

STRATOFLY THE SUNDUSTER

Complete data for building a reliable one wheel gas model with sensational glide

by **JERRY BROFMAN**

FOR the last two years in the gas model world, there has been an ever increasing demand for high performance. "The Sunduster" appears in response to this demand. This ship has been designed with extra large wing area for its size of motor displacement in order to promote excellent soaring qualities, which is essential for a contest ship. The other requirement is the climb. To achieve these qualities the ship was designed to incorporate the following features:

- 1—A long nose moment to help it hold its course.
- 2—A thin airfoil to give it speed on the climb and less drag.
- 3—A completely cowled and inverted motor in a streamlined, light efficient fuselage to reduce drag and give it a fast climb.
- 4—Large elevator surfaces to prevent stalling and induce stability.
- 5—Light, strong and easy to build structure.

The Sunduster was taken to the model flying field at Creedmore, L. I., for testing. It was found to have one of the most sensational glides ever seen in a gas model. Its first power flight was with the motor running very slowly; at the end of ten seconds the motor cut, and she pulled out into a smooth graceful glide which lasted one minute and forty seconds.

It was noticed during the flight that upthrust was needed in the motor. The ship was retrieved, the cowl removed, and two small washers were inserted under the two rear bolts to give it the required upthrust. Two more flights were then made with the motor advanced two notches. The times of the two flights were 3:21 and 3:56 respectively, each on a *ten second motor run*. All of these preliminary flights were made



Its designer and a few of the trophies it has won

with a low pitched, thin bladed 14" prop.

A higher pitched *wide bladed* 14" prop was added, and the motor was revved one notch more, which was only half speed. This flight was *sensational!* She climbed like a bullet, and after *seven seconds* the motor cut, and she started on a glide that lasted *five minutes and twenty seconds*.

On the next flight the motor was opened still higher, and she was let loose. She pitched her nose skyward and spiraled up. When the motor cut she leveled off into a slow, flat turning glide to the right. We followed the ship for about twenty minutes as she lazily drifted across the afternoon sky. The total time of the flight was 27:25 on a *ten second motor run!* This flight proved the ship to be definitely the superior contest plane that every modeler is looking

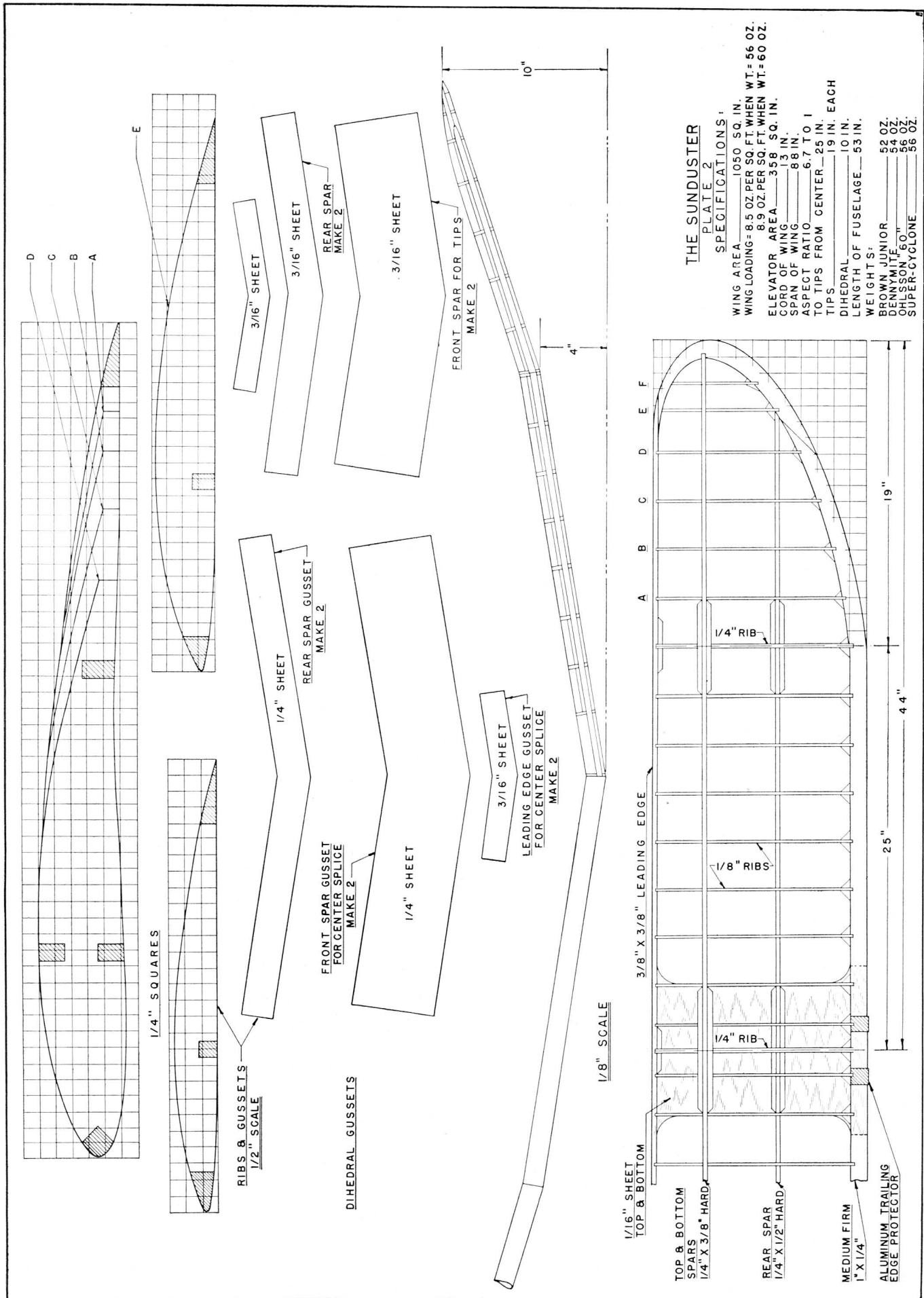
for. Here it is, The Sunduster—so see what you can do with it.

BUILDING AND FLYING—First, you must scale the plans to working size.

Follow the scale on the plans; then carefully study all the plans.

To build the body, first build the crutch out of 1/2" x 1/4" hard firm balsa. Then cut out all the top formers and glue in place onto the crutch. Cut out the firewall from 1/8" plywood, and cement onto the crutch at first 1/4" balsa former. At this point, cut out the 1/4" sheet balsa floor and glue on the firewall as indicated on the plans. Then cement the 3/16" square braces from the crutch to the floor. When this is done, lay the rear 1/4" square longeron on the body, getting the correct curve by cementing 1/4" x 1/8" braces flat on the rear bulkheads—then cement the 3/16" square braces, getting their length from your scaled up plan. Glue on the bottom longeron of 1/4" x 3/4" hard balsa on the 1/4" square. Reglue all the joints on the fuselage. When dry, put on the stringers of 3/16" square. After the stringers have dried, glue in the 1" x 1/2" x 8 1/4" gum or basswood motor mounts.

Bend the landing gear from a length of 3/32" steel wire. Remember to put a 3 1/2" sponge rubber wheel in first. A sponge rubber wheel is recommended, because the way the wheel is mounted on the landing gear it cannot be removed. If it were an airwheel and got punctured, it could not be changed. The landing gear is then tied to the firewall, first with milk bottle wire, then with heavy thread, then it is cemented a few times. Then cement the 1/8" stringers to the rear bulkheads, and cement the wing platform onto the body. Cement the dihedral guide of 1/2" x 1/4" hard balsa onto the wing platform.



THE SUNDUSTER

PLATE 2

SPECIFICATIONS:

WING AREA	1050 SQ. IN.
WING LOADING	8.5 OZ. PER SQ. FT. WHEN WT. = 56 OZ.
ELEVATOR AREA	358 SQ. IN.
CORD OF WING	13 IN.
SPAN OF WING	88 IN.
ASPECT RATIO	6.7 TO 1
TIPS FROM CENTER	25 IN.
TIPS	19 IN. EACH
DIHEDRAL	10 IN.
LENGTH OF FUSELAGE	53 IN.
WEIGHTS:	
BROWN JUNIOR	52 OZ.
DENNYMITE	54 OZ.
OHLSOON #60	56 OZ.
SUPER-CYCLONE	56 OZ.

IGNITION—You will notice in The Sunduster that the ignition is enclosed completely in the fuselage (except the battery box) and cannot be tampered with, without cutting away the silk. This means that a perfect ignition *must* be installed. The plan should be followed as to position of coil, battery box and timer. The coil should weigh about 2 ounces, and the batteries should be intermediate cells, as weight and balance are important. If the motor weighs more than a Super Cyclone (7 1/2 oz. bare), the coil must be shifted back 1" for every extra ounce up to 11 oz. motor weight. All connections should be soldered, and made with a good grade of heavy stranded wire.

COWLING—The cowling is beautiful when finished and it is pretty easy to construct. First, cement the five rough balsa blocks together. After these have dried, cut to the rough oversize shape of the firewall. The motor should be mounted before finishing, as your mounting may vary in some respects.

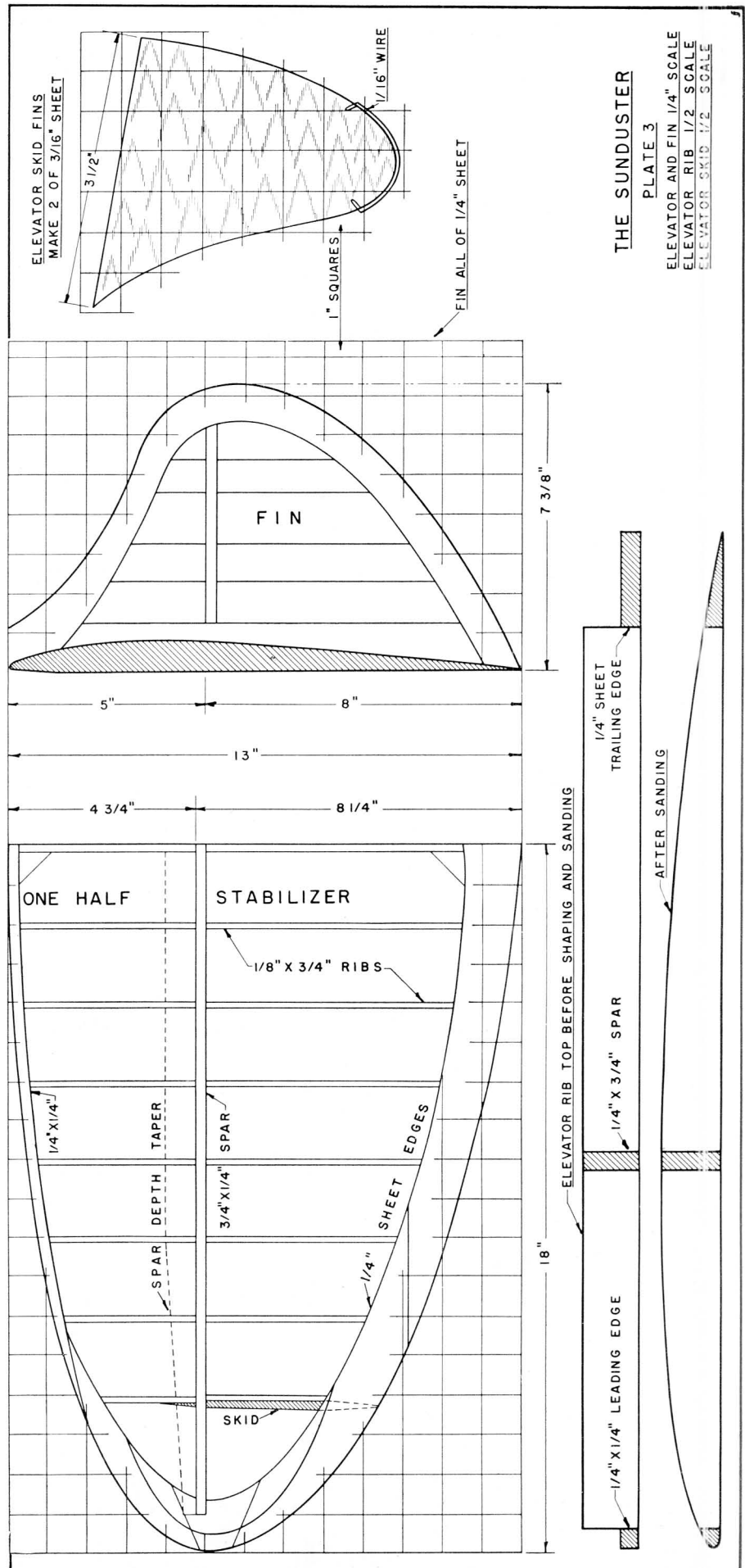
The cowling is determined by slipping the block over the nose, and letting the motor make an impression on the soft wood. Cuts and sandings may be made to allow better fit until the block finally rests flush against the firewall, and the motor is completely enclosed. If the Super Cyclone is used, the whole front must be left open so the carburetor (air-intake) can function properly. The holes for exhaust and gas can be made now.

The final forming of the cowl is done with a sand block, plenty of elbow grease, and an eye to the outline of the ship. Start with coarse 1 1/2 sandpaper to fine 4/0 sandpaper. Then give the cowl about two coats of wood filler and sand with 10/0 sandpaper between coats. After this give it about ten coats of cement *inside* and out, sanding between each coat. Now it is ready for the final color dopping.

FINISHING FUSELAGE—After the cowl and ignition are in, the sub-rudder is formed and cemented in place. From 1/16 steel wire bend a hook for rubber to fit on the sub-rudder to hold on the elevator. The bottom block is carved from a piece of 1 1/4" x 1 3/4" x 16" medium balsa, and *should not* be hollowed out. It should be rounded to conform with the firewall and plan shapes. Then finish with wood filler and glue. All joints should be cemented thoroughly at least two or three times. The entire fuselage is now sanded completely and should be covered with silk. The silk should be clear doped at least five times, and should be colored doped at least in the front with three coats of your favorite color.

TAIL ASSEMBLY—The elevator surfaces are built in the conventional manner. The main spar—which is of 1/4" x 3/4" hard balsa—is tapered before it is pinned onto the plan, and the leading and trailing edges are then pinned on the plan. The ribs (which you will note are *not* cut to an airfoil at this stage) are inserted. After the assembly is dry, remove from plans and reglue. When dry the entire assembly is cut, including ribs, by free hand to eye curve and sanded to shape. Remember to

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THE SUNDUSTER
 PLATE 3
 ELEVATOR AND FIN 1/4" SCALE
 ELEVATOR RIB 1/2 SCALE
 ELEVATOR SKID 1/2 SCALE

GRIME...

...does **NOT** pay!

[TAKE A TIP TO
"KEEP 'EM FLYING"]



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DO YOUR SHARE, this way:

1. Adhere to manufacturer's operating suggestions in operating your engine.
2. Keep engine clean, free from dirt, dust or gummy oil accumulations. SERVICE AFTER FLYING AND PROTECT WHEN IDLE!
3. Make minor adjustments promptly. Neglect may lead to major, irreparable difficulties.
4. If engine acts irregularly and you are unable to make repairs, do not incur danger of complete loss by continued operation. HAVE IT RESTORED TO ORIGINAL FLYING POWER BY OUR FACTORY EXPERTS!

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mit photographs or any other information pertaining to the model, to prove its authenticity, which will aid the Official in judging the model for scale and workmanship.

Where conclusive certification is not presented as to authenticity of the plans, only the Judges' decision will be considered.

A certified plan is one from an official source that supplies the full dimensions of the man-carrying ship.

By not supplying plans that are certified, a contestant places himself at a disadvantage, particularly if his model is of an experimental or an old or uncommon aircraft.

The structure, finish and detail of the model should reproduce the airplane as nearly as possible. Illustration: A colored doped model will have an advantage over a model not finished as the man-carrying ship.

INDOOR

A model, to be eligible in this event, shall be an exact replica of a man-carrying machine, every part being proportional in size to the corresponding part of the larger machine. No part of the model may be larger or smaller in proportion to improve its performance except that the propellers may be altered in blade width, pitch and diameter.

The model shall be rubber powered.

The effective projected wing area of models in this event shall not exceed 150 square inches. The name of the contestant, name of the ship, the effective projected wing area and weight of the model shall be plainly marked on the wing of each model entered. No weight rule.

All models will be judged according to the following point system:

1. General Workmanship:	
Neatness of workmanship.....	16 points
Amount of detail.....	9 points
Finish.....	7 points
Total.....	32 points
2. Fidelity to Scale:	
Fuselage.....	6 points
Wing.....	5 points
Empennage.....	5 points
Landing Gear.....	4 points
Engine, cowl, propeller, etc.....	3 points
Total.....	23 points

Some builders go into more detail than others, reproducing engine cylinders, instrument boards, interiors, controls, lights, etc.

In addition to the fifty-five points for workmanship and scale, thirty-five points will be awarded for the longest official flight. Scoring for flying shall

be the basis of the longest official flight and a proportionate number of points will be awarded between zero seconds and the longest official flight.

Each contestant shall be allowed three official flights.

Scoring time shall be the longest single official flight.

Models failing to make an official flight of five seconds or more will not be eligible for awards.

In case of a tie in total points scored:

(1) Highest score in workmanship.
If still tied:

(2) Highest scoring time in flights.

A contestant may present only one model to be judged for workmanship. If this model cracks up before an official flight is made, a second or third model may be presented in succession, to be judged for workmanship.

The model, with full size scale drawing (scale indicated) and the authentic plans of the man-carrying ship, must be submitted to the Flying Scale Model Judges. The contestant may also submit photographs or any other information pertaining to the model, to prove its authenticity, which will aid the Official in judging the model for scale and workmanship.

Where conclusive certification is not presented as to authenticity of the plans, only the Judges' decision will be considered.

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By not supplying plans that are certified, a contestant places himself at a disadvantage, particularly if his model is of an experimental or an old or uncommon aircraft.

The structure, finish and detail of the model should reproduce the airplane as nearly as possible. Illustration: A colored doped model will have an advantage over a model not finished as the man-carrying ship.

GAS MODELS

Concerning the Flying Scale Model Aircraft powered by internal combustion engine(s), we feel that this would prove to be a very interesting class and that every effort should be made to popularize it.

The Committee does not feel ready to assert a definite opinion on these matters until we have tried out more extensively certain rules in actual competition. However, here are some general ideas.

Flying Scale Model Aircraft, powered by Internal Combustion Engine(s):

1. Apply the rules for Outdoor Rubber Powered Flying Scale Model Aircraft
 - a. In regard to judging the workmanship and scale

- b. In regard to proportioning points for flight time.
2. Apply the rules for Outdoor Model Aircraft, powered by Internal Combustion Engine(s).

VICTORY

Stratofly the Sunduster

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cement on the two tail skids.

The rudder is built flat; all edges are cut from 1/4" sheet. When completed the entire assembly is sanded.

FINISHING TAIL ASSEMBLY—First cover elevator, preferably with silkspan. Dope both sides at once to prevent warps; give it three to four coats of clean dope with a light 10/0 sanding between coats.

Now cover the rudder in the same fashion. When you have doped rudder, glue it onto the top of the elevator. Make sure it is at right angles to the elevator by using a T-square.

You may add a former, corresponding to former "J" on the body, and make a fillet between the rudder and elevator, of silk. This will add to the streamline effect of the ship.

THE WING—The first step is cutting all the ribs as shown on plan. Cut all the main ribs, and then put them in a vise and sand as a unit—this will give you all the ribs of uniform size. Then cut and sand the tip ribs two at a time.

Now cut the trailing edge and tips of 1/4" hard firm balsa. First build any center section by pinning the front bottom spar of 1/4" x 3/8" onto the plan. Remember to extend all spars at least 1 1/2" in order to be safe in case of a mistake. Notch the trailing edge to correspond to the ribs, and pin down to the plan. Next step is to insert the ribs on the spar and glue. Glue on the leading edge of hard 3/8" square balsa into the notched ribs. Glue on the top front spar of 1/4" x 3/8" in the notched ribs.

After the assembly has dried, remove it from the plan and insert the rear spar of 1/2" x 1/4" hard balsa, and reglue all joints. Build the other three sections in the same manner. First join the tips in this fashion:

Pin down a finished center section to plans, and square all the three spars. Fill in the two center spars with 1/4" sheet balsa to the first rib. Obtain a block 6" high and block up the tip. Mark off the angle on the spars and cut the spars. You may also obtain same angle by the gussets on the printed wing plans. Fill in the front spars as on the center section, and cut the four dihedral gussets of 3/16" sheet (1/4" sheet for center splice) and glue the spars together, pinning the gussets in place. Make the center dihedral splice in the same way, using sheet balsa gussets of 1/4" sheet and use a 4" block to prop up center sections. You will note that all the dihedral ribs will

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