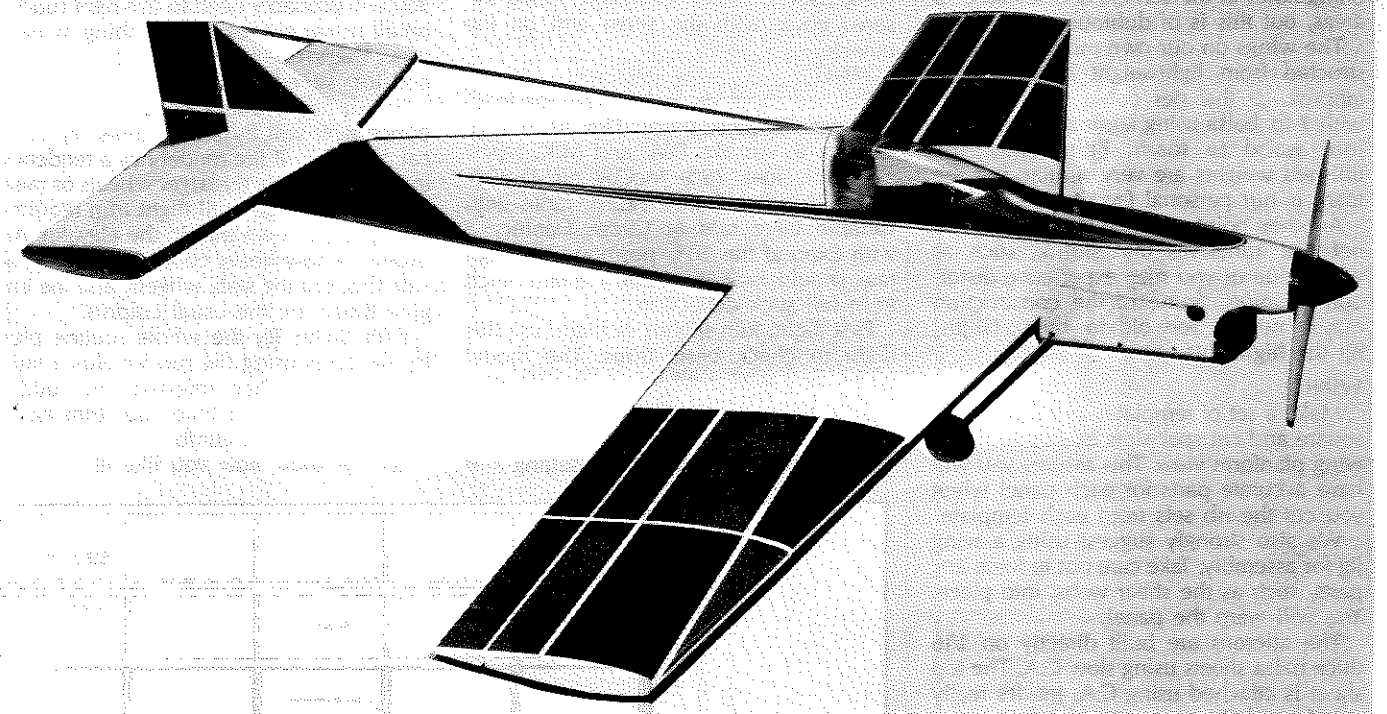
the Runaround



By DICK HANSON . . . This month, Dick switches from "How to Fly Pattern" to "What to Fly Pattern . . . With". Designer of the popular "Tiporare" (Tipo), had the 'Turnaround' in mind for this one.

• If you are a Novice or an Expert, this design is for you! Sound familiar? Maybe so, but let me tell you about the rather Plain Jane looking design we call the "Runaround".

Approximately seven years ago we worked up the Tiporare design, which has been well received by many pattern buffs. Then two years ago we worked up a very scale-like Dalotel which has also been extremely successful. These two designs spent so much time together the result was inevitable. You guessed it. The Runaround is a direct descendant of these two designs. Like most offspring, it looks more like one parent than the other. In this case the planform is much like the Dalotel, but the chin is from the Tipo as is the basic size.

The airfoil that evolved is a slick 12% section that really works! This is the thinnest section we feel practical for most fliers. The wing loading must of course be kept down when using this section at low airspeeds. No problem here, because the Runaround's 750 sq. inches carry only 6-7 lbs. of weight. The powerplant recommended is a .90 four-cycle that will easily turn 10,000 to 12,000 rpm. We like the O.S., but the new Enya .80 may be a good choice. The new electrics should also be considered.

If you have flown or watched large T.O.C. models being flown, you will note that the best ones are not too fast, but have excellent vertical performance plus airspeed stability. Air brakes, variable speed props, thick airfoils, etc., are *not* required to achieve these characteristics. High power and a relatively large propeller seem to be the best setup for these big models. This *can* be duplicated in a smaller size model.

Here's how. The O.S. .90 turns 10,000+ on 12 x 10 propellers. It only weighs 24 ozs., which is less than a .60 using a tuned pipe, and it has the advantage of being the easiest starting engine I've ever tried. I'm talking one-flip starts in below freezing weather. Add very low vibration and only 7 ozs. of fuel required for a FAI pattern. You can see why I am so taken with this engine. It's reliable, light, and fuel stingy.

The shape of the Runaround was not based on looks as much as function. The inverted engine, which we formerly resisted, is very acceptable when using a four-stroke, because flooding is not a problem and tank installation becomes very easy. . .mainly because it doesn't have to clear an exhaust system. The deep chin, as used on the Tipos, is very desirable in our opinion, both for lateral area distribution and general streamlining. It is extended even further on this design.

Studies of the airflow over the top of a fuselage indicate a *very* smooth line is desirable from the spinner to the vertical fin. The setup shown is quite slippery, and in fact, allowed the use of a very short vertical fin. Abrupt canopy lines do cause more turbulence, which can cause tail wiggle if the vertical fin placement is not correct. We have tested this phenomenon extensively. The scale Dalotel has an abrupt canopy entry and requires the tail rudder/fin setup to prevent wiggle. If you want to experiment, make a foam block about 3 x 3-inches and tape it to the top of your model's fuselage at various points. You should encounter rudder blanking at some point, which will induce a steady wiggle in the model.

The high stab placement is deliberate, and we feel it is the most desirable placement . . . if the idea is to keep it away from wing wake. The adjustable engine mount allows us to dial in neutral pitch arrangements by shimming at four points. We also kept the high thrust line, swept wing l.e., and large stab used on the Dalotel. The low speed stability of this arrangement is very good. It will *fly* at approximately 20-25 mph.

The fixed swept gear was swiped from light plane practice. It's effective in reducing bounce and best of all, it's L-I-G-H-T. Having no gear in the wing allows a finished wing weight of 24 ozs. That's including finish, servos, and all!

If you are still interested, we will describe the basic construction concept used. It's really not for beginners or nervous types. The version shown is intended

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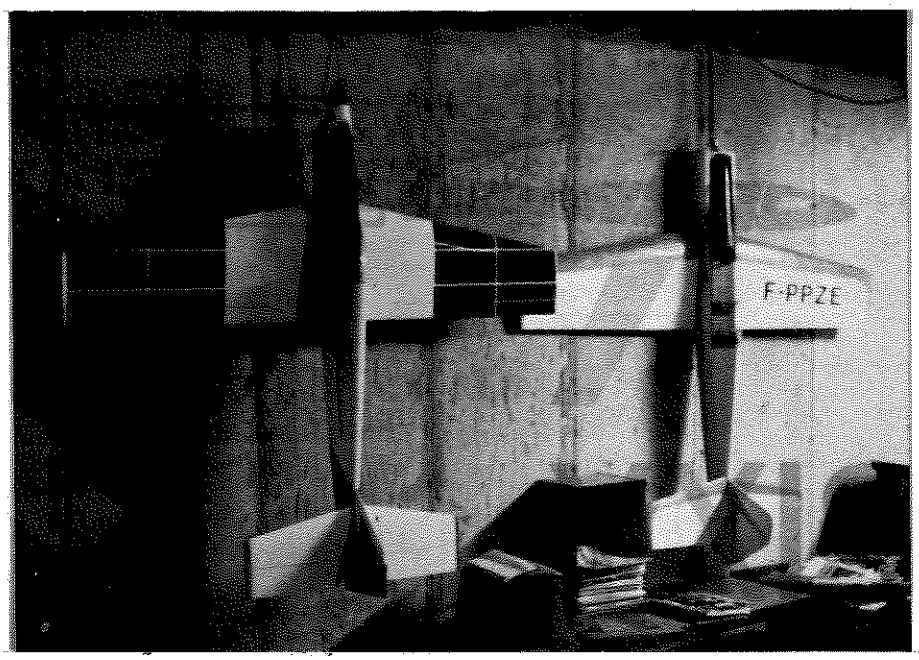
Two pictures tell the story: on the scale, at right, completed ship weighs 6-1/2 pounds. Below, comparison of Runaround lines to well-proven Dalotel layout.



for *good* builders who live to cut lots of balsa parts. If it is neatly assembled using fast and slow C.A., the finished weight and strength will be very good. This is due to the many "closed boxes" that are formed throughout the entire structure. You may, if you choose, cut round lightening holes in the centers of most sheeted areas, but this is of dubious merit.

The wings on our own models are constructed from lightweight beaded foam (approx. .9 lbs. per cubic foot) sheeted with 7 lb. balsa using laminating epoxy to join wood to foam. Either way, the finished weights are very similar, but the foam is our personal favorite.

Another point worth mentioning. . .do not use adhesives that shrink, such as white glue or you may experience distortion at joints. Some of the construction may be new (or very old) to you, so I'll just hit the highlights

WING

Make a set of templates as shown, then square and cut spar slots exactly to fit the wing planform view. This assures you will have accurate parts for each panel when you cut the rib sets from each template.

We also strongly suggest using a wing jig for assembly. Take care not to force any parts, such as the shear webs, into place. You will warp the panel.

The ailerons are built directly on 1/16 thick balsa sheets using slow C.A. The top sheet is attached using C.A. Jet. It's really simple and strong.

We join the wings by adding a soft balsa rib 1/4 inch thick to one wing panel center rib. Sand dihedral angle to fit then wick some C.A. into the joint. The glass cloth can be applied with warmed epoxy or C.A.

STABILIZER

Sheet the entire stab, but do it from leading edge to center of spar first. Then add from spar to trailing edge, using standard C.A. on the first side, and slow C.A. on the second side. Be careful, as you can twist it easily and when fully covered it is extraordinarily rigid!

The elevators are built over 1/16 sheet . . .same as ailerons.

FUSELAGE

Build the basic structure upside down on the 3/32 sheet which runs from the canopy aft. Next add forward hollowed blocks. Build the turtle deck placing the bulkheads directly over main bulkheads.

We form the entire turtle deck sheeting by prewetting, shaping and drying *before* attaching it using slow C.A. The chin is self explanatory. . .don't forget to use lite plywood. The canopy should gently flow from forward blocks to turtle deck. Use epoxy and micro balloons to form fillet.

We covered our model using World Tex white. This was then trimmed with Super Monokote. A spray bomb of Pactra butyrate white was then casually squirted over everything. When dry, the overspray was wiped from the Monokote using thinner on a rag. It's very quick!

We forgot to mention controls! The elevators and rudder are connected to their respective servos using .047 music wire passed through tan colored Sullivan inner rods. The open fuselage bottom allows you to easily route these in a smooth gentle curve for a super-smooth yet tight control hook up. Refer to sketch.

The ailerons each have their own servo mounted in the bottom of their respective wing panels. Super Monokote forms the servo cover with the servo arm on the outside.

FLYING

Balance about six inches from the leading edge. Try these props: 12 x 10, 11 x 11, 12-1/2 x 8. We like D.W. and M.K. types.

Try this fuel: 15% McCoy oil 15-20% nitro. Try using Futaba P.C.M. radio with variable trace rate or Circus Century 7 with Expo at the 50% position. The high rate should kick in about a quarter-inch from full stick deflection.

First flight: Run slightly rich and use this flight to check basic trims. The model glides very well until you raise the nose. It then assumes a high drag profile and sinks fast.

Second flight: Adjust power setting and try stall turns. You should be able to hover easily for a couple of seconds before turning. The basic thrust alignment and/or elevator alignment may require tweaking to get smooth predictable climbing.

Third flight: Adjust power setting again and try loops, both inside and outside. You will probably need to use right rudder on all power entries into climbing maneuvers. That's normal with large propellers and low speeds.

Fourth flight: Check your battery! A 10 ounce tank will fly a *long* time. Try vertical climbs. . . if the model has a tendency to pull to the top, try larger wheels or raise stab trailing edge until flight trim requires a very slight down trim in the elevator. An excessive nose heavy condition can aggravate this, but the stab, wheels, and the engine thrust are the usual culprits.

Fifth flight: Try the whole routine plus try flat turns using the rudder plus a little up elevator. When inverted, the rudder turns will require a little "up" trim again or the model will climb.

Let me know how you like it! •