Pattern Aircraft Flight Trimming Chart

The following chart may be used to systematically set up and trim a model for straight flight and aerobatic maneuvers. Please note that for best results, trimming should be done in near-calm conditions. Before you decide to make a change, be sure to test the change several times before making adjustments. If any changes are made, go back through the previous steps and verify that they have not been affected. If they have, make further adjustments as necessary.

To test for	Test Procedure	Observations	Adjustments
1.Control neutrals	Fly the model straight and level	Use the transmitter for hands off straight and level flight	Change electronic sub-trims or adjust clevises to centre transmitter trims
2.Control throws	Fly the model and apply full deflection of each control one at a time	Check the response of each control • Aileron high rate: 3 rolls in 4 secs; low-rate: 3 rolls in 6 secs • Elevator high-rate: to give a smooth square corner; low-rate gives approx. 130 ft dia loop • Rudder: high-rate 30-35° for stall turns; low-rate maintains knife edge	Change END POINT (for high-rates), and Dual Rate settings (for low-rates) to achieve desired responses.
3. Decalage	Power off vertical dive (crosswind if any). Release controls when model vertical (elevator trim must be neutral)	A. Model continues straight down B. Model starts to pull out (nose up)? C. Model starts to tuck in (nose down)?	A. No adjustment B. Reduce incidence C. Increase incidence
4. Centre of Gravity	Method 1: Roll into near vertical-banked turn. Method 2. Roll model inverted	A1. Nose Drops B1. Tail Drops A2. Lots of forward stick (down elevator) required to maintain level flight B2. No forward stick (down elevator) required to maintain level flight, or model climbs	A. Add weight to tail B. Add weight to nose
5. Tip weight (coarse adjustment)	Fly model straight and level upright. Check aileron trim maintains level wings. Roll model inverted, wings level. Release aileron stick.	A. Model does not drop a wing B. Left wing drops C. Right wing drops	A. No adjustment B. Add weight to right tip C. Add weight to left tip
6. Side thrust and warped wing	Fly model away from you into any wind. Pull it into a vertical climb, watch for deviations as it slows down.	A. Model continues straight up B. Model veers left C. Model veers right D. Model veers right	A. No adjustment B. Add right thrust C. Reduce right thrust D. Put trim tab under left wing tip *
7. Up/down thrust	Fly the model on normal path into any wind, parallel to strip at a distance of around 100m from you (elevator trim should be neutral as per Test 3). Pull it into a vertical climb and neutralise elevator.	A. Model continues straight up B. Model pitches up (goes toward top of model) C. Model pitches down (goes toward bottom of model)	A. No adjustment B. Add down thrust C. Reduce down thrust
8. Tip weight (fine adjustment)	Method 1: fly the model as per Test 6 and pull into a reasonably small dia loop (one loop only) Method 2: fly the model as per Test 6 and then push into an outside loop (one only, fairly tight)	A. Models comes out with wings level B. Model comes out right wing low C. Model comes out left wing low	A. No adjustment B. Add weight to left tip C. Add weight to right tip

Pattern Aircraft Flight Trimming Chart (continued)

To test for	Test Procedure	Observations	Adjustments
9. Aileron differential	Method 1: fly model toward you and pull into a vertical climb before it reaches you. Neutralise controls, then half-roll the model.	A. No heading changes B. Heading change opposite to roll command (i.e. heading veers left after right roll) C. Heading change in direction of roll command	A. Differential settings OK B. Increase differential C. Decrease differential
		A. Roll axis on model centreline B. Roll axis off to same side of model as roll command (i.e. right roll, roll axis off right tip) C. Roll axis off to opposite side of mdoel as roll command	A. Differential settings OK B. Increase differential C. Decrease differential
	Method 2: fly the model on normal pass and do three or more rolls		A. Differential settings OK B. Increase differential C. Decrease differential
	Method 3: fly the model straight and level and gently rock the aileron stick back and forth	A. Model flies straight ahead with yawing B. Model yaws away from roll command (i.e. right roll, yaw left) C. Model yaws towards roll command (i.e. right roll, yaw right)	
10. Dihedral	Method 1: Fly the model on a normal pass and roll into knife-edge flight; maintain flight with top rudder (do this test in both left and right knife-edge flight) Method 2: Apply rudder in level flight	A. Model has no tendency to roll B. Model rolls in direction of applied rudder C. Model rolls in opposite direction in both tests	A. Dihedral OK B1. Reduce dihedral B2. Use mixer to produce aileron opposing rudder travel (start with 10%) C1. Increase dihedral C2. Mix ailerons with rudder direction 10%
11. Elevator alignment (for models with independent elevator halves)	Fly the model as in Test 6 and pull up into an outside loop. Roll it inverted and repeat the above by pushing up into an outside loop.	A. No rolling tendency when elevator applied B. Model rolls in same direction in both tests – halves misaligned C. Model rolls opposite directions in both tests. One elevator half has more throw than the other (model rolls to side with most throw).	A. Elevators in correct alignment B. Either raise one half or lower the other C. Reduce throw on one side, or increase throw on other.

12. Pitching in knife-edge flight	Fly the model as in Test 10	A. There is no pitch up or down
		B. The nose pitches up (the model climbs laterally)
		C. Nose pitches down (model dives laterally)
			A. No adjustment needed
			B. Alternative cures:
			  1) move CG aft;
			  2) increase incidence;
			  3) droop ailerons;
			  4) mix down elevator with rudder
			C. Reverse "B" above

* Trim tab is 3/16" x ¾" x 4" trailing edge stock, placed just in front of aileron bottom pointed end forward.