

# MODEL BUILDER



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## 1920's Navy Flying Boat

This model looks just about like any Navy flying boat you might have seen back in the early 1920's (if you happened to be around at the time), and flies in the same lazy manner.

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PHOTOS BY MARK COWLES

• U.S. Navy flying boats of the World War I and twenties era were many, and varied greatly in plan form. There were two general types, one similar to our

model, and the other with hull and outriggers to the empennage, such as the Curtiss NC-4 of transatlantic fame. But I think it's safe to say that all were bi-

planes with rigging far more complicated than this non-scale subject.

About 1964, M.A.N. published Ken Willard's "Little Swell," a monoplane flying boat. Right away, I saw the possibilities of making it into a boat such as I had been thinking of building.

The hull of a flying boat can take considerable experimentation and building trial and error before you hit upon the right design. After reading that this was Ken's third try, I decided to stick with his hull design and blow it up two times in size. The rest of the ship is my idea of a composite of all of these great old Navy Flying boats. Also, it is of great satisfaction to see it lumber along until it hits that last ripple and becomes airborne. It then cruises around with no great performance, much as those ships did. There is little doubt that it could stand a 60 for power, but I preferred the challenge of a strong 40, such as the Super Tigre ball bearing rear valve it now has, for realism.

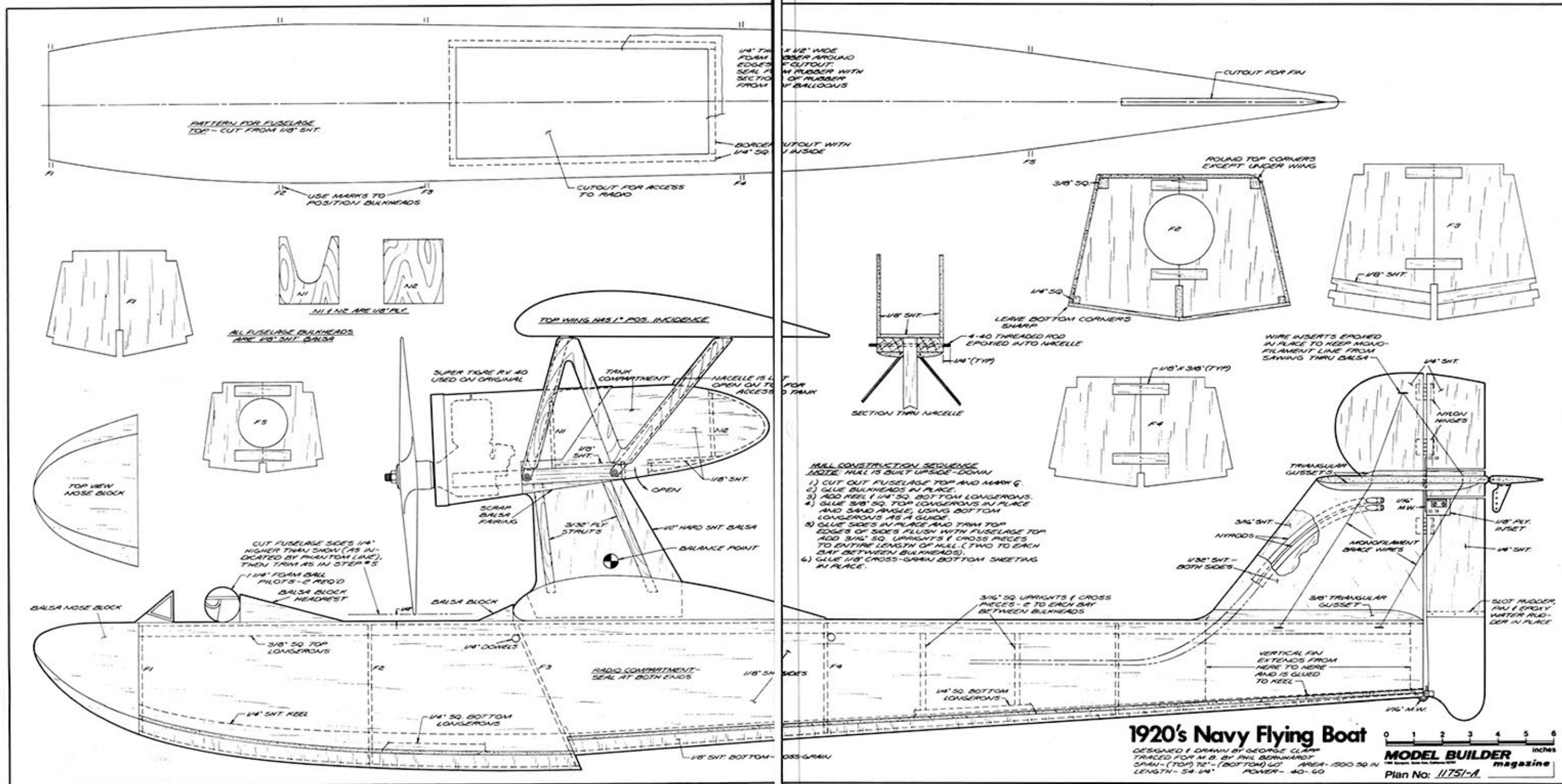
### HULL CONSTRUCTION

The hull is quite simple to build, with 6 steps clearly shown on the plans. It should be noted that the top view lines represent the exact shape of the top piece of the hull.

1. Use the top pattern right off the



Todd Bradbury, the author's No. 3 grandson, poses with the Navy flying boat. Hmmm . . . wonder what frequency George is using?



plans. As the top of the hull is flat, it makes an easy foundation for building the hull upside down.

2. Draw center line on top skin and install bulkheads.

3. Lay keel and bottom longerons.

4. Lay top longerons and sand angle on these, using bottom longerons as guide. This should sand angle back to top skin. Now cut out radio access below wing and border with 1/4 inch balsa between top longerons and bulkheads.

5. Make outside skins from 1/8 inch medium balsa, using side view as pat-

tern. Note 1/4 inch excess added to top. Top will then have to be fit to allow for angle of sides of hull. This will make a gentle curve on the top of side pieces. Sides are then glued in place. Now add 3/16 sq. hard balsa cross pieces. These should be two to each bay between bulkheads, except between F-2 and F-3, where one is enough.

6. Bottom is then layed on, cross grain, for strength. Add block to nose and sand entire hull to shape. Then add block for wing to butt against at front, and pilots' head rest (two pilots).

#### TAIL SURFACES

Make vertical stabilizer, using 3/16 medium balsa. Then cut out way for Nyrod and sandwich 1/32 hard sheet balsa to both sides. Make curves for Nyrod as gentle as possible. Nyrod will have to be glued in at same time that 1/32 sides are applied. Make sure Nyrod is long enough to go to radio area of hull. It was feared at first that this would bind Nyrod too much, but it works very well. Note that entire vertical fin goes through fuselage and down to keel. Add fillet at base of fin.

Now make horizontal stabilizer and glue or epoxy to top of vertical fin. The entire hull, vertical fin and horizontal stab are then silked and doped with several coats of clear. Rudder and elevator are then made, silked and doped. Nylon hinges are installed. Water rudder is then made of .020 galvanized steel. It is pinned and epoxied to groove cut in bottom of rudder. Tab on water rudder is then formed around .062 piano wire, wire being bent as per drawing.

Tail section is now complete. Note small pieces of wire inset in fins. This

keeps No. 20 monofilament leader brace wires from working in balsa.

#### TOP WING

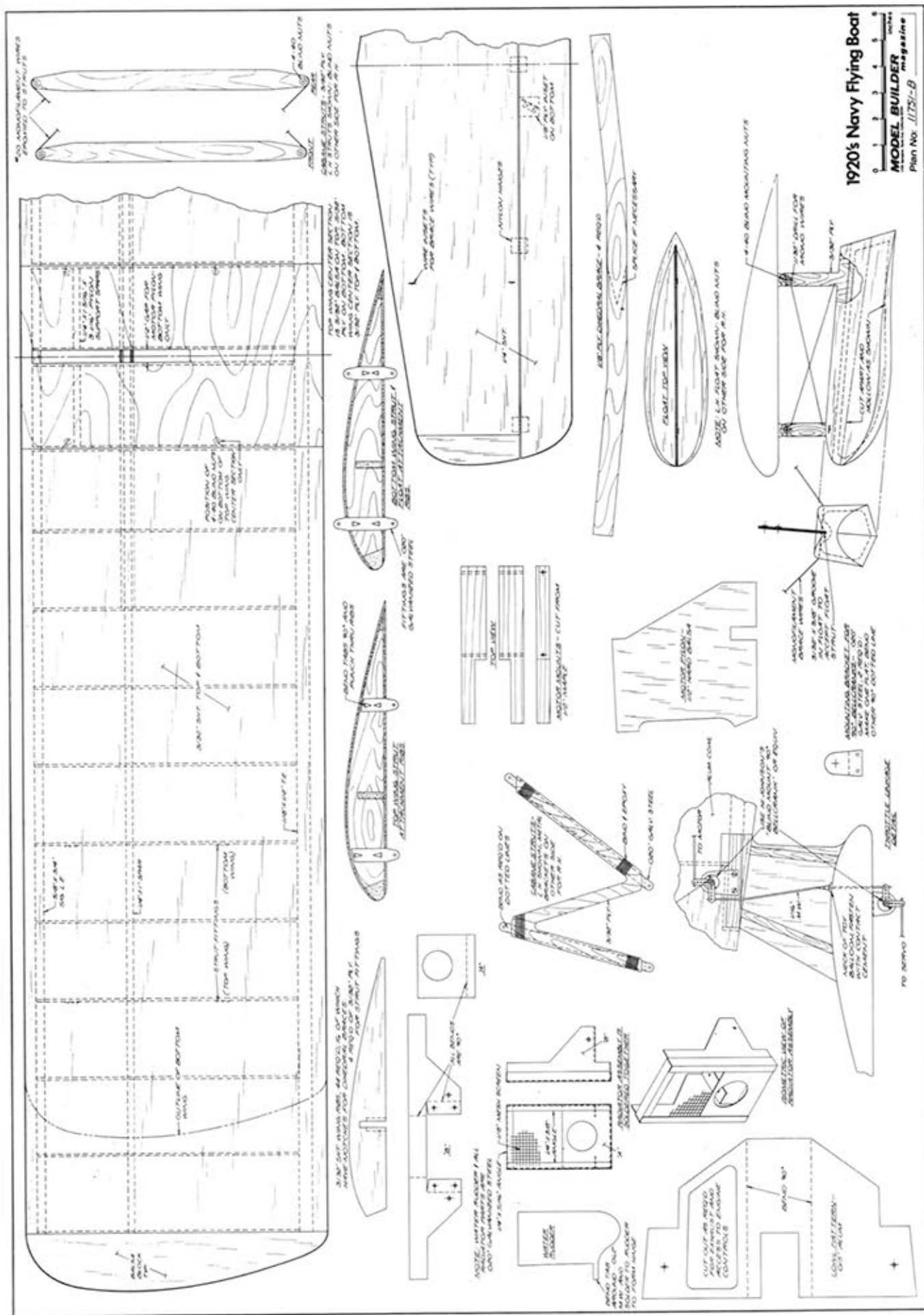
Wings are both pretty much alike in construction. Lay 3/32 bottom sheets and pin down. Now add spar, ribs, trailing and leading edges. Note center section on top wing is 3/32 plywood on bottom surface only. Now add dihedral, glue wing splice in place, and 3/32 outside panels to plywood center section. Next, add blind nuts to center section and epoxy strut fittings to out panels. Finally, add top skin to top wing.

#### BOTTOM WING

Bottom wing is very similar, but both bottom and top surface of the center section is 3/32 plywood, and it has short pylon spars. Entire center section is epoxied. Of course, pylon has to be installed before top skin. For strut fittings shown, I made a small die and punched burrs in them. But they could be made with holes and pinned to ribs. Tips on both wings are made from blocks.

#### TIP FLOATS

These were made of a solid block,



Close-up photo of engine mounting. Note waterproof shield around throttle linkage where it comes up through the lower wing. "Rustic" cowling is very typical of early 20's era . . . certainly no problem with cooling. Note fuel lines from tank to upper surface of top wing.

split to hollow out, then glued back together. Slot in top accepts one-piece plywood struts.

**MISCELLANEOUS**

The struts, motor mount, cowlings, engine, dummy radiator, etc., are pretty much self-explanatory on the drawings.

**WATER TIGHTNESS**

This cannot be stressed too much. You will note the toy balloon neck around throttle exit. Also, good quality sponge rubber around radio access opening covered with toy balloon sections.

Cement down sponge rubber, then be careful not to get contact cement on sponge when attaching membrane over it.

**RIGGING**

Entire wire bracing is done with No. 20 monofilament fish leader. After installation, it is heat shrunk. Make sure you get a line that will shrink. I had some that would not, and had to replace it.

**CONCLUSION**

I would like to thank Harvey Saddler,

of Phoenix, Arizona, who helped me with the construction of this airplane while I was there, in 1967-68. This ship is over six years old and has dropped from about 20 feet up after a stall (I got excited and forgot to extend transmitter antenna) into the water, with the only damage being a missing windshield. This is the advantage of building them like a brick **CENSORED** (*Shame on you, George! wcn*). May you get as much enjoyment out of building and flying it as I have.



Our cover star, Jeff, gives us an underside view of the flying boat. Ship is a slow and realistic flier with the .40 rear rotor Supertigre.



The author poses in an appropriate background. The floats are rigged on a Cessna 172.