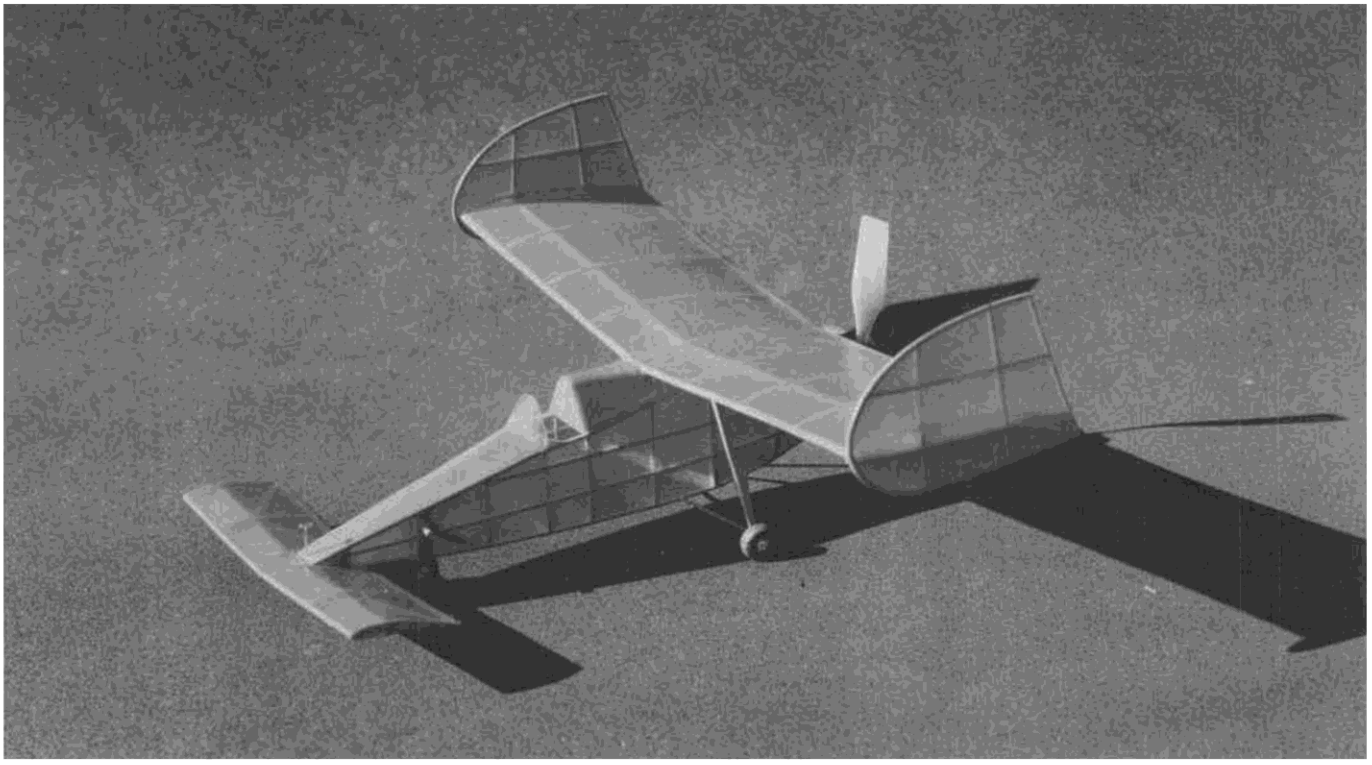
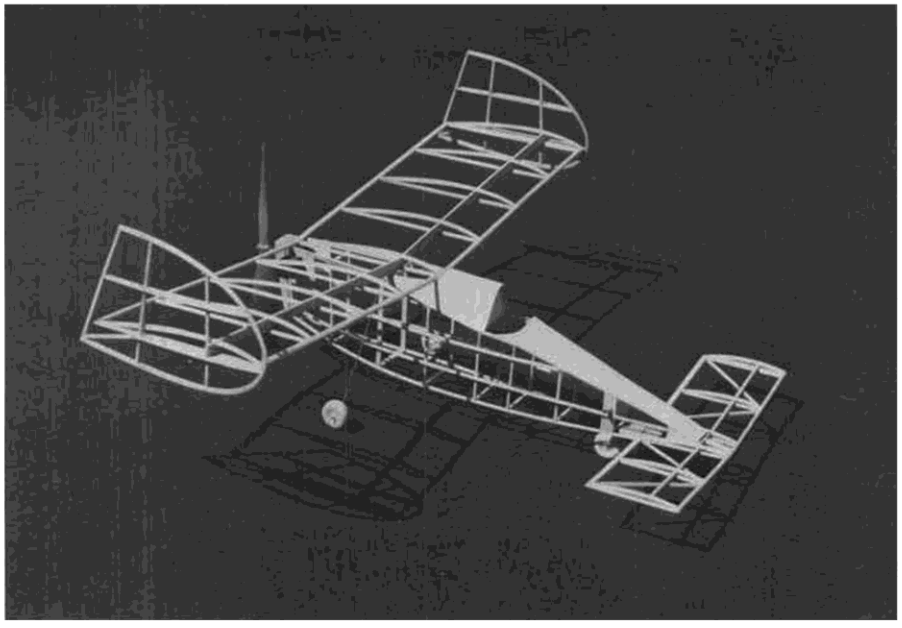


R.M.-12

By WALT MOONEY... This month the Ol' Perfesser digs deep into his bag of Peanuts for this model, a canard that will give a Fike or a Lacey a run for their money, if you build it light!

• Canard configurations are not my favorites; I think they are oversold by their proponents. However, the three-view of this little canard design by Radu Manicatide looked as if it could be made to fly as a model and was interesting. The model might have flown directly off the drawing board, so to speak, except that the first attempt was indoors, and the model flew into a wall. The first canard, the structure of which shows clearly in the skeleton photos, was demolished. A new canard was constructed using harder balsa and a bamboo leading edge. The second attempt at flying resulted in an impact with a basketball backboard which demolished the second canard. The third canard was built as shown on the plans and has survived several impacts. The model is a little more stable than on its earlier test flights because the canard is heavier and the model's center of gravity has moved to the position shown on the plans. In spite of the large vertical fins and the deep aft body of the design, it has a slight dutch roll in flight indicating that the real airplane was probably marginal as far as directional stability is concerned.



The R.M.-12, designed by Radu Manicatide went through several design changes before arriving at the configuration you see here.

The R.M.12 makes into an interesting peanut and has enough wing area to make it look like it might be a Fike or Lacey beater. If you can keep yours off the wall, a light propeller and a lightly constructed canard might make it so, but mine did not turn into a Fike beater although it flies quite well.

CONSTRUCTION

In spite of its somewhat different configuration from the more common peanuts, the model construction follows time honored building techniques.

Start the fuselage by building two fuselage side frames exactly alike directly over the plans. When these are dry, remove them from the plans and separate them using a thin razor blade. Then assemble them into the standard fuselage box by adding crosspieces between the top and bottom of each upright. The fuselage cross-sections are essentially rectangular back to the back of the cockpit; behind the cockpit the top longerons are closer together than the bottom ones for two bays, and then the bottom longerons come completely together at the very back end. Formers F-1 and F-2 are cut from 1/32 sheet and cement in place at the front and back of the cockpit respectively. Soft sheet balsa is used to cover the top of the fuselage forward of the cockpit. Two triangular pieces of 1/32 sheet and a small block are used to cover the top aft of the cockpit. There are two stringers on each side of the fuselage made from 1/16 squares. They are cemented to the outside of the fuselage box everywhere except at the very last upright where they are butted flush against it. A small carved block forms the very front of the fuselage.

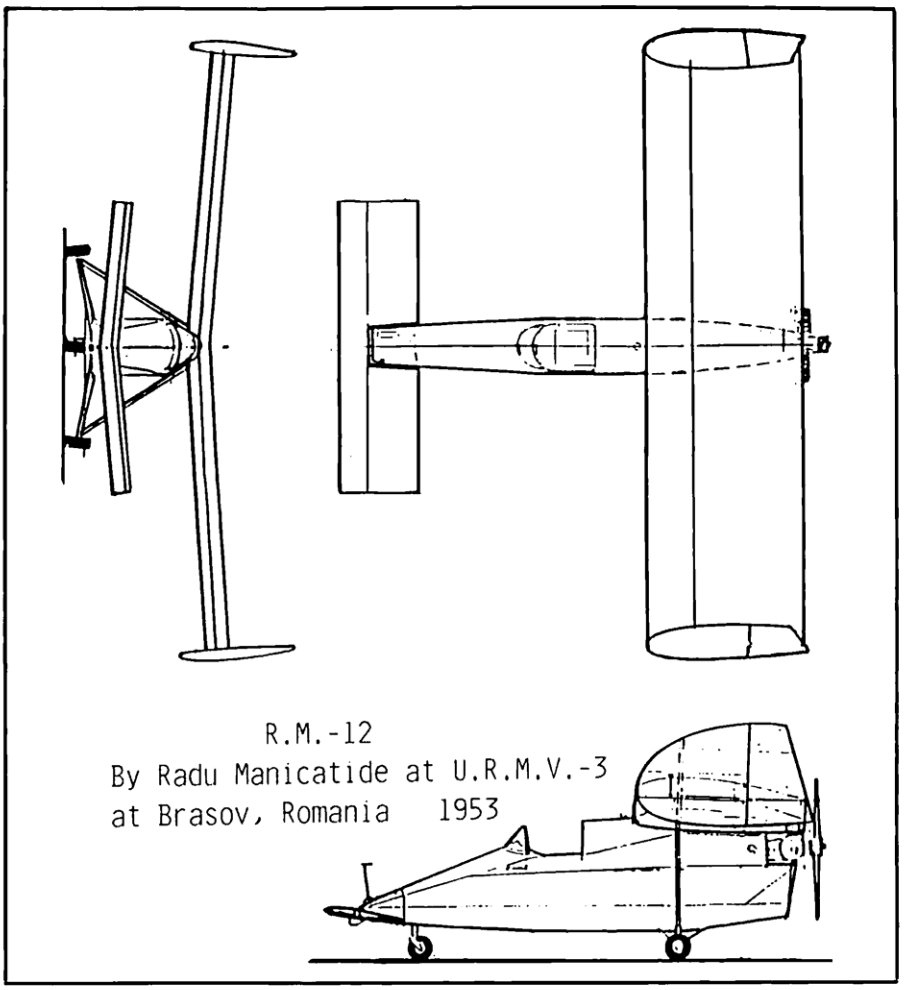
Bend the landing gear wires to match the plan, only half a pattern is shown on the

front view. Remember to install the nose wheel on the wire before completing the bends. Cut a piece of 1/8-inch thick balsa to fit in the first bay between the bottom longerons, and install the nosegear wire on it before cementing it in place. Cut the F-3 crosspiece and use it to replace the square one in the fuselage box to support the main landing gear wire. The main wheels may be retained on the wire with a small blob of cement.

The thrust block is made from four pieces of 1/8 sheet balsa laminated together. Alternate the grain direction so the block will resist splitting. The most forward layer should be shaped and sized to be a snug fit in the very aft end of the fuselage box. Carve the rest of the block to the shape shown in the top and side view. Make a hole in the block to accept a small thrust bearing and cement it in place being careful not to plug the hole in the thrust bearing with cement.

A pusher propeller is required for this design. The one on the model in the photos was modified from a conventional Sleek Streek plastic propeller. The freewheeling ratchet molded into the front of the propeller hub was cut off flush to make a smooth thrust surface, and a similar freewheeling ratchet was cut into the aft end of the hub. Standard methods were used to bend a propeller shaft hook and install the propeller on the thrust block. A flat washer or small bead or even a sequin should be placed between the propeller and the thrust bearing on the shaft to reduce friction.

Make the vertical tail outlines around a cardboard or balsa from using two strips of 1/32 by 1/16 balsa strips laminated together using white glue. When these are dry, construct the left vertical tail directly over the plan by pinning one of the outlines in place over the plan. Fit the two spars and the trailing edge in place and cement the joints. Now add the two ribs, noting that the lower rib is cut and angled down at the rear spar. When the left vertical is dry, remove it from the plans and make an outline/spars/trailing edge assembly for the right side. When this is dry, remove it from the plan, and using the left one as a guide, add the ribs on the other side of this assembly so that you end up with a left and right vertical tail.



Build the bottom surface of the wing directly over the plan as a flat panel unit. Make up a wing spar with the dihedral break at the center. Cut an upper chord pattern out of some suitable material and slice at least nine rib top caps from firm 1/16 sheet balsa. Trim a small triangle of material off the trailing edge of each cap so it will fit precisely as shown on the wing rib pattern on the plan. Now cement the left half of the wing spar in place on the top or the bottom surface assembly. Cement the outer four left-hand top rib chords in place. Cut the wing leading and trailing edge about two-thirds of the way through, making a narrow "V" notch at the cut to allow for wing dihedral. Now bend up the left wing half until the right-hand side of the spar is in contact with the right lower surface and cement it to the ribs. Try not to separate the leading and trailing edges completely while making the dihedral break, but in any case cement the center joint. Remove the wing from the

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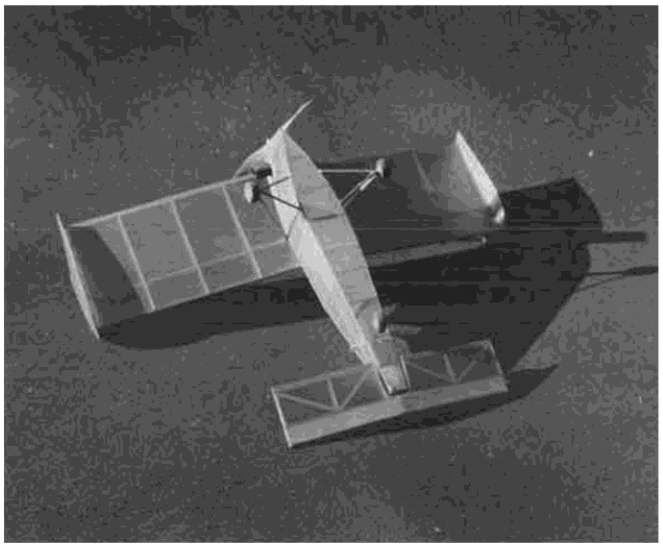
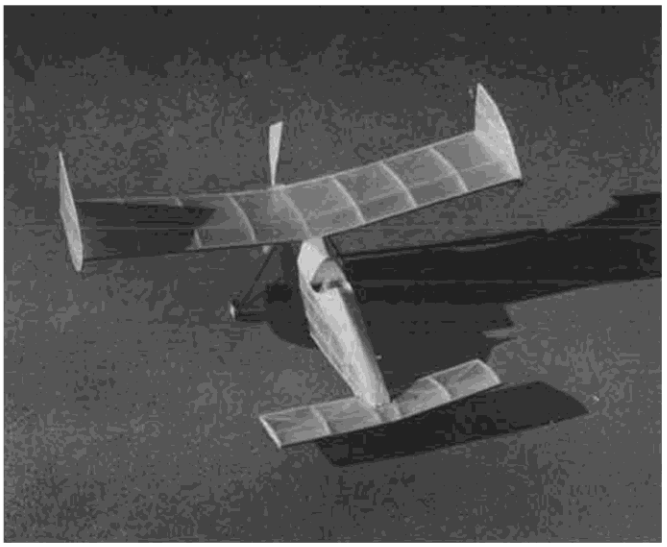


Undercarriage view of the R.M.-12. Be sure to install nosewheel on wire before you finish bending the gear wire!



Plane requires a pusher prop, and the Perfesser modified a Sleek Streek prop, which works fine.

plan and cement the final center top rib chord in place.

The construction of the canard is also done over the plan, but because of the bamboo leading edge and the plywood bottom plate it has to be built one side at a time. Cut the bamboo leading edge to length. (I used a cooking skewer as a source for my bamboo.) Bend the dihedral angle in the bamboo. This can be done by hand using a little trial and error. Cut the bottom plate from 1/32 plywood and bend the dihedral in it also. This dihedral angle bend is small enough that neither the plate nor the leading edge should break at the bend, but they should hold the dihedral angle permanently. Make the canard spar from 1/16 by 1/8 balsa.

Pin the left-hand side of the spar down on the plan and the left trailing edge and cement three ribs in place. Slide the left-hand side of the plate under the ribs and cement it to the ribs and where it is butted against the spar. Add the leading edge and the 1/16 square diagonals that run between the spar and the trailing edge.

When the left-hand assembly is dry, push the right-hand side of the leading edge, plate, and spar down on the plan, and install the right-hand ribs trailing edge and diagonal braces.

All the major structure has now been constructed and should be prepared for covering. The leading and trailing edges of all the surfaces must be shaped to the cross-sections shown on the plan. Typically the leading edges are rounded and the trailing edges are tapered to a triangular section. Take a couple of lengths of paper clip wire and poke them through the canard spar flush with the plate and all the way up to the leading edge. Cement them firmly in place on the top of the plate.

Now, using 240 or finer sandpaper, smooth all the structural components so there are no unwanted bumps or strings of cement, etc. Cover the model using your favorite lightweight tissue. The model in the photos was covered with red Japanese tissue because I like red and I don't know what color the real plane was. Bill Hannan who helped generate the three-view presented from several photographs and a couple of three-views with obvious errors wrote to Romania, but his contact was unable to get the color scheme. The photos that I have seen make the airplane look like some relatively dark color but could also be flat aluminum. Bill's three-view looks very good with respect to all the photos I have seen.

Final assembly consists of cementing the fins to the wings, cementing the wings to the fuselage, and installing the canard surface. This is done by poking the wires, extending aft of the canard spar, through the block on the front of the nose and into the filler balsa that supports the nose gear.

Details include the windshield, the dummy engine cylinders, and the landing gear struts. Medium Williams Bros. dummy cylinders were used and are cemented to the fuselage but not to the thrust block, which must be removable so the rubber motor can be stretch wound for maximum turns.

When the model is completely assembled, check it over carefully to see that everything lines up properly and that there are not any noticeable unsymmetrical warps. The model in the photos has a little washout that warped into each wing, but the washout is symmetrical and probably is really a little help in preventing a tip stall and subsequent spiral dive. The model should balance somewhere near the CG shown. If it doesn't, ballast it with modeling clay until it does. Try a hand-launched glide either over soft grass or from a very low altitude to determine at least approximately the correct canard setting. The trailing edge of the canard needed to be an eighth of an inch below the fuselage on the model in the photos, which is significantly more up elevator than shows in the three-view.

This model is sure to attract some attention at the model field. Have fun with your R.M.12. •