

1/2 A Brigadier



By JIM REYNOLDS . . . The popularity of the 1/2A Texaco Old Timer event is on the upswing. If you are looking for a model to compete with, or just have fun with, this 82 percent Berkeley *Brigadier* will fill the bill.

• The 1/2A Texaco version of the *Brigadier* (the spelling of the *Brigadier* is Berkeley's not mine, not Webster's) was built to generate some interest here in the San Antonio area for the Texaco event. From what I have read, heard, and personally experienced, 1/2A Texaco is a truly fun event. If you have been flying more, and enjoying it less, give 1/2A Texaco a try.

Any SAM approved Old Timer model can be used, that is, models designed, kitted, or plans published prior to December 31, 1942. It can be scaled up or down to any size. The engine must be a Cox Babybee, Goldenbee, or Blackwidow. The fuel tank is limited to the 8 cc stunt tank that comes with the Goldenbee or Blackwidow. And finally, the model must weigh a minimum of eight ounces for each square foot of wing area. The object is to stay airborne 15 minutes on 8 cc of fuel.

I chose the *Brigadier* as a 1/2A Texaco model because I had built a Berkeley *Brigadier* kit when I was a kid, back in the 40's. It was my first gas model. The model was never flown with power because I could not afford the engine. However, with the correct weight rock in the nose, it had a beautiful glide! I have never forgotten that model.

The original *Brigadier* had a wing span of 55 inches and a wing area of about 445 square inches. It seemed too big for

1/2A Texaco. By reducing it 18 percent, the wing span came to 45 inches and the wing area was just under 300 square inches. It looked good on paper. There was enough room in the cabin area for two Ace R/C Bantam servos, a 225 mah battery pack, and a Royal Vanguard receiver.

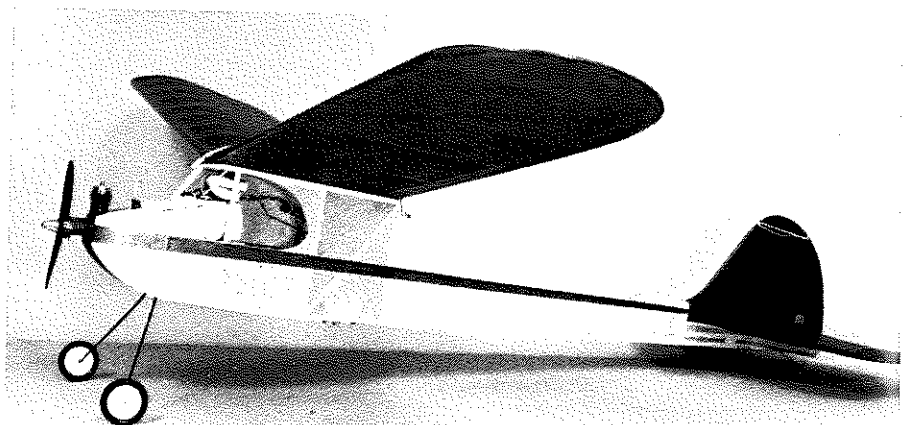
There is nothing unusual about the *Brigadier's* construction. The wing and the tail were completed first, so they could be attached to an uncovered fuselage. This way you can move the RC equipment around to get the balance

point right, without punching holes in the fuselage covering. The plans show the location of my radio equipment. My servos were put in with thin servo tape, but servo rails could be used, too.

The landing gear wire slides up into a slot made by some 1/16 ply pieces glued to the 1/32 ply fuselage doublers. It is then epoxied in place.

The needle valve of the Blackwidow was too short to clear the top of the firewall. An extension was made by

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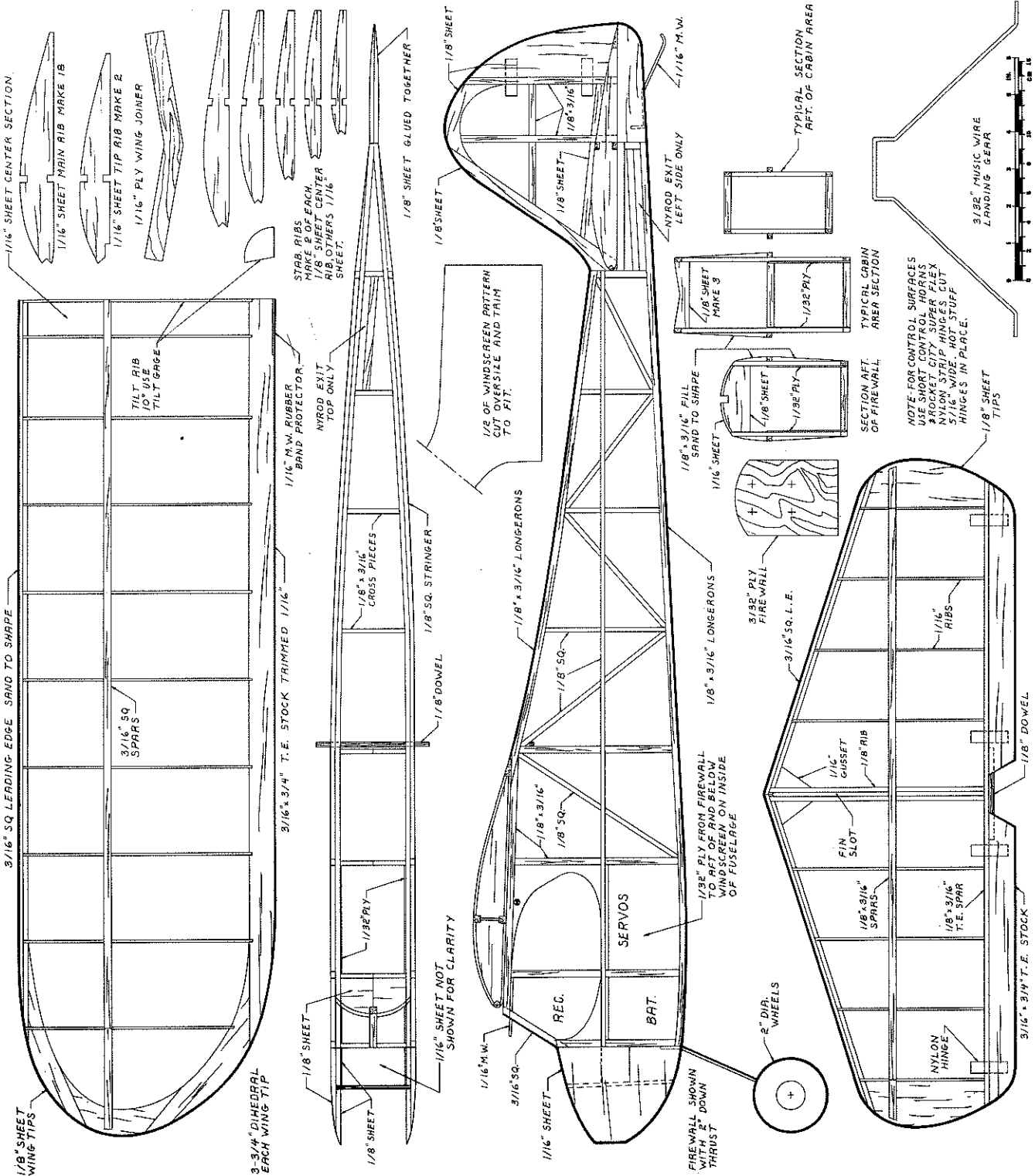
At 16-1/2 ounces, this 300 square-inch wing area O/T is a real feather. Three-minute engine runs produce nearly out-of-sight climb-outs. Author's model was covered using Silkspan.

1/2A BRIGIDIER

1940 AIR YOUTH OF AMERICA
 GAS MODEL THE

DESIGNED BY BERKELEY MODELS
 SCALED FOR 1/2A TEXACO
 BY JIM REYNOLDS
 SPAN 45 IN. AREA 297 SQ. IN.
 WEIGHT 16.5 OZ.

Plan No. 1B1-01





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match drill the holes with a 1/8-inch drill at right angles to the top surface of the trailing edge and forward hatch. Thread the hold down plates in the fuselage with an 8-32 tap. Now ream the corresponding holes through the wing just large enough to pass 8-32 nylon bolts. Place a drop of Hot Stuff (or Zap, etc.) into each wing hole. This will harden the wood to resist compression loads and wear. Treat the threaded holes too and retap the threads after curing.

Fully sand all surfaces and remove all dust to receive the selected covering film using the manufacturer's instructions. Attach the tail parts and rig the elevator controls. The pull for off switch installation is depicted on the drawing. Some trimming of the dacron v-control string length may be required to desensitize the shut-off point and still function reliably at full down. When satisfied with the adjustment, apply a small amount of Hot Stuff on the dacron string knots.

PREFLIGHT

Check all control surfaces not only for deflection, but also for proper direction.

Place a soft, half-inch thick balsa block in front of the motor battery. It will function as an energy absorber in the event of a crash. It may save both motor and battery in one those sudden stops. Restrain the aft end of the motor battery if you use a two by three cell stick configuration to prevent it from interfering with the aileron horn and links.

FLYING

Ohm-Y-Gosh is an intermediate design requiring prior flying skill, but it is not a difficult model to fly.

On the first flight, have the elevator trailing edge trimmed up about 1/16 of an inch above neutral. Hand launch firmly and with a slight nose up attitude. The airfoil used on this model has high drag at low speed, so don't let it climb too steeply after launch. Level it out as soon as it is at a safe altitude, and let it gain speed.

The model rolls 360 degrees in about two seconds which should be easy to handle in the excitement of a race.

For aerobatics, consider mounting the motor battery flat against the bottom of the wing. The aileron servo must be submerged flat into the wing's depth in this case; this will allow the model to achieve a more uniform roll rate. Bill Warner made a version which used this feature with a fixed wing and battery hatch on the fuselage bottom.

Electric powered flight is a very enjoyable alternative to the usual form of flying, and best of all, it allows the use of many flying sites which would otherwise be unusable.

Brigidier . . . Continued from page 38

drilling a hole in the needle valve and soldering in a short piece of 1/32 music wire. The engine was held in place by four 3-48 screws and blind nuts.

The control surface hinges were made from Rocket City nylon strip hinge material cut 5/16 of an inch wide. If you have never used these extruded nylon hinges, give them a try. Use a number 11 blade, cut a slot the thickness of the blade, push the hinge in place, and then add Hot Stuff. There is no open hinge line, so the glue cannot run in and lock up the hinge. Simple, fast, clean, and effective hinges are a real pleasure!

The model was finished with GM weight Silkspan and butyrate dope. To save weight but still have color, the Silkspan for the wing and tail was dyed purple with Tintex. When the dyed Silkspan dries, it is all wrinkled, but that is all right if you cover your models wet. If you cover dry, it might be worthwhile to iron the stuff first. Of course, you can

save all of this fun by covering with one of the lightweight plastic materials. The completed model weighed 16.5 ounces.

Just in case you have a pet model that you would like to scale for 1/2A Texaco, here is how to figure the dimensions. All you mathematicians can leave now and come back for the flying in the next paragraph. For years, whenever I wanted to scale a model up or down to a new wing area, I would pick some wingspan that sounded right, do the math, and see what the results were. Most of the time I would do this trial-and-error exercise two or three times until I got the wing area I wanted. I knew there had to be a better way, and there is. The magic formula is:

$$\sqrt{\frac{\text{new wing area}}{\text{old wing area}}} = \text{percent of old model}$$

The *Brigidier* had a wing area of 445 square inches and a span of 55 inches. I wanted 300 square inches so . . . 300 divided by 445 equals .674 and the square root of .674 is .821. Now .821 times the 55-inch old wing span equals a new wing span of 45 inches. See, it works.

The first flight of the *Brigidier* was made with a Cox Blackwidow turning a 5-4 plastic prop, a half-full fuel tank, and a slightly rich needle valve setting. It took off as if it knew just what it was supposed to do. Neutral elevator gave a nice climb. When the engine quit, full up elevator trim produced a flat guide. Five minutes later it was rolling down the runway.

The controls are set up so that elevator travel is plus or minus 3/16 of an inch, and rudder throw is plus or minus 5/8 of an inch. The landing gear has about two degrees of toe-in. This is supposed to make tail draggers take off in more or less of a straight line. It seems to work.

The next flight was made with a 6-4 wood prop and a full tank of fuel. The engine run was right on three minutes and the altitude gained was almost out of sight. In fact, with two of us watching, we lost sight of the model twice. I had to spiral down to regain visual contact. Fortunately, the white fuselage would flash in the sun each time the model would make a turn. The flight would have maxed out at fifteen minutes, but my neck gave out before the lift. Full down elevator trim brought the *Brigidier* down.

Subsequent flights have been made with different fuels and prop combinations in an attempt to gain maximum altitude with the longest engine run. I do not have the answer yet, but do not be afraid to try low or no nitro fuels and props of seven or eight-inch diameter.

So far, I have enticed a dozen local modelers to give 1/2A Texaco a try. What more can you ask for, uncomplicated rules, fast building, inexpensive models, and a minimum of R/C equipment. Build a *Brigidier* and join the fun.

