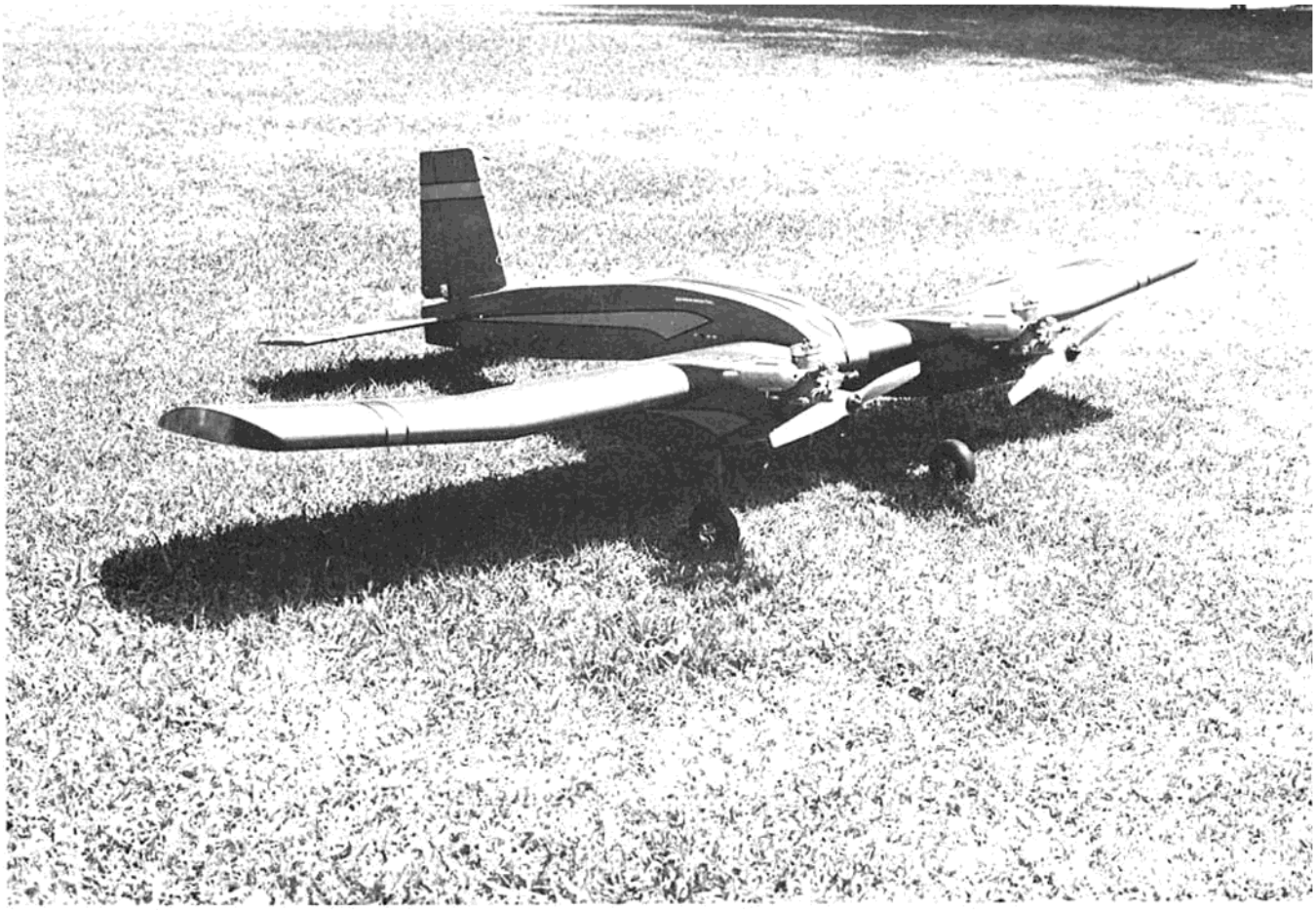
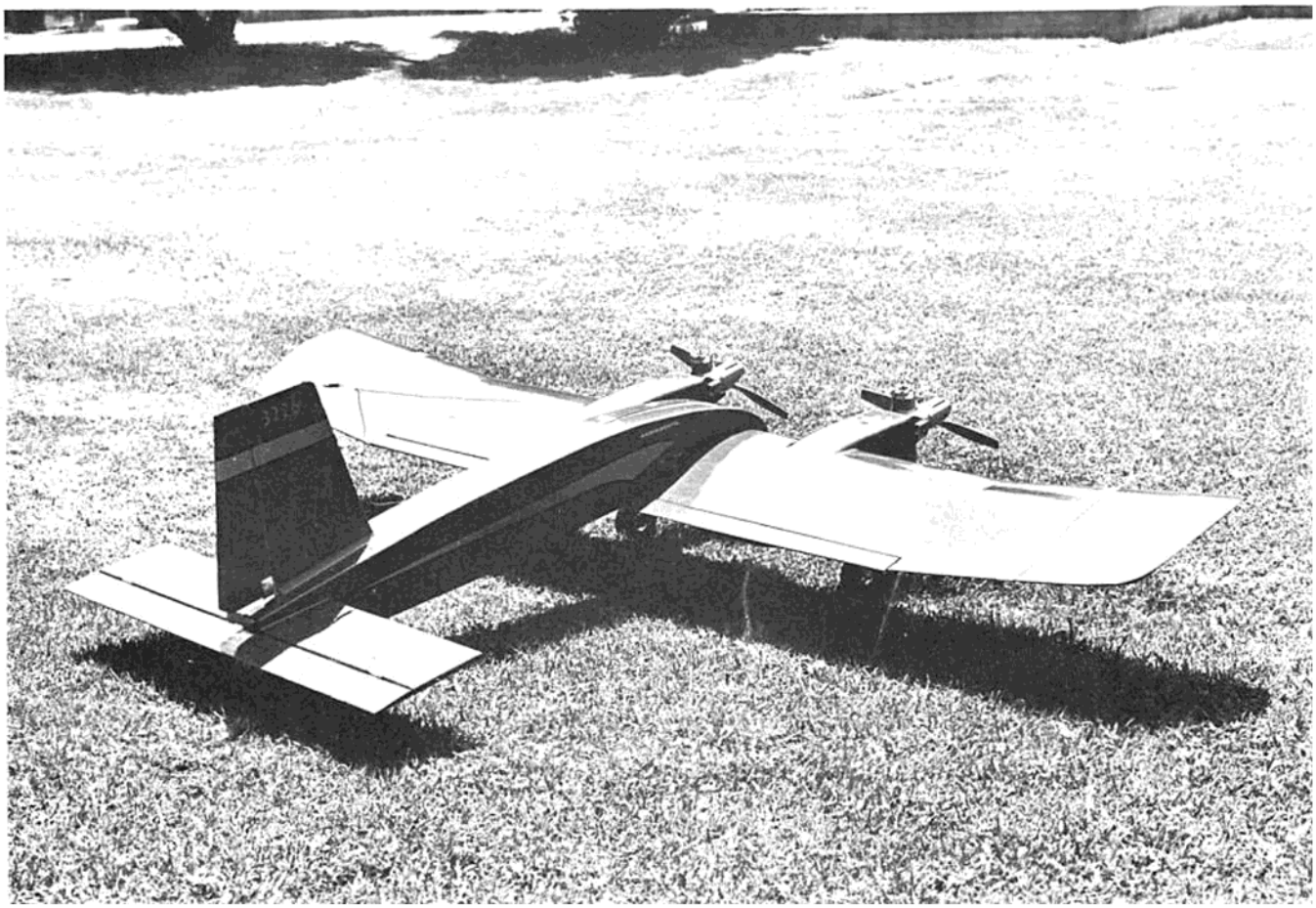




Based on the premise that two Black Russians are always better than one, our local resident hobby shop proprietor strikes back at sanity with the

VOLTWIN

BY GEORGE KOSTURA

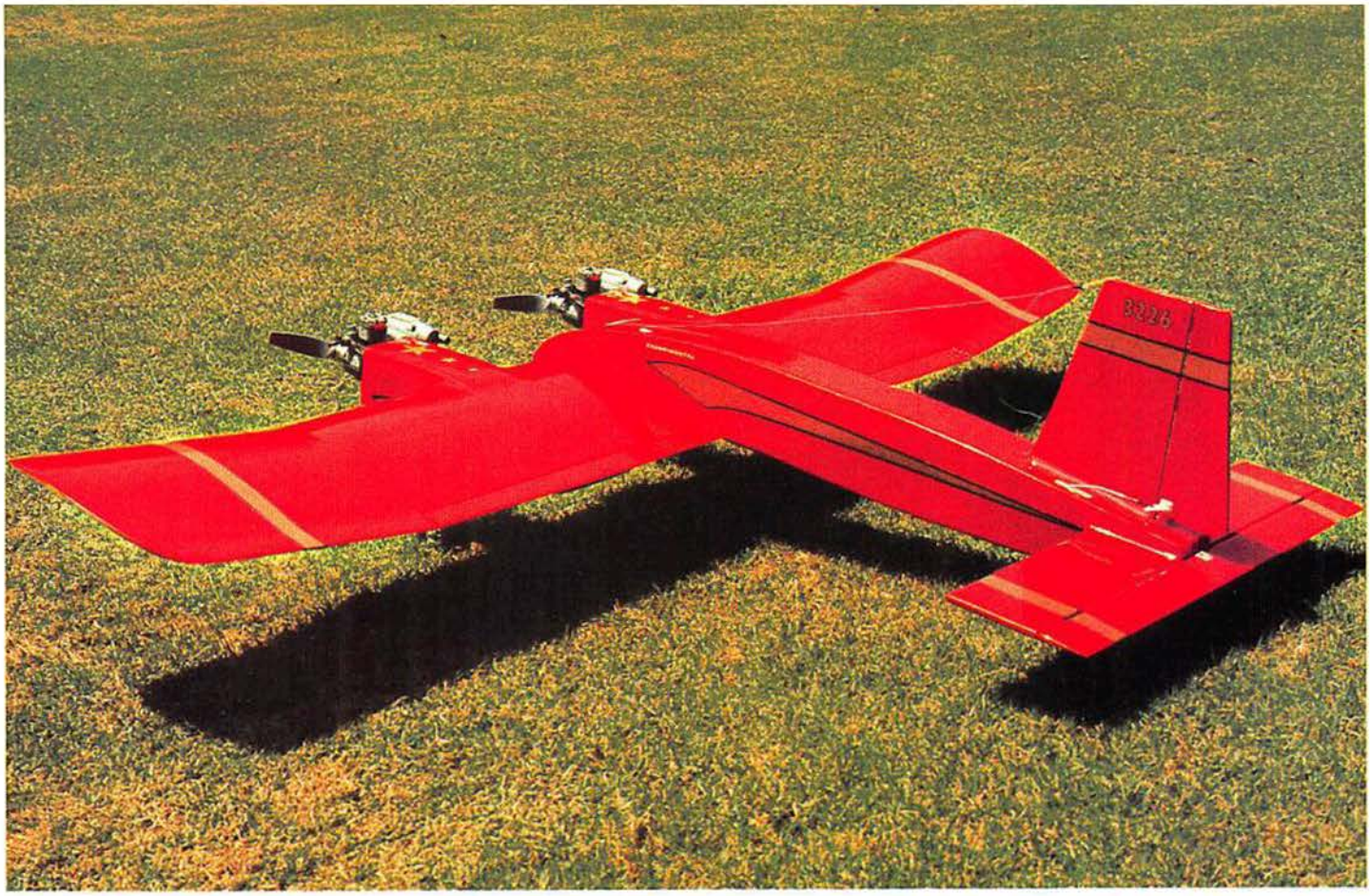
To start building this model, first read the plans. All of the materials listed (not necessarily in alphabetical order) can be found in most hobby shops in moderate supply. In keeping with everything else you want to buy today, you may have to substitute bed sheets for covering, since silk is incognito! But, please do not break up the furniture to replace balsa. Wives and mothers frown upon this. I am sure these emergencies can be taken care of as they appear. When you have all of the knotty balsa wood and warped plywood, along with assorted spit and bailing wire assembled, construction may begin.

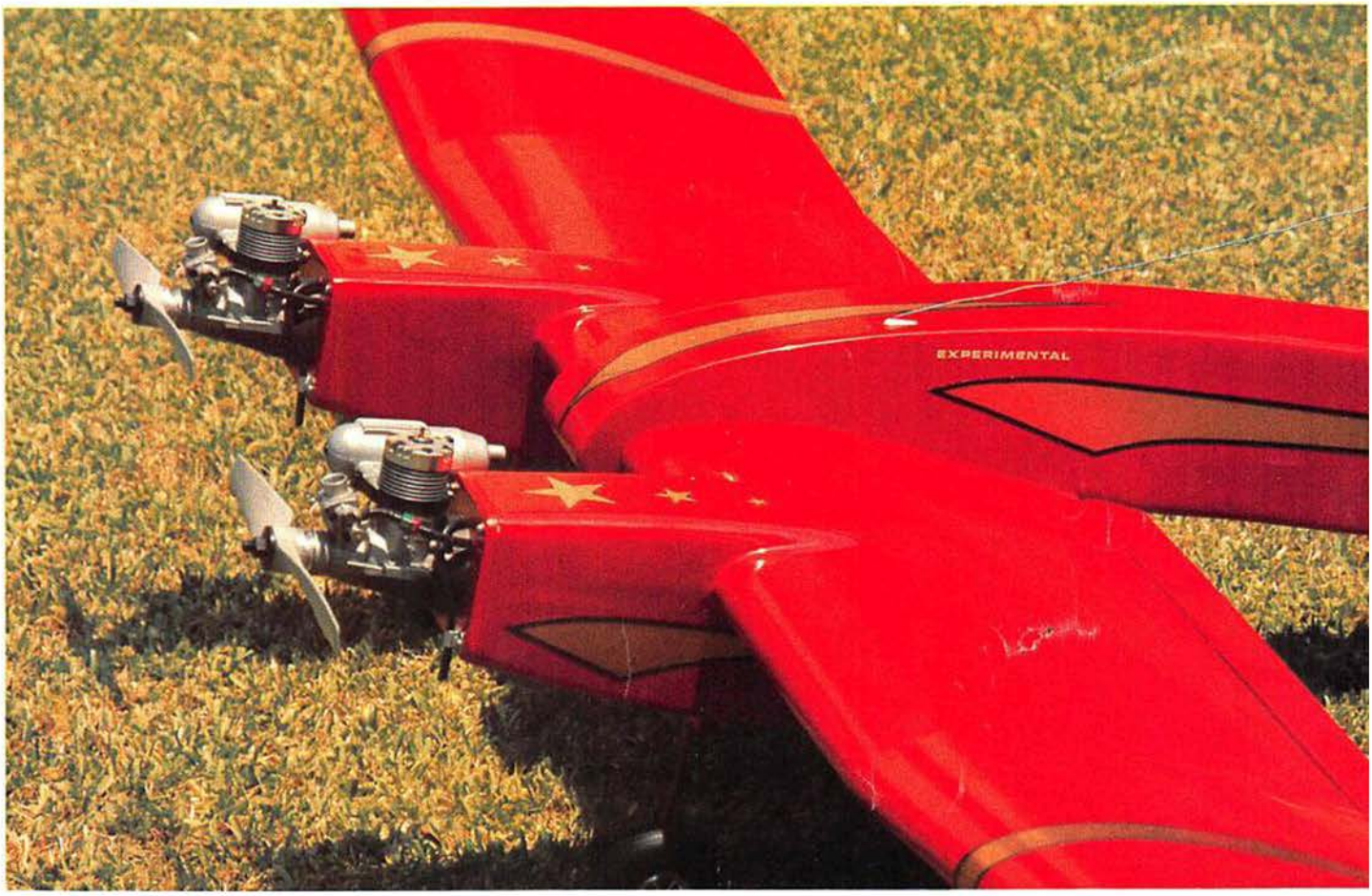
Some people like to build wings and hate fuselages, while some like to build fuselages and hate wings. I always start with the one I dislike — that way the model has a fraction of a chance of getting finished. Starting with 3/32" balsa, make a box, putting the formers into place if you can reach them. Of course, some formers must be placed in the fuselage or you may get some flutter in flight, constituting a very crazy flight pattern. After all of this is glued together, it makes it easier to run the nose into something hard. This gives the snubbed nose effect. It is best to be absolutely sure all glued parts are dry before you complete this part of construction or you may have to start all over again. After this is completed, some sanding may be necessary. As this expends a certain amount of energy, I always use my own judgement as to how much is needed. (Often as little as possible; usually, none.)

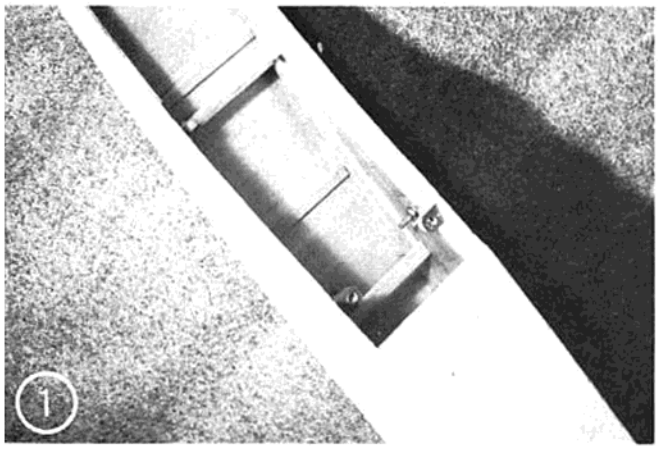
Now, make sure the wing cutout is made in the right direction. The fatter part goes toward the nose (this is done to make a better fit for the ailerons). According to how much time you want to spend on this model, fillets may or may not be used. They don't have too much to do with how the plane flies. But some modelers prefer staying in the workshop to watching TV before the kids go to bed.

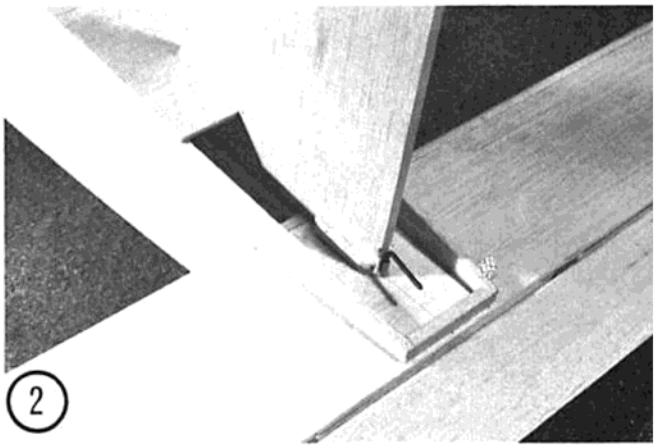
Now that you have some idea of how the fuselage goes together, it is time to think about the flappers that hold this thing up in the air. Wings are fun!! They have nice curves and forms. We try to copy birds for airfoils which works out very well. They should, since birds had them first. Now it's time to get out the calculator and figure airfoils. In other words, what percentage of lift we can get without too much drag. And always take into consideration stall attitudes. Isn't it strange the birds didn't invent the calculator? After selecting the airfoil, we get out the foam cutter and cut the wing. Looking at this white lump laying there, I decided it didn't have very much character so for kicks I put polyhedral in the wing tips. This doesn't make a lot of difference in the model's flying capability, but it does do strange things to the overall appearance. The foam should then be covered with 1/16" balsa. This, also, doesn't help the flying but have you ever seen white foam after a few flights? It gets greasy and gas stained — looks bad! This, too, can be sanded, but with all due respect, don't overdo it. It's not **supposed** to look that good.

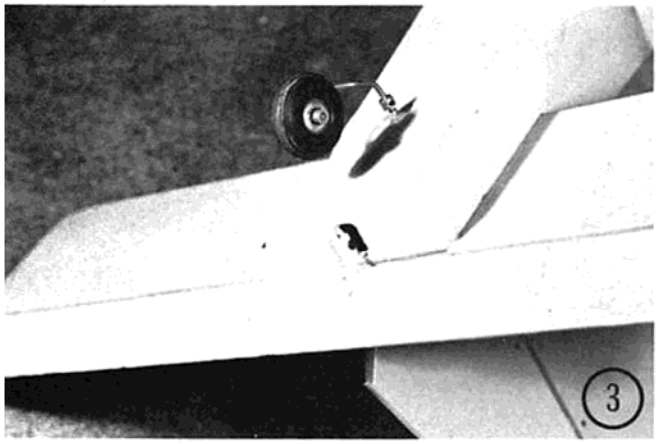
The ailerons are easy to install — they are strips of trailing edge already formed in the correct size. They are connected with little nylon things that move. These should be placed in the wing and aileron (one end in each). Hey, that makes it move up and down! Pin these into place with round toothpicks (after dinner) or, if you think the plane may only survive one or two flights, use wood screws — then you can remove

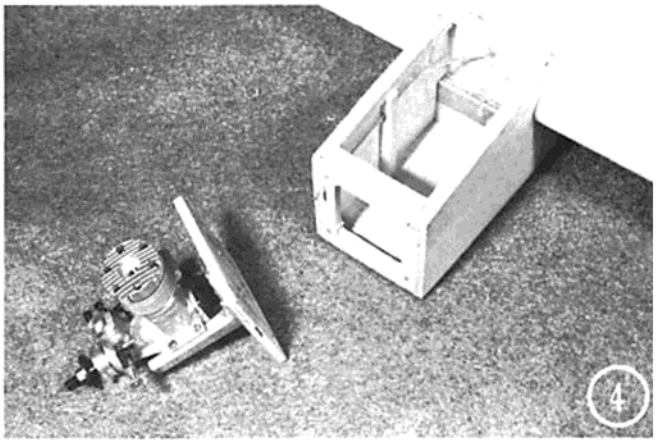


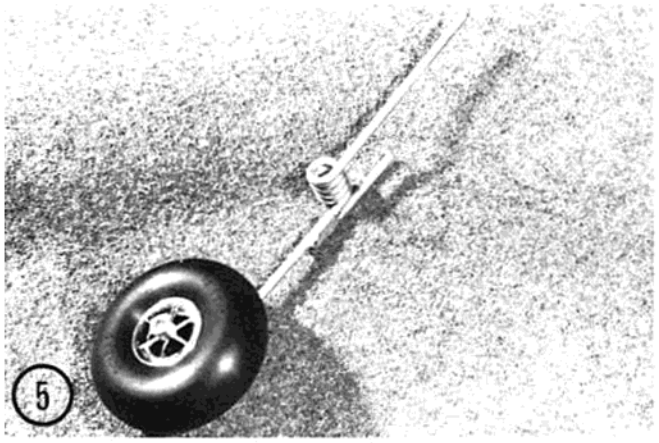

EXPERIMENTAL



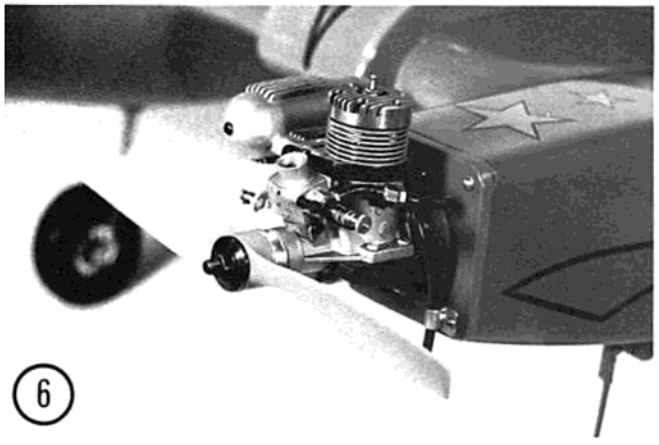


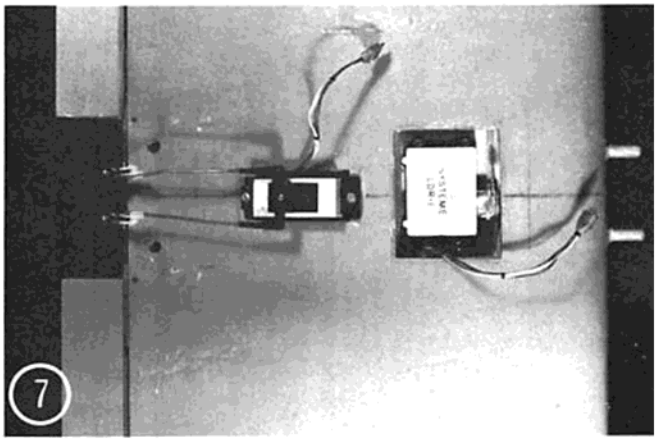






(1) View of wing saddle and aluminum wing hold-down screw mounts.
(2) Rudder tiller arm extends through fuselage and into balsa rudder.
(3) Bottom view illustrating steerable tail wheel and elevator control horn location.
(4) Firewalls bolt to nacelles for easy access to throttle linkage and fuel tanks.
(5) Standard steerable nose gears beefed up with extra 'arm' for plug-in attachment.
(6) O.S. .40 and Max Muffler in place on nacelle.
(7) Location of throttle and aileron servos mounted in wing.





UGLY TWIN

Designed By: George Kostura

TYPE AIRCRAFT
Twin Engine Sport Aircraft
WINGSPAN
66 Inches
WING CHORD
12 Inches
TOTAL WING AREA
792 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¼ Inches
O.A. FUSELAGE LENGTH
37½ Inches
RADIO COMPARTMENT AREA
(L) 9" X (W) 3" X (H) 2½"
STABILIZER SPAN
24 Inches
STABILIZER CHORD (incl. elev.)
6 Inches
STABILIZER AREA
144 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Mid-Fuselage
VERTICAL FIN HEIGHT
9¼ Inches
VERTICAL FIN WIDTH (incl. rudder)
7½ Inches (average)
REC. ENGINE SIZE
30- 40 Cubic Inch
FUEL TANK SIZE
6-8 Ounces (2 req.)
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rudder, Elevator, Ailerons, Throttle
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Balsa Covered Foam
Empennage	Balsa
Weight Ready-To-Fly	128 Ounces
Wing Loading	23 Oz./Sq. Ft.

them and use them on your next project.

Now that the wings are ready we need something to hold the engines and gas tank. So the nacelles are put together with the same box construction, making sure you have enough room for a gas tank in each one and linkage for throttle. These are then joined to the wing. Please allow clearance for the propellers — they spin easier if they don't collide with each other. The engine mounts used can be of the aluminum type or any old angle iron you have laying around the garage. Secure the engine mounts to the nacelles, now you are ready to install the engines and throttle linkages — this is a very critical step. It would be disasterous if one engine was at full throttle while the other was idling. Tachs help to synch engines, but if you don't have one of those, ears are sometimes reliable.

The empennage is made of sheet balsa rounded out to have as little airfoil as possible. This is attached to the rear of the fuselage. Most birds have pretty tail feathers but this one is more like an ugly duckling. Getting the stabilizer, rudder, and wing decalage correct is the most critical part of building this plane. They should be somewhere around 0-0. Engines also are on the zero line. Otherwise the engines will go in different directions and the tail may not even leave the ground.

We are now ready to finish the model. To do this, find the cleanest broom in the house. You will need a large pail for the dope, since the broom will not fit into those small cans. You'll find that this is not the best way to paint but it covers much faster. Of course you can be matriculate and use a brush. There are other covering materials that are applied with irons. Wives frown on these, since you only know how to use the iron for this operation and not to press your pants.

At this point you will notice I haven't given any directions for installing the radio. Everybody has their own way of using spit and bailing wire. I like the trays the manufacturers provide with the sets mounted on hardwood rails. Others like two sided tape. In any form, praying helps a lot!

It has finally come to that day. First Flight Test! All pilots know ground checking your plane is most important. I did put in all of the hinges, engines bolted in tight, fuel in the tanks — hook up the batteries and fire it up. Get the engines singing the same tune. Check the movable surfaces — some of our best patterns have been made with ailerons or rudder hooked up backwards. Of course they usually end up with pieces of balsa wood, engines and radio equipment strewn out all over the hardest spot on the field.

And so, off into the Wild Blue Yonder. Happy Flying!!

You're going to be **quite** surprised at how the Ugly Twin flies. So we won't tell you - - - you'll just have to find out for yourself.