1/8" dowel about 1/4" long and then splitting them. This gives a flat gluing surface. Hold down stab with rubber bands and cement keys in place on bottom of stab. Give stab and rudder two coats of fuelproof.

The front of the trailing edge of the wing must be raised up 1/16" to conform with the correct airfoil shape. Shim up the trailing edge and pin in place on the plans. Taper leading edge as noted on plans and pin it in place. When cutting the ribs it would be best to leave them about 1/32" long and then sand them to fit as they are inserted in place. Next cut out gussets and cement in place. The tip gussets are made of 1/4" sheet balsa. When wing is dry remove from the board and insert the spars; allow to dry thoroughly and then trim down and sand the leading edges and tips. Part wing at the outer dihedral joint and put in specified tip dihedral. Dihedral braces are made of 1/8" medium sheet balsa. No dihedral brace is required on the trailing edge at the tip dihedral joint; the gussets do this job well enough. Join the wing in the center. Be sure to insert center rib on the spar before joining wing. Do not put gussets in the center section panel or there will not be enough room for the sheet covering; after the wing has been joined, sheet cover the center section with 3/32" soft sheet balsa. Note that the sheet covering is inlaid between the ribs, not on top. Sand entire wing structure lightly. Cover wing with Jap tissue or comparable covering material, then give three coats of clear dope and two coats of fuelproof.

The floats are built entirely of 3/32" sheet balsa. No leading or trailing edges other than the sheet balsa were used as sheet balsa seemed to be sufficient strength. Cover bottom of float with 3/32" sheet balsa. Notch sides of float to take a piece of 1/8 x 1/4". Wrap a piece of 1/16" I.D. one inch long brass tubing to a piece 1/8 x 1/4" balsa with thread and then insert unit into notch. Cover top of float with 3/32" balsa. The floats are then placed on the landing gear. Prop up the front of the floats in the following manner. Pin the trailing edge of the float to the board and then place a piece of 1/8" sq. under the step of float; while in this position cement on float attachment hooks of 1/16" music wire. When dry, remove from board and coat liberally with cement. After building rear float cut slot in top as noted on plans. To install rear float, cement to the sub-rudder at proper angle. Dope the floats well. Give at least four or five coats of clear dope and two colored.

Balance model 3-1/4 inches forward of trailing edge. Test glide a few times. When a smooth glide is attained you are ready for power flight. Set the rudder tab over to the left about 1/32". This model should climb in a wide right circle and glide in a flat right circle. Set timer for about ten seconds, run engine a little rich and then launch model. If the power flight is too tight it can be corrected by moving the tab. Thrust adjustments are not necessary as tab adjustments will do the job just as well. When tab is set cement it so it will not move. If the circle in the glide is not tight enough it can be tightened by tilting the stab so the left side is low; this will tighten up the circle to the right. Never move the rudder tab more than a 1/64" at a time. It is very effective. At all times use a fuse, even when testing. Many a good model has been lost on a five or six second test hop.

TO MODEL MODERN AIRCRAFT YOU MUST HAVE

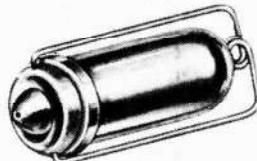


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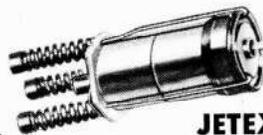


JETEX #50 engine

SPECIFICATION CHART :		Jetex jet engines			
MODEL	50	100	200	350	
ENGINE WEIGHT	.2 oz	.6 oz	1.1 oz	2.5 oz	
FUEL WEIGHT (MIN.)	.2 oz	.28 oz	.3 oz	.4 oz	
TOTAL WEIGHT	.4 oz	.88 oz	1.4 oz	2.9 oz	
THRUST (MAX.)	.6 oz	1.2 oz	2.3 oz	4.0 oz	
DURATION - ONE CHARGE	12 sec	20 sec	20 sec	12 sec	
DURATION - TWO CHARGES	—	—	32 sec	24 sec	
DURATION - THREE CHARGES	—	—	—	36 sec	
TORQUE	NONE	NONE	NONE	NONE	
EXHAUST VELOCITY	1200 $\frac{1}{2}$	1200 $\frac{1}{2}$	1200 $\frac{1}{2}$	1200 $\frac{1}{2}$	
OVERALL LENGTH	1 $\frac{1}{8}$ "	2 $\frac{1}{4}$ "	2 $\frac{7}{8}$ "	3 $\frac{3}{4}$ "	
MAXIMUM DIAMETER	$\frac{1}{16}$ "	1"	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "	
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Air Ways at British Nationals

(Continued from page 18)

brother Alan, who piled up 330 points out of a possible 400, with a very fast Elfin 2.49 diesel powered semi-scale. Although only a medium moment-arm job (without flaps), we have seldom seen tighter loops, bunts or eights. Brian gained his second place (323 points) with a two year old Yulon 30 (gloplug) powered design. A typical Nats entry in stunt featured 200-300 sq. in. of wing area, side-mounted motor, drop out undercart and good semi-scale appearance. Most competitors favored diesel in preference to glo-motors.

In speed, no new design trends were apparent—British diesels being used in the smaller models and American glo-motors (McCoys' etc.) in the larger classes. Mike Billington and Dick Taylor teamed up to walk away with class three (McCoy 19—95.16 mph), class four (112-24 mph) and six (McCoy 60—128.29 mph). This was the first time that speed had been included in the program.

Free flight has enjoyed a big come-back

this season and entries for this event totaled 134. Pete Wyatt won comfortably with two maximum flights of five minutes each (15 second motor run). His model is a conventional pylon (medium height) with sharp tip dihedral and undercambered wing section. The fin is fixed to the fuselage and placed forward of the stabilizer to allow the latter to tip for D/T purposes. The undercarriage is the single leg whisker type and the power-plant a sidemounted Elfin 2.49 diesel. Other models entered ranged all the way from Half-A's of 150 sq. in. to 1000 sq. in. monsters.

The rubber and glider events took place on the first day of the meeting, in very poor weather conditions, Ron Warring winning the former with his Zomby Wakefield (627 seconds) and J. Lambie the latter with 497 seconds. In both these and the free flight power, the aggregate of two flights counted for points. Gliders were mostly about Nordic A-2 size, but several eight and ten footers were seen going up on the towlines. In R/C, Sid Allen won with a simple slabside cabin.

—BILL DEAN.