



Just out of the factory, the prototype Big John was powered (?) by a Forster .99 and was covered with blue and yellow parachute nylon, finished in clear butyrate. Struts are plug-in type. Sewn Figure 8 hinges a carryover from Galloping Ghost days.

BIG JOHN the First

The prototype Big John is still this editor's all-time favorite of his own designs. Perhaps you'd like to share the pleasure of flying a big, lazy biplane that will do just about any maneuver... if you don't mind waiting a little while for them to get completedA great exhibition airplane! By BILL NORTHROP.

The prototype Big John (B.J. the First) came about, indirectly, as the result of our purchasing a set of English- made, 6 inch diameter, M & S Air- wheels. This was in late 1957.

Being a typical, balsa dust-in-the- hair modeler (the ones who stick pieces of wood together, cover them with something, and then somehow make the whole assemblage stay in the air without visible means of support), we built a model just to suit the wheels, a 3 inch scale Gipsy Moth. We purchased the last completely assembled Forster .99, two speed ignition engine for power (Forster Bros, put it together for us from parts and said it would be the *last one* they'd sell complete). The finished plane weighed just a spec under 15 lbs. and had wing area that wouldn't quit! The combination turned out to be too much for the Forster, but by now, we were determined to get that engine airborne on *something*, so we drew up and built the prototype Big John.

Even though it was 6 pounds lighter and

much smaller (only 1500 sq. in!), the Forster *still* didn't seem to have the power, and so, as with the Gipsy, we went to a Fox 59 in order to fly.

By the summer of 1963, we had acquired a Quadruplex proportional system, and had a real ball flying Big John at various R/C meetings, where it attracted lots of attention. The most often heard comment; sort of a backhanded compliment, was, "Gee, that flies real great . . . for a biplane!"

Tell ya what ... It's the kinda plane that makes you want to shoot touch- and-go's, tankfull after tankfull. It'll do 3-point or wheel-only landings with equal agility. Aileron rolls are a little slow . . . but oh ... so majestic. Throw in a little rudder and they're a bit faster. Snaps and spins are easier with the enlarged rudder area . . . but still not quick and jumpy like a model . . . just slow, realistic, and pretty like a real airplane!

On Labor Day Weekend, 1963, we joined some pretty noteworthy company at



Model of Big John insignia, presented to us at a DCRC banquet. Similar to GL type (Enlisted men upstairs, officers below!).

Dahlgren Naval Weapons Lab, Dahlgren, Virginia . . . namely Maynard Hill, Walt Good, and Howard McEntee. The occasion was the first of many World R/C Record Trials sponsored by the DC R/C Club, and the primary objective that year was to capture the R/C Altitude record, then held by Russia. We brought Big John along for the fun flying between trials, but were convinced by others that we should also shoot at the record. And what d'ya know? Big John flew to 7,470 feet; enough to beat the Russians, but not as high as Maynard (13,320), Walt (10,080), or Howard (9,210). Hmmm. Maybe we should have tried to convince the FAI to establish a record category for R/C biplanes. Don't think it's been beaten yet!

A year later we developed Big John O.M.T. (One More Time), which had numerous modifications, including many added construction details such as fairings stringers, full symmetrical tail surfaces, thicker wing section, wheel brakes, nylon bolt assembly, etc. This was published in RCM in 1965.

In retrospect however, we still sorta favor the simpler construction in the prototype. In the November 1971 issue of MODEL BUILDER, we printed a picture of B.J. the First and promised to publish a construction article on it, someday.

So, in spite of numerous requests, we bring it to you now, our own all-time favorite design. Certain new modifications have been added without losing the basic simplicity of the prototype. Rudder area is increased, ailerons have been widened and shortened, and the original top-opening hatch has been replaced by the bottom wing opening. For reasons discussed in the building instructions, we also made a change in the stab and fin construction. After reading that portion, you can decide for yourself whether to follow it.

CONSTRUCTION:

Our favorite method of building a model airplane is to start with the tail surfaces. It's purely a psychological thing. . . the stabilizer, elevator, fin and rudder are usually easy and fast building. Within a short time, therefore, we'll have these parts built and this inspires us to continue the project into, say, the wings. After all, why waste that perfectly good tail section we've just built! The wings are usually next, mostly because they (or it) are the most tedious and should be tackled at the height of enthusiasm.

Finally, if we've been able to control ourselves, comes the fuselage. By this time, we're beginning to see the fruits of our labor take shape, and since the fuselage is usually the most interesting part of the project, we've practically got it licked. In addition, having the flying surfaces completed, we are able to make the fuselage cut-outs exactly correct to accept them.

As we said earlier, B.J.-T.F. is large, but

extremely easy to build.

Our instructions will therefore skip certain elementary building techniques.

The fin and rudder are basic built-up structures which may be assembled right on the plans. Shim up the rudder trailing edge with 1/8 inch scraps. To simplify matters, drill 5/32 inch diameter holes through ribs . . . where the 1/8 square diagonals intersect... before gluing them in place. Select fairly hard stock for the 1/4 X 1/2 fin spar, but keep all the remaining framework as light as possible. It is important to make the fin keel from a balsa lamination of 1/8 and 1/4 inch material. If you fly off grass and B.J. should happen to stub a toe and flip over, that hard fin spar and the fin keel must absorb the shock.

The stabilizer and elevators can also be built right on the plans. Again, use shims for the trailing edges. The 1/4 X 1/2 inch stabilizer spar should be of hard stock, even spruce (Everyone ground-loops sooner or later!), but all other parts must come from light stock.

Without going into the aerodynamics of it (I couldn't if I wanted to), suffice it to say that the airplane tracks a lot groovier with the "diamond" stabilizer airfoil. This is a modification from the prototype, which was flat. The flat stabilizer tends to make the elevator over-sensitive. Incidentally, you might want to try the same thing on the fin. Occasionally, in dead air, you can notice an ever-so-slight tendency for a ship with a flat fin and rudder to "swim" or oscillate. This was a noticeable characteristic on many Quick-Flys, particularly when inverted . . . Something about the flat surfaces performing a continuing series of high-speed stalls . . . Anyhow, we've indicated the modification with dotted lines if you want to try it.

Don't let that coat hanger wire elevator joiner bother you. Just be sure to select some of the more sturdy stuff. Reason for using it is that it's easy to align the elevators after they're installed. This idea came from the late Doctor Bob Lien of New Orleans.

The most difficult thing about the wings is buying all that wood! However, remember that you're not building just an ordinary airplane (Sure, I'm prejudiced!), and you're going to get lots of mileage and pleasure out of it!

There are two fast ways to cut out the 58 duplicate ribs. One way is to make a sheet metal template. Place it on a piece of medium hardwood scrap, such as a spruce 2x4, and punch two holes through it with a hammer and nail. The resulting jagged flash around the holes will grip the sheet rib stock when pressed into place while you slice out the ribs. By careful overlapping, you should be able to get quite a few ribs out of a 3/32 X 3 X 36 inch sheet without too much waste.

The other method is "baloney slicing," and requires the use of a good jig-saw or a band-saw with a fairly thin blade.

With this method, you trace the rib pattern on a block of balsa, cut it out, and then, with the saw fence set for a 3/32 inch cut, start slicing off ribs. Fortunately, the ribs will be sheeted or capped, so the possibly "toothed" edge will not be exposed to covering. Note: Ribs are not fully symmetrical. Be sure to identify top from bottom during installation.

Wings are built (2 left and 2 right, please!) on the plan. First, pin down the bottom rear sheet. Second, glue and pin the bottom rear spar in place. Third, set up the 1/4 X 1/2 jig strip and then glue in all ribs. Fourth, add both top spars and sub-leading edge. Fifth, install rear spar webbing. Sixth, add top rear sheeting (Bottom rear sheet should be beveled before starting construction, or, build wing with trailing edge at edge of building board, then bottom sheet can be beveled . . . more accurately ... in place, after ribs are installed). Seventh, add top front sheeting. Eighth, add root and tip panel sheeting and cap all ribs. Ninth, when glue is dry, turn panel over, pin down and reposition jig strip. Tenth, add bottom front spar and install front spar webbing. Eleventh, add bottom front sheeting. Twelfth, add tip panel sheeting and cap 6 ribs. Let panel dry and then remove from board.

Repeat the above 12 steps ... 3 more times! Note: Panels are exactly alike. Left or right is determined by installation of webbing, and upper root paneling.

The two center sections are built in the same manner. Again, don't cover bottom surfaces between front and rear spars as yet. However, there are two variations. First, it's obvious there are no cap strips, but also, leave out the webbing. The dihedral braces will take care of this. Second, just before adding the bottom leading edge sheeting, install the leading edge dihedral braces. Cut and remove 3/32 inch from the nose of each rib and epoxy the braces in position. Bottom front sheeting can then be added.

Match up your two center sections and four panels into two wings and block-sand mating root ends for a snug fit with 1° (1 inch at tip) dihedral . . . Slanting the panel root ribs ever-so-slightly during construction would help here. Also, it will be necessary to cut away 3/32 inch from each panel root rib to clear the dihedral brace. When you're all set, simply butt-glue the wings together, making sure to slop epoxy onto the area where the L.E. braces make contact jig panels up for 1" dihedral in each until dry.

Main dihedral braces are installed by cutting away ribs at the spars and slipping the braces in place, with lots of epoxy. After this, the bottom sheeting can be completed.

Up to now, the wings are still alike. Select the stronger (heavier) one to be the bottom wing (it takes more of a beating, and will also carry the ailerons). Measure off and mark each panel to cut out the ailerons.

The first cut should be 2-1/2 inches in from



After some changes from initial "rollout," B.J. was fitted with a Fox .59; fuselage, fin, and rudder were painted with blue Hobbypoxy; and a Quadruplex radio on 6 meters was installed.

the trailing edge, top and bottom. Next, find the fourth rib out from the dihedral break by poking a pin through the sheeting, then mark and cut the sheeting just outboard of the rib. Finally, insert a piece of backless X-Acto saw blade through the long cut in the sheeting, and zip through the ribs . . . Catch the aileron in your lap.

By repeating the process, cut the aileron down to size, slanting the bottom back to allow for downward movement. Sand all exposed edges and cap with 1/8 inch sheet. Don't forget to install the 1/16 ply aileron horn rib and micarta horn assembly . . . and also whatever blocks may be necessary to hold your choice of hinges. Make cutout for aileron servo and complete control installation in usual manner.

Complete wings by adding leading edges and tips. Note: If struts are desired for appearance, try the simple installation shown.

The 1/4 square holes go all the way through the wing. Make struts from 1/4 or 3/8 sheet balsa and make the plug-in stubs about a half inch long.

With extra long stubs, the struts arc less apt to pop out when the wings flex during extreme maneuvers. Should a stub break off during some extra-vehicular action such as a ground loop, it can be removed easily before inserting a substitute strut.

The fuselage is a very simple box affair, with a round upper deck. The longerons key into the 1/4 inch front sheet sides, and a few stiffeners, no doublers, are used. After the duplicate sides are built, begin construction by installing bulkhead B and the 1/4 square cross pieces at station E. Align this first assembly very carefully and the rest of the fuselage should go together nice and straight.

The hardwood landing gear supports and cabane strut supports, which key into the 1/8 ply stiffeners, are best cut from maple or walnut. If this is difficult to accomplish, use ready-made landing gear blocks such as available from Sig, Top Elite, etc. and revise the 1/8 ply stiffener cut-outs to suit.

Install 5/32 inch O.D. brass tubing to receive the cabane struts before epoxying the strut braces in place.

The cabane struts, which can be bent to shape and assembled at any time during the construction . . . even after covering . . . arc made of 1/8 inch music wire. Once the main "U" shaped pieces are bent to shape, cut them in half and slip into the fuselage tubing. Bend to shape and install the wing saddle and the diagonals. For maximum strength, bind all joints with copper wire and use silver solder. When the fuselage is totally completed, covered and painted, or Monokoted, the cabanes are installed for keeps by adding the 1/16 wire cross braces. This locks the assembly in place.

The nose is built "inward." The 3/4 inch balsa cheeks go inside the 1/4 inch sides, and then the maple motor bearers are epoxied inside the cheeks. After adding the ply tank floor and bulkhead "A," the chin block and remaining fillers may be added. Due to the wide nose, the right side of the cowl will have to be carved out to accept a muffler, but actually, this will look better than having the pipe sticking out in the breeze as with the usual skinny fuselage.

We took the simplest route for final assembly. Wings are rubber banded on, though the bottom one can be downloaded and bolted if you wish. The tail section is epoxied in place, but here again, if you have a storage or transportation problem, it's not too difficult to rubber band or bolt on. Main problem is that you have to give up that rudder hinge down near the horn and tail-wheel arm. This is pretty important for slop-free rudder control.

Well, that's it . . . in what turned out to be a pretty large nutshell. If you have any questions on construction of B.J., give a call or drop a note. We'll be glad to help.#



How's that for a beautiful flying field? And it's green grass, man! Note top hatch and old style cabane struts. Trexler airwheels.



"Flip her over, Boo-Boo, and I'll prove to you that I'm a better flier than the aver age bear!" Yogi has flown three of our biplanes.