a realistic looking DELTA for 3-function r/c

34" span for .19 to .20 motors

PAVEL BOSAK'S

ARROW

THE ARROW was built after some experiments involving several models of this configuration. One of these also had a pusher engine/prop set-up, and there were other variants, but *Arrow* was the last, and the best, of the series.

The first in the series was created some four years ago, and was "rudder-only" controlled by single-channel push-button radio. It had a Jena .15 engine and I flew it in a number of contests for this category of model. Later, when I needed an attactive and different model for a flying display, I fitted an Enya .19 with a 9x5 pusher prop. Radio equipment is three-function, on rudder, elevator and throttle. The model is of all balsa construction and is built "in one piece". This, however, is of no consequence to the average modeller who, nowadays, at least has the use of a 'banger'.

CONSTRUCTION

General

It is best to begin by constructing the various sub-assemblies. First, the ribs, with ply bracing for the undercarriage; then the fuselage sides with ply doublers according to the plan; fuselage bulkheads, rudder, engine mount etc. follow. All the details appear on the plan, as do those of the fuel tank, which I originally built—from tinplate—to fit, though you may find something suitable in your local model shop.

One point must be gone into in some detail, however, and that is the fin construction. The fin is made up from a balsa frame, built over the plan, and then covered with sheet each side. When made, it is covered with lightweight Modelspan. It should be finished, covered and doped before fitting into the fuselage. Note that the lower part of the fin goes right to the bottom of the fuselage. Do please double-check

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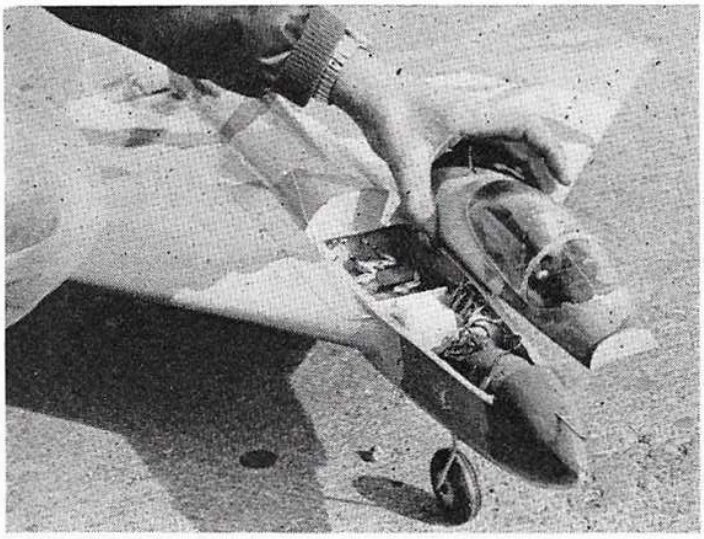
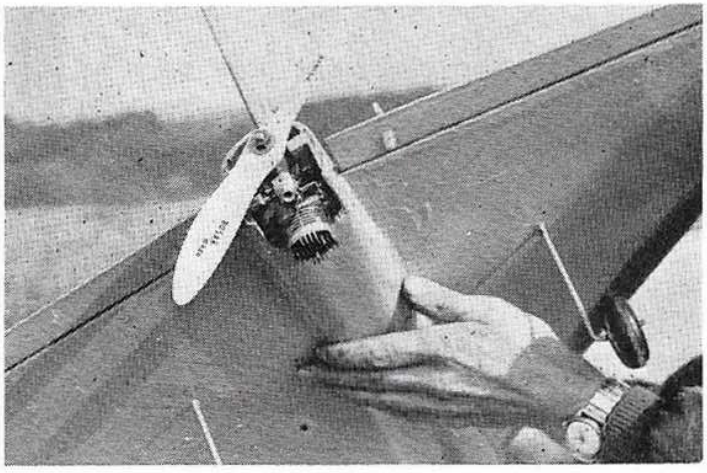
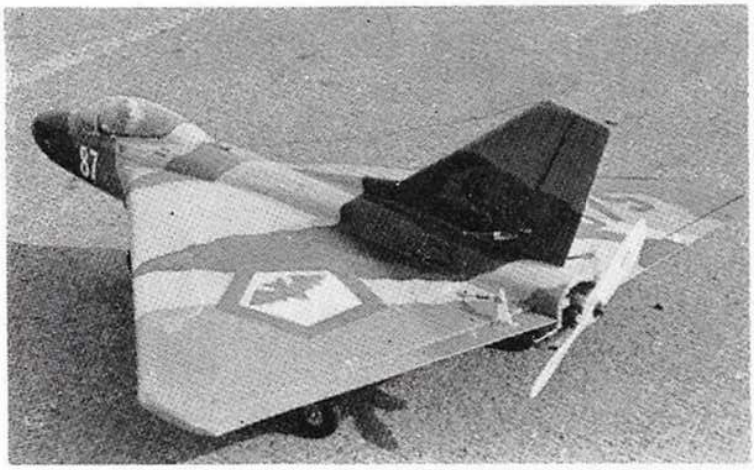
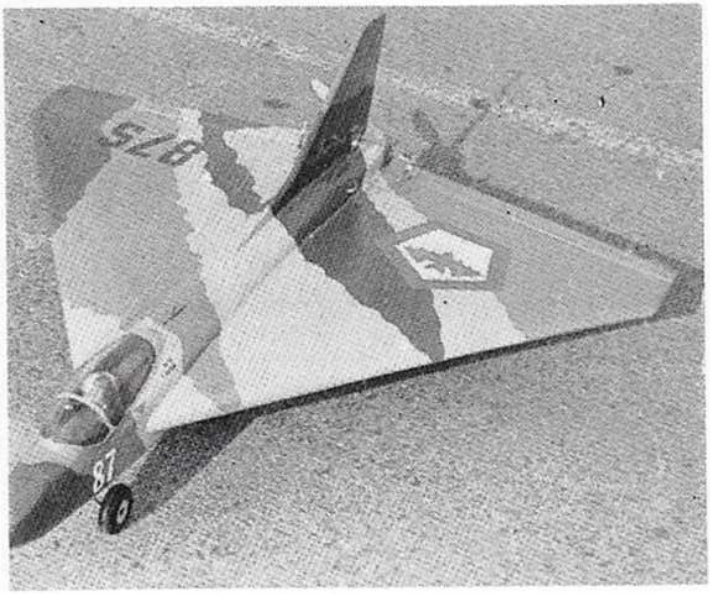








The realistic lines of *Arrow* are emphasised in these on-the-tarmac shots.

this for squareness after gluing, before leaving it to set.

Something different in this type of model is its tank, because of the use of the pusher engine set-up. This can be soldered up from shim brass, or tinplate as mentioned, fitting the bent copper pipes as per plan. For easier orientation (it's a pusher, remember!) a note of direction of flight (an *arrow*, would-you-believe!) is shown alongside the sketch of the tank, on the plans. If a commercial tank is used, this may involve a longer feed tube to the engine, but I have not tried this set-up myself and cannot therefore recommend it—though, personally I feel it might lead to an erratic fuel supply. It's worth while soldering up the tank, a simple enough job for the modeller, I would think.

Assembly

Bolt the steerable nosewheel assembly (many commercial units will suit) to former F1. Again, bought ready-made or else home-produced from ply or paxolin—even metal—the motor mount is bolted to former F5. For gluing the sides and formers together it is best, I find, to use an epoxy adhesive. After this has had a good time to cure, holes are drilled for the wing spars, then cut with the modelling knife to the actual cross-section shape of the spars.

The spars themselves are now fitted to the fuselage, and the positions of the wing ribs marked. These are now fitted and glued in place. Now follow leading and trailing edges, and tips and, when all is set, the main wheel leg mounts and the sheet covering panels. These latter should be made up, pre-joined, and applied as four complete panels. It's obviously better to use the widest sheet you can lay your hands on, as there will be that many less butt-joints to be made in the panels.

Turning our attention to the fuselage, or nacelle, we next fit the motor mount. There is no side-thrust, but the downthrust should be as indicated on the plan. Now turn your attention to the fuselage bottom, which is planked with $\frac{3}{16}$in. sheet balsa. Now install the tank in the fuselage, together with its feedout tube to the engine, and then fit the fin—with its rudder hinged to it—and the pushrods for rudder and elevator. The fuselage top—also planked with $\frac{3}{16}$in. balsa—may now be fitted. The canopy area is then cut away as shown, and the ply cut-outs cemented to (a) fuselage and (b) removable portion. You can either cut away the part where the canopy itself goes, or just paint it black—perhaps including a pilot. It'll be stronger if it's not cut away, of course, but you may need to poke some of your radio gear up into the pilot's domain!

Rudder and elevator are from solid balsa, sanded to shape and covered with lightweight Modelspan.

With everything complete in the woodwork department, the next thing is to thoroughly sand the whole airframe down, smoothing all the curves and filling the gaps in the planking etc.

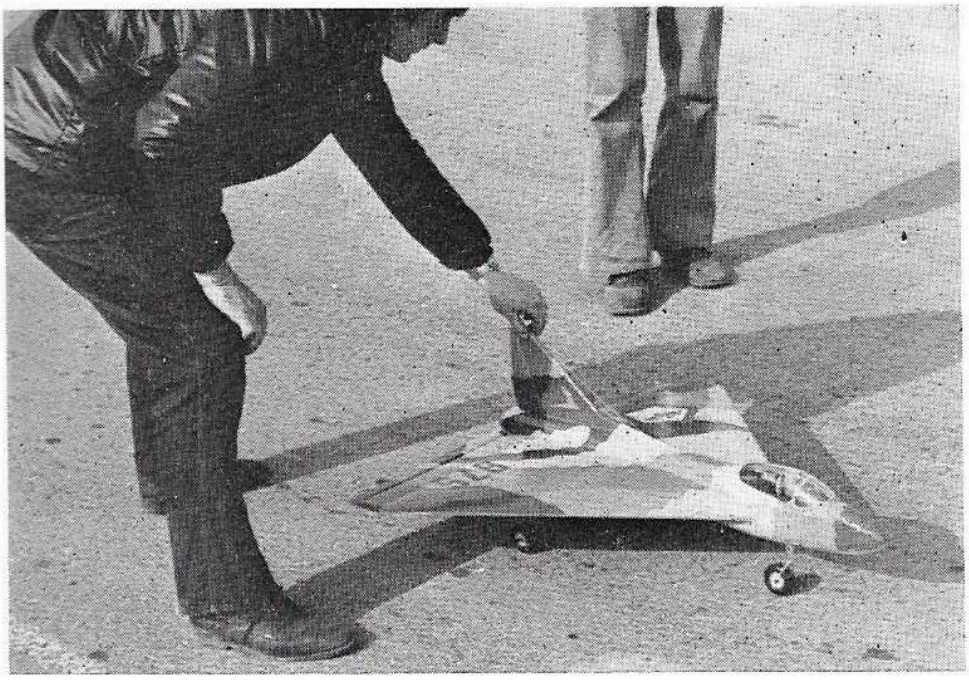
Finishing

The whole model is given several coats of clear dope, again sanding between coats, then a coat of sanding sealer, followed by the colour finish of your choice. I used acetate dope colours, followed by a coat of fuel-proofer, with special attention to the area around the motor mount with this—in other words, a second coat. Personally, I think the *Arrow* looks best in service camouflage—but there will be those who want to paint it red . . .

Final assembly

Fix the elevator, and rudder horns, re-install the radio equipment and set up the linkage accurately. Bolt the engine to its mount, and,

Pavel Bosak, seen at right with *Arrow*, is a prolific designer and builder. He lives in Klatovy, Czechoslovakia, and seems to favour the small and medium type of model, of the sort that is quite quickly built—and easily transported—of which *Arrow* is one of his most recent examples.

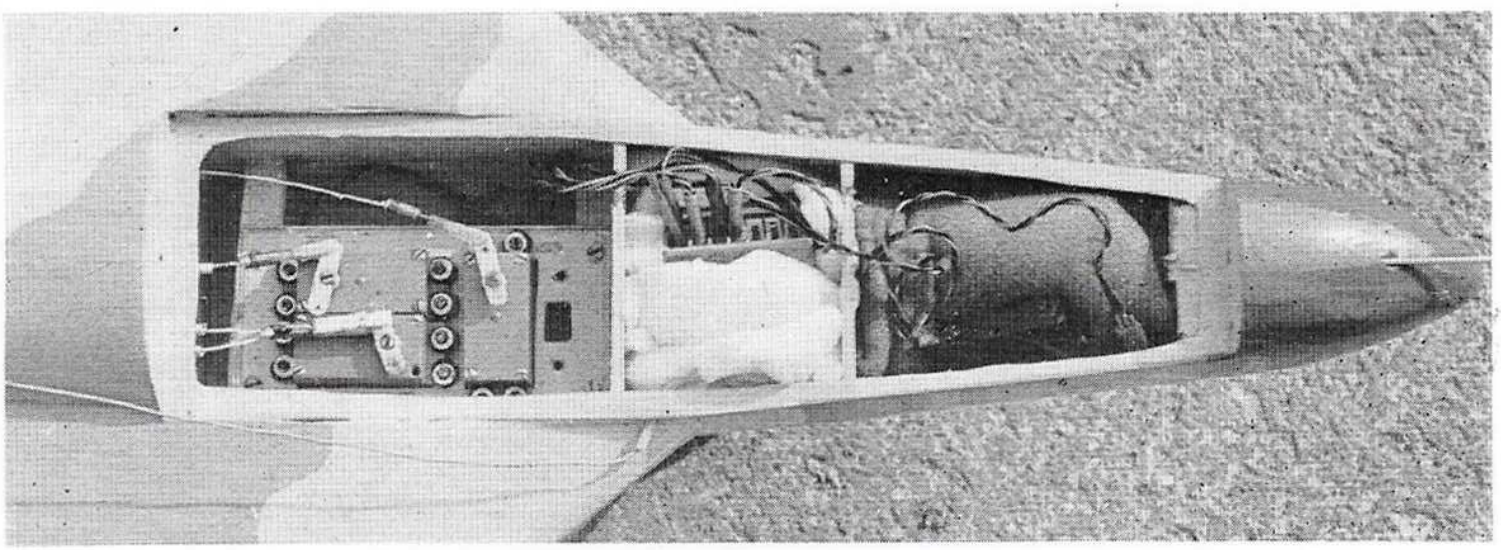


finally, fit the wheels, either soldering retaining washers to the legs, or using commercial collets.

Flying . . .

Before venturing out to the flying field, be sure to check the c.g. (with tank empty). This is most important. Next check that the rudder is dead-centre when the servo is at neutral. The model is quite sensitive and this is essential, particularly for the first flights. The elevators, however, should have some 2½deg. of "up" at neutral (if you follow me), so that the pitching moment is balanced.

Really, the *Arrow* is not very different in flight from an ordinary rudder/elevator design—except that the landing speed must be kept fairly high, or a stall and incipient



spin can result. On the first flights, the model should be flown wide and high, while getting accustomed to its handling characteristics. This is a fun model rather than an aerobatic one, and the only "aerobatics" I have done with the prototype are loops, which were done cleanly. (Of course, there will be those who fit extra servos and electronic or mechanical mixers—and convert the twin elevators into "elevons"—but, if they do, then *they* can have the fun of sorting it out—though I'm sure *Arrow* would roll spectacularly in this mode.)

My final advice is in connection with the use of a pusher motor. If you are releasing the model for r.o.g. takeoffs, then beware of holding it by the fin for restraining it before release. Your finger could slip into the propeller arc and receive a nasty gash. Good luck with your *Arrow*—I would be interested to hear how you go on with yours, and have asked the Editor to forward to me (in Czechoslovakia) any letters about this model.