Basically simple in design the Angel combines the many features found in hi-performance free flight—high aspect ratio—good wing planform —good moment arms—hi-thrust—good power.

ANGEL

HI-PERFORMANCE FREE FLIGHT FOR FAI OR CLASS CATEGORIES CAN BE MEASURED ONLY BY RESULTS—AS RESULTS ARE WHAT WE ARE SEEKING OUR FAI'ER FOR THE SERIOUS CONTEST MAN.

by MIKE POORMAN

► The design presented here is the fourth of a series started in 1959. The first was a pylon type with some very vicious tendencies. However it did reach the semi-finals. The second pylon ship was abandoned immediately after building due to very little improvement in stability. It was then I decided upon the hi-thrust force arrangement. I found it able to handle as much power as it is possible to pack on the front end and not to be too critical to torque. In fact, I have changed to different make and size props with very little disturbance of the power adjustment. Almost unheard of in a pylon ship, isn't it?

You may question, as several have already, the short tail moment. This will permit that tight turn for dynamic soaring in the windy weather. I insist too, that the tail should be kept to a minimum weight. This will reduce the pendulum action for excellent stall recovery. These two features give a quick transition into the glide from almost any altitude she has assumed when the engine stops. The windier it is the better she will fly.

Because of the jump right out of your hand performance our author utilizes the front of the high pylon to good advantage—note the strong, firm grip used to restrain the Angel.

With the 6409 airfoil and 8 to 1 aspect ratio you have a fine all weather wing. Maybe the glide isn't quite as good as the higher A.R. wings, but on windy days (and we sure get 'em) you will be flying instead of repairing. For calm weather just open up the glide turn.

Our hi-thrust design has never been out placed in eastern F.A.I. competition, except when it was blown away and lost for 2 weeks at the very windy 1960 semi-finals.

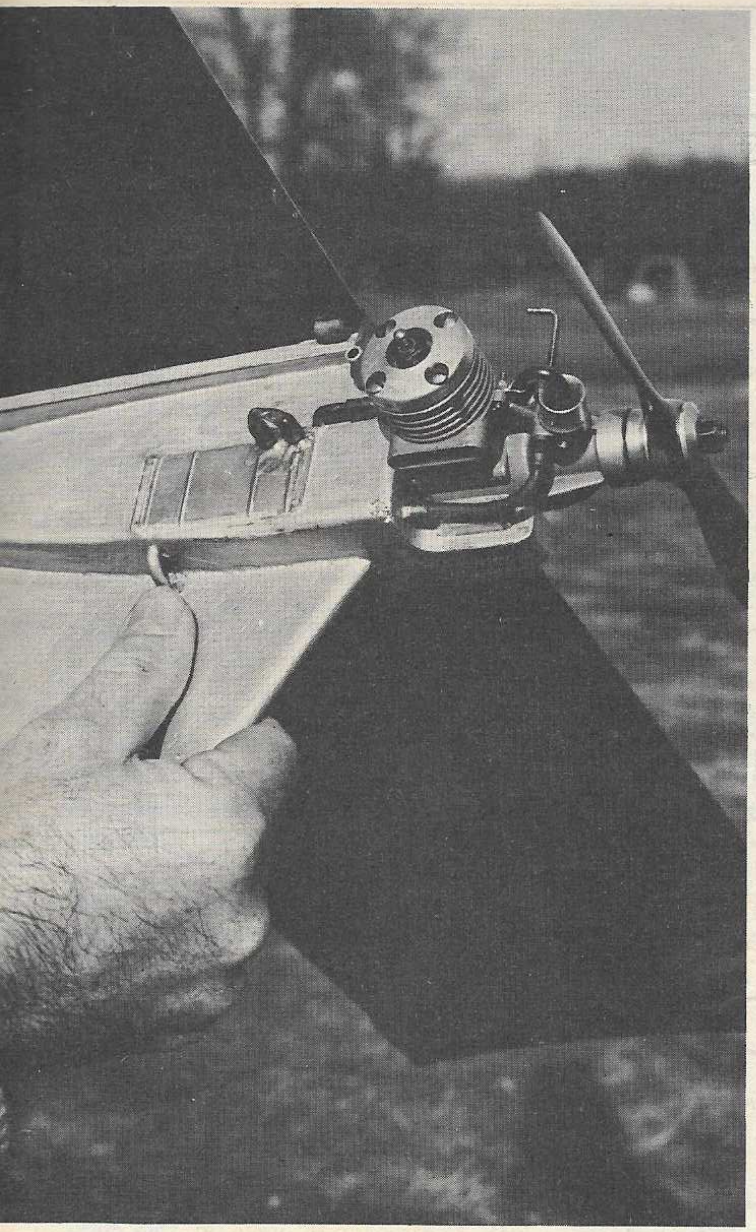
The ship may appear to be a frail bird but my pair have held together very well having flown hundreds of times under all kinds of weather conditions. In fact No. 2 is wearing the wing from the 1959 model.

A word of advice, power is most important. If you are seriously considering F.A.I. competition and the engine you have selected won't turn an 8-4 or equivalent at 18,000 rpm or better, get one that will. It is only by tremendous speed in the climb that you get the good transition. The forward speed after the engine cuts puts her over the hump and into the turn.

Construction:

F.A.I. not being recommended for the beginner and assuming you know how to build, we will chop most of the details for just a few hints.

Add 3/16" wash-in to left inboard wing panel (*Continued on next page*)



Areas held to minimum—note fuel tank built into engine mount and fairing—Super Tigre pressured for maximum performance.

Tatone flood off timer used for motor cut-off—fuel feed lines extends through pylon from fuel tank. Notel fuel pressure take-off.

ANGEL . . . continued

and about ⅛" wash-out to tips. A little more in the left tip than the right. Heavy silk on wing and light weight ½A silk or tissue on tail. The body is very simple. Before placing ⅛ x ¼ pieces on outside of boom, jig it up some way and check boom with straight edge. Cement pieces on and let dry thoroughly before you remove from jig. Not shown on the plans but for good D.T. insurance you may add four 1/16" plywood strips to the outside of the boom at rear of pylon. Cut them to width so they won't show when you cover boom with heavy silk or nylon. The motor block is perhaps the most precise part of the ship and should be made of very hard 6 ply. plywood or maple and should be milled. However, you can, if you must, improvise your own mounting, just be sure to maintain the 1½ degree left thrust and center line shown. I used a No. 6 perfect tank for reworking to pressure as shown. Motor block and tank are attached with epoxy resin and the nacelle built around them. I find that epoxy resin mixed with activator and then thinned with butyrate thinner and applied with a brush gives you the finest fuel proofer for your front end that can be obtained. When applied thin the job is smooth and light weight. The paint may come off but the epoxy won't. The stab is kept as light as possible. Complete assembly should weigh no more than 1½ ounces. Spruce should be used for top stringer tho'. It will prevent a lot of grief on those rough D.T.S.

Adjustment:

You have, of course, keyed all surfaces and made sure rudder is in exact zero-zero alignment with pylon, required wash-in in left inboard panel, and wash-out in tips. Balance point should be at 2-3/16" from trailing edge of wing. Left side of stab should be tilted to an angle slightly more than that of the inboard wing panel for a starting point. Block stab at rear 3/32". Add ballast if required to wing platform over CG to bring up to 26.6 ounces. Make power tab from ¾ in. piece of ½ in. trailing edge and glue to rear of rudder at right lower side. You will need only about 1/16" right tab if thrust and wash-in are correct.

Flying:

Make necessary test glides to be certain that no stalls are present and that the model has left turn. Make first flight with about 4 seconds on clock with engine at full peak. Launch slightly to left of wind at about 60 degree up with a good hard throw. If it goes straight reduce tab or vice versa. Correct angle of climb with stab blocking. It should climb at about 70 degree angle making one complete turn in 10 seconds. Make plenty of short runs before you come up to 10 seconds and always light the fuse. *Caution*, never launch to right of wind. Lots of luck. ●