X

Free-Flight Engine Power

CLASSY GASSY II

ENGINE-POWERED MODELS are, by far, the most popular of all Free-Flight types. Sizes are determined in wing area, and not wing span, and these range from one hundred to one thousand square-inch wing areas. Wing area is the product of the span multiplied by the average chord, with allowances made for area lost by wing-tip curves. This area rule applies to all Free-Flight types, including rubber and gliders.

Power for these sizes ranges as follows: .049" engines—150 square inches; .074" engines—180 square inches; .099" engines—225 square inches; .19" engines—350 square inches; .29" engines—500 square inches; 49" engines—850 square inches, and .60" engines—1000 square inches. The above-mentioned combinations are for average-good flying characteristics, and modifications can be made to suit special desired conditions.

Classy Gassy II is the descendant of a larger prize-winning model built by the author several years ago. This previous craft was, itself, the result of much experimentation and experience. Our model, plans of which are presented one-half size, features a greatly simplified structure in comparison to its ancestor. This craft is of the smaller type, with 165 square inches of wing area. Performance, truthfully, could not be better, for the climb is like that of a rocket while the glide simulates a buzzard.

FUSELAGE

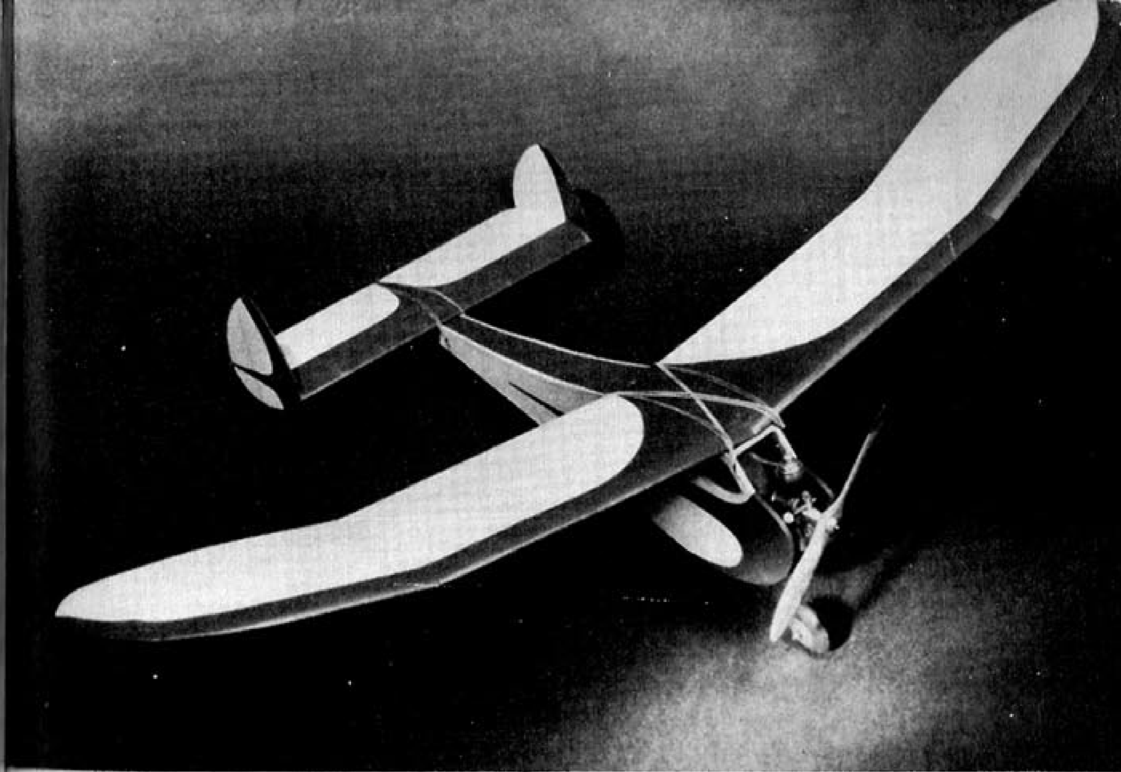
Here, again, it is found that the side-frame of fuselage construction is used. Note the sheet-balsa nose side. This is built integral with the side frame. Note that the leading portion of the wing platform is 1/4" higher than the trailing portion. The major difference between a Towline Glider or Rubber Model and the engine-powered or Gas-Model fuselage is the addition of engine mounts which, in this case, are in the form of a plywood bulkhead. This should be very firmly attached to the sides. Celluloid is used to cover the windshield and windows.

A mono-wheel landing gear is fitted as a weightsaver. The model is kept upright by the two rudders that form two points of support at the rear, like a tricycle. Once bent to shape, and wheel washer soldered to the axle, the landing gear is cemented to the plywood bulkhead, using several applications of cement. Cover the fuselage, and brush on four coats of clear dope in the manner described in previous chapters.

The fuel tank should be installed at this time, unless the engine you intend to use has an attached fuel tank. If a separate fuel tank is required, locate it in the fuselage, as shown. The fuel feed line should protrude through the fuselage side, along with the filling and vent lines. The reason for this will be explained later.

WING

In view of the heavier wing loading, as compared to Towline Gliders and rubber-powered craft, engine-powered models require reinforcing at the dihedral breaks. Before the wing is assembled, cut the spar into four lengths and lay flat on the work table at the angle that the dihedral will form as it appears in the front view. Now, cement 1/16" sheet joiners atop these joints, using plenty of adhesive. When dry, we have the complete



Sheet balsa nose sides, rubber band wing anchors and celluloid covered cabin are clearly defined in this photo of our Classy Gassy II. Note how twin rudders hold model upright despite single wheel landing gear. *Target Photo*

spar with dihedral. Proceed to construct the wing in the accepted manner, except that one panel will have to be assembled at a time, because of the dihedral breaks. Sand the structure, when completed, and cover with lightweight silkspan. Apply four coats of clear dope.

EMPENNAGE

As usual this component follows conventional wing construction. Following the application of four coats of clear dope, add the sheet-balsa rudders after they have been well sanded.

ASSEMBLY

Rubber bands hold the wing and tail in place. These rubber anchors can be made as hooks, by a method similar to that used on the Nimbus-Nudger. Another popular fastening for rubber bands is to drive 1/8" dowels through the fuselage covering on each side. These dowels must be in one piece and protrude at least 3/8" on each side. Be certain to locate these dowels near wood structure, in order that they may be cemented securely.

PAINTING

The majority of models flown today do not sport colored dope. This is either because of the weight saved, or because the builder was so anxious to fly his creation that he could not wait to paint it! We feel that one or two coats of colored dope do not interfere greatly with performance, except perhaps under keen competition. Whether or not your model is painted, you must apply a coat of transparent fuel-proofer to protect your finish. An additional coat will help in the nose area.

FLYING

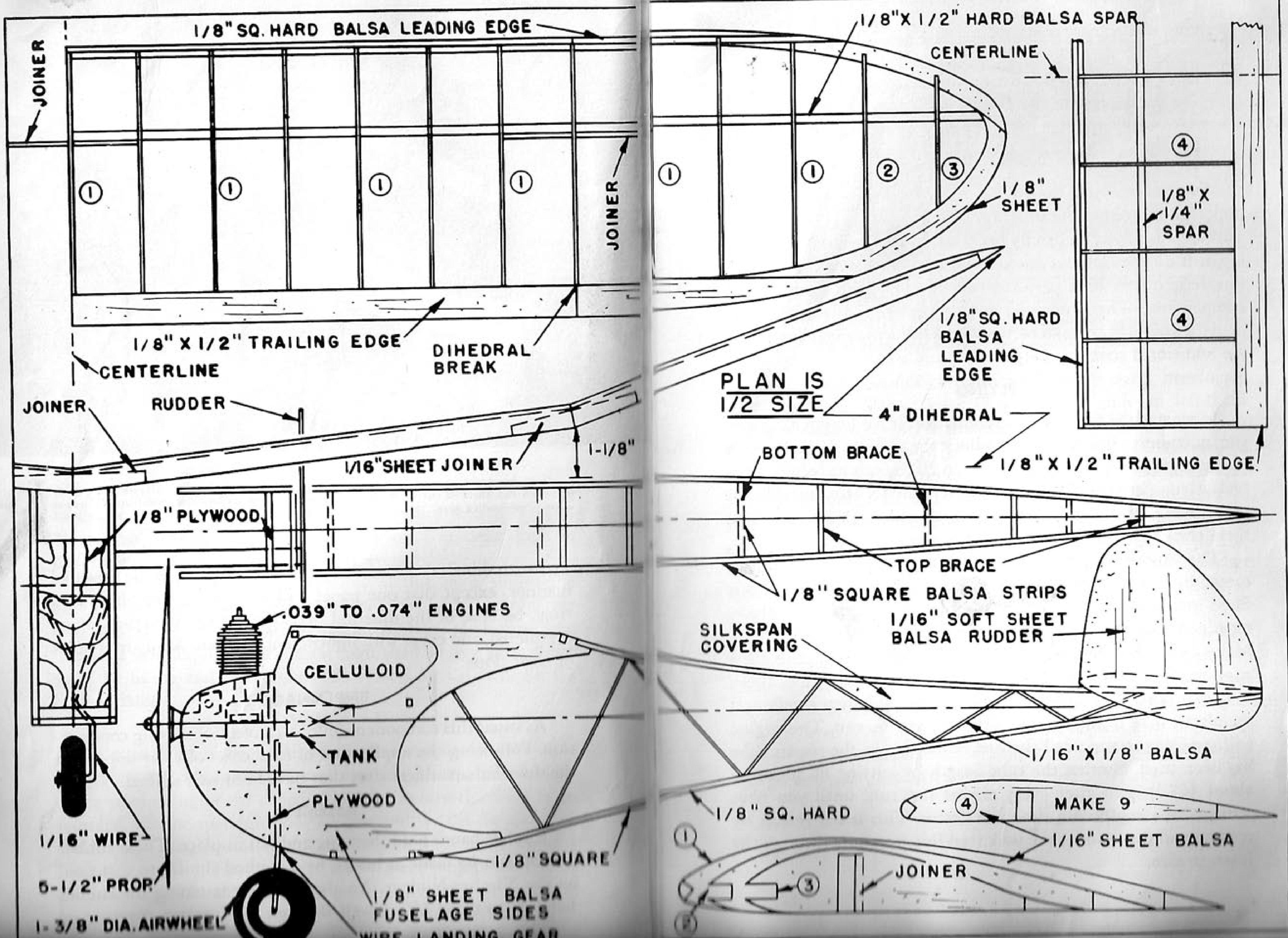
In view of the fact that time limits are set for length of engine run, at contests, it is necessary to limit the amount of fuel supply to the engine. Engine-runs from 15 to 20 seconds are often specified at competitions. This same time limit is also suitable for sport flying. It is surprising to witness the high altitude that these craft can attain in 15 seconds.

The engine can be stopped during flight by one of two methods. One is to use a commercial fuel-shut-off timer. This is fitted into the feed line and shuts off the fuel supply at a predetermined time. These timers are available at all hobby shops. Many model-builders use a simpler method of stopping their engines while in the air. Use a long plastic tube feed line, about four inches to start with. Start the engine and then disconnect the plastic tube from the tank. Time the engine run. The engine will continue to run until the fuel remaining in the plastic tube has been used. Shorten the tube length by cutting off pieces of about 1/4" lengths after every engine test run, until you have achieved the engine-run time you desire. This is the reason we recommend that you let the tank feed-line protrude through the fuselage side.

The author demonstrates the climbing ability of his model, which, just released, not pushed, starts its skyrocket climb. Rate of climb is important in free flight competition because the higher up the model is when the engine stops the longer it takes to come down.
Target Photo

Test gliding should follow the basic pattern previously described. Our Classy Gassy II was set to glide in left-hand circles of about sixty feet in diameter. This was done by offsetting one of the rudders, only, to the left about 3/8". This can be modified as testing progresses. It is recommended that the model be set to climb to the right in forty-foot circles. In order to do this, the craft must be adjusted to overpower the left rudder that was just fitted. Offsetting the engine so that it will pull to the right will accomplish this end. Insert a metal or fibre washer behind the engine-mounting hole, between the engine and bulkhead, on the left side of the model.

If the model climbs well, but glides straight, add more rudder offset. Should the craft glide well, but stall in the climb, add down thrust by inserting washers behind the upper portion of the engine, to tilt the engine downward. Study the flight characteristics carefully, and make adjustments accordingly. When the power cuts, your model should perform a horizontal figure eight and go into a flat, smooth glide.



1/8" SQ. HARD BALSA LEADING EDGE
JOINER
1/8" X 1/2" HARD BALSA SPAR
CENTERLINE
1
2
3
4
1/8" SHEET
1/8" X 1/4" SPAR
JOINER
1/8" X 1/2" TRAILING EDGE
DIHEDRAL BREAK
CENTERLINE
1/8" SQ. HARD BALSA LEADING EDGE
PLAN IS 1/2 SIZE
4" DIHEDRAL
JOINER
RUDDER
1-1/8"
1/16" SHEET JOINER
1/8" X 1/2" TRAILING EDGE
BOTTOM BRACE
1/8" PLYWOOD
TOP BRACE
1/8" SQUARE BALSA STRIPS
.039" TO .074" ENGINES
1/16" SOFT SHEET BALSA RUDDER
SILKSPAN COVERING
CELLULOID
TANK
1/16" X 1/8" BALSA
PLYWOOD
1/8" SQ. HARD
MAKE 9
1/16" SHEET BALSA
1/16" WIRE
1/8" SQUARE
JOINER
5-1/2" PROP
1/8" SHEET BALSA FUSELAGE SIDES
1-3/8" DIA. AIRWHEEL
WIRE LANDING GEAR