

## 1912 AV RO

By Bili Hannai

**While the cat's away, the mice fly! The manager of "Hannan's Hangar," a new series starting next month, fills in for the Missing Mooney. Only a little bigger than a Peanut, the Avro G is an indoor/outdoor model.**

Walt Mooney is a tough act to follow, but we'll do our best to fill in while he is out of town on business, as we are as anxious as the rest of you to keep the tiny models flying!

This model originally appeared in the English magazine *Aeromodeller*, and is being reprinted thanks to the kind cooperation of Editor R.G. Moulton. As originally designed, this model was intended for the all-sheet wood class of indoor flying scale models, which were being flown at both Wilmington and Sepulveda, Calif. The model has also been flown outside under relatively calm conditions, and with slight "beefing up" would make a fine aircraft for

the new Bill Brown CO- power plant.

During our years of flying scale models, we have found that there are two basic categories of competitors. One is the endurance fiend, who sort of likes scale models, the other type is the authenticity-at-any-price buff, who hopes that his overweight museum piece may somehow manage to fly, "because the real one did." Our little Avro is intended to fit somewhere between these extremes in thinking.

The full-size Avro "G" was entered in the Military Trials of 1912, and was the only entry with an enclosed cabin. Well, almost enclosed. According to the Dec. 19, 1912 issue of *THE AERO PLANE*,

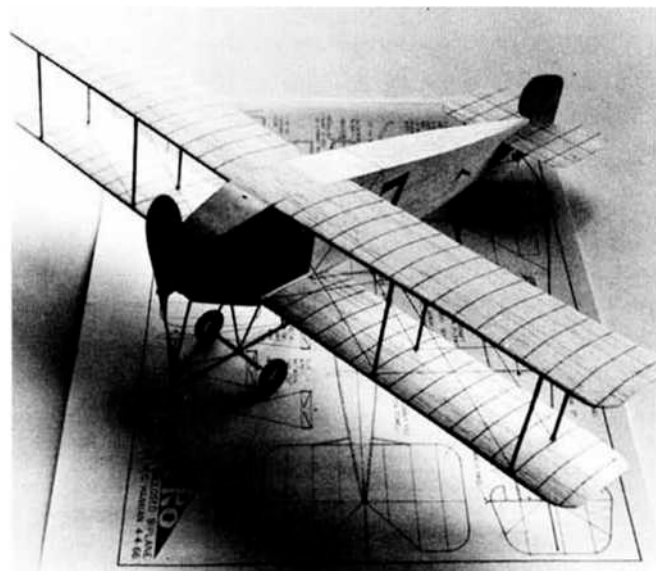
"The windows are not covered at all, but the only wind felt is the side draught when banking in a turn." The "G" also had the unique distinction of being the first aircraft in which a letter was typed, while airborne. Perhaps of greater importance, the Avro, being flown at the time by Lt. Wilfred Park, R.N., became the first aircraft to successfully recover from a true spin.

The "G" was fitted with a four-cylinder 60 h.p. Green engine, which provided a maximum speed of approximately 62 mph, and in spite of having excellent fuel economy, was considered underpowered.

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Maybe they didn't need to know where they were going back in 1912 but you gotta admit there isn't a heck of a lot of forward visibility!



Typical of Bill Hannan's work, the Avro G is neat, tastefully detailed, and is definitely obscure! Natural finish saves weight.

Construction of the model is quite simple, and the drawings should be nearly self-explanatory. Of particular importance is the selection of light sheet balsa. The model's strength is based upon its configuration, not upon rugged (read heavy) materials!

The fuselage formers are constructed picture-frame style from fairly hard 1/16 inch square, which may be pinned to the board while drying. Meanwhile, the body sides may be cut to shape from 1/32 inch sheet. Be certain that they are exactly alike, so that everything will line up correctly. It is well to cut the slot for the stabilizer through both sides at once, for accuracy. Cement the aft end of the fuselage sides together, and add the formers working from the rear forward. After the basic structure has dried, bend the wire landing gear legs to size, add the hard balsa "sandwich" mounts, and glue securely into the fuselage. By threading the bamboo skid through the "eyes" in the landing gear legs while the glue is still wet; it will be simple to line everything up properly.

Speaking of that bamboo skid, it occurs to me that some of you may not be familiar with the material. Often, bamboo can be obtained from ornamental place mats. Another source is chop sticks (although they are rapidly being replaced with the plastic variety, it seems.) At any rate, bamboo is worth the bother to find, as it is almost as rugged as music wire, with much less weight. The original model has survived several severe "dorks" thanks to the sturdy bamboo skid. It is easier to scrape the bamboo to round section, rather than carve, as you might balsa wood, and a single edge razor will do the job. The curve is imparted over a hot soldering iron, being careful not to char the wood. Frankly, the operation is about like trying to stretch-mold canopies, and usually takes me two or three tries.

Returning to the fuselage, cover the top and bottom with 1/32 inch sheet, which is applied oversize, then trimmed flush when dry.

After the fuselage is assembled, it should be given a careful overall block sanding, to further reduce weight, especially in the non-stressed area aft of the rear rubber peg. Note that the bamboo tail skid is fastened to the rear of the fuselage ALONGSIDE of the rudder, where it may flex under landing loads, without disturbing the delicate rudder. (On the real "G," the metal-shod lower rudder was actually used as a tail skid).

The tailplanes are simply cut and sanded to shape from 1/64 inch sheet balsa. If you haven't any of this precious stuff, make your own by block sanding 1/32 inch sheet ... in one direction only, and away from you, to avoid buckling the balsa. Also, turn the sheet over every few strokes, to avoid distortion which may be brought about by sanding only one side.

The wing panels are all the same shape and should be cut from 1/32 inch sheet. Glue hard 1/16 inch square balsa strips on the underside of each leading edge and weight them down flat while they dry. The curve of the wings is slight, so the ribs can be added without the need of moistening, doping or such. Be certain that the finished wings are not warped.

The various "rib lines," etc., are drawn on the balsa with a thin marking or ballpoint pen, before the model is assembled, and the figure 7's are cut from black tissue and clear doped to the fuselage sides. The dummy radiators are drawn in ink on tracing paper and glued to both sides of the fuselage. The cowling is covered with aluminum-painted paper or thin aluminum foil which lends a realistic effect with very little weight. The louvres and other details are simulated by embossing them with a stylus (an empty ball-point would do) before attaching the paper or foil to the fuselage with contact cement.

Mark the exact position of the wing roots on the fuselage sides. Note that only the upper wing has 3° incidence, relative to the thrust line, and that all four wing panels should have 5/16 inch dihedral as measured at their tips. The wing struts pass through openings in the lower wing panels and glue alongside the wing ribs. No openings are needed on the upper panels, as the struts simply glue against the underside, alongside the ribs.

Glue the tailplanes and their struts in position, and check their alignment carefully.

The model may be rigged with silk thread, which in addition to its great strength, is much smoother in appearance than cotton thread.

Be certain that the finished model is free from warps. The prototype required additional ballast in the nose, a bit of left rudder, plus some down and right thrust, and slight wash-in of the lower left wing in order to fly in left circles under the 23 ft. ceiling at Sepulveda Junior High School. Power is provided by a single loop of 1/8 inch brown rubber, or 3/32 inch Pirelli, about 12 inches long. If more power

is needed to make the model climb, shorten the loop. Our model employed a 4 inch diameter Kaysun plastic prop, but performance could be improved with a hand-carved balsa one.

If you decide to install a CO2 engine, make a firewall of 1/32 inch plywood and mount the engine with 00-90 model railroad screws, which will permit easy thrust adjustment. Remember that the large end of the fuel tank must be lower than the outlet end.