

WIDGEON

Scale modelling can be real fun with this rubber-powered cutie



Bill is justly proud of this fine flying model. The simple lines and the parasol wing add to the flying prowess and the details, such as the gas tank on the wing and the struts, add to the model's appearance. Note the glider-type vertical fin.

Flying is the best part of this model. The shallow climb and realistic appearance do much to make for added pleasure. Fellow flyers will envy this ship.

by Bill Krecek

● With the growing interest in flying scale models, it seems appropriate to present a simple sure-fire easy-to-build model that even the most in experienced modeller can build. To us, this British 2-seater, the Westland Widgeon III, fills the bill.

This not a true scale model for contests as some liberties were taken with dihedral, stab area and simplification of the engine. The main purpose was to produce a good flyer and encourage the novice in this phase of flying. The small size holds the building cost to a minimum and the "store bought" prop and plastic thrust button simplify building.

The bulge on the top centersection is the gravity feed fuel tank which houses the rubber bands for wing attachment on the model. The landing gear is made removable so that those desiring longer flights and more sensational flights may install a longer gear and a larger hand-carved prop. Detachable wing struts are also used as the centersection mounting of the wing is more than adequate. By attaching the exhaust stack with a drop of cement, it is possible to remove this part with a flick of the finger in the event you want to strip down the model for "souped up" performance.

Some of you may want to glow. A word of caution, the Cox "Pee-Wee" is too much engine for this little (Please turn Page)



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ship — the weight would make the model nose heavy in any case. Scaled up $1\frac{1}{2}$ times for approximately 190 square inches of wing area, would make the model about right. Doubled in size the ship would be about 235 square inches and would work fine with an old series .049 engine — stay away from later model engines which will be too hot.

The original flew on 6 strands of $\frac{3}{32}$ " flat rubber using a hardwood prop. Complete the model weighed about $1\frac{1}{2}$ ounces so don't expect wind penetration. Before starting construction, familiarize yourself with the plan and the building sequence.

FUSELAGE: This is the best starting point as it involves the most work. The lower bend in the longerons is made by soaking the $\frac{1}{16}$ " square strips in water and bending them around a heated light bulb. Apply a slight pressure at first and work the bend around to suit the curve shown on the plans. Pin the strips in place along with the top longerons and cement the uprights in place.

Make the large front gusset and the pieces for the rear peg from $\frac{1}{32}$ " sheet. After inserting these, build the second frame over the first. Make sure to put thin strips of paper under the upper frame cement joints to keep the frames from sticking together. Wax paper is fine for this.

While these pieces are drying (remember the wet longerons take time to set properly) cut out the formers from $\frac{1}{32}$ " sheet. The former at the rear of the cockpits has an extra ring on

it to act as a doubler and is cross-grained to add strength.

You may like to use a simple fuselage jig as we did. This was cut using a piece of sheet wood cut to the shape of the inside of the top view. When the sides are dry, they are bent around this jig which tends to relieve some of the strain when bringing the rear together. Cut and install the top and bottom cross-braces up to the front of the rear cockpit checking for squareness as you go. Next, pull the sides together at the rear and add the remaining cross-braces. Use pins and rubber bands as necessary to hold the sides together.

Make a paper pattern of the turtle deck and, when it fits correctly, transfer this to a sanded piece of $\frac{1}{32}$ " sheet. Choose wood that will bend easily. Make sure the piece is $\frac{1}{16}$ " wider to fit the fuselage. The forward cowling is made from a pattern and applied in the same way. Remove the fuselage jig and laminate the nose former using $\frac{1}{16}$ " sheet cross-grain.



This shot of the uncovered Widgeon gives some idea of the structural detail and assembly.

After this is done, make the upper and lower nose blocks using very soft and light balsa. Trim these to rough shape and hollow them out. The upper piece is the only one cemented in place.

Cut the landing gear tubes and cement them in place. Note the gussets inside the large gusset on the inside. The lower nose block can now be installed. Sand the nose block assembly to shape and add the $\frac{1}{32}$ " fairings.

LANDING GEAR: This is made simple and sturdy and .032" to .040" piano wire is used for the axles. Bend the struts to proper length taking note that a 6" piece of wire is used to form the bearing for the axle. This last part is done by clamping a short piece of wire in a vise and wrapping the .025" wire around it. Bend the rear strut to proper length and install it in the fuselage and then bend the front strut. Don't make two struts alike when trying to make the opposite side.

The gear is kept in place through the use of weak rubber bands beneath the fuselage. The shock housing is made from two pieces of $\frac{1}{16}$ " balsa. Make the wheels by laminating three plys of sheet together using plywood for a center core and balsa on the outside. The inner disc and cone are of paper. We used art paper to match the color scheme. The wheels can be spun on a hand power tool and sanded to a nice round finished shape. When finished, they are held on by a washer that is cemented in place.

Decide what color tissue you plan to use as the top of the fuselage and the engine fairing should be covered now. It is also necessary to install the front windshield. After the cabane is in place it would be difficult to work in this area.

CABANE: Make the wing platform from two pieces of $\frac{1}{32}$ " sheet, cross-grained. Note that the upper piece is $\frac{1}{32}$ " larger all way around and is done to receive the wire struts. Cut a $\frac{1}{4}$ " (Please turn to Page 42)



Transportation and storage are a snap. Small rubber bands hold parts together.

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hole for the wing attachment bands to pass through. The second and third strut assembly is made in one piece using the side view as a pattern. Be accurate here as this assembly supplies the proper incidence adjustment. The fore and aft struts are made separately and cemented in place. Now, all of the gussets and eyelets to complete the assembly. The saddle at the tail is added at a slight incidence.

TAIL: The tail surfaces require little explanation as they are self-explanatory. When making the stab, the top spar is cemented to the bottom spar at the center. This bend should be put in first as should the droop at the tips or else the structure will have a tendency to warp.

WING: The wing is simple to build. Get the hardest wood over the tank and center-section. Slip the $\frac{1}{8}$ " butt ribs over the spar pieces and then add the leading edge. Check that this assembly fits with the platform and allow it to dry. The main panels can be built at this point. Pin down the leading edge, add the tips and ribs (leave out the lower spars) and cement the trailing edge in place. Before adding the top spars, bend them as on the stab to get the proper taper.

After this has dried, add the lower spars and sand the entire assembly smooth. The ribs are slightly larger to allow them to be sanded smooth. Add these panels to the center-section. No splice is needed at the trailing edge but be sure to add the $\frac{1}{16}$ " doubler at the leading edge and rear spar. Cement the $\frac{1}{32}$ " sheet in place making sure that it is angled to fit the cutout.

Short, $\frac{1}{4}$ ", pieces of aluminum tubing are used for the strut attachment. Cement them in place using tissue reinforcement to make sure they are secure. Add $\frac{1}{32}$ " gussets to both sides making them flush with the ribs and spars.

Before building up the tank, cover the wings with lightweight tissue and water spray. Put on one coat of thin plasticized dope. When this is dry, you can build up the tank by assembling the sides and adding the $\frac{1}{16}$ " x $\frac{1}{4}$ " brace. The lower edge of the sides act as stops for the platform so check that this works out. Add $\frac{1}{16}$ " square pieces on both sides for this same purpose. Cement the wire hook to the brace and fit the $\frac{1}{32}$ " sheet cover. Cut out a hole and cement the cover in place.

DETAILS: The wing struts are of $\frac{1}{16}$ " x $\frac{1}{16}$ " balsa and are made to fit the model. Complete the rear ones and then install the front ones.

The nose is made up of three pieces of $\frac{1}{8}$ " hard balsa and is cross-grained. The plug is made of two pieces. Drill out the plastic nose plug and add a short piece of $\frac{1}{16}$ " tubing for a rear
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thrust guide. Note that right and down thrust is used. For a quickie prop, use a 6" Paulowina but sand it down thinner and balance it. Don't skimp as the prop is a very important part of a model. Use a free-wheeling prop to improve the glide.

The exhaust stack is eye-catching and is worth the effort. Use $\frac{1}{8}$ " o.d. aluminum tubing and bend it as shown. Cement the $\frac{1}{32}$ " x $\frac{1}{8}$ " manifold to the stack and plug the end of the tube. Brackets are made by bending two pins.

COVERING: Complete the covering of the fuselage, tank, platform, tail and struts with light-weight tissue. Water-spray the stab tip as on wing tip. Brush on one coat of clear dope and use black tissue strips for the control outlines and license numbers on the wing and fuselage. These are applied with thinner that is brushed through the tissue after the trim is located in place on the model. Color dope the nose section to match the fuselage and use flat railroad black on the tires and shock absorber housing. Black and grey adds a fine color scheme on the engine.

We used small black tubing on the landing gear struts. The propeller is given a coat of clear dope and fine sanded to a smooth finish. After the model has been fully trimmed, apply two coats of clear dope to the wing and three to the fuselage. To prevent warping, plasticize the dope using a few drops of castor oil and keep the mixture thinned out. It is better to have a few wrinkles on a damp day rather than a warped model on a hot day.

ASSEMBLY AND FLYING: Assemble the model by installing the landing gear in the tubes and use rubber bands to hold the gear in place. The wing is attached with shortened rubber bands (you can't buy them short enough for this purpose) and a pin under the platform. Drill the hole for the rear dowel peg and fit the peg snugly in place. The tail is cemented in place and should be aligned with the wing. Slip the struts in place and secure them with bands.

Slide the stack through the pin retainers and tack the manifold with a single drop of cement if you prefer to remove it. Add the rear windshield to complete and you are ready to set the model up for flight.

The motor is made up from six strands of $\frac{3}{32}$ " flat rubber made up to a length of 11 $\frac{1}{2}$ ". Wash the packing powder off with soap and water and rinse the motor clean. Lubricate the motor with a 50-50 mixture of green soap and glycerine (both can be obtained at drugstores). The motor is installed so that it is snug between the prop hook and rear peg so that the motor will not go slack and cause the prop to dangle after the winds are run out.

The model should balance at the point indicated on the plan. Correction

may be effected by placing a small glob of modelling clay on the lighter end of the model. Check the glide while doing this and trim the model, using clay, until the correct glide is obtained. If large amounts of clay are needed, rebalance the model and jack up the front of the wing to correct for dives—the reverse if the model stalls. After the glide is satisfactory, put about 30 turns into the motor and launch the model level with the ground. The Widgeon should circle to the left under power and tighten up its turn after the winds are run down. Adjust the turn using the rudder.

Increase the winds to about 100 and check out the trim. Best flights can be made using a winder, convert a hand drill by putting a hook in the chuck, and stretching the motor out. Wind toward the model so that you have about 400-425 winds in the motor when you arrive at the plug. This is not turns of the hand drill but the actual revolutions of the propeller. Most drills have about 5 to 1 ratios and you should get some 80 winder turns. Hot weather has a way of sapping strength from rubber motors as it has from people so you may have to substitute $\frac{1}{8}$ " rubber on hot days—you'll have to ease off on the winds too as the $\frac{1}{8}$ " won't take as many as the thinner motor.

Remember, this light-weight is no barrier buster, so give it the care it deserves and you'll have fun with it. We've had a number of people ask for plans of the model, so it must have some flying field appeal. A hand-carved prop will add much to the performance but it's not necessary for a day out on the field and loads of fun flying.

BILL OF MATERIALS

(Balsa unless specified otherwise)

- 1— $\frac{1}{32}$ " x 3" x 36".....Ribs, formers, platform, tank sides, planking
- 1— $\frac{1}{16}$ " x 2" x 36".....Cowl sides, curved pieces, stab, saddle, former, wheel discs
- 2— $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36".....Longerons
- 4— $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36".....Uprights, cross-braces, tail, leading edges
- 1— $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36".....Tail trailing edge, tips
- 1— $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36".....Wing trailing edge
- 1— $\frac{1}{8}$ " x $\frac{1}{8}$ " x 36".....Wing leading edge

Cement; pins; $\frac{1}{8}$ " aluminum tubing; .025" and .032" piano wire; rubber bands; tissue; clear dope; $\frac{3}{32}$ " rubber; 6" Paulowina prop; $\frac{1}{16}$ " plywood; scrap $\frac{1}{8}$ " sheet; balsa block; thinner; $\frac{1}{16}$ " dowel.