

High Tension a single channel 31" span for 049 power, out-of-the rut model with a hot aerobatic performance by B J Austin from Radio Modeller January 1969



A high degree of manoeuvrability, combined with an attractive, out-of-the-rut appearance, was what I was aiming for when I dreamed up High Tension in the summer of 1967.

I believe it has lived up to expectations. The name - initially given because of the model's pylon-racer appearance - seems particularly apt in terms of its flying performance, too.

To achieve manoeuvrability (beginners would call it "hairy"— but this is not a

beginners' model!) a rather rearward c.g. is used, plus deBolt type rigging. That is to say, 5° wing incidence and $3\frac{1}{2}^\circ$ tailplane incidence. The wing has only 4° dihedral, for grooviness - and a tapered wing for its tip stalling characteristics.

The other main point of design is the underfin, which allows the use of a full depth rudder. That is to say, a good proportion of the rudder is below the centre line of the fuselage. It should be understood that a rudder mounted above the fuselage centre-line, whilst producing a turn in the desired direction, also induces a rolling action in the opposite direction.

High Tension will only fly properly when adequately powered, so use a good powerful motor. A Cox Tee Dee .049 is used in the original and is highly recommended. Do not imagine that for first flights something with less "poke" will suffice—it won't. This is not a beginners' model, as I said, and simply underpowering a high-performance job will never turn it into such. In fact, under-powering can be more dangerous than seemingly over-powering.

Construction

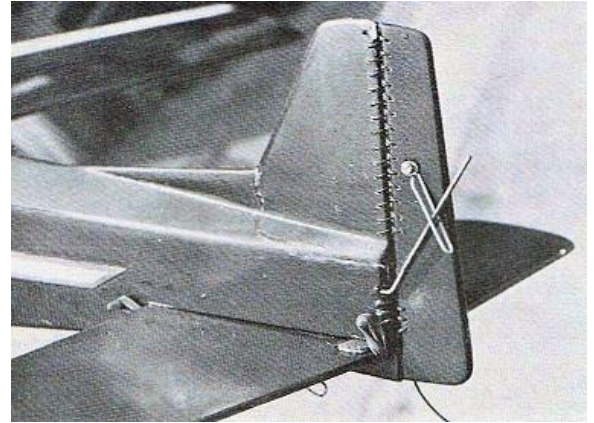
Wings. All the wing ribs are first cut to the root rib size (to be tapered down to actual size later). Next cut $\frac{1}{16}$ in. sheet to the outline of the wings, for the lower surface, less tip blocks. Mark the rib positions on the sheet and then pin it to the building board. Glue the $\frac{3}{16}$ in. sq. leading edge and the $\frac{1}{8}$ in. x $\frac{1}{2}$ in. trailing edge to it, and pin these down in turn. Glue the root rib, from $\frac{1}{8}$ in. hard sheet, in position at an angle of 4° to the board, using the dihedral template shown on the plan, and pin both rib and template in position. Fit all the other ribs, cutting their trailing edges down to fit, and follow with the $\frac{1}{8}$ in. x $\frac{3}{8}$ in. hard mainspar.



The glue I use is Evostik Resin W, so it's necessary to leave the wings at this stage, overnight, to dry. When ready, unpin the wings and sand down the top of the leading edge to suit the airfoil section. The ribs are now contoured, aft of the mainspar, to blend with the trailing edge. This is best done with a sanding block, after which the top sheeting can be proceeded with. This is first cut to size, leaving roughly $\frac{1}{8}$ in. at either end for trimming, and also remembering to allow extra width when cutting, for the top curvature.

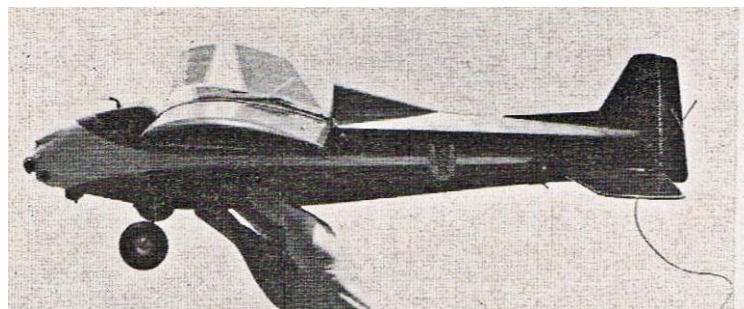
Mark a line approximately $\frac{3}{16}$ in. from the leading edge and $\frac{1}{2}$ in. from the trailing edge of this top sheet, on the inside, as a guide, and smear these areas with Evo Stik. Smear a thin film of Evo Stik on the mating leading and trailing edges, and to tops of ribs and spar. Now take the top sheet and, holding it not quite vertically, line up along the leading edge and when certain that everything is aligned, slowly lower it towards the trailing edge. Do not push it down on to the trailing edge as yet, but run your thumb along the

leading edge, applying pressure to make sure of a good bond. Now place the palms of the hands on to the fore edge of the top sheet and smooth back towards the trailing edge. When the two trailing edge surfaces meet, run the thumb along to make sure, once again, of a good bond, and then pin through leading and trailing edges, to the board, leaving over night to set After fitting the tip blocks (soft 1/2 in. sheet), sand overlap off root ribs and glue the two wing panels together at the correct dihedral angle. This is done by packing 1 1/32 in. under the tip ribs. Use some polythene sheeting under the wings when glueing, to prevent the structure adhering to the board, and leave overnight to set firmly. When dry, sand the wing down well and fix a 2 in. wide strip of fibreglass surface matting around the centre joint - either with cement or fibreglass resin. The top decking fairing is added later when the fuselage is built, and faired in to suit the contour of the fuselage.



Fuselage. This is best built up side down, as the structure will sit flat on the board, before the formers and nose blocks are added. The actual construction raises no special problems but do note that the slot to take the torque-rod bearing should have an angle filed on it, as shown on the plan, to make sure that the torque-rod does not bind. Sand the entire structure and give two coats of sanding sealer, sanding between coats. Cover with lightweight Modelspan tissue, doped on, and apply two further coats of sanding sealer, again rubbing down between coats, this time with No. 400 wet and dry paper. Now apply the colour finish of your choice—and fuel- proofer, if a fuel-proof finish has not been used.

Trimming and flying There should be no problems here, provided a few simple rules are followed. These are: (1) Make sure the engine is giving full power; this is most important, even for first flights. (2) Do not attempt to give any signals while the model is still close to the ground, on first flights, until you are accustomed to the response and the model's general characteristics. If your wing is built accurately, and the tailplane not warped, High Tension should climb away quite straight, from the launch, with no signals needed for correction. The model is groovy.



That is to say, it holds a turn, which is the way I like a model to fly. And it conserves actuator turns, too!

High Tension is capable of many exciting manoeuvres, some of which are not usually associated with single-channel flying, including loops, barrel rolls, stall turns, roll-off-the-top, upward-roll and spin. To achieve a spin, the cg.

needs to be just a shade further back than shown on the plan— but don't overdo it!

On landing, where the speed is decreased, it is very easy to tip-stall the wing so try to maintain a fair flying speed—and beware of tight turns near the ground on the final approach—you have been warned! However, the model is very responsive both on and off power, and you will soon get used to its characteristics, and be able to put them to good effect with some thrilling aerobatics.