

# How to Construct The Flying Aces Stick

**FANS, IT'S NOT DIFFICULT AT ALL TO GET YOUR START IN THE GAS MODEL FIELD—AND FLYING ACES PROVES IT RIGHT HERE BY OFFERING YOU AN EASILY-BUILT, LOW-COST GAS JOB. JUST AS THE STICK MODEL HAS ALWAYS BEEN THE STEPPING STONE FOR BEGINNERS IN THE RUBBER-MOTOR FIELD, YOU'LL FIND THAT THIS SLEEK, STICK-TYPER IS JUST THE SHIP TO LEAD OFF WITH IN THE POWER CLASS. YES, SHE LOOKS MIGHTY GOOD—AND SHE'S JUST AS GOOD AS SHE LOOKS!**

**By Bill Effinger & Thracey Petride**

"DOESN'T a fellow have to have something extra on the ball to become a gas jobber?" Not a bit of it, brother! If you're an average rubber-model builder with a little spare common sense, you're all set to "get in."

"But," you say, "a gas model is a darn complicated thing to build, and—"

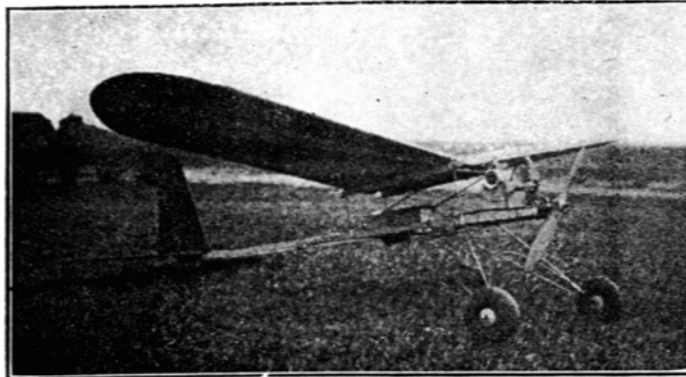
Pardon us for interrupting, but you're wrong again! Maybe you never realized it before, but there are stick-type gas jobs just as there are stick-type rubber powered models. And that's what we've got for here. Of course, we don't have to tell you that in this model game you can't beat a stick job when it comes to learning the ropes.

There are really only two reasons why the average model airplane builder who wants to make a gas model hesitates—he's worried about his inexperience with power jobs and also about the cost. Since gas models are generally conceded to be the most advanced form of model building, he may come to the mistaken conclusion that gas model construction is only for the most expert and experienced builders.

As for the cost, our gas model prospect has heard that the average outlay for gas models is about \$35—all of which

goes up in so much smoke if the ship is not properly designed and balanced.

Fortunately, however, we can assure you that the trend is now away from the complicated airplane structures which demand so much extreme expertness on the part of the builder. Smooth, clean ships which are simply made have already replaced the old "flying box cars." And best of all, the trend in the gas job field is definitely away from high costs.



*Here 'tis, fans—the snappy, 5-ft. span Flying Aces Stick Gas Job. And as you can see, she's every inch a flyer! That's a Baby Cyclone engine in her nose.*

The Flying Aces Stick Gas Job was designed to be as simple as possible, and at the same time to be strong, stable, and capable of flights of good duration. We built this model at a minimum expense, yet the completed ship fulfilled our highest expectations. More than one hundred flights were made, each ending with a perfect landing. The plane always takes off after a very short run, and it has climbed steadily in each flight until the engine "faded out." In the return journey, its glides are smooth and flat.

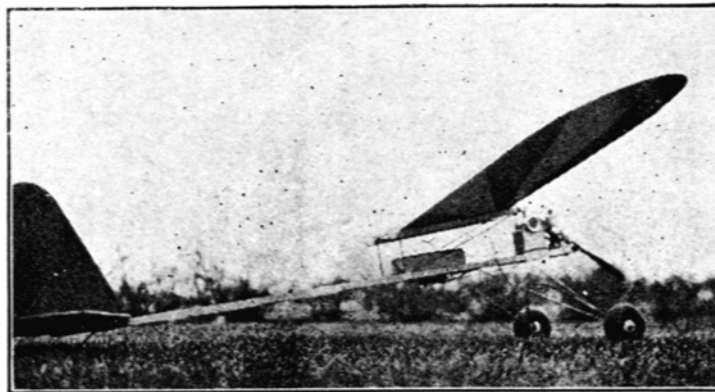
It only costs a few dollars to build the Flying Aces Stick Gas Job, and it's as easy to build as a good rubber powered model—in fact, easier than many of the rubber motored replica craft. Above all, this gas model will give you real experience in building and flying powered craft. Okay, then. Let's get started—

### THE MOTOR STICK

THE motor stick is the backbone of the plane and should be constructed first. The outline of the motor stick is laid out, according to the dimensions on the plans (see following pages), on a smooth board. The 1/4" by 1/2" spruce longerons are bent along the outline and the cross members

are cemented in place with model cement. After the cement has dried, small holes are drilled in the longerons, using a brad as a drill. Two 3/4" brads are nailed in each cross member.

The two longerons are cemented together in the rear, and a balsa gusset is used for strengthening. The motor mount is simply two pieces of 1/4" thick plywood which are glued together and cut out to fit whichever motor you use. Drill small holes and insert 1/2" round-head wood screws to further secure your mount.



*In this photo, the simplicity of the ship's structure is well brought out. There's not a single complication to "stump" you in building her. In fact, a lot of replica, rubber-powered models are harder to construct.*

### LANDING GEAR AND WING MOUNT

THE landing gear is bent from 3/32" diameter steel music wire. It is made in two pieces, according to the dimensions shown on the plans. The bottom of the landing gear is bound together with copper wire and soldered.

Care should be exercised in bending the landing gear. Make sure that one side is not longer than the other, and that all the angles are equal. The finished landing gear is bound to the longerons and cross members with copper wire. We recommend 3 1/2" pneumatic wheels for the model, but if you find the expense is too great, home-made wooden wheels, will serve the purpose.

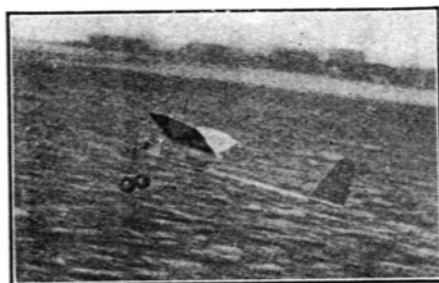
The wing mount is also bent from 3/32" diameter steel wire and then bound to the fuselage and cross members. Note that the front brace is 5/16" higher than the rear in order to give the proper amount of incidence to the wing. Two 3/16" by 1/2" spruce wing supports are then bound securely to the mount with soft copper wire. !•

## TAIL ASSEMBLY

OUR tail surfaces are all-balsa in construction and are built to the dimensions shown. The leading edge is rounded, and the trailing edge is tapered. The tips are 1/4" sheet balsa. All the 1/8" by 1/4" tail ribs are spaced 2" apart. After the tail surfaces are covered, they are cemented firmly to the motor stick.

## WING

THE wing is, of course, one of the most important parts of the model. It should be built with extreme care and precision. A warped wing will give you all kinds of trouble when flying the ship. First, cut out all the wing ribs, twenty-one in number. For accuracy it is best to cut out a metal or plywood template of the rib for a guide.



*The take-off.*

Front and rear wing spars are constructed next. The center section portion of the spars is filled in with 1/8" sheet balsa filler block, as indicated on Plate 4. The distance between the upper and lower wing spars should be carefully measured from the rib template. A 1/16" sheet balsa cover plate is cemented to the outside of the spars and allowed to dry for at least thirty minutes. After the cement has dried, mark off the location of the ribs on the spars. Slide the ribs between the spars and cement. Be sure that the ribs are square with the spars. It will be necessary to cut the center rib into three pieces because of the filler blocks.

Next, the leading and trailing edges are planed, sanded to shape, and cemented in their respective notches. The tips are constructed of two plies of 1/8" sheet balsa. The grain should be crossed at an angle of about 15°. The spars are cracked 6" from the tip and brought together to meet at the tip. The cracks should be well cemented. The last rib is smaller than the others and should be attached as shown on

the perspective drawing. The wing is attached to the wing mount with 6 to 8 strands of 3/16" rubber. The rubber should be tight enough to prevent the wing from lifting off the plane while in flight.

### **COVERING**

WING and tail surfaces are covered with bamboo paper after the center section of the wing is first covered with 1/32" sheet balsa. The grain of this balsa should run in the very same direction as the spars.

Sand the joints smooth and cover with bamboo paper. Covering gas models with bamboo paper is easier than covering rubber powered models with tissue paper. Here are a few helpful suggestions: Apply it to the framework (with cement) in pieces as large as possible; moisten the covering by spraying with water; and allow it to shrink overnight.

A good color scheme is an important part of your ship. Models have often been lost because of poor visibility against natural backgrounds. Avoid painting your ship dark blue, green, gray, or black. Our original Flying Aces Stick Gas Job was painted light blue and orange. This combination offered a contrast against the sky and landscape. Striping tape should be used to obtain even lines when painting the "sunburst" we used. The model need not be coated with clear dope.

### **MOTOR INSTALLATION**

ANY of the reliable gas motors can be used in the model as long as the total weight of the plane does not exceed 2 1/2 lbs. With our Baby Cyclone, the ship weighed 1 lbs., and with our Brown Junior it weighed slightly under 2 lbs. A small toggle switch should be placed in the circuit to prevent short circuits when the engine is not running.

The motor installation will vary with the type of engine used. If your motor is of the gravity feed type, a small box should be built from " sheet balsa in order to raise the tank above the engine. The engine should be wired as in the diagram. The batteries are placed in the battery box, which is constructed from 1/16" Birch plywood with 1/8" Basswood ends. Brass contact plates are fastened to each end of the box with pins. The spring at the negative pole (zinc cover of battery) is bent from .034 music wire and should be sufficiently strong to make a good contact. All wiring connections must be cleaned and firmly soldered. This is

absolutely necessary for the smooth functioning of your engine.

## PROPELLER

THE size of the propeller will naturally depend on the size of the engine which you use. Make your propeller to the specifications of the engine manufacturer. As the ship does not require much power to fly, almost any shape propeller that your engine can turn over will keep the ship in the air. However, to obtain the most efficiency from your plane, a propeller may be made according to the information given in your July issue of FLYING ACES. The speed of the plane is roughly 25 m.p.h.



*Aloft!*

## FLYING INSTRUCTIONS

TWO things are necessary to obtain good flights from your model. The first is the proper adjustments, and the second is, believe it or not, self-control.

It is best to adjust the model so that it will be slightly nose heavy for the first flight. This can be done by placing the wing on the mount in such a position that the ship will balance about 1 1/2" back from the leading edge of the wing. You see, it is better to have the model glide steeply on its first flight than to have it stall and dive back into the ground. Make sure that the wing is well centered and that it is perpendicular to the centerline of the plane.

Self-control only comes with experience. If possible, have an experienced gas model builder with you when you make your first flight. Select a large open field which is as far away from buildings and other obstructions as possible. Remember that a model drifts in the direction that the wind is blowing. Make sure that everything is clear in that direction.

Now put enough gas in the tank to last for about one minute. Start the motor up—but do not let it run too fast on the first flight. This is to prevent the ship from spinning with the torque. If the model goes into a steep bank, correct this on the next flight by shifting the wing area a small amount to the side of the plane which needs more lift. After the banking

has been corrected, move the wing forward, a little at a time, until you get a smooth, flat glide without any stalling tendency.

After you've got in a lot of flying time, you might try building a body for your F.A. Stick Gas Job. We did that with our original ship—and the resulting model won a contest against a slew of bigger ships.

That's all there is to it, fellows. And now, are there any questions? If so, just write the authors, care FLYING ACES Magazine, 67 West 44th St., New York City, enclosing a stamped, self-addressed envelope for our reply.