

In the May 1990 issue of this magazine the plans for my 96" glow powered Spook was published. Since then many Spooks have been built, and I have had many letters and pictures from happy owners from all over the world. My Spook has had over 1,000 flights and is still undamaged and in good flying condition. As I got older I became interested in electric powered models. I found it was easier to go to the flying field with a charged battery model, transmitter, charger, and a few tools and be able to fly. No heavy toolbox, fuel container, pump, starting batteries, or cleaning materials, etc., are required. Also there were no fuel stains in my car or on my clothes after a day's flying.

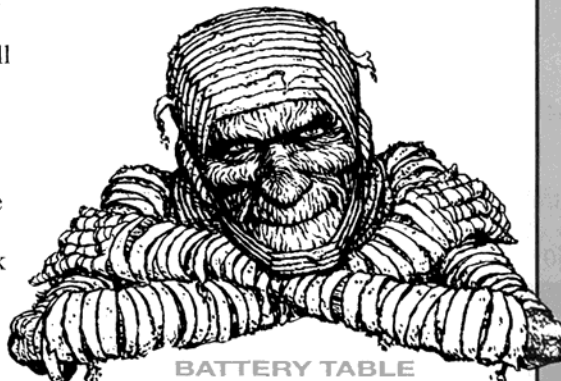
There is much interest now in small lightweight electric powered models and I felt that the Spook would be an ideal model to build and an excellent one for beginners.

The original Spook was 48" in size and was designed in 1940 by Barney Snyder and John Muir. The 48" Spook was a free-flight model, and with its beautiful gull wing and large stabilizer was an extremely stable flier which would make it most suitable for electric powered flight. You can take off and climb high up, shut off the motor, and it will glide around and maybe catch a thermal; when it descends, you can restart the motor and climb up again. It's lots of fun flying this way. Well, now if you feel that you must own and fly an electric Spook, let's get started.

CONSTRUCTION

Motor:

I used a Master Airscrew 3.5:1 geared electric motor for power and 7 cells (see battery box details) giving approximately a 12 to 15 oz. per sq. ft. wing loading, depending on the size of the battery pack. A larger size battery will give a longer flying time, but will increase the wing loading and the model will fly faster. Using a lighter battery will shorten the power on flying time but will also make the model much lighter and, of course, it will fly slower. Study the battery table and you can experiment with different sized battery packs and propellers.



BATTERY TABLE

7-Cell mAh	Wt. Oz.	Spook Wt. Oz.	Wing Loading Oz./Sq. Ft.
500	4.9	27.9	12.4
800	8.4	31.4	14
1000	9.0	32.0	14.3
1250	10.5	33.5	14.9

Note: All weights are approximate

SPOOK 48" (Electric)

Designed by:
Lloyd Ressler

TYPE AIRCRAFT

Vintage

WINGSPAN

48 Inches

WING CHORD

6-3/4 Inches (Avg.)

TOTAL WING AREA

321 Sq. In.

WING LOCATION

High Wing

AIRFOIL

Original (Undercamber)

WING PLANFORM

Constant Chord/Gull

DIHEDRAL, EACH TIP

5-1/2 Inches

OVERALL FUSELAGE LENGTH

31 Inches

RADIO COMPARTMENT SIZE

4" (L) x 2" (W) x 4" (H)

STABILIZER SPAN

20 Inches

STABILIZER CHORD (inc. elev.)

5 Inches (Avg.)

STABILIZER AREA

85 Sq. In. (Approx.)

STAB AIRFOIL SECTION

Symmetrical

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

7-3/4 Inches

VERTICAL FIN WIDTH (inc. rud.)

4-3/4 Inches (Avg.)

REC. MOTOR SIZE

Master Airscrew Geared 05 Electric

BATTERY PACK SIZE

7-Cell, 500 mAh - 1250 mAh

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

Rudder, Elevator, Throttle

C.G. (from L.E.)

2 Inches

ELEVATOR THROWS

3/8" Up — 3/8" Down

RUDDER THROWS

7/8" Left — 7/8" Right

SIDETHRUST

2° Right

DOWNTHRUST/UPTHRUST

2° Down

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Lite Ply

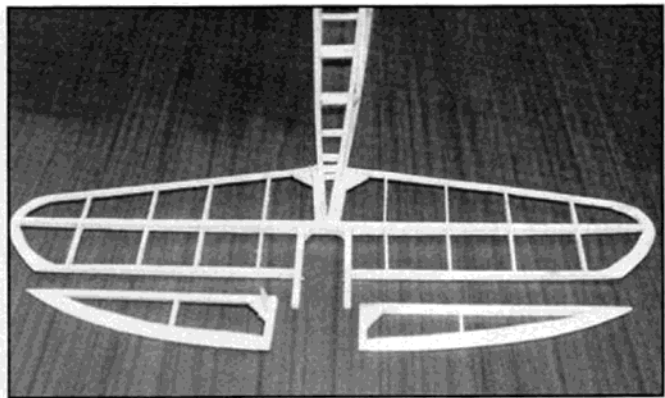
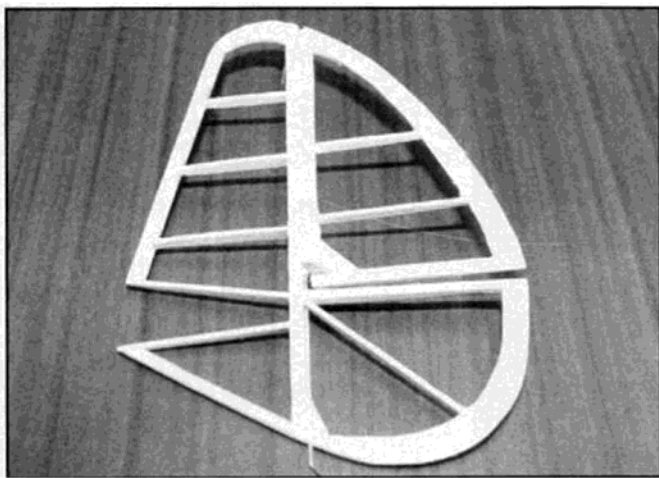
Wing Balsa & Plywood

Empennage Balsa

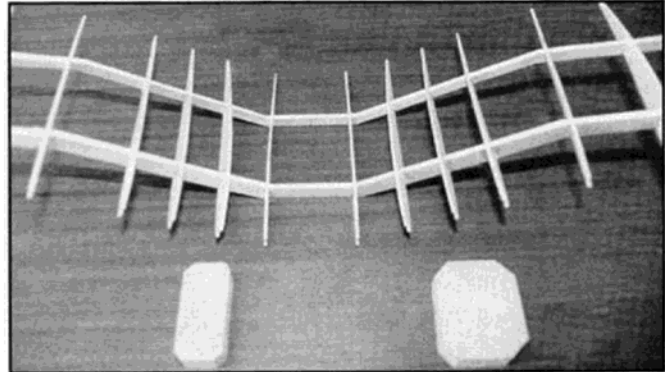
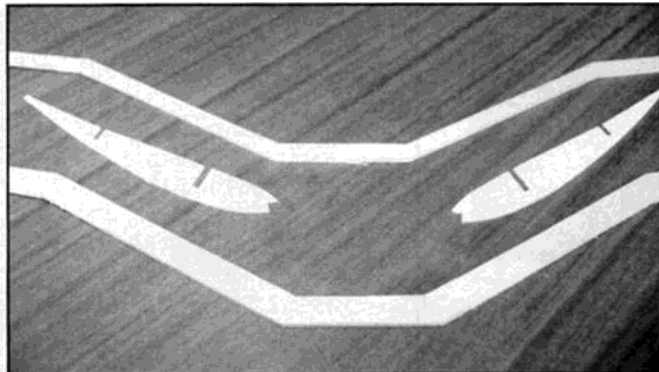
Wt. Ready To Fly 28-34 Oz.

..... (1 Lb. 12 Oz. to 2 Lbs. 2 Oz.)

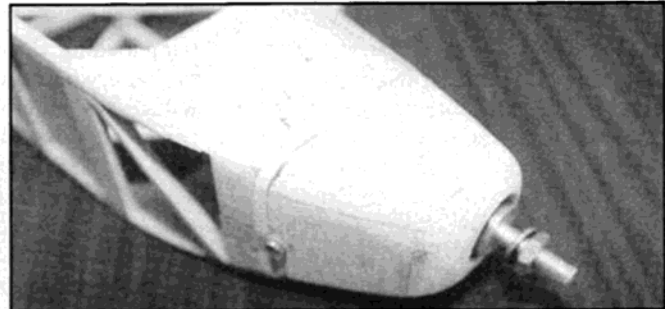
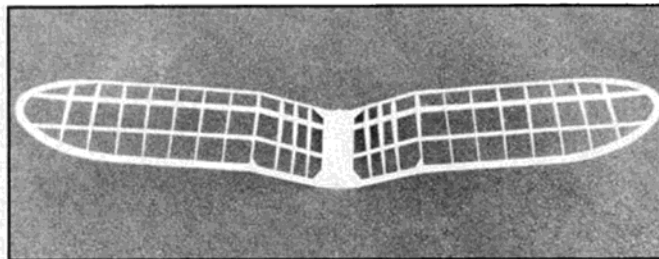
Wing Loading 12-15 Oz./Sq. Ft.



ABOVE: Horizontal stabilizer and elevator with plywood control horn. **LEFT:** Vertical fin and rudder with ironed-on hinge, steerable tail skid and plywood control horn.



LEFT: Spars and ribs ready to assemble wing. **RIGHT:** Beginning of wing assembly using rib spacer jig blocks.



ABOVE: Completed wing ready for covering. **RIGHT:** Front of cowl showing tab and screw.

Radio:

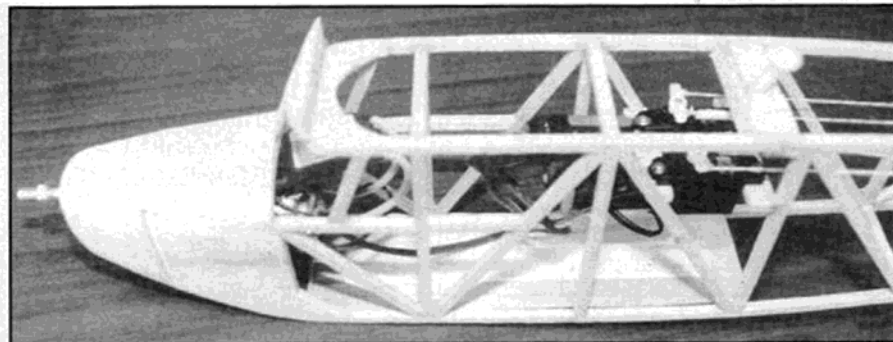
I used a very small receiver, a Jeti REX4 and two Multiplex MS-X3 servos and a lightweight speed controller with BEC and brake. Using the brake will make the model glide much better than if the propeller freewheels. I connected the four control lines (pull-pull system) to the servos using fishing line (Leeda Polyester 50

lb. test) which is light in weight and does not stretch.

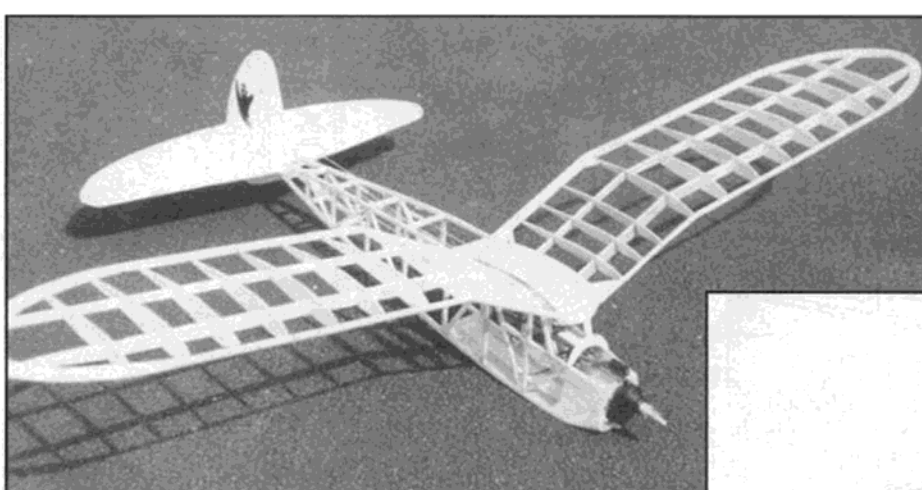
Fuselage:

Most of the model is constructed from 3/16" balsa. I bought 3/16" sheet balsa and cut it into strips. The fuselage is quite easy to build and should present no problems. Glue up two sides identical to each other (make the

second side over the first separating them with plastic film), then glue the sides together using a square to ensure that all is accurate. Epoxy the front cabin parts together to strengthen the wing plywood dowel mount. Note: You may have to change the motor mount bulkhead shown in Sec. AA if you use a different motor than the Master Airscrew motor I used. Install your electric motor mount bulkhead and construct the nose section to suit as per plan. Glue in the 1/64" plywood floor and glue Velcro on to secure the battery pack. The small cowl is held on with two small hooks and a rubber band. The front of the cowl hooks over the gearbox of the Master Airscrew motor assembly and is secured by the 1/64" plywood tab glued to the bottom of the fuselage; use a small 1/4" wood screw to hold it in place.

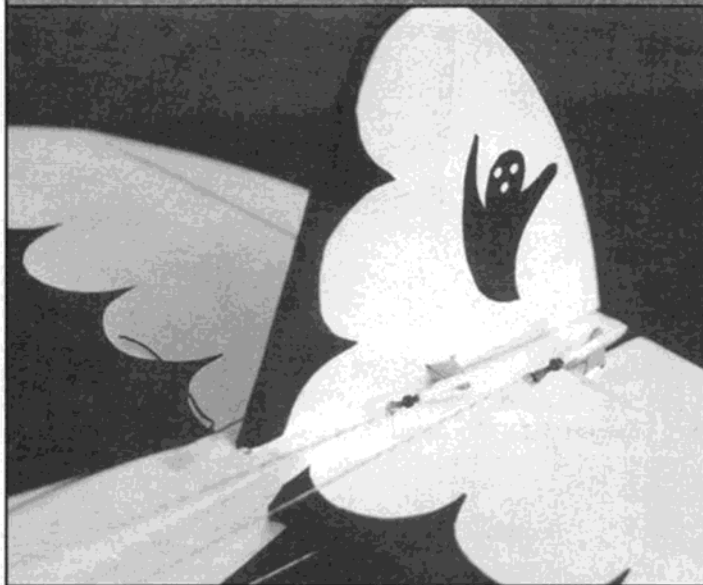
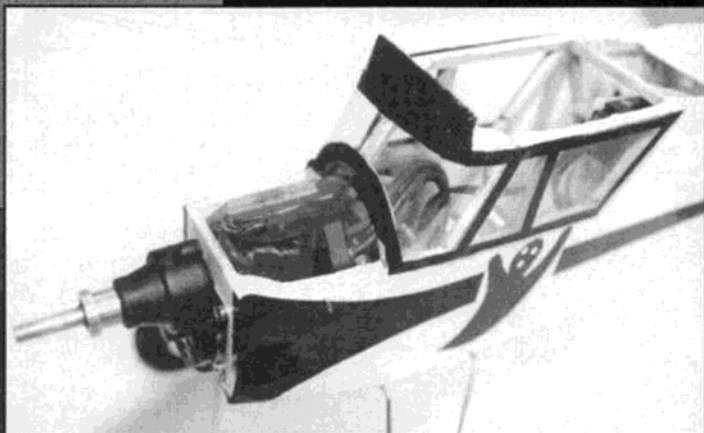


Fuselage showing servos, pull-pull lines, and wing mount.



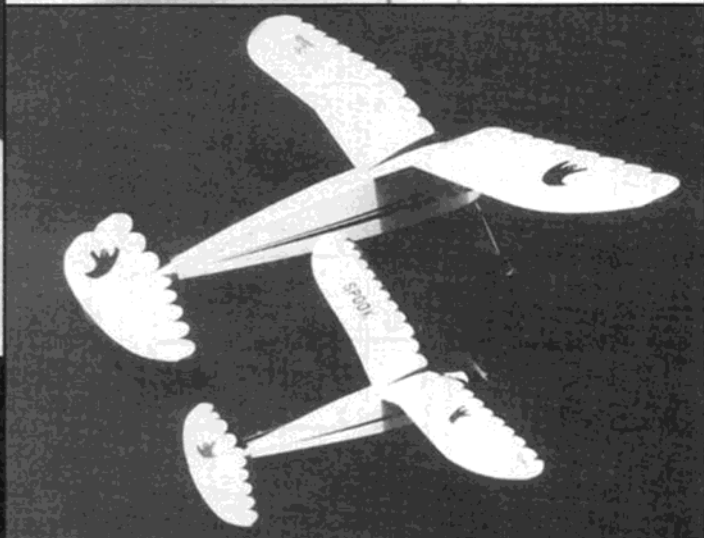
LEFT: Assembled Spook, ready for covering.

BELOW: Motor, speed control, and fuselage front wing mount.



ABOVE: Tail showing plywood horns and pull-pull lines.

RIGHT: 48" Spook with its big brother.



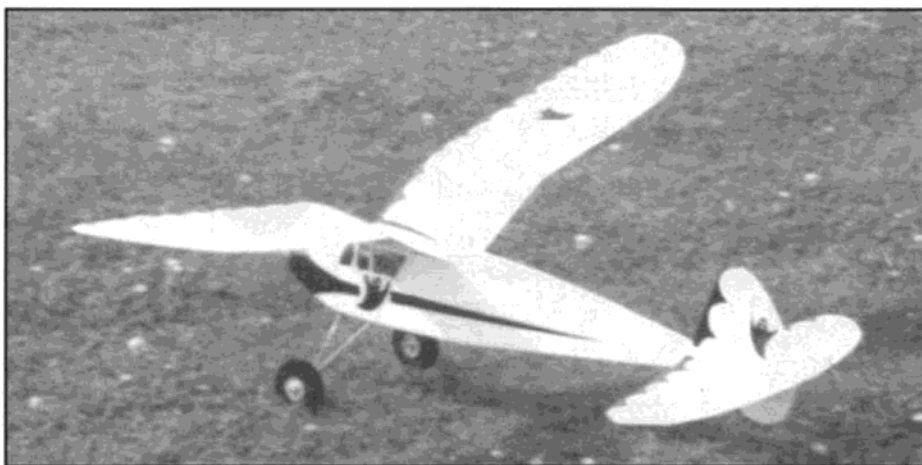
Landing Gear:

The landing gear is straightforward and needs no explanation. I attached the landing gear to the model with the plastic plates that come with control horns and very small wood screws. However, if you prefer, you can drill holes in the light ply landing gear

mount and sew the landing gear on with strong thread. I used 2-1/4" lightweight wheels, but you can use smaller ones if you wish. You will note that the landing gear is quite high; this is to accommodate the large diameter props that geared electric motors require.

Wing:

You may think the wing will be very difficult to build, but, in fact, it is very easy and goes together quickly if you use the wing ribs and the simple wing jig blocks (see plan). First, make the 1/64" plywood dihedral pieces accurately and glue them to the spars. When making the rear spar, place it over the larger front spar (separated by plastic film, of course) to make sure that the angle of the spars are exactly the same. This will ensure that the wing is accurate and, of course, the dihedral angle is already determined. Do not attempt to build the wing on the plan, you should build it in your hands. To assemble the wing, simply place a few of the W1 ribs on the spars, then, using the wing block as a spacer, slide the first rib into the correct position and glue it to the spar, then glue the next rib — again using the spacer to position it.



Keep doing this and you will find the wing builds very quickly. Remember to use wing block 2 and W2 ribs as shown on the plan for the outer wing panels. The rest is easy: glue the leading edge, trailing edge, and wingtips in place as shown on the plan to complete the wing.

To mount the wing on the fuselage, drill a 3/16" hole through the 1/8" ply former on the fuselage into the balsa crosspiece on the wing. Do not drill into the spar. This crosspiece should be shaped to the contour of the ribs, and to be able to be glued to the ply center section. Now you can glue the dowel into the wing balsa crosspiece and use some scrap balsa to glue and secure the dowel to the main spar. Glue the 1/64" plywood center section on the top of the wing only, then drill the 3/16" hole for the plastic wing bolt which secures the rear of the wing to the fuselage. Of course, you know that before you drill through the wing into the fuselage, you must make sure that the wing is exactly square. To do this, pin a length of the non-stretchable fishing line to the center of the rudder post and measure the distance to the main spar on one wingtip, then check the distance to the other wingtip. Move the wing until the distance is the same and the wing will be square. Drill the hole into the fuselage through the 3/16" hole in the wing. Next, tap the fuselage crosspiece for a 1/4" thread to suit your plastic bolt, run some CA into the hole to harden the thread. If you don't have a tap, you can use a blind nut. You can then open up the hole in the wing to 1/4" to fit the bolt.

Stabilizer/Elevator:

Build the stabilizer and elevators as shown on the plans but do not glue on the elevators and elevator center section. It is not necessary to taper the spars if you use the Solartex hinges as described later in the article. Glue the stabilizer to the model, making sure it is square with the fuselage and with the wing.

Vertical Fin/Rudder:

Build the vertical fin and rudder as shown on the plans, but do not glue the bottom fin on. After the stabilizer is

glued onto the model you can glue the fin in place, then complete the bottom fin and add the stabilizer center section. You can now epoxy the 1/16" wire coupler to the elevators and then iron on the Solartex hinges, if you decide to use this type of hinge. Otherwise, make the required slots for your favorite type of hinge material. To make Solartex hinges, cut 1/2" strips of Solartex the length of the control surfaces. The hard part is to get someone with a sewing machine to sew the strips using a polyester thread and a fine stitch. They must be sewn together down the center with the adhesive sides of the fabric facing each other. The Solartex hinge is then ironed onto the stabilizer spar, taking care to keep the seam straight and tight in the middle of the spar. The control surfaces are ironed on the same way. All surfaces should move freely.

Covering:

I covered the Spook with ordinary plastic film covering. You can apply the Spook insignia if you wish as shown on the drawing and photos.

Batteries:

Before flying you must cycle new batteries three times. First charge should be a slow one, then tie the Spook securely to your table and let the motor run at full throttle until the motor stops. Time this run and then recharge the battery at a fast rate as recommended by the battery manufacturer. Again run the motor until the battery runs down and record the time. Do this once more before flying. This will let you know how long the model will fly at full throttle and also if your batteries are sound. It is a good idea to test the controls when the motor stops to make sure your BEC is working properly.

Safety:

A few words about this most important subject. Some modelers think that electric motors are much safer than glow engines. Wrong, both are equally dangerous, but electric ones, because they are almost silent and can start so easily (no attaching batteries and flicking propellers, etc.) can be most dangerous. Last month one of our club members had to have 22 stitches in his hand when his model suddenly started. One other modeler had a bad experience last year when his transmitter was on the wrong model number. All the controls were in reverse and the model got away at full throttle; he pulled the throttle stick back and

then the throttle trim, but the model kept going at full speed, luckily down the runway. Not realizing the controls were in reverse he tried to take off but the model cartwheeled and broke up.

You must always have someone hold the model before you arm the plane. This will ensure that you have time to correct any faults or misadjustments and check that all controls are working in the correct manner.

Another useful idea is to put a small fuse between the motor and the speed control. This will save you much grief if the model lands in some obstruction, or even deep grass where the propeller cannot turn if the throttle is still open. The result would be one burnt out motor and speed control.

If you intend to experiment and change motors and different size and type of battery packs, here is a great idea I always use. It is very time consuming and a nuisance to put the wing on the model each time you make a change in order to balance the plane. After you have flown the Spook and found the ideal C.G., remove the wing and then balance the model with the wing off, mark the wingless balance point on the fuselage. Now it is easy and quick to make any changes in the model which may affect the C.G. without putting on and taking off the wing each time.

Flying:

If you balance the model as indicated on the plans by moving the battery pack, and have set the elevator and rudder throws as shown, the Spook will fly beautifully right from the start. Point the model into the wind and open the throttle slowly, the model should take off in ten yards or so. Good luck and safe flying. →