

## SPORT

International modeling isn't necessarily a global cold war affair. A hot spot is Tripoli, where you get shot at when you go flying. It's also where semi-scale sport trainers, like the Akromaster are found.  
by Arnold P. Milton

We all have an idea of what a perfect model airplane should be. In most cases it is probably based upon the modeler's flying, building, and financial abilities; and, perhaps, geographical location. This is the story of my perfect airplane.

Three years ago, I found myself beyond the initial training stage in flying ability, after crashing Jim Kirkland's Beachcomber, Nick Zioli's Pitts Special, and a self-designed 1000 sq. in. glider-type "thing" that was never meant to do aerobatics with a ST 71. Thus, after learning the rudiments of flying the way a lot of us unfortunately seem to do, I was ready for an airplane that could train me through the intermediate stage and into expert flying. I decided that a large plane with precise, but not critical, flying characteristics was required. It should be capable of all aerobatics and, therefore, be high powered with light weight.

About this time AAM (February 1970) carried a story on the Spinks Akromaster with an accompanying article about computer and wind tunnel designed airfoils by Dr. Walter Good. Portions of both articles were incorporated into this design.

The model utilizes the symmetrical E 747 airfoil, which gives excellent inverted and slow speed performance. The model differs from true scale, in that the fuselage is narrower to expose the top cooling fins on the side-mounted ST 71. Big engines can develop heat problems if improperly cooled. I also

thought it improved the model's appearance. The nose is altered slightly to facilitate cooling and building. The wing and tail have straight leading edges—also for easier building.

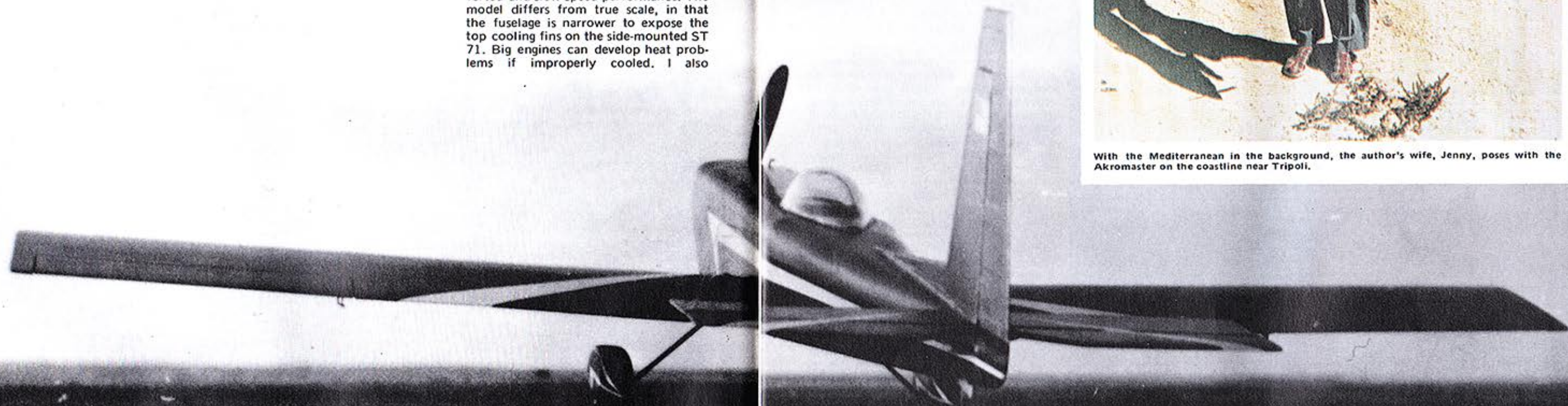
Although the plane is not designed for the novice builder, the lines of the Akromaster adapt readily to simplified model design and rapid construction. Building speed might be shortened by using Profoam, in place of the formers and sheeting, on the top of the fuselage. The wing can also be easily made from foam, by using the base and tip templates shown on the plans.

The basic structure of the nose, the motor mount beams and three plywood formers (including firewall), should be epoxied together first. Cut out the 1/8" aluminum mounting plate to fit your engine, drill the mounting holes for the plate in the maple beams, and mount the plate to the beams. The beams should be parallel and correctly spaced. Slip the three plywood formers on the beams and epoxy in place. Do this over the plans and be sure everything is square. Add the fuel tank box after the epoxy has set.

The two sides should have the wing saddles, stringers, and 1/4" vertical sup-



With the Mediterranean in the background, the author's wife, Jenny, poses with the Akromaster on the coastline near Tripoli.



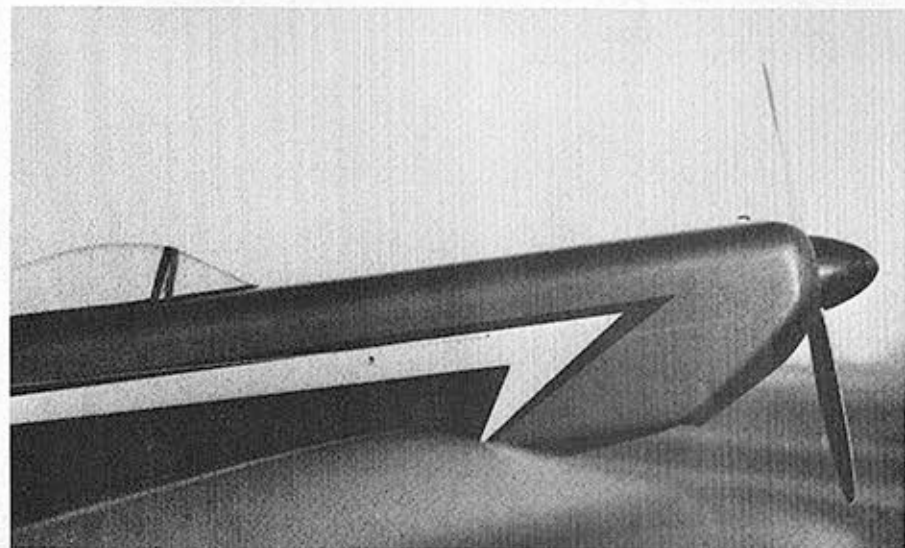
# Spinks Akromaster



ABOVE: ST 71 is very comfortable in the spacious nose. The tank protrudes through the bulkhead for easy inspection. Tatone manifold ducts the goop out the bottom.

RIGHT: "Gee, Daddy, it's bigger than me!" remarks the author's daughter tactfully, as she permanently impregnates the dope finish with bubble gum (plasticizer).

BELOW: At last, a good looking box fuselage. Straight lines can be handsome.



ports glued in place prior to mounting them to the nose assembly. An important point in this regard is to postpone gluing the top 3/8" sq. stringers to the 1/8" sheet sides aft of the cockpit until these stringers have been joined at the tail. Do this after the sides have been glued to the nose assembly. This will aid in accurately lining up the fuselage, and will establish a "bend line" where the fuselage breaks sharply toward the tail. The top stringers should be spliced and glued at the bend line, as shown on the plans, prior to gluing them to the forward part of the fuselage sides, and before the attachment of the sides to the nose assembly.

Everything else is "follow your nose" construction, with the possible exception of the wing ribs. If you are building the wing out of balsa, simply cut out the base and tip templates in plywood. Bolt a "sandwich" of eleven balsa sheets in between (size and shape on plans), and carve and sand to shape. Repeat for the other wing half. The tab "feet" on the plywood ribs should be positioned on a flat surface as you tighten up the stack prior to shaping. The tabs keep the wing aligned during construction. After the wing framework and leading and trailing edge top sheeting are completely dry, cut off the tabs and sheet the bottom sides. The ailerons are cut out after sheeting. The tail control surfaces are not sheeted, for scale effect and lightness.

For foolproof canopy mounting, I like to perforate the bottom edge of the canopy with a straight pin, prior to epoxying it in place. Punch holes completely around the canopy, approximately 1/16" apart and 1/16" away from the edge. The canopy interior can be given a nice scale effect by simply painting the wood with black watercolor. If the canopy is then epoxyed in place, the glue penetrates thoroughly into the wood and through the pin holes, to form a very strong bond. This should be done prior to finishing the rest of the plane. I use slow-curing Hobbypro II glue for better penetration when attaching the canopy.

I also use this glue in the engine and gas tank compartment, for good wood penetration and excellent fuel-proofing. A nice feature of this design is the isolation of the engine and fuel tank from the airplane interior. A pylon 12-oz. tank slides through the front opening into the tank box, prior to engine installation. The tank and engine installation is an exercise in "tight fit," but is rewarding in looks and operational ease. I have found Du-Bro ball head wrenches invaluable for mounting the 6-32 engine-to-plate and 4-40 plate-to-beam socket head bolts. Be sure to put lock washers beneath the bolt heads. Also epoxy 6-32 blind nuts on the back of the 1/8" aluminum engine mounting plate, so that the bolts can be tightened without stripping threads out of the plate.

I couldn't resist building in a "parachute box" behind the wing, just in case the mood strikes me later. It is there, if I want to cut out the trap door and add

the chute. Whether you use it or not, it still adds strength to the fuselage.

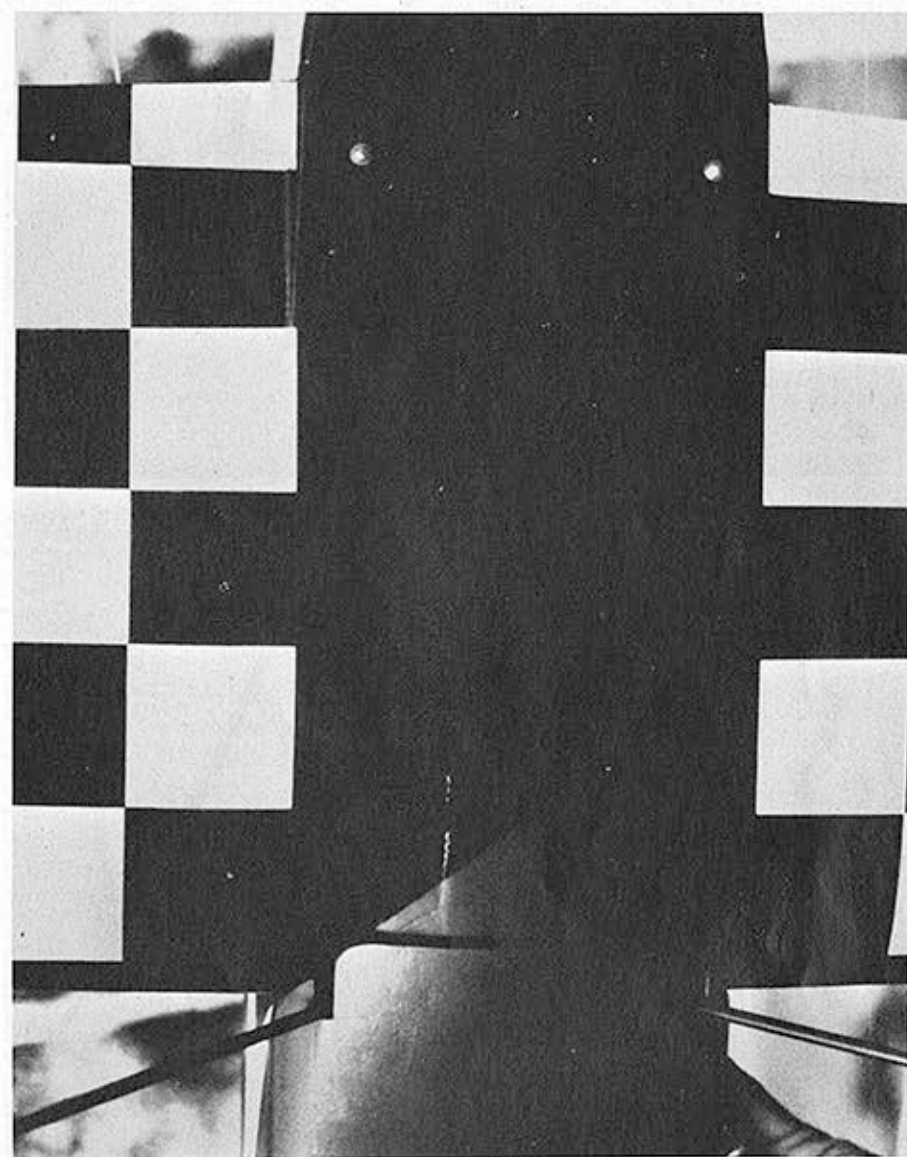
Several steps were taken to lighten the aircraft. Holes were cut in the plywood firewall and covered with balsa (see plans). The maple beams behind the firewall were drilled with a 1/4" bit, on 5/8" centers, for lightness. Regular, instead of low bounce wheels, were used. The lightest weight balsa was used throughout, except in critical areas, such as pushrods, elevator joiner, and 1/8" medium weight fuselage top sheeting and wing spars. Most importantly, the finish is minimal, but adequate.

I used the silk and dope method. Initial preparation was with three coats of clear, followed by silk (not a heavier synthetic). This was followed by four more coats of clear, two coats of color, and one coat of clear. Sanding was done as needed between coats. No sanding sealer was used. Although not as slick as glass, this finish is fuelproof and pleasing to look at. With the engine exhaust pointing down, the plane receives very little of the exhaust residue and, consequently, needs little protection.

After construction, a slight sagging was noted in the top fuselage sheeting behind the cockpit. This has since been obviated by doubling the number of formers in this area on the plans. If you like a heavy finish, however, I can't guarantee that you won't have sags in the top sheeting on a plane of this size. In this case, I suggest you use hard balsa for sheeting or, as I suggested earlier, go to Profoam.

The 3/16" steel music wire landing gear is about right for this size airplane—no chance for weight economy there. Another nice feature of this design is that the plane will sit on its gear with the wing removed. The gear is also easily removable, and will deform after considerable force is applied, with no damage to the plane (this has been field tested by a landing in soft sand).

In spite of its large size, the plane is not particularly expensive, in comparison to the average contemporary 60



ABOVE: Landing gear falls into the lower nose block. Checkerboard paint scheme on both lower wing and stab adds a nice touch, and aids in flight visibility and orientation. BELOW: Author reaches  $V_3$  quickly, to ensure that the plane will clear any obstacles at the edge of the field. The obstruction is a tree some twenty miles away.





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## SPINKS AKROMASTER

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castoring tailwheel (I like to blast around on the ground). A touch of up elevator gently lifts the plane off.

Those big wings and the throaty roar of the muffled ST 71 are impressive. Loops are effortless. Rolls are majestic, with a slight touch of down elevator in the inverted position. She really moves at full throttle with a 14-6 prop. The airplane responds well to trim commands. Once you get used to the deceptive speed of this large plane, landings are a breeze. Set up about 80 yards out and 20 yards up, cut the throttle and roll in down trim. The Akromaster is extremely stable at slow speed. Flare slightly just before touching down. If you land with appreciable speed, you will be surprised at the length of the roll out. . .its long.

For you hot shots with five or more channels, I suggest clipping four inches off each wing tip for a faster roll rate. Maintain the same aileron area, but add flaps or flaperons. You should also clip the tip off the tail. If you don't have a ST 71, you really ought to get one, but your 60 will do if you hold the weight down. Good flying and be careful how, and where, you fly!