



# CONSOLIDATED PT-1

by John Winter

Here is a ship to tease your memory. The prototype saw service before 1927. Anyway, whether you can remember the "wood and wire days" or not, this job offers plenty of flying fun for you.

## Here's a 1927-vintage rubber-powered Sport ship complete with Full-Size plans

● The prototype of this model was used to train Air Corps cadets at Brooks Field, Texas long before many of us made our first "hop" with the stork. What a breath-taking ride that must have been (few of us remember) for it probably faired well with the PT-1's maximum speed of 92 m.p.h. Anyhow, taken with this model as we were, we decided to build one for fun.

The super simple lines of this ship lend themselves to making the "wind up" job shown on these pages. Simple slab-sided fuselage, constant chord wings, simple tips, and the general

lack of frills are outstanding. Sold? Well, we suggest that you look over the plans before starting out so that you fully understand the building sequence.

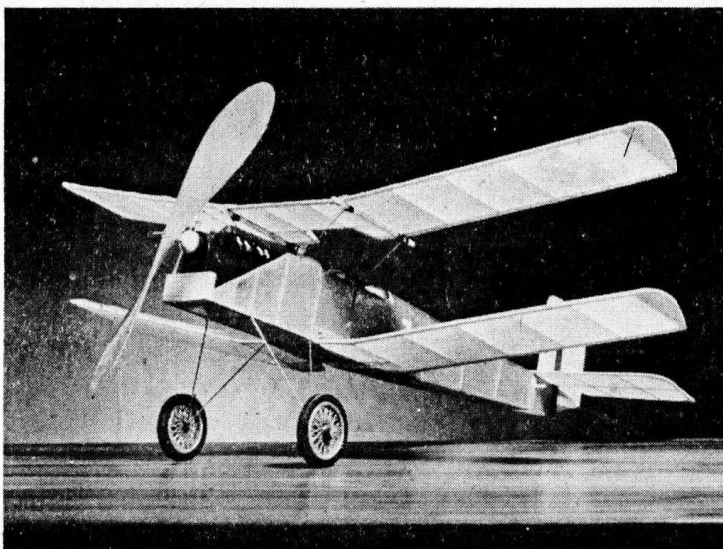
**FUSELAGE:** This part is so simple to build that we won't stand for any griping over the slight effort it takes to build the dummy engine. Besides, isn't it a better looking nose than a hunk of clay or solder?

Start by making the two fuselage sides. Build them directly over the plan (using wax paper under the con-

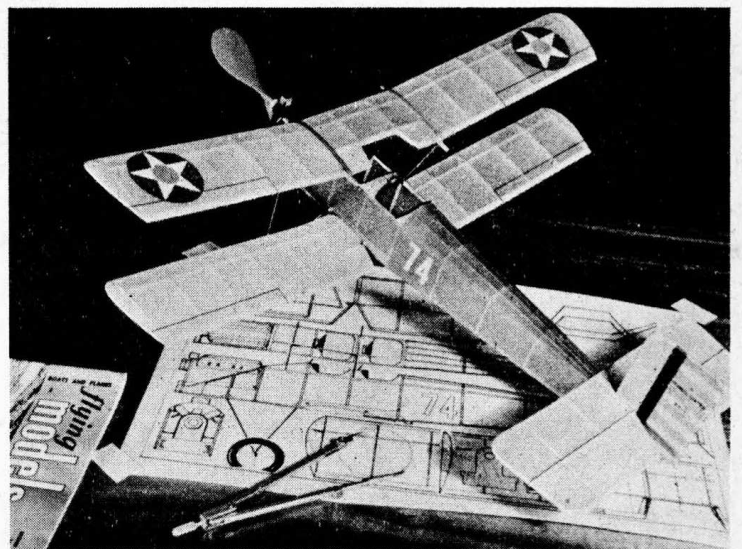
struction, of course). Cement the  $\frac{1}{16}$ " sheet balsa portions in place and the gussets.

All cuts should be made accurately so that the parts join with the maximum areas of wood touching. Pre-cement all end-grain joints for strong junctions—a trick that adds a considerable amount of strength for very little effort.

Join the completed sides starting at the back of the cockpit and working toward the nose. This is the parallel portion as seen in the top view of the



A close-up of the PT-1 showing the "engine." This detail adds to the model's appearance without reducing performance. The ship flies well.



Covered with olive drab and yellow tissue, the PT-1 will draw a large crowd every time it's flown. Both wings are held on with rubber bands.

fuselage. All cross-pieces are equal length. Install the "radiator," N-1, at this time. Do not fit the top formers as yet—these are A, B and so forth.

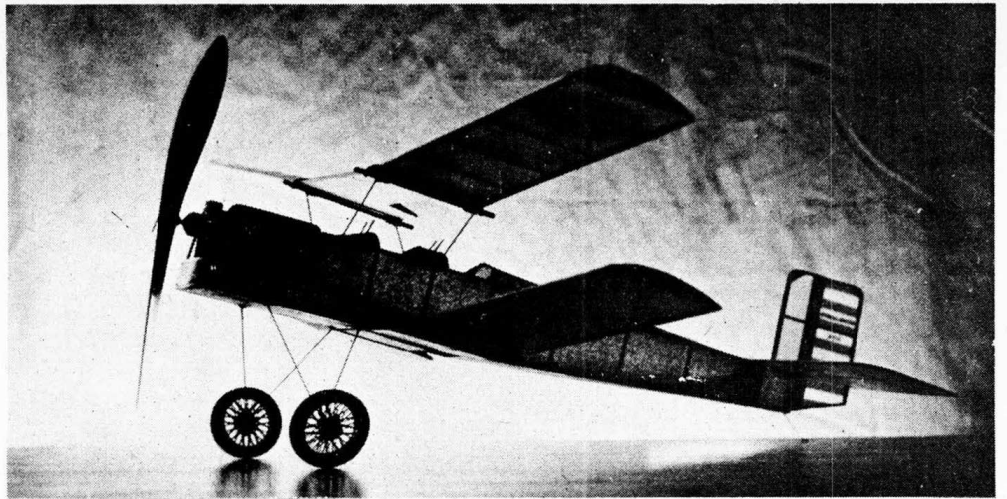
Next, join the fuselage sides at the rear using a piece of  $\frac{3}{16}$ " x  $\frac{1}{8}$ " for a tail post. This part can be built up from three pieces of  $\frac{1}{16}$ " strip if necessary. Once this has been done, and the alignment has been checked, you can add the remainder of the cross-pieces. Refer to the top view for their length.

Don't just sit there chewing on a piece of balsa! This is the time to be doing something useful. Get out your wire and pliers and make up the landing gear, wing struts and tail skid. As you complete these parts, install them on the fuselage. The wing struts will prove easier to handle if you assemble them before you cement them in place. Use split bamboo as noted. This is easy to make and short pieces of bamboo are easy to come by so don't cut corners by using balsa which won't have the necessary strength.

Bamboo is easily split if you follow this simple procedure. Split a strip of bamboo down the middle. Take one of the halves and split it down the middle. Then, take one of these halves and split it down the middle again, and so on. Simple? You may ruin a piece or two but you will have a pile of bamboo strips in short order.

The formers should be cut out and cemented in place at this time. Note that the forward portion of the fuselage is covered with bond paper and that bamboo stringers are used aft of the rear cockpit.

The bond paper will have to be put on in two pieces to get the downward slope shown on the side view. Use care in fitting the paper and avoid trouble.



A clever back-lighting photo of the author's PT-1 shows up some of the structure of the ship. The scale-like wheels were obtained from a plastic automobile kit. The propeller is also plastic.

Finish up the nose and the rest will be easy. Cut out and cement the "crankcase front" (N-2) to the back of N-1 and mount this assembly between the  $\frac{1}{16}$ " balsa projections on the front of the main frame. The crankcase cover, made from a piece of  $\frac{1}{32}$ " sheet 2" x 2 $\frac{3}{4}$ ", is bent and cemented in place using the time honored method of cut-and-try. Moisten the wood if it proves difficult to bend. Support this crankcase cover at the rear with a strip of  $\frac{1}{16}$ " x  $\frac{1}{8}$ " balsa.

The two cylinder heads for the dummy engine are made from  $\frac{1}{4}$ " x  $\frac{1}{2}$ " x  $1\frac{7}{8}$ " balsa and are attached so that they bear against the upper fuselage longerons. This completes the assembly and you will note that the engine is now a permanent part of the fuselage. The thrust bearing pieces (N-3) are now attached. Make two from  $\frac{1}{8}$ " balsa and cement them in place as noted. The hole for the thrust bearing is drilled after these pieces are permanently in place. Choose a drill to suit the thrust bearing you plan to insert.

**WINGS AND TAIL:** Draw out the full wing planform using the outline of the left wing panel as a guide. Since all dimensions can be taken directly off of the plan this will prove simple.

Cut out all of the ribs and stack them together. Push straight pins through this stack to hold the ribs aligned and then sand the whole stack to a uniform contour. This procedure helps to insure a straight wing structure. Note that we used thin  $\frac{1}{32}$ " ribs, except for the four noted, to keep the wing light.

After the wing has been assembled, crack the leading edges and the trailing edges at the point marked "dihedral break" on the wing planform. Raise the tips  $1\frac{1}{2}$ " and place a block under each panel until these cemented joints dry. The centersection remains flat on the board. Once this step is completed you can add the wing tips and spars. The wing tips are beveled so that they angle up at about 30° to the leading edge. Add the small gusset at the tips as noted. The lower wing should be made in the same manner and we recommend that you build both at the same time.

There is little to say about the stabilizer and the rudder. These are built from strip stock as noted. Place some wax paper over the plan and build directly on top of the drawing.

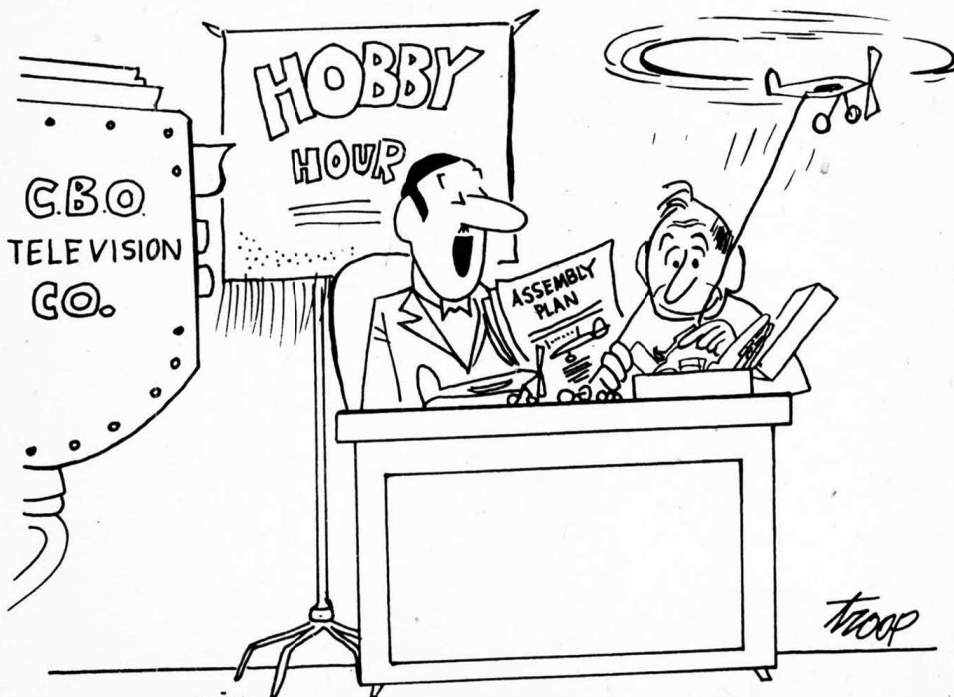
**FINISHING:** Cover the fuselage with olive drab or brown colored paper if it is available. If not, take white tissue paper and dye it in "Tintex" or coffee to get the desired color.

Cover the fuselage in sections to make the job simpler. Note that the bottom of the fuselage, where the lower wing mounts, is left open. Tissue can be applied easily if you use a thickened mixture of clear model dope. This can be accomplished by adding model cement to the dope. Make sure that both will mix without curdling.

An excellent tissue adhesive is white library paste—the type that softens with water. It dries quickly and holds well. Lepage's mucilage works well too. We suggest these for we have found that some modellers find it difficult to cover using dope as an adhesive. Cement works well but leaves lumpy

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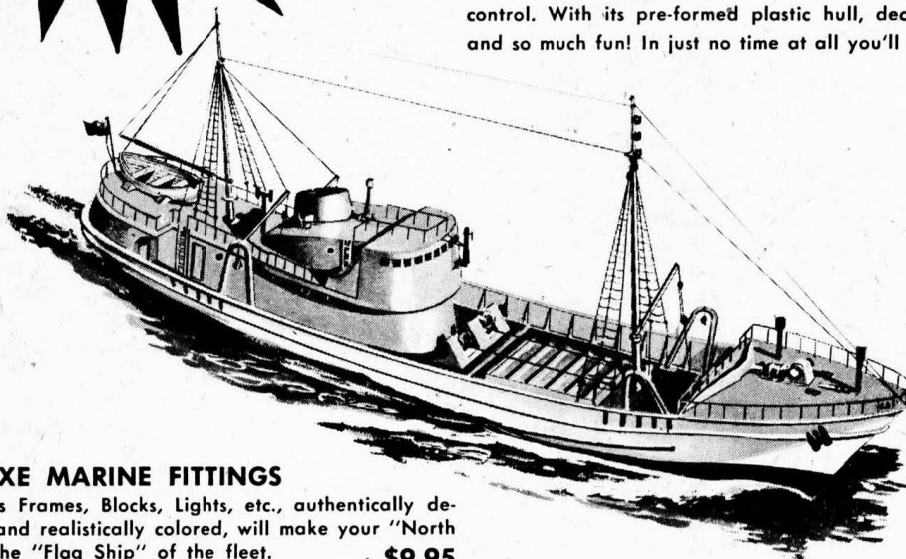
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spots under the tissue because it dries too fast. Water shrink the covering before doping.

The wings and tail are covered with yellow tissue on both sides. On our ship we covered the rear section of the rudder with white tissue and after applying one coat of dope, which should be allowed to dry, we added strips of blue and red tissue to get the barred effect.

The wheels which you see in the photos were obtained from a plastic old-time race car kit. Though they are scale-like they are a trifle heavy. We suggest regular wooden wheels for best flight performance. The center discs of these can be painted white with silver spokes. The tires are painted with black dope.

We use small pieces of rubber, cut from the end of a pencil eraser, to hold the wheels on. These are pierced with a pin and forced onto the axle end.

The prop assembly is made up from a standard thrust button, a wire shaft and an 8" plastic prop. You should add a few washers under the prop for smoother operation. Since some propellers have a free-wheeling ratchet moulded into them, all you need do is bend a right angle into the prop shaft after you have mounted all of the parts in place on the thrust button.

The motor is made up from two or three loops of 1/8" flat T-56 rubber which can be purchased in most hobby shops. Since the price is cheap we usually buy eight or ten feet at a time. This

provides for extra motors or changes in power we might wish to make. After making up a motor we lubricate it with castor oil.

The motor is attached to the motor peg and then it is drawn through to the front with a piece of wire. Attach it to the prop shaft and you are all set to go.

The wing is attached to the wing saddle with short rubber bands. We use yellow ones and they are hardy noticeable at all.

Fancy trimming is up to you. It adds nothing to the flying and if carried to extreme will detract from performance. "U. S. ARMY" can be applied across the lower wing in 1 1/2" high black letters. This can be done with decals or you can cut the letter from black tissue paper and dope them on.

Lettering on the rear of the fuselage is done with white tempera paint and a fine artists' brush. Clear dope is added after the color has dried to protect it. The radiator and 1/4" square header tank can be doped silver while dull black is fitting for the rest of the engine. Short lengths of aluminum tubing work fine for exhaust stacks and wing walks can be made from strips of black tissue which are doped onto the lower wing as noted.

**FLYING:** The PT-1 should balance on a point in line with the center of the front cockpit when balanced by the wing tips. First trial glides should be made over tall grass — otherwise

known as the "maladjusted model's mattress." If you are like us you'll probably give the ship its first toss over a concrete walk and find it survives the abuse. Minor trim adjustments can be made by placing slivers of wood under the upper leading edge if the ship dives, and at the rear of the wing if the ship stalls. Make your first power flights with approximately 50 hand-winds and correct any nasty tendencies before going further. Our original flew in fairly tight left circles with 0° thrust and no rudder offset. The glide was a loose right turn.

We have built three of these ships so far. Naturally, this ship has winning potential and is capable of winning the Wakefield Cup. So much so, that we would like to hear from you should you make a place on the team and succeed in doing so. Our question will be, "How DID you do it!" So much for kidding. Have fun.

### BILL OF MATERIALS

(Balsa unless otherwise specified)

6-1/16" x 1/16" x 36"	Fuselage frame, wing spars, tail surfaces
1-1/16" x 1/8" x 36"	Fuselage and tail surfaces
2-1/8" x 1/8" x 36"	Wing leading edge
2-1/16" x 3/16" x 36"	Wing trailing edge
1-1/32" x 3" x 36"	Wing ribs, crankcase cover
1-1/16" x 3" x 36"	Wing ribs, tips, fuselage formers, sheet areas
1-1/8" x 2" x 36"	Nose pieces, tail post

Balsa block, 1/4" x 1/2" x 17/8"; bamboo; 3/32" dowel; .040 piano wire; 1 1/2" wheels; 8" plastic propeller; decals; 80" of 1/8" T-56 rubber; rubber lubricant; thrust bearing; small washers; thread; pins; clear dope; yellow and brown Japanese tissue; patience and fortitude.