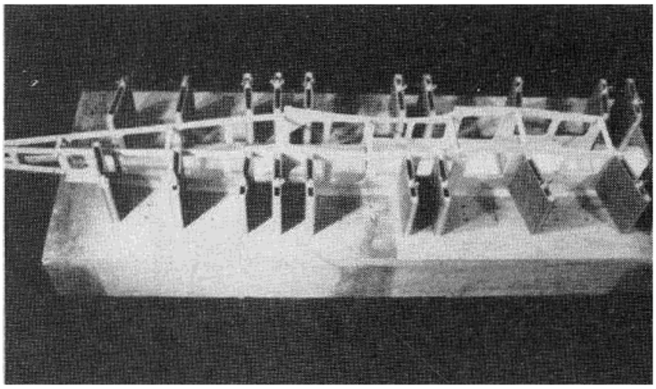
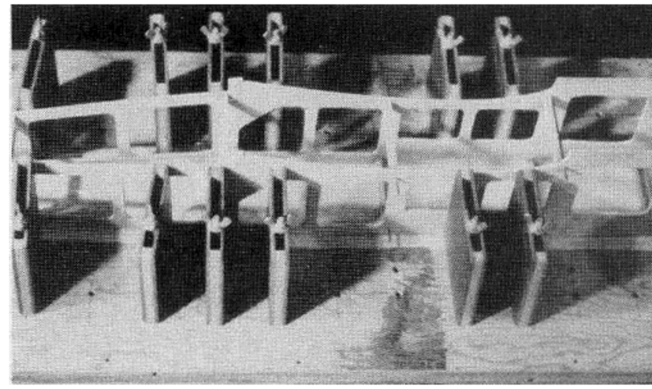
UTILITY BIPE

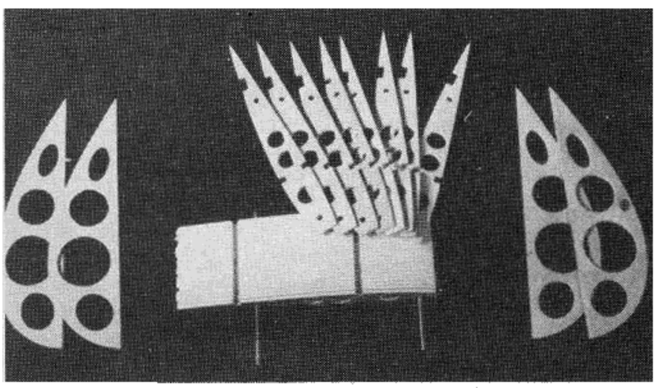
Every RC'er needs a good test bed, this one just happens to be good looking and a great performer.

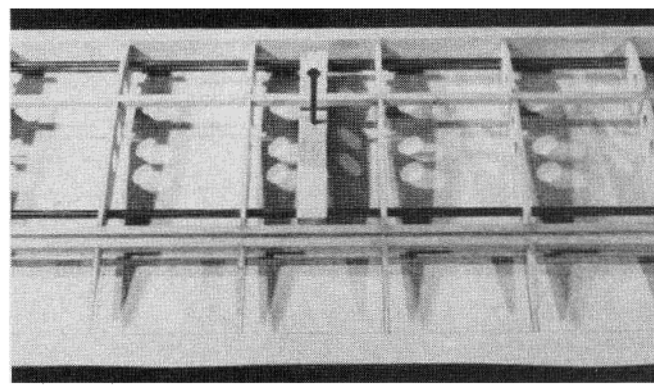
By Martin A. Fallandy





Fuselage is built upside down in an RCM fuselage jig. Spacers made of 1/4" sq. balsa, and alignment pins made of 1/16" music wire, help keep everything square during assembly. (The RCM fuselage jig appeared in the February 1972 issue.)





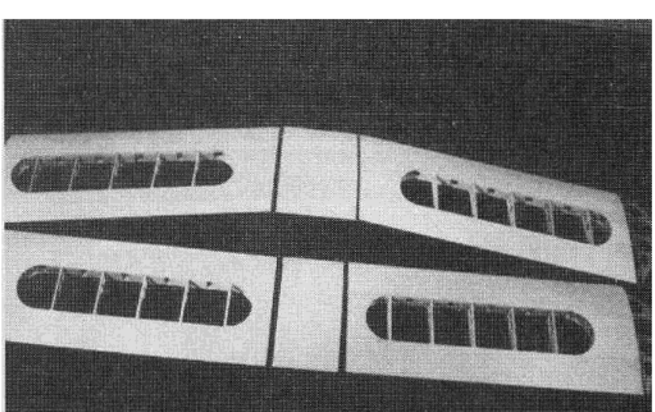
LEFT: All of the wing ribs are drilled to accept the alignment rods on the RCM wing jig. Lightening holes are drilled at key locations in both the ribs and wingtips. RIGHT: Both wings are assembled in the RCM wing jig, lower right wing panel is shown here. (The RCM wing jig appeared in the Flight Training Course Vol. I, as well as a modified version in the July 1991 issue.)

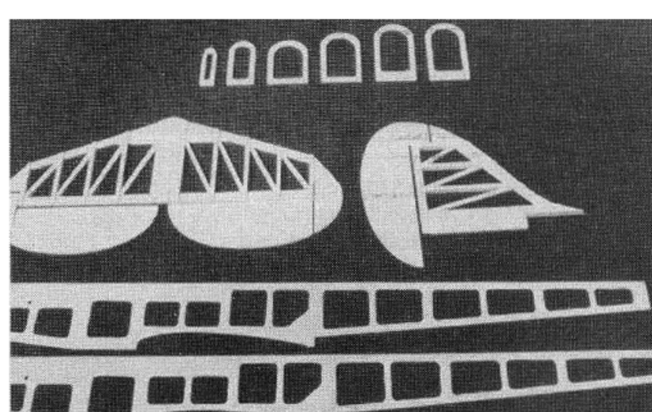
Dear fellow scratch-builder; it's a sorry state when the truly gifted, such as ourselves, are constantly stymied by the mundane tasks forced upon us by the multitude of those less fortunate; mowing the lawn, taking out the trash, etc. A person of your stature can easily phantom this dichotomy and will understand the true value of Utility Bipe.

My old reliable test bed, "The Digester," by the late great D.B. Mathes, which appeared in the December '64 issue of RCM finally gave up. This is Plan #127, and I still recommend it as an excellent test vehicle.

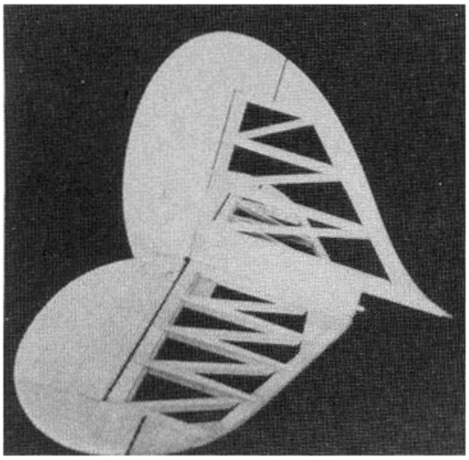
I have been flying a Kraft series "80" system for the past 12 years with absolutely no problems. But my fellow R/C buffs kept extolling the virtues of the new equipment on the market, especially some of the new servos. After a survey of the market, an Airtronics Spectra 7 seemed to fit the bill. A few calls to the very knowledgeable Jack Albrecht straightened me out on the bells and whistles. Permission was granted to invest and I found myself in possession of an Airtronics Spectra 7, some 732 and 102 servos. Then I remembered an article Jim Oddino wrote, stating that new equipment should be tried in an old reliable utility type plane. So I bribed the nurse for a couple of 2-H pencils --- Dick Kidd will no longer accept drawings in crayon, seems the wax gums up the rolls in the repro-machine --- and started to draw up Utility Bipe.

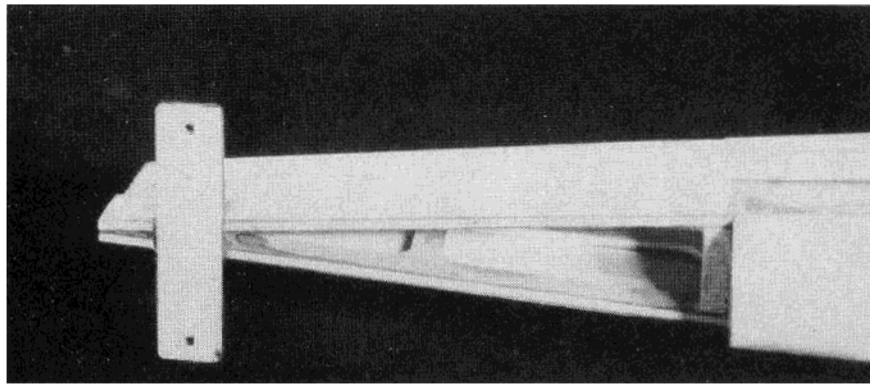
Utility Bipe is the culmination (hopefully) of all the good things in the various models I have designed and built through the years.



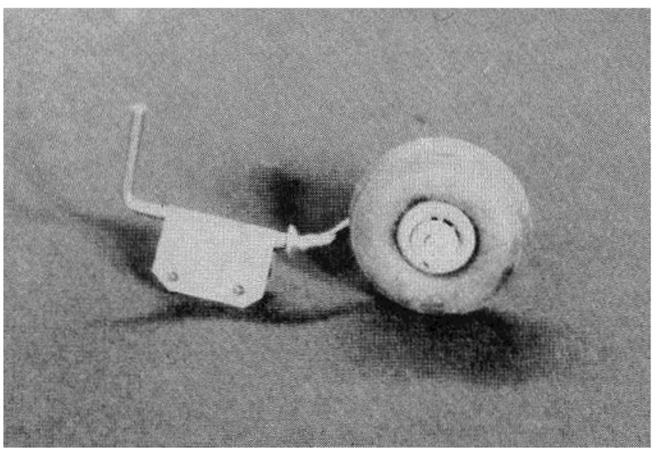


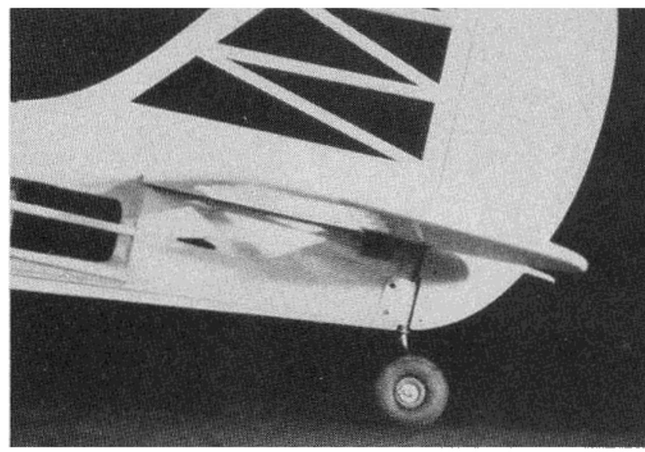
LEFT: Top wing is swept back 10° and has no dihedral. Bottom wing has no sweep, but does have 1/2" dihedral at outer rib station in each panel, with center section flat on the work surface. RIGHT: Fuselage sides and bulkheads are made from 3/32" sheet balsa with 1/64" plywood laminated to each side. Stabilizer and fin are built-up balsa structure with solid sheet control surfaces.



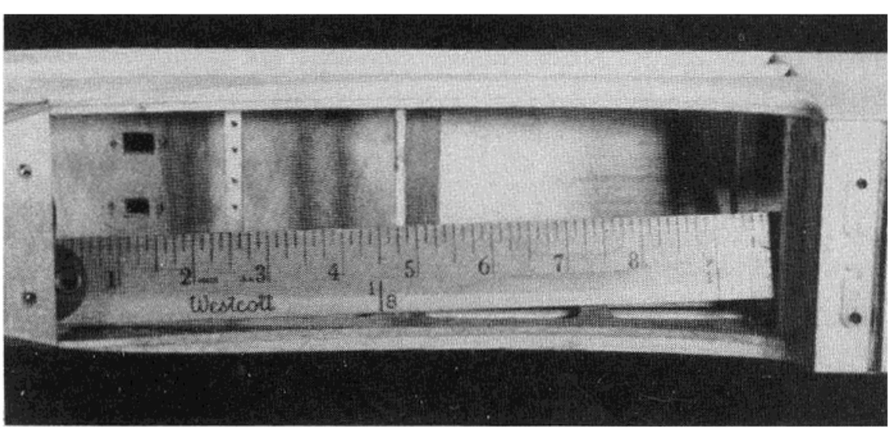


LEFT: Finished tail assembly. Note 1/4" plywood inserts for control horns, dowel locator pin for removable tail option, and 1/8" sq. balsa strips on top of stabilizer sanded to an airfoil shape (see plan). RIGHT: For removable tail option, a 1/8" plywood plate is installed parallel to the stabilizer. Be sure it is 90° to fuselage sides before final gluing.





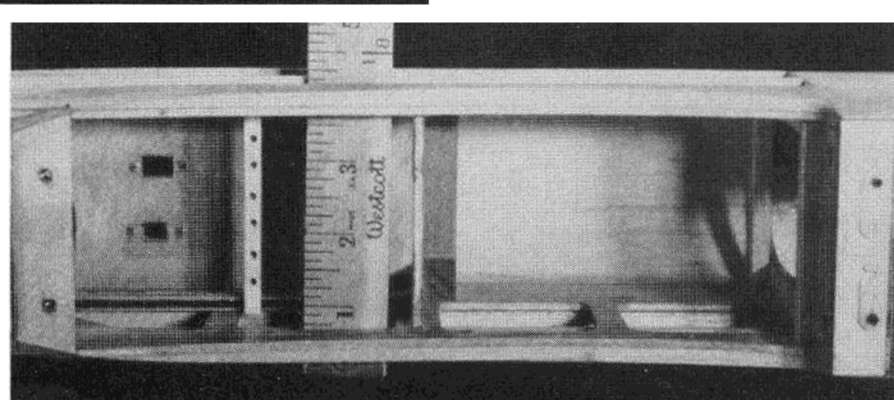
LEFT: Tail wheel is constructed from 1/8" music wire, 1/8" i.d. brass tubing with brass sheet wrapped around it, and soldered in place. This assembly is then bolted to the rear of the fuselage. RIGHT: Finished removable tail section with tail wheel shown in place.

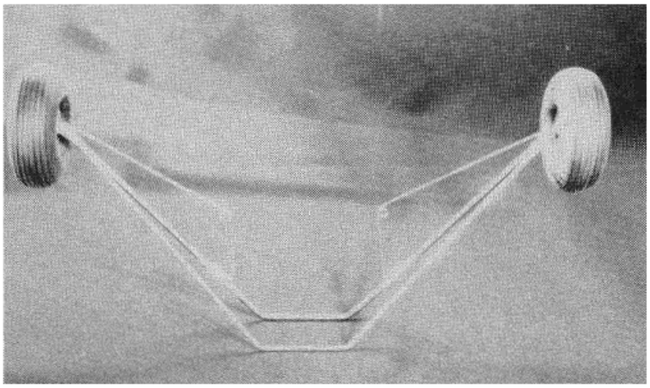


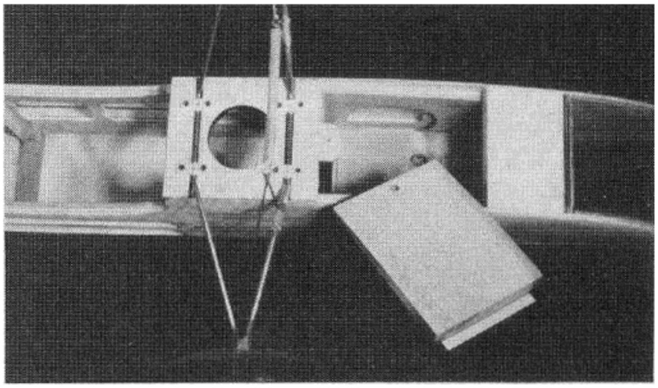
LEFT & BELOW: View through wing saddle at the large area available for radio equipment.

The great day came and my friend Bob Frazier and I flew it at the Sepulveda Basin. I'm the kind who can't tell Ripple from Champagne, but I must admit there is a discernible difference in the tightness of the new equipment. Things went well and I know that when you build yours, you will be thrilled.

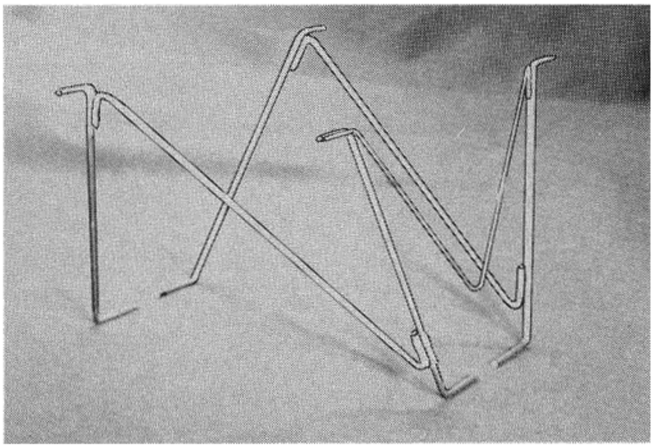
The next step was to visit the Antelope Valley Tail Winds and have their top "hot dog," John Emch, wring out Utility Bipe. Another member, John Cory, a professional flight photographer, was also kind enough to come out and take the "still" and "in-flight" pictures. This club is very well

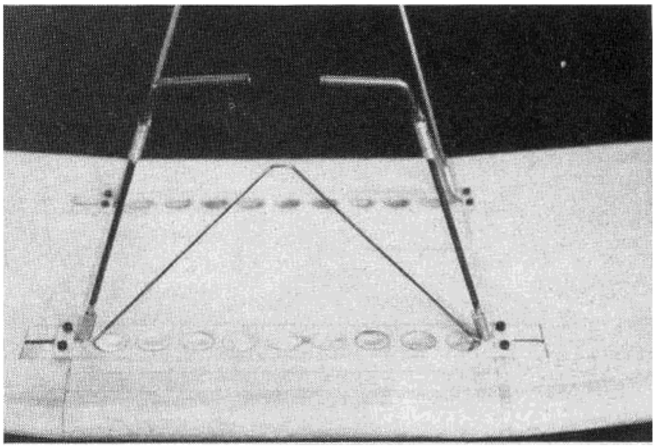




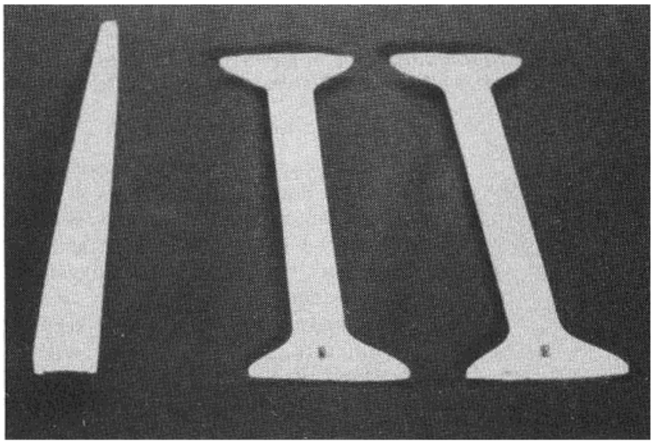


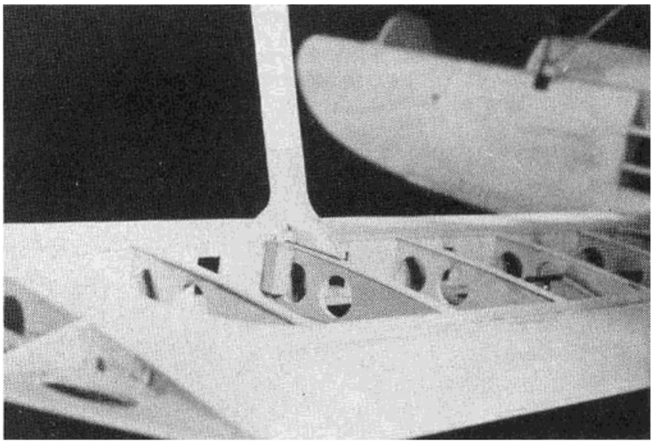
LEFT: A combination of 3/16", 5/32", and 1/16" music wire make up the spring loaded main landing gear assembly. RIGHT: Landing gear is secured to the fuselage with nylon straps and 4-40 bolts through blind nuts. Removable hatch provides access to the battery and receiver compartment.





LEFT: Cabane struts are assembled using 1/8" and 1/16" music wire bent as per plan. RIGHT: 4-40 bolts are used to attach the cabane struts to the underside of the top wing. Note lightening holes in 1/4" plywood strut mount plates.





LEFT: Interplane "I" struts are made from several layers of balsa/plywood. The head rest fairing to the left is carved from a soft balsa block. RIGHT: Interplane struts are secured to the wing with a Du-Bro ball link (see plan for details).

run and quite hospitable. The field is in the middle of the Mojave Desert about 50 miles from water, 40 miles from wood and 10' from Hades. You cannot possibly bother anyone when flying from this field. Utility Bipe survived, John Emch even had a few horn toads standing at attention, plus some very helpful suggestions to make it a better flying plane.

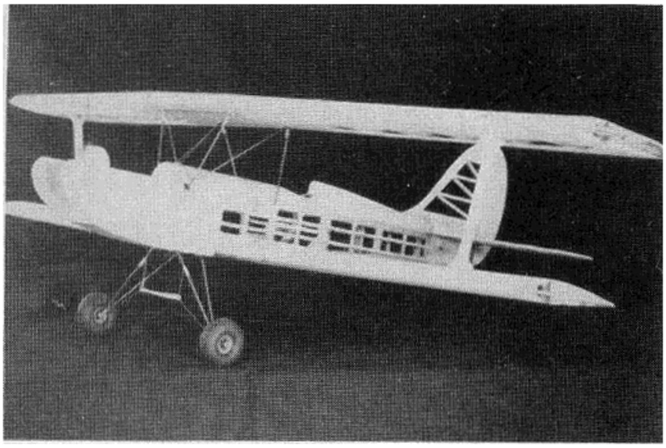
When you try out one of the new bells or whistles on a new radio you don't need the added attraction of a plane that flies on the razor's edge. Utility Bipe will provide you with a stable platform that stalls flat, and will do all the good maneuvers. Take-offs are straight and true, landings are floaters.

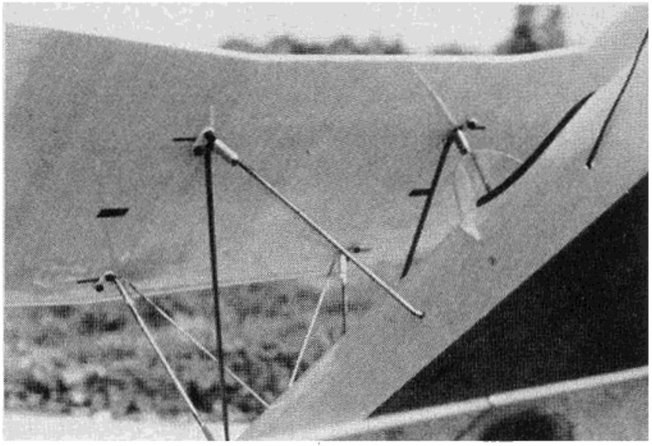
Construction

Utility Bipe construction is simple and straightforward (how many times have you read that?). The fuselage is a box, assembled inverted on an RCM Feb. 1972 jig. Cut out the two sides as a unit, gluing them together in the lightening hole areas. The two sides will then separate when these lightening hole areas are removed. In the jig, the sides are separated with 1/4" sq. balsa. Pass 1/16" music wire through the 1/16" predrilled holes for lateral alignment and to position the bulkheads. The bulkheads go inside the box with stringers and some sheeting on the outside for shape.

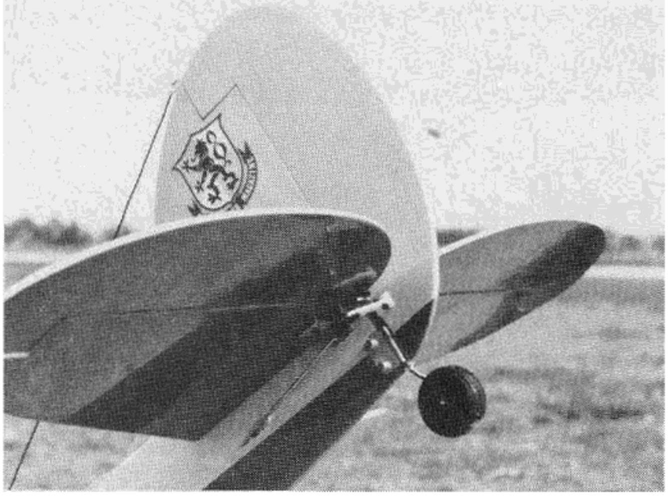
The wing jig system shown in the July 1991 RCM issue was used to lay up the wings. I did not go quite that elaborate, building over the plans will give you the correct rib separation. Also be sure to fiberglass where indicated as there are no heavy wing spars.

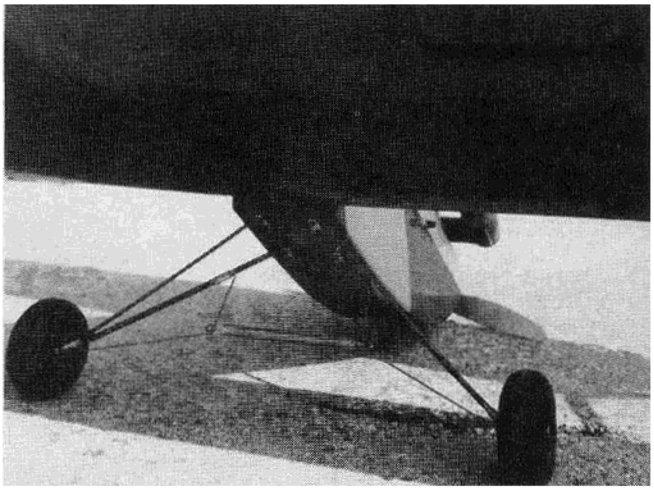
The tail section is conventional, but don't



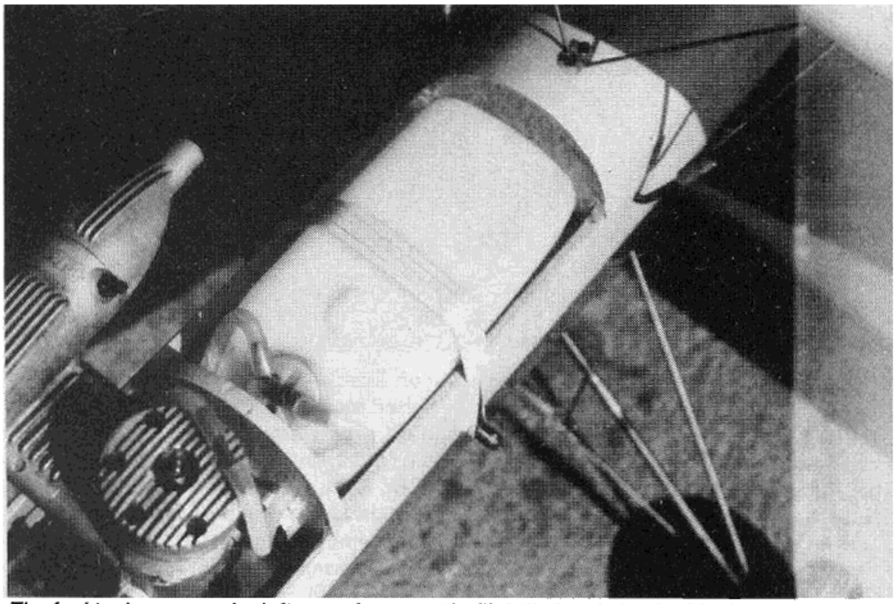


LEFT: Completed airframe ready for covering. RIGHT: The upper wing is attached to the fuselage by the cabane strut assembly; 1/8" holes drilled in the fuselage side accept the struts, and then the wing is bolted in place.





LEFT: Completed tail assembly. To remove the tail, disconnect the rudder and elevator control rods, remove the 4-40 bolts from the support brace, and slide the tail assembly rearward. RIGHT: Spring loaded landing gear is attached to fuselage with 4-40 bolts. See text for wheel alignment details.



The fuel tank area can be left open for easy "in flight" visual check of fuel consumption.

fail to put in the stabilizer spar that runs from side to side. I used some of the 1/64" ply; 3/32" balsa; and 1/64" ply laminate for this spar.

Generally, I tend to build on the stout side, adding beef where I've had failures in the past. A few ounces of beef in the right places will greatly increase strength and durability. If you are an excellent flier, don't hesitate to lighten things up. When I fly, folks come from miles around to see what next unnamed maneuvers will occur. It has been my experience, however, that one of the keys to a straight and true taildragger take-off run is a rugged tail wheel assembly.

But make this your test bed, keep the parameters and I know you will be successful. For instance, if you are checking out a new twin cylinder opposed 4-stroke, you may want to leave off the cheeks in front of the fire wall.

Flying:

Much has been written regarding taking off a taildragger, so let me add mine. Give your front wheels a little tow in and a little slant in. Make sure all the controls are neutral and the model rolls straight. Add throttle slowly and constantly. As the model accelerates, add rudder as required, usually right rudder. Keep the model on the runway or close to the runway until the engine unloads. When the plane has absorbed the thrust and torque of the engine, start lifting her off the runway. This will eliminate any tendency to torque roll if you are using a relatively powerful engine.

Give Utility Bipe a try, I know you will be satisfied. Happy landings. □