

Construct Our

# "Baby Barnstormer"

F. A.'S GAS MODEL OF THE MONTH

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Hair-trigger temper on the getaway! That's what this swell B.B. job has—and that's why we dubbed her the B.B. Easy on the pocketbook and easy to build, too, this ship will turn in a big batch of snappy flights. All set? Then take it away—

\* \* \*

By Fred C. Tuxworth

**A** BROWN powered 300-square-inch wing area model was first introduced in Detroit at the '36 Nationals. Thracy Petrides was the originator. The high performance of this diminutive ship attracted much favorable attention.

Since then the popularity of this type of model has increased tremendously. It offers great possibilities in the limited-engine-run events, and its ability to get away from the ground quickly makes it a consistent windy-weather ship for contests.

My model described here—the "Baby Barnstormer"—was built during spare time within a week, and it had made its first ninety flights within the following two weeks. An example of its toughness and reliability is the fact that the landings of over half of these ninety flights were in freshly plowed fields where the model had no choice but to tumble wing over wing. Under these unfavorable conditions damages were frequent. But due to the model's rigid construction the job was always put back in ship-shape order after a few minutes out for repairs.

The "Barnstormer" is very stable. As can be seen in our accompanying photograph, the line of thrust is high and the center of lateral area is low. It has never stalled, although in every flight it zooms nearly vertically from

the take-off to an altitude of about a hundred feet where it hangs almost motionless while it assumes a less precarious, but still spectacular, climbing angle.

Several models of the same general design were built and powered with three different makes of engines. All proved interesting and successful. With but few changes, chiefly with the gas tank, the model can be built around any 1/6 to 1/5 h. p. engine.

## FUSELAGE CONSTRUCTION

**F**OR convenience in lay out, the fuselage drawing is provided with a "working thrust line." The angles of incidence of the wing and stabilizer and the actual line of thrust are all measured from this line. One-quarter square hard balsa is used for the longerons, cross-members, and battery slide. The engine mounts are cut to the indicated dimensions from 1/4" basswood and are mounted by building bulkheads around them. The distance between the engine bearers will, of course, be determined by the engine used. It may be necessary to cut away part of the vertical cross-members, as shown, for the firewall bulkhead. (Section "A-A").

The formers around the firewall bulkhead are cut from 1/4" stock; a ring of 1/8" sheet is glued to the front, and the outside edge is rounded off as depicted in the drawing. The wing mounts are made from 3/16" hard balsa; they are cut to fit the lower surface of the wing.

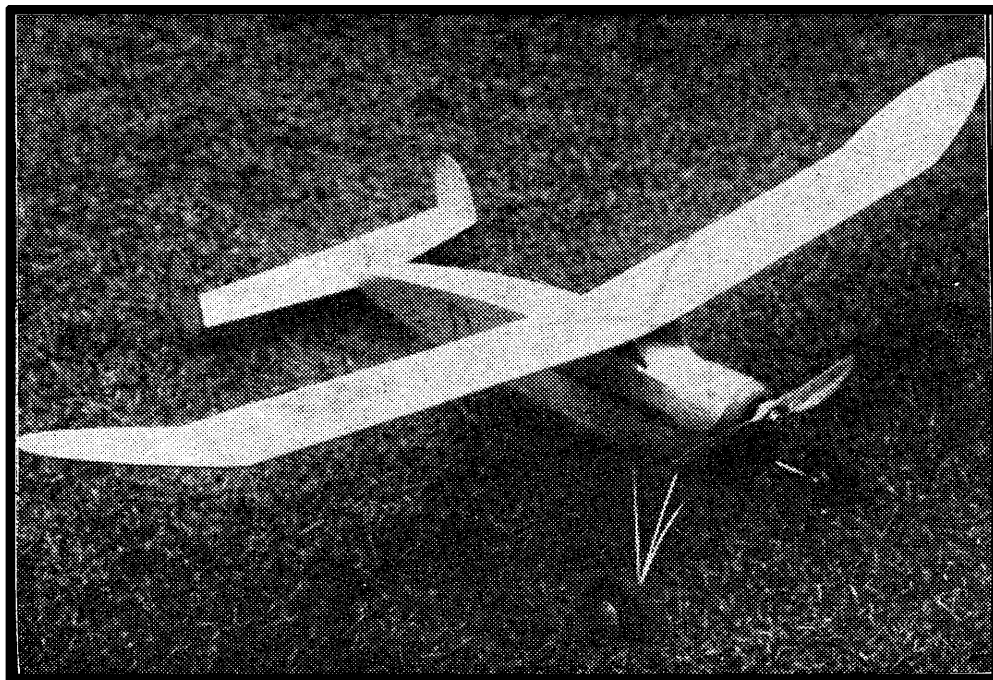
The landing gear struts are made from 3/32" piano wire, and they are bound in place with heavy linen thread. Light 3/4" diameter air-wheels may be used; but because of the plane's high landing speed, heavier 3 1/2" wheels are more advisable.

The stabilizer is streamlined in section and is assembled in the usual manner. However, the spar connecting the leading edges and the two center ribs are left out. These are put in place after the stabilizer has been attached to the fuselage. The fins are made from balsa of medium hardness, and are equipped with bamboo skids. Both fins have adjustment tabs with aluminum hinges. Several generous applications of glue should be used in mounting the fins.

## BUILDING THE WING

**A** GRANT airfoil section is used for the wing. The ribs are cut from 1/16" medium balsa. The leading trailing edges of the tips are cut and shaped from 1/4" hard sheet. Rectangular pieces of balsa are glued in position for the tip ribs. These are cut and sanded to a wing section when dry (camber on the lower surface is not necessary here). Dihedral is put in after the wing is assembled. The spar is cut at each joint and gussets of hard 1/32" sheet balsa are glued on both sides.

Left: As graceful a gas craft as we've seen in many a modeling moon is this spiffy "Baby Barnstormer." There's airworthiness in every line of this twin-finned job. And that completely closed in motor cowling makes you think you're double-O-ing a full-size ship.



## • Plans For This Model On Following Pages •

After the framework is completed the leading edge of the upper surface of the wing and the entire upper and lower surface of the center section is covered with soft 1/32" sheet. Some builders doubtlessly will want to use an ordinary dihedral wing instead of the polyhedral one shown; but of the several wings tried, this design proved most successful.

### MOUNTING THE ENGINE

**T**HE engine is mounted with wood screws. It should have about one degree right thrust. If a Baby Cyclone is used, a small gas tank may be made from very thin sheet brass and mounted on strips of brass directly above the crankcase. This is necessary to insure a constant supply of fuel to the carburetor in the extremely steep climbing attitude the model will assume. If a Brown Jr., or any similar engine, is used, it may be fitted with a fuel tank like that described in the drawings. The ends of the tank are the lids of small salve cans. These may be obtained at any drug store. The rest of the tank is made from thin sheet iron or brass.

For strength, the fuel line protrudes through both the top and bottom of the tank. The bottom end of the tube is closed with solder and the fuel enters through small holes which are drilled through the tube wall. When soldering the gas line to the carburetor body, be certain that there are no airholes. This type of tank is large enough for nearly any gas model flight, and it makes changing your type of engine very simple.

### THE PROPELLER

**T**HE 12" propeller shown in the drawings was designed for a Brown Jr. It is high pitched and will hold down the r.p.m.'s. Carve it from basswood and leave the blades thick for strength and greater fly-wheel action. After the plane has been flown several times and all of the "bugs" have been eliminated, a more efficient propeller may be used. If an engine smaller than a Brown Jr. is installed, the regular designed propeller may be used from the start.

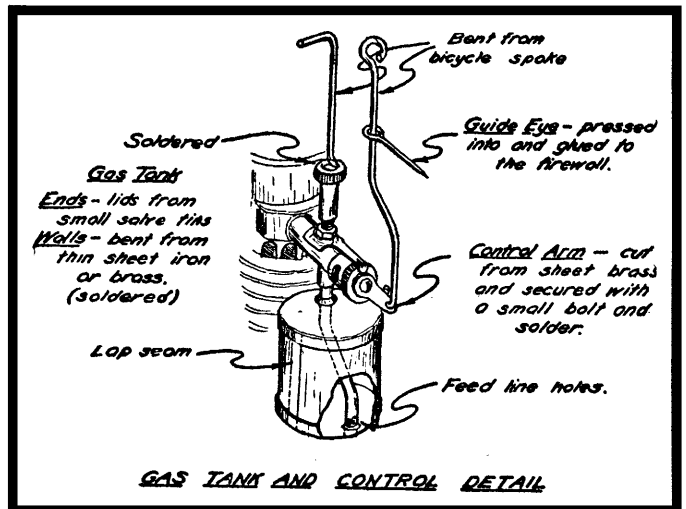
### THE IGNITION COIL

**I**S mounted on the back of the firewall. Either large or small dry-cells may be used. The cells are mounted separately, and a basswood block is cut to shape and bound and glued to each of the cardboard cell cases. These blocks are drilled to receive a small wood screw, which is used to clamp the cells to the battery slide.

### COWLING

**T**HE cowling has been designed for simplicity of construction and repair. The forward part is an elliptical ring, of the dimensions indicated, cut and shaped from hard balsa. The blank for this ring is made from laminated rings of 1/8" sheet. The skirt of the cowl is made from a strip of aluminum 3 1/2" wide. Turn under 1/8" along the trailing edge for strength and bend the aluminum to shape. The seam should be at the bottom. The aluminum is attached to the wood ring with glue and ordinary pins cut 1/4" long.

The cowl should have a hole in the top through which the needle valve and choke controls protrude. If the engine does not have a choke nut, a hole should be cut



Gas tanks are often a problem for the petrol model builder. But Tuxworth's tank can be built easily and with the simplest of materials. This diagram, showing the unit, illustrates details of installation and control.

in the side of the cowl through which the engine may be choked with a finger. A spark control may be used if desired, but the spark of most engines can be set before starting. Give the engine bearers, firewall, and all wood parts on the inside of the cowl several coats of shellac.

Punch several holes in the aluminum at the bottom of the cowl to allow any spilled gasoline to drain immediately. This will virtually eliminate the possibility of fire. Mount the cowl with two small wood screws to the engine bearers.

### COVERING THE MODEL

**E**ITHER bamboo paper or silk may be used for covering. Give the bottom a double layer for protection against tearing by underbrush. Leave one bay immediately forward of the battery slide uncovered for access to the batteries. A piece of light cardboard held in place by several spots of glue serves as a covering for this opening. The fins are covered with paper. Give the entire model a coat of clear dope and sand very lightly to remove any fuzz. After this, two coats of pigmented dope should be applied.

### FINAL ASSEMBLY

**T**HE wing is held in place with rubber strands. Two pins, cut 1/2" long, may be pressed through the center section trailing edge into the wing mounts to prevent the wing from shifting position. The builder should have no trouble running the engine inverted. However, there are a few troubles which may arise if proper precautions are not taken. A booster of two or three large dry-cells should always be used for starting, and the ignition switch should always be on when priming. This will insure a hot and consistent spark which will ignite the gas as it enters the cylinder and prevent its fouling the plug.

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### MATERIALS FOR THE "BARNSTORMER"

1/4" sq. hard balsa for longerons, cross-members, and battery side;  
1/4" Basswood for engine mount;  
3/16" hard balsa for wing mount;  
Medium hard balsa for fins and wing ribs;  
Hard balsa for cowling ring;  
1/4" hard sheet balsa for leading and trailing edges of wings;

1/32" hard sheet balsa for gussets;  
1/32" soft sheet balsa for center-section wing covering;  
Basswood for propeller;  
Thin sheet brass for gas tank;  
Aluminum sheet, shellac, and bamboo paper or silk for covering;  
Dope (clear and pigmented).

ing everything you could to keep her from landing. Then when we actually did hit, I hardly even felt it. It was smooth—awfully smooth—and all the time we were trying not to do it. It beats me!”

As Jack tried to explain his reactions, a thoughtful expression had come over Macklin's bronzed features. And when the student finished speaking, the instructor's eyes lit up and he literally beamed on young Conroy.

## Construct Our “Baby Barnstormer”

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### TEST FLYING

WITH models of this type, test flying will be a little different from “shake down” flights with larger gas models. More than the usual amount of care should be taken because of its speed. Remove the batteries from the slide and fasten them to the bottom of the fuselage with rubber bands. Use a piece of  $\frac{1}{8}$ ” sheet balsa between them and the fuselage to prevent their being pushed through the covering. Place them well forward, far enough so that there is no chance of the plane taking off, and the

“Boy! You've given me an idea. Give me a little time to work it out, and I have a hunch that we've got something—something that may run that little landing complex of yours into a corner and slaughter it!”

Macklin chuckled to himself. “Come on, kid. Open that gas valve up and we'll wind her up and get back to the field. That'll be all for today. But next week, be all set to try something.”

Still chuckling, Macklin walked

model is ready for its first trial. If a timer is being used, any smooth field is suitable. But if no timer is available, a fifty-foot runway terminating in a patch of long grass should be chosen for the tests.

Start the engine and let it run well open, then release the “Barnstormer” down the runway. It should taxi tail-high, and at high speed, until the timer shuts off the engine or until it reaches the high grass. This is a very satisfactory first trial.

Now move the batteries back about

around to the front of the plane. “Gas on—contact!” he boomed.

*In our great March FLYING ACES, George Lyle brings you the tenth and final hour of this pep-packed fictionalized flying course—and that tenth session is the one that counts! Will Jack Conroy make the grade? That, fellows, is the big question you'll find answered when you drop back here at our training tarmac next month.*

a half an inch and repeat the procedure. Probably no flight will result this time either, nor the next several times, and it all becomes very monotonous. But remember that although there have been no flights as yet there have also been no sickening stalls. Just be patient and continue to move the batteries back a little each trial, and finally the model will take off cleanly and assume a surprisingly steep climbing attitude. The batteries may then be placed inside the fuselage and adjusted according to the performance.

## Don Patrol

(Continued from page 12)

*si! Madre de Dios!*”

Meanwhile Lieutenant Pinkham circled, then sideslipped the Spad down toward the biggest windmill. He threw a Mills bomb at it and the Spanish brass hats waved their arms and yelled when, with an ear-splitting WHAM! it knocked one arm off the mill. The Yankee pilot wing-slapped down then, and the Hisso of his plane developed a hacking cough. The gas-buggyload of Spaniards came to a stop two hundred feet below and, seeing half a dozen men pile out of it, Phineas grinned broadly.

“Perfect!” he chuckled. “Haw-w-w-w! Now if Spiggity red tabs are as dumb as Allied Intelligence officers—” He left the rest of his hopes in the air while he eased the Spad down. Then he got out and strolled toward the Iberians.

“*Santa Maria!*” puffed a fat officer, eyes popping at sight of Phineas' get-up, “you are under arrest, *Señor*. You bomb *el* windmill—the windmills of Don Quixote—”

“Haw-w-w-w, you don't tell me!” Phineas guffawed. “Now we got hunk. My great-great-great-grandpadre took a poke at yon windmills, *Señor*, and got slapped down. I am Don Quixote Pinkhamo. A Spad is better than a bony nag when you fight windmills, huh?”

“*Carramba! Dios! Capitan*, you hear what thees *hombre* he say? Don Qui—maybe she ees too moch *arguardiente* I have drank, *si*. But thees *hombre* he look moch like as the old Don, *si!*”

The Spanish brass hats withdrew in a tight gang for a conference. Then the citizen in civvies—Don Pedro Avocado—made himself known and, seizing Phineas by the shoulders, kissed him soundly on each cheek. “We tak' you to *el generallissimo*. *Viva* Don Pinkhamo, *viva-a-a!* He teach *Soldados* to fly for

King Alphonso. *Viva!*”

“Do anyt'eeng,” Phineas pleaded, “only don't hug me again, *amigo*. And now how far is it to Manzanares, Seniors?”

“Ah, *Señor*, first we take you to drink some *aguardiente*, *si*? We celebrate! *Viva* Don Pinkhamo! Ver' queeck after we bring you back to *el* fly wagon *pronto!*”

While this oration in garbled English was assailing his eardrums, Phineas' attention was distracted by a big sign on a tree. There was a picture of a bull lifting a matador up by his pants.

“Bull fight, huh?” Phineas queried. “Where do you get tickets? *Señor* Tortilla Tamales! Is he a good toreador?”

“Ho! Ho!” a Spanish brass hat laughed, showing two rows of white teeth in a swarthy face. “*Señor* Tamales say he ees bes' matador in whole worl'. Better as *Señor* Quito Casaba, *el* hero of all Spain. Tamales he come from Lisbon very queeck *y* fight *el toro*, what you call bull, at Manzanares in wan two week, *y* Casaba he call heem *la cucaracha* in the papers *y* he say Tamales he only fight the bull who are fill' with *aguardiente*. All over Spain they look for mos' wildes' bull of all bulls *y* Tamales he ees no go'n' see *el toro* before he go in *plaza de toro*. Casaba mak' ver' sure Tamales he no geeve *el toro* what ees call' by *Americanos* wan *Mickey Finno*, *si!* Ho! Ho! Tamales he have for to be ver' *bueno*, *si!*”

“It's all bull to me,” Phineas sniffed. “Now where's your drinking place?”

“*Muy Pronto*, we go thees place! Miguel, you feed thees car planty petrol!”

ON THE WAY to the inn, Phineas and his Castilian escort happened to drive past a Spanish rube's home-

stead. The irate tiller of the soil was arguing very lustily with several officious looking citizens while four other men pulled on a rope in a nearby field. On the end of the rope was the most vicious he-cow that Phineas Pinkham had ever clamped an eye on. It seemed to snort fire and brimstone and its angry bellows made him homesick for the drome of the Ninth.

“Wait—one *minuto!*” he yipped. “That Spaniard don't look like his heart is in sellin' the roast biff. *Carramba*, if them bums are stealin' the bull, we will show them, huh?”

The whole thing was explained by an olive-skinned Castilian prince of privilege who claimed to be the mayor of Manzanares. They had found the bull, a real honest-to-goodness *Miura* for the upstart, Tamales, to work on. Its horns were just the right length and it had a temper nastier than a Borgia's. It weighed but three pounds less than a rhino, and if the Spanish hick did not have sense enough to take a thousand pesos for it, he could go and peel an olive.

“*Santa Maria!*” the Spick peasant stormed. “*Carramba!* You steal *el toro*. I am persecute', *si*? Some day, my fran's, comes eet *el* revolution. We drive out *grandees y hidalgos* who want we should fight for Germany, *si*. *Viva la Fra-ance!* We no forget you steal heem *los toros* of ver' best! *Santa Maria!* Christopher Colombo!”

Don Pedro Avocado ordered the Spanish rube to be silent under pain of being cut in half. He thereupon stood by and let the blue bloods from Manzanares confiscate the agitated chunk of beef-on-the-hoof while Yankee Phineas Pinkham consoled the peasant as best he could.