

The TwinStar Reports
Setting up twin engines
By Dick Sutton

As I indicated in the previous kit review of the TwinStar, I had decided to forgo the y-harness that was suggested in the instructions and opted, instead, for using the mixing features of my Futaba 8UAF. I initially setup the engines using a y-harness (I'm normally a 'follow the directions' kind of guy). However, it didn't take long until I realized that no matter how carefully I set up the throttle pushrods, the two engines didn't respond identically.

After much frustration, I finally realized something that should have been self-evident: no two engines run exactly the same. Therefore, all my tweaking was an exercise in futility. That's when I decided that there had to be a better way. During my previous attempts at sync'ing the engines, I noticed that I could set them much more accurately by ear than by using the tach. Therefore, I came up with this idea: make one engine the master and then match the 2nd to the first. Simple, but how do I accomplish this? When all else fails read the manual! I discovered that there is a Throttle-Mixture feature of the 8UAF (TH-NDL). Now the intent of this function is to allow for in-flight needle valve adjustment. But I decided, why not just substitute the left engine servo for the needle valve servo? So, I plugged the right engine servo into channel 3 (throttle channel) and the left engine servo into channel 8 (per the manual). I tried it and it worked amazingly well. Using this setup allows me to adjust the right engine (master) first for best performance, then using the channel 8 knob, I can make fine adjustments to the left engine until the engines are sync'd.

As I mentioned earlier, I found that I could accurately sync the engines by listening for and eliminating the 'beat' frequency between the engines. Each engine produces a frequency at any given throttle setting. When two engines are running simultaneously, any difference in the frequencies (RPM's) becomes evident as a new 'throbbing' frequency. By adjusting one of the engines, this 'beat' frequency can be made to disappear. This technique worked remarkably well and made the process of adjusting the engines almost trivial.

There were even some interesting side effects. This mixing setup allows the throttle-cut switch to kill both engines. In addition, the throttle trim is linked so that the trim affects both engines, simultaneously. Who could ask for more? Both of these features are a definite bonus. I could have implemented the above by using a P-MIX (for those who don't own an 8UAF) by setting the throttle as Master and channel 8 as Slave and setting Link on. An offset would also have to be used to account for the non-centering nature of the throttle channel. This complexity, although not too difficult, is the reason I searched for a built-in solution. And the results? Well, this plane, the engines, and this set-up technique make the TwinStar a pleasure to fly!

Next month, I plan on reporting on the implementation and use of differential throttles (i.e. mixing the engines with the rudder for smother/more realistic turns.