



# ANT- 25

A Stand-Off Scale powered glider that was never really a glider but a ship designed to break distance records/**Pavel Bosak**

**R**ecently, the concept of the powered glider as an R/C ship has been gaining some measure of popularity in many countries. By "powered glider" I do not mean that well-known sort of arrangement that entails placing a low efficiency engine on a pylon above the wing and causing much drag thereby worsening flying characteristics. Engines used in powered gliders are usually more efficient than the auxiliary engines and they are usually placed in the fuselage nose and under the engine hood. This makes the glider appearance as well as the powered flying characteristics much more acceptable.

Powered gliders, usually built as semi-scale ships, also have other distinct advantages for certain types of flying over other, more classic designs. Besides their scale appearance, which I find pleasing, they are

Author Pavel Bosak poses for the camera with his Ant-25 powered sailplane. The scale-like appearance is a welcome change of pace in a soaring type ship. Note the large amount of rudder area (**below**).

PHOTOGRAPHY: PAVEL BOSAK



easy and slow on their take off as opposed to an unpowered sailplane on a high-start launch. You also don't need all of that space. The slower and more uniform take-off also gives the pilot more time to think and control his aircraft than other R/C types do. With elevator control and a slightly larger, throttled engine, basic aerobatic figures can be taught easily. All things considered, powered gliders have a lot to offer and we can presume that they will continue to attract many fans.

### The prototype

When I decided to build a motor slider, I also decided that it would be a model with low fuel consumption, not need too much service or concrete runways and that flies nicely. In thinking over what model to build I looked at a lot of magazines and I noticed ANT -25. The authentic plane was not a glider of course but I was so much attracted by its wing span that I decided to build a motor glider version.

ANT -25 was constructed by A.N. Tupolev and production of the first two prototypes began on July 1, 1932. It was specially designed for long, cross-country flights. The first take off was in 1933. The engine of the aircraft had high specific speed and a small, efficient propeller. The duration of the first flight was 48 hours and at the speed 212km/hour the distance covered was 7200 km. That is why the second prototype attracted more attention at its first take-off on the 10th of September 1933. A new engine was installed in it. In spite of this the flying range was not longer than 10,800 km. The cause of this "short" flight was found to be the corrugated sheet on the wings. Solution was to lay cloth in sheets on the wings and elevator and the surface was then varnished and polished.

The results were satisfying. Flight time was now 81 hours with a flying range of 13,200 km.

The record flights were started from the airport of Scelkovo, where a new concrete runway was built. It was 4km long and on a moderate slope so that the take off of an overloaded aircraft was easy. After some long distance flights over USSR territory the aircraft flew over the North pole on July 18, 1937 and landed in Portland, Washington, on the 20th of July. The crew were V.P. Tshkalov, G.F. Bajdukow and A.V. Bel-yakow.

My model is not a scale flying aircraft and there are moderate adaptations on it. Elevator is enlarged and so are the wing tips. Even the undercarriage is specially arranged. On the prototype it was in the wings and retracted backwards. On the model it is mounted in the fuselage and, if you wish, can be dismantled. When I fly on grass I use a landing ski which, in the side view looks like an oil cooler. My model is also without any details of the authentic plane.

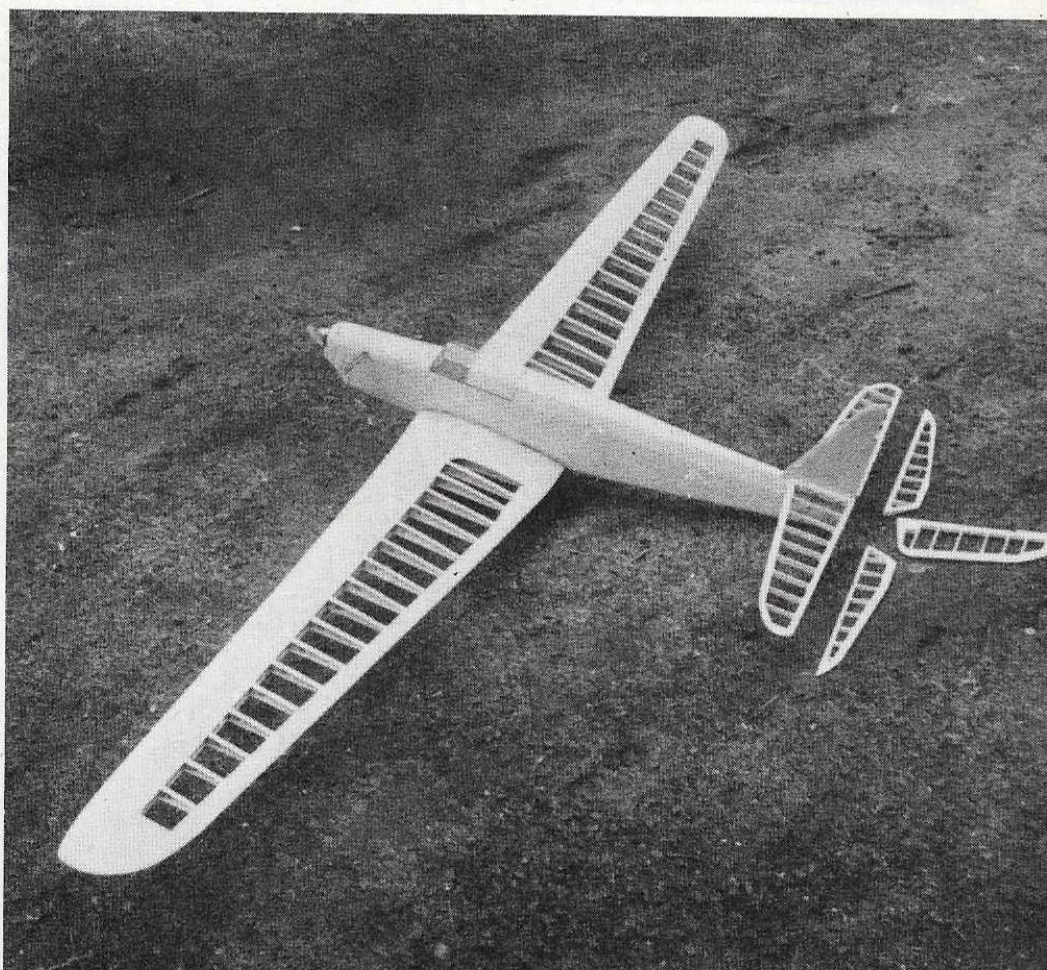
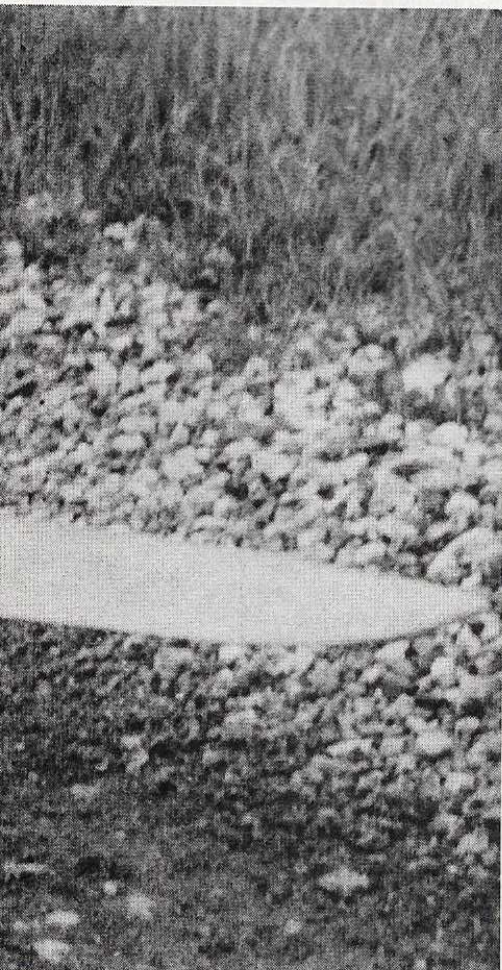
### Building the wing

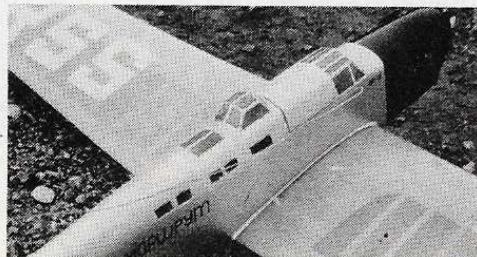
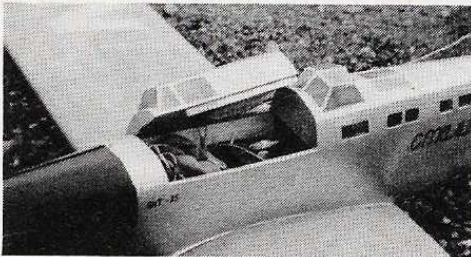
The wing is of all-balsa construction. Begin the building with the ribs as per the plan. Ribs W2—W6 are made exactly according to the plan and the rest are cut out together as follows. Cut plywood templates of ribs W7 and W22. Now cut 14 balsa rectangular and screw them between the two plywood templates making sure that the relationship between the templates is correct by lining up the spar slots in the templates. All the ribs are thus made together and the accuracy of the double-taper wing is assured. Build each wing panel in two parts, the center section and the longer main tapered section. Only after spar web and spars are

assembled onto the ribs and glued do you join both wing parts together with the help of the plywood dihedral braces W23. Before ribs W2-W5 are glued in place they must be strengthened by doubling the front of them with plywood. After assembly, glue the sleeves for the steel spar which is used for fixing the wings onto fuselage. Now sheet the bottom of wing with balsa as per the plans and cement hardwood block W24 in place. Now sheet the top of the wing. After the wing has been sanded, cement outside ply rib W1 in place. The peg for fixing the wing and hook for tightening both panels of the wing together by rubber bands will be fixed in place during the fuselage assembly.

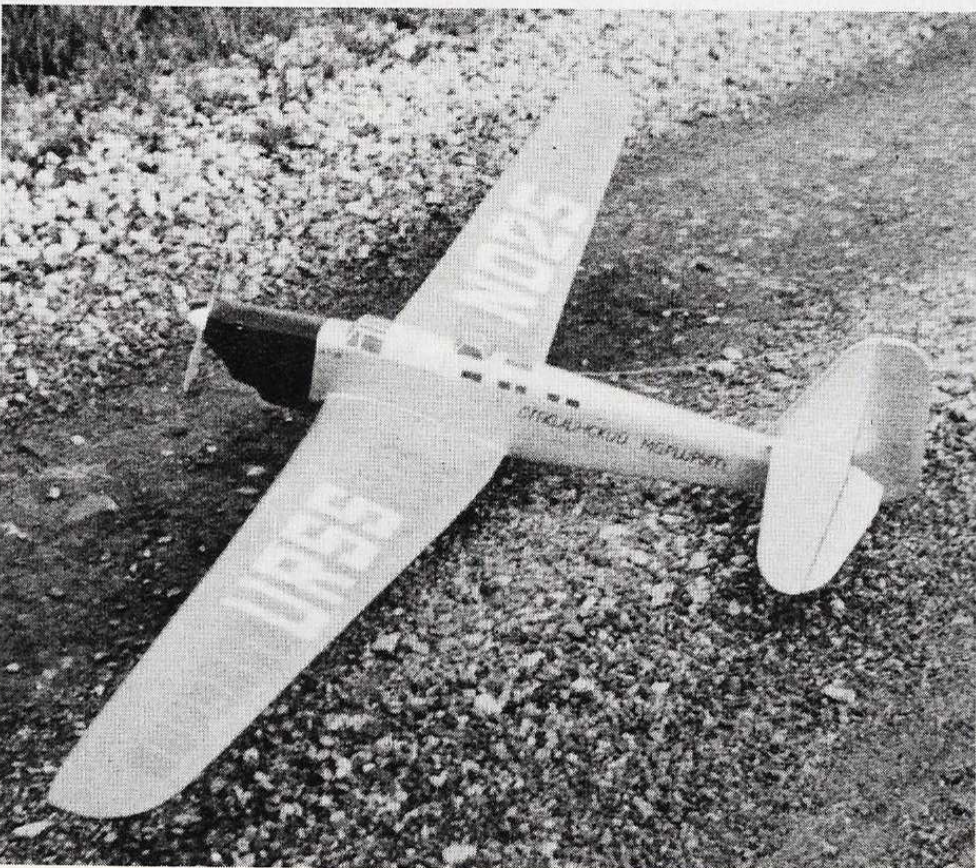
### Building the fuselage

Cut the sides according to the plan and, in the front part, strengthen them with  $\frac{1}{32}$ " plywood doublers. Then come the formers and vertical stab with rudder. The sides of the fuselage are balsa sheeted before gluing the rudder on it. Make the bottom fuselage cover. If engine mount is to be according to the plan ( $\frac{1}{4}$ " ply), cement it in place now, but if you buy a radial mount, screw it now onto former F2. On the plywood motor mount epoxy the nuts in place according to the engine used. Install the fuel tank and cement in the tubes for the undercarriage. Now you can balsa sheet the fuselage top. Make a removable canopy from formers F6 to F7. Now cement tail wheel and elevator bed. Sand the whole fuselage. Cut necessary holes for windows and for elevator and rudder pushrods. Cover the fuselage with your favorite covering and finally cement windows from thin perspex or celuloid. Now cut F11 formers. It is best to draw their shape exactly according to wing. Fix them on the wing and drill the hole for the center peg. Now we must cement





The Ant-25 breaks down for transport and ease of repair when necessary (top). Here we see the radio compartment access (above left). Note celluloid windows. The light weight construction is evident here (above right). The Ant-25 is a rarely seen subject in modeling. It's sure to get attention.



the center peg into both wings. Install the steel spar into fuselage, put some cement on the F11 formers and assemble the wings and fuselage together. It is advisable first to put wax paper between F11 and W1 formers so that the wing does not become glued to the fuselage. Press wings tightly to the fuselage and let it all dry. Carefully control the angle of incidence and the line-up of the wings with the fuselage and rudder at this time. When dry, screw the hooks into the wings and cut a hole into fuselage for a rubber band. Finally install the canopy and landing ski which is glued on front bottom part of the fuselage.

#### Elevator and rudder

The tail feathers consist of a frame into which rectangular balsa ribs are glued. End ribs are strengthened with thin plywood. Now cement brass tubes into the elevator. After sanding, cover the elevator and rudder.

#### Completing the model

Hinge the rudders with nylon hinges, fix the control horns and install radio and engine. The undercarriage is made of steel wire in two pieces as shown on the plan. Put it into the holes and lock it in this position by a piece of wire is put through the holes in the landing ski. Control perpendicular line of wings and tail surfaces. Be sure that the point of balance is in the proper place.

#### Flying the model

My ANT-25 flies nicely and it satisfied me in every way I hoped for. Flight altitude depends on fuel tank capacity. The engine of original model works for 3-4 minutes and the altitude reached is around 200 meters. Under dead clam conditions model glides for 6-7 minutes. Controlling the model will be no problem for the beginner because the model, though it is low-winged, is stable and can be easily flown. After dismantling the undercarriage it is not necessary to balance the model again. It is enough to trim the elevator a little.