Setting Up a Pattern Plane

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One of the local pilots at my home field recently expressed an interest in flying competitively for the upcoming pattern season. His enthusiasm is particularly inspiring, since he does not even know the sequences yet. In fact he is not even sure which class he will be flying in next year! He is no stranger to aerobatics though, placing first in sportsman at several local IMAC contests. After discovering that we lost the District 1 vs. District 2 pattern competition in August by one class, he became committed to help us win it back next year. He recently got his pattern plane flying and is ready to start practicing. The 5 steps below will assure that he will start off on right track. If you are thinking of getting into pattern (or other precision aerobatics flying for that matter) this primer may contain some helpful hints for you as well.

Photo taken by Bob Kane at the 2001 NATS after a 4th place finish. Don (left) and his father and caller, Tony. Aircraft uses JR 10X transmitter, 950 rx, 8131 servos (elevator), 8411 servo (rudder), and 7005 servos (ailerons).

My inspiration comes from the legendary Steve Stricker, who coached me about 7 years ago on the basics of setting up a pattern plane for competition. I thank him for his patience and have followed his advice closely. I guess its worked somewhat because as soon as I took the time to set up my plane appropriately, I found myself making it to the finals at the NATS on a regular basis!

1. The first thing to do is either purchase or construct a control throw meter to set your control surface deflections. I use the CRC meter which is available from Central Hobbies. Check each aileron separately and start with the same amount of throw up and down for each aileron. Do the same for the elevator halves.

2. The next step is to set flight trims. I normally start with straight and level flight back and forth making sure the ailerons and elevator are trimmed for cruise (about half to three quarter throttle) rather than full throttle. Why do this? Basically, you want to trim the plane at the speed you will be flying at in competition.

3. Step 3 is trimming the up's and down's. This is important because up and down lines impact heading changes during transition back to horizontal flight. I often do a series of stall turns (right to left and left to right) to check thrust. As the plane slows on the up line, it shows any thrust angle adjustments that are needed. I adjust the thrust to give hands-off up lines. For down lines, I use the throttle to elevator mix. I offset the mix to kick in at just a couple of clicks of throttle stick so it will only impact down lines. Set the mix on the 10X to "orig" so any throttle trim lever adjustments will not affect the mix rate. I also use throttle to aileron mix to adjust any rolling tendency on downlines. Again, I set the

(offset) to begin the mix with a couple of clicks of throttle. As a side benefit, I found this mixing helps spin entries and outside loops (where throttle is at idle on the backside). Finally, I'll do some rolls up and down to adjust roll differential. Get a helper to determine which wing is "dragging" behind the other during vertical up and down rolls. Put more up aileron throw in the wing that is leading to set up for nice axial rolls.

4. Now the easy part, that is, its easy when setting up knife edge mixing with the JR 10X. I use the rudder to aileron and elevator mix (pre-set mix function). It is important to set up knife edge mixing even in lower classes that do not have knife edge maneuvers. Why? You'll find that the roll/pitch coupling with rudder impacts maneuvers such as loops (with rudder correction) and even stall turns. The mixing helps all maneuvers look better.

5. Finally, check for control throws. I found that maximum flight scores resulted from using only enough control throw to execute the maneuvers safely. I set up high rates for spins and snaps but normally fly low rates elsewhere in the sequence. This result in high degree of smoothness and gracefulness.

This trimming process takes a lot of discipline, but if you take the time to trim the plane out using the five simple steps above, it will enable great looking maneuvers with less work. I love doing just a simple square loop with a perfectly trimmed pattern airplane. In calm weather its just a matter of pulling elevator on the four corners and letting the plane fly itself through for a perfect maneuver. Try it!