Affilliated to the British Model Flying Association
Club No. 561

BRIGHTON RADIO FLYING CLUB - MODEL SAFETY CHECKLIST – FIXED WING

Before any new aircraft is flown at the club site it must be checked for airworthiness and then checked again at regular intervals and especially after a crash. The following notes outline the **minimum** standards expected for safe flight. New modellers wishing to improve the performance of their models are encouraged to seek further advice from experienced club members.

1. AIRFRAME

This needs to be accurately and strongly built but, in particular, check the following. Tail plane and fin must be very firmly attached. If foam wings are used the joint must be bandaged and care must be taken not to weaken the veneer by sanding at the edge of the bandage. If built-up wings are used make sure that any spar webbing shown on the plan is not forgotten and that the wood grain runs vertically.

2. ENGINE

Check that the firewall is secure and well fuel-proofed. Fix the mount to the firewall and the engine to the mount using thread lock, nylock nuts or lock nuts. Check that the propeller is balanced and undamaged. Use a blunt-nosed spinner. If necessary, file the cut-outs on the spinner so that it does not touch the propeller blades.

3. CONTROL SURFACE HINGES

Check that these are very firmly fixed and that the hinge gap is as small as possible without causing binding.. Ideally each hinge should be glued and pinned with cocktail sticks. If hinges are not pinned then drill small holes through them to allow bridges of glue to form between the wood on either side. This is particularly important if mylar hinges are used.

4. WING FIXING

Where rubber bands are used the BMFA recommends three bands on each side. Make sure that there is plenty of clearance between the ends of wing fixing dowels and strip ailerons. If the wing moves slightly in flight one aileron can be fouled and control lost. (This is a bad design fault on some trainers. Reposition the dowel or trim the inner edge of the ailerons slightly). If wing bolts are used make sure that the loads on soft wing surfaces are spread by means of thin ply plates or commercial washers.

5. UNDERCARRIAGE

Make sure that everything is secure, that the wheels rotate freely and that the model runs straight. A very common fault which makes take off difficult is for the main wheels to be incorrectly aligned. If they toe in slightly (point inwards towards the front of the aircraft) the model will tend to resume its original course after it hits a bump. If they toe out any deviation from course will become progressively worse.

6. RADIO INSTALLATION

Servos should be securely mounted with rubber grommets. Remember that standard servos are not adequate for large or fast-flying models. The receiver should be well protected from vibration by foam rubber. The battery pack should be fixed securely to prevent it causing damage in the event of a bad landing or crash. Connecting wires should be secured and the battery to switch connector secured with masking tape. The aerial should be routed away from servos and fastened. If aerials are left trailing in the wind, the wire will eventually break leaving the insulation intact with no obvious sign of damage. All battery connections should be welded or soldered - spring loaded battery holders can cause serious interference. N.B. this advice is particularly important if an on-board glow system is used.

7. CONTROL CONNECTIONS

Check servo arms are firmly screwed down and at right angles to the servo body when the transmitter stick is centred (unless you deliberately want differential movement). The threaded ends of push rods should be long enough to be visible once the clevis has been screwed on and connected to the control horn. Make sure that any keepers supplied with clevises are positioned to grip the clevis arms but do not foul the horn. (A 5mm length of fuel tubing slipped over the arms of the clevis will make an excellent keeper). If you are using metal clevises do not forget to tighten the locknut. Snake connectors should be fastened firmly at each end and in the middle. To avoid interference do not use metal to metal connections especially on the throttle link. i.e. if the arm on the carburettor is made of metal use a nylon clevis. Finally check for slop in each linkage and replace any servo arm or control horn if this occurs.

8. CONTROL ADJUSTMENT

Adjust control movements to those recommended by the manufacturer. Do this by using different holes on servo arms and control horns. Minor adjustments can then be made using computer radios. The aim should be to maximise each servo's power by using its full movement. Check that it is impossible for servo arms to foul each other. Now move each control to its limits including full trim. If a servo buzzes it has stalled. This can result in rapid battery drain. Free off the linkage and/or hinges until no buzzing occurs. Finally check that each control is working in the correct direction (**including the throttle** to avoid starting accidents).

9. FAIL SAFE

If your radio has a fail safe you MUST set the throttle to idle (or stop in the case of electric motor).

10. BALANCE

Probably the single biggest cause of first flight problems is having the Centre of Gravity too far back. Balance the model according to the plan with the tank empty. If the plan shows fore and aft limits for the C.of G. it is sensible to balance the model in the middle of this range and then to add small pieces of lead to the nose to bring the balance point to the forward limit. These may be gradually removed once the model has been test flown.

Remember:

Balance too far forward - model is sluggish on elevator.

Balance too far back - model will probably crash.

11. RANGE CHECK

Make sure that all batteries are fully charged. With the aid of a helper conduct a thorough range check according to the radio manufacturer's instructions. Repeat the check with the engine running. If a fail safe is fitted, check that the engine returns to idle speed on loss or corruption of signal.