A NOVEL DETHERMALIZER

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Many of the dethermalizer (DT) techniques that we use with model airplanes are either unreliable, complicated or both. The one shown here is something that I have worked on for several years and now feel is perfected. At the heart of the system are two small torsion springs that actuate a pop-up wing or stabilizer, although only the wing DT is illustrated here. This DT is reliable, simple and also has the advantage of concentrating the weight of the system near the center of gravity. It is illustrated in the accompanying photographs as installed on my Scientific Bantam, a simple 25-inch span, high wing sport model. It would obviously be almost impossible to make this work on a low winger, although it can be used in the more conventional stab DT.

Fig 1

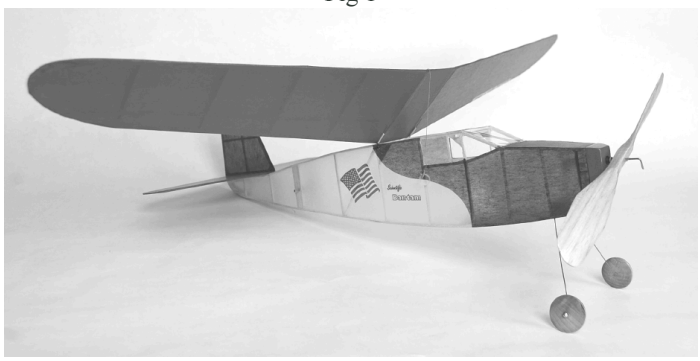

Fig 2

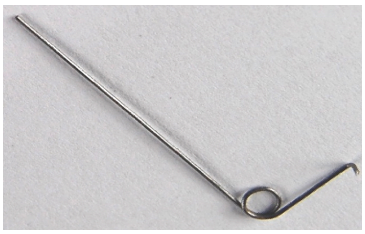

Fig 3

Figures 1 and 2 show the model in flying trim and with the wing elevated when the DT is activated. Notice the rods that are located in the fuselage at the wing leading and trailing edge locations, much as they would usually be to hold down the wing with rubber bands. Now, however, the rearmost rod (carbon fiber) is accompanied by balsa fuselage gussets just forward of the rod, which will be used to anchor torsion springs (Figure 3). Each spring is bent from .015 music wire and incorporates two coils in the wire and a short hook at one end that will be anchored in the gusset (Figure 4). The rod is used as a pivot for the spring, not to hold down a rubber band. Do not use heavier gauge wire because it will likely dislocate the mechanism when the spring is compressed. The torsion spring only has to be strong enough to support the raised wing in flight. The springs are easy to fabricate with chain-nose pliers.

Carefully place a spring coil over the rod and rotate the spring so that the long arm is at a 45 degree angle to the top of the fuselage. Coat the hooked end of the spring with glue and push it into the gusset. Add another coat or two to the short end of the spring once it is in place. Repeat with the other spring and check to be certain that both are aligned at the same 45 degree angle (Figure 4).

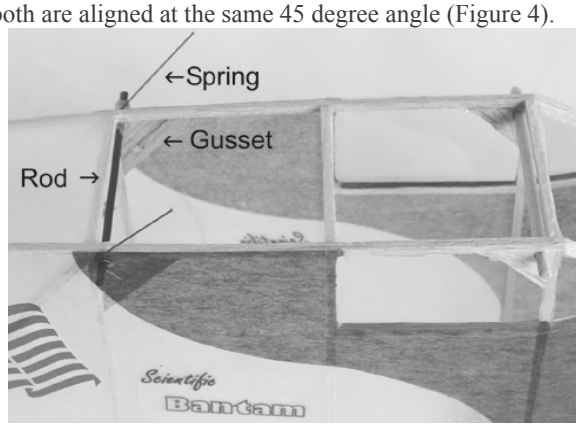

Fig 4

Then glue two short lengths of 1/16-inch diameter aluminum tubing (the ones on the model are 3/8-inch long) to the bottom of the wing near the trailing edge (Figure 5). The wing should be built with gussets where the tubes will be located. Be sure to remove the tissue where the tubes will be glued. As an added precaution you may want to sew in around the tube with cotton thread, although it was not necessary in this installation. The aluminum tubes should be placed precisely so that they will accept the long ends of the springs. When the wing tubes are dry, slip the wires into the tubes (Figure 6). Do not glue the ends of the wire once the wing is in place. In fact, the wing can be removed from the fuselage at any time for easy storage or transport.

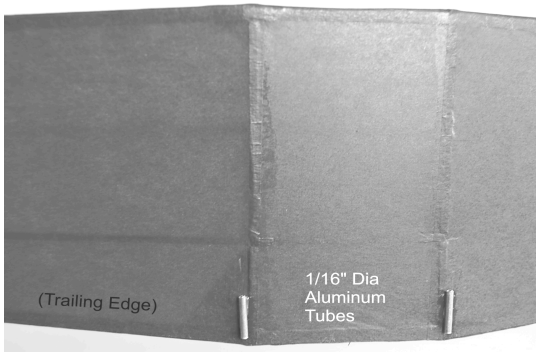

Fig 5

On some models, I've added a short limiting line that prevents the wing from pivoting too far back. This line runs from the fuselage at the top of the windshield or the ends of the front rod to the center of the wing's leading edge. There is none installed on this model.

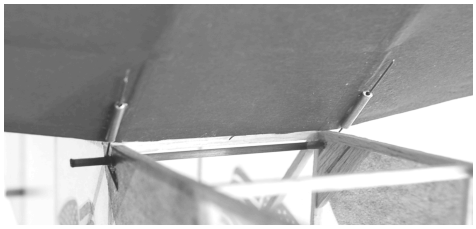

Fig 6

The wing is held down by a length of line (the red nylon line in Figure 7) that extends from the end of the rearmost rod, across the wing top center section and then over the front rod and down the side of the fuselage. The hold down line terminates in a small wire loop to which a DT dental rubber band is attached. On the bottom of the model is a conventional snuffer tube for a fuse and a small wire hook for catching the other end of the stretched rubber band (Figure 8). The fuse was not installed when the photo was taken for clarity, but this is the conventional arrangement that most modelers use.

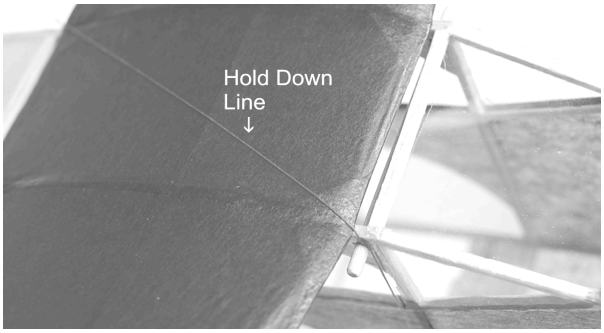

Fig 7

I am not a big fan of viscous timers because of their variability with temperature changes, but one could certainly be substituted for a fuse.

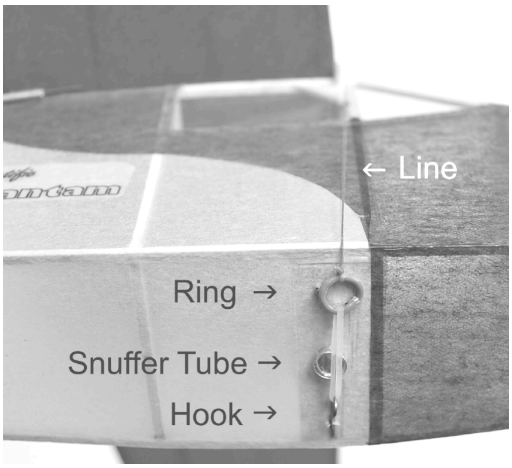

Fig 8

Because the tail is glued in place, it is unlikely to come out of position as sometimes happens with pop-up stab DT's. But the torsion spring mechanism can easily be adapted to a stab DT, which I have done successfully on several models where a wing DT was not practical.