

## **First Flight Check List**

First flights shall be relatively short in duration and be devoted to checking out the "trim" of the aircraft. This should include slow flight and stall characteristics to assist the pilot with first landings. Control limits, roll rates, climb rates and glide rates should also be included. Conduct the first flight on during optimal conditions. The conditions may be ok for that type of airplane, but are they acceptable if the plane has a serious condition?

### Items to check at home

#### **Balance and Alignment**

- Is the longitudinal center of gravity (fore and aft) within the range shown on the plans when the fuel tank is empty?
- Is the model balanced laterally (side to side)?
- Are there any twists in the wing or tail?
- Loctite all nuts and bolts. This is especially important in gas models.

#### **Engine / Motor Security and Operation**

- Is the propeller nut and spinner tight?
- Make sure the prop does not touch the spinner at the cut-outs.
- Has the propeller been balanced and checked for damage?
- Propellers must have the edges rounded to prevent cutting your hand.
- Is the fuel tank installed correctly? (i.e., carburetor at the same height as fuel tank, clunk in proper position and moving freely, fuel lines in good condition and connected to the engine correctly, no kinks in fuel lines)
- Test for proper and bind free low idle and full throttle.
- If the gas engine has been sitting for the winter, clean the carb screen and unstick the flapper valves.
- Mix up fresh fuel. Never use last year's gasoline.
- In the case of ignition engine powered aircraft, they shall be capable of being shut down from the transmitter by an alternate means to the throttle control (for example a separate servo operated kill switch.). An engine kill switch on the aircraft that can be operated by a person holding the plane is also required. Verify that both work.

#### **Radio Equipment and Control Linkages**

- Is the receiver's 72 mhz antenna fully extended without strain and in good condition? 2.4ghz antennas are properly orientated? Avoid close proximity to metal and wires.
- Are servo arms firmly attached with screw in place? Loctite metal servos.
- Are the control throws in the correct direction with proper amount of deflection (as per plan)? Including the nose wheel.
- Ensure that rudder and elevator arms do not interfere with each other through their full range of movement.
- Ensure that wires inside the fuse can not get caught in servo arms.
- Set-up dual rates. Expo should be between zero and 30.

- Ensure that batteries are secure and can resist flight Gs. (up or down)
- Trim steps should be set to course so you can make large trim changes quickly.
- Test servo current draw to detect a bad servo or binding pushrod.
- Control surfaces must return to center after deflection.
- Test voltage at end of long wire runs to detect excessive voltage drop.
- Verify the failsafe works and throttle goes to idle in the event of signal interruption by turning off the transmitter and observing the results. Separate failsafe devices can be added if your receiver does not have this feature.
- Servo and control horn arms should be 90 degrees to pushrod when centered.
- Battery connectors and servo extensions held together with clips or ties.
- Batteries (especially new and old ones) are tested and cycled.
- A dual battery system for redundancy with separate switches for each battery is suggested for larger models.
- Are all control surfaces securely attached? (i.e., hinges glued, pinned). Pull on each one to test.
- Hinge gaps should be sealed or less than 1/16".
- Are all the clevises closed? (keepers or fuel tubing should be fitted to ensure they stay closed) Are the rods threaded into the ends enough?
- Turn on the radio and check for slop in the control linkages by grabbing the outboard end of the control surface and gently moving it up and down. It should not move more than a degree or so. Too much free movement can result in flutter.
- Check for control springiness. Hold or clamp the control surface so that it can not move. Apply a load to surfaces by moving the transmitter stick slightly and check for any flexing of control cables/rods. Watch the linkage for twisting of the horn or servo arm or flexing of the pushrod. Ball linkages are a prime cause of twisting arms.
- Check for binding and erratic servo performance. Slowly move servos through their complete range not just jamming the sticks back and forth. Be sure they operate smoothly throughout the entire control range.

### At the field before the first flight

#### **Control Surfaces and Linkages**

- Are all the clevises closed? (keepers or fuel tubing should be fitted to ensure they stay closed)

#### **Engine / Motor Security and Operation**

- Is the propeller nut and/or spinner tight?
- Test for proper and bind free low idle and full throttle. Does the throttle trim tab shut down the engine?
- Fill tank and visually verify that it is full. Drain the tank using the tube that goes to the carb and visually verify that it is empty. If you use a drain line that goes to the bottom of the front of the tank, hold the nose high as you empty with the engine pickup line to test that it is not mixed up with the drain line.
- Check for bubbles in the fuel line while the engine is running.

- Verify that both the servo operated kill switch and the kill switch on the outside of the aircraft work.

### **Radio Equipment**

- Are the batteries charged and in good condition (check under load with a volt meter)?
- Dual rates set up for first flight
- Turn on transmitter and check the correct model is selected (if applicable) and then turn on the receiver.
- Ask someone to help and walk away from the model until signs of loss of control are apparent.
- If electric powered ensure that the range is not worse with the motor running.
- Gas planes - Run a similar check with the engine operating at power levels from idle to maximum power. If there is range degradation with an operating engine there is an issue with ignition noise and/or a vibration induced problem. ANY reduction in range means a loss in signal/noise ratio and a chance of control loss in flight.
- Test reception with a data logger
- Do not taxi airplane around until it is completely ready to fly. Taxis tests quickly and accidentally become first flights

### **After the first flight**

- Check for loose bolts, muffler looseness.
- Check prop nut tightness.
- Check battery voltage to determine if the battery has been depleted more than expected.
- Check fuel level to determine if actual consumption meets expectation.
- Adjust the dual rates and expo. Adjust the control linkages for proper throw rather than reducing servo movement in the radio.
- Adjust the CG location only a small amount before retesting.