

Aylesbury and District Model Flying Club

Pre-flight Checklist (Introduction)

When you have completed your model, make sure it is thoroughly checked over by someone who has plenty of experience building and flying models. Our Club Training Officer, Richard Ginger, will be more than pleased to help you establish the airworthiness of your model. In his absence, ask the duty trainer (Details in the Club Magazine) to perform these vital checks. When we say thoroughly, we don't mean just picking it up and checking the balance. (Richard Ginger's contact details are available from the club secretary – see the "Contact Us" page on www.admfc.co.uk).

Every area of your model, its assembly and setup should be reviewed in detail by an expert before its first flight. This will substantially reduce the risk of a "first flight" disaster but more importantly, ensure that your model is safe to fly and not a potential danger to other modelers or the public.

The importance of thorough pre-flight checks cannot be overemphasized! Models are sometimes lost due to a simple oversight that could have been spotted in time and quite easily by an experienced eye!

Before the first flight:

Model Weight

Lighter is better. If possible, make sure that the "all up" weight of your model is in accordance with the published weight for the model in the plans or assembly instructions before coming to the flying field. A kitchen scales can usually be coaxed into giving a reasonably accurate measure of your models weight though this can be tricky if all you have is a wall mounted scales! Extra weight won't stop the model flying but it will probably be faster and harder to trim. It will certainly be harder to land if overweight.

If your first model is an Almost Ready To Fly (ARTF), the only influences regarding all up weight will be your choice of radio gear, the in flight battery pack, the engine and tank etc. Modern miniature equipment should not unduly impact the correct flying weight of an ARTF model however. This is why this type of model is the most appropriate type to start aero modelling and when learning to fly a model for the first time. If you have built your model from scratch using a plan then hopefully you have followed guidance regarding the correct selection of airframe materials, adhesives and coverings in order to keep airframe weight to a minimum.

Balance

The location for the Centre of Gravity (C of G) of your model is vital to its correct operation. The key influence with an ARTF model for the correct C of G is the weight and position of the engine, the radio gear and the battery pack. There is little choice for engine position and servo position as these are usually pre defined. The engine goes at the very front and the servos fit in the ready installed servo tray. The batteries however must be placed securely in the fuselage such that the C of G is within the range shown by the manufacturer.

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It is also important to ensure that the model is in balance along the fuselage or longitudinal axis. Does it balance from side to side? Again, with an ARTF model, the conformity of constructional technique is likely to produce a pretty perfect result every time. It's worth checking though because if the model isn't balanced across the wing it can impact the ease with which the model will fly and result in the need for unnecessary corrective trim settings to be introduced in order to ensure straight and level flight.

Alignment

Check that all flying surfaces are at their proper angles and are positioned correctly. An experienced modeler can quickly establish this. Check that the fin is vertical and at right angles to the tail plane. Check that the tail plane is parallel with the main wings. Ensure that there are no twists or warps in the wings (other than those intended in the design of the model, e.g. wing tip washout). Make sure the undercarriage is secure. The wheels should be free to turn, facing directly in line with the fuselage and secured on the axles using screwed collets or soldered washers.

Control surfaces

Give a firm pull on all control surfaces to ensure that they are securely fixed to the wing, tail plane and fin. In most cases, the failure of a control surface is due to poorly fitted hinges and only occasionally due to poor quality hinges. Hinges must be glued and pinned. This will ensure a long and reliable life for the airframe.

Once satisfied that the control surface hinges are securely mounted, check that the direction and throw of all control surfaces are correct. They must move in the correct direction as commanded by the transmitter stick movements. The amount of movement of each control surface will normally be indicated in the model instructions or on the plan.

Control linkage

Check that all control linkages are correctly fitted and secure. Ensure that all snap-links are closed. If snap-links have been used at the servo end of control rods, it is a good idea to provide additional security such as a short length of fuel hose to keep them closed. Snap-links are more likely to come loose when used on the servo control arms. Check that all screws have been attached to servo horns and are secure.

Radio

The radio installation should have been performed neatly and in accordance with the kit plans and radio manufacturer's instructions. Servo leads, battery leads and the receiver aerial should be secured clear of the moving servo arms and the control rods / snakes etc. The aerial lead should travel on the outside of the model for as much of its length as sensibly possible. Underneath or above the fuselage to the top of the fin are the best places.

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Make sure that the transmitter and receiver battery packs are fully charged before going to the field. Confirm that the receiver and the in flight battery pack is protected from engine vibration with "foam". Both of these items must be secured inside the model so that they cannot move around the cabin during flight.

Perform a field radio range check. If this is performed at our flying field, make sure you observe the club rules regarding frequency peg use before turning on your transmitter. Do not be tempted to turn on your radio equipment to check model operation by the road where you unloaded your model from the car.

With the transmitter aerial fully retracted, turn on the transmitter. Then turn on the model / receiver switch. While standing by the model, check that all controls move the model's control surfaces as expected. Check correct throw and direction of movement for all surfaces. Don't forget the throttle.

Walk about 30 metres away from the model. Have a helper confirm that the control surfaces move to your command and that there is no servo jitter present.

Engine and fuel

A lot has been written about engines and there is much information on the internet about the running-in / breaking-in of model aero engines. If the engine is new, make sure it is bench run-in using the manufacturer's instructions before fitting it to your model and always before coming to the field for the first flight. Never fly a model with a brand new engine which has not been broken in.

Check that the engine is securely screwed to the engine bearers. Check that the propeller is secure on the engine crankshaft. A balanced propeller will pay long term dividends for airframe life, engine life and model reliability. Check that the fuel tubing is not kinked or blocked. Check that the throttle mechanism is free to move under servo control.

Check that the fuel tank is level with the flying attitude of the plane and that the carburettor is at the same height as the fuel tank (not above). Ensure that the fuel tank "clunk" is in the proper position and moving freely. Once the motor has been started, run it at full throttle with the plane's nose straight up in the air to make sure it won't stall when full power is applied in flight.

The pre flight checks recommended above should be carried out before the first flight of the model, after crash repair and at the beginning of every season. The following pre flight checks should be performed before every flight.

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Pre flight checks – every flight.

Check that the model wing to fuselage join is secure.

Check general airframe integrity, i.e. wing to tail plane alignment, propeller condition and security, condition and alignment of the undercarriage and control surface movement / throw / directions.

Make sure the fuel tank is full. Place your frequency peg on the field peg board. Turn on the transmitter. Turn on the model receiver power switch.

Start the engine and ask your helper to raise the nose of the model and apply full throttle. Make final carburettor adjustments to ensure correct mixture and engine peak performance as necessary.

Place the model on the strip facing directly into the wind. Stand in front of the model's tail plane so that the model is restrained.

Apply full throttle. Check all control surfaces operate correctly. Throttle back and step clear of the model. Check around you that there is nobody near or on the patch who might be in danger when you start your take off run.

Remember, if you have any doubts about any aspect of your models integrity or safety, don't fly, speak to an expert first.

When you are sure everything is OK, loudly announce that you plan to take off. Throttle up and enjoy!