

Mansfield & District R/C Model Flying Club.
Beginners Notes.



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Introduction.

Flying Radio Controlled model aircraft is very enjoyable and rewarding, but newcomers to the hobby often find it much more difficult than they envisaged and they quickly become disenchanted. Furthermore, newcomers are not always aware that it can be a dangerous hobby, dangerous not only to the flyer but also to the general public.

These notes have been prepared with the newcomer to the hobby in mind. It is hoped that the notes will enable the reader to avoid many of the problems encountered when starting out in the hobby. Hopefully, we should be able to remove some of the frustration felt when things go wrong, prevent some of those expensive mistakes that we all make, and most important of all, create a safe environment.

We make no apology for expanding a little on the subject of safety when flying. A model plane is definitely not a toy. If the proper procedures are not observed on the ground then the flyer or his assistants can receive serious injuries from rotating propellers etc; visits to the hospital are a possibility. Then, when the plane gets into the air, this missile weighing several pounds moving at 50+ miles per hour has a potential to inflict severe injury on people or animals and extensive damage to property. As you will soon see, the bulk of this document concerns things we do to reduce the dangers inherent in the hobby.

As a first step in creating this safe flying environment the club has a Constitution which includes safety rules, please read this in conjunction with this document

In no particular order we would draw your attention to several safety rules, all new pilots must be accompanied by an instructor until they have obtained an "A" certificate. The "A" certificate is a basic flying test, which verifies that the pilot has sufficient control of his aircraft to be considered a safe flyer. The instructors will explain the test to the pupils.

Just in case anything goes wrong, even after we have taken all the necessary precautions, the club also insists that all people flying at the field must have current BMFA (British Model Flying Association) insurance covering third party damage and injury.

The club also strongly recommends that you do not fly alone as you may need help in an emergency.



In addition to all this attention to safety we also need to pay careful attention to keeping noise down. Many flying sites throughout the country are lost as a result of complaints from the public concerning noise.



The club insists that certain noise levels are not exceeded and we have officers with measuring equipment to police this aspect of our flying. Some notes are included here which will help you to meet the requirements, and of course you will find that the noise officers and other club members will be pleased to help you if you have a problem.

Later in this document we have included a few hints and tips which should help you to enjoy the hobby.

Finally as far as this introduction is concerned, please don't be put off by the volume of this document. We would like to give you as much information as possible but we don't want you to be frightened off by all these "do's and don'ts etc". What we suggest is; have a read right through it and the **Constitution** initially but don't expect to remember it all. Go to the flying field and find an instructor who will look over your equipment and show you how to fly while at the same time introducing you to the safety aspects of flying which are described in this document. If you then read through it again from time to time you will soon pick up all the requirements for safe and happy flying.

Before going to the field.

There are many checks, which you can make before you go to the field. These will make sure that you can fly safely when you get there.

- The receiver and transmitter batteries should be rechargeable and the cells connected together either by welding or soldering. The techniques used in model cars are not acceptable in the flying environment.
- Wrap the receiver and battery in firm protective foam and secure them in some way to save your delicate equipment from the effects of vibration or in the event of a crash.
- Mount the servos correctly. Servos are supplied with special rubber mounts, screws and metal sleeves. Ask if you don't know how they fit together.
- Ensure that all control surfaces are free, that the pushrods are well clear of the airframe and any snakes run freely. If any servos buzz when switched on the cause must be found or the receiver battery will go flat very quickly with the possibility of a crash resulting.
- Where snakes are used care must be taken at the ends where the inner leaves the outer as the inner may bend here under stress. Keep this part of the inner short or fit a length of pushrod inside the protruding portion.
- Pin all hinges to ensure that they cannot pull out in flight.
- Avoid any metal to metal contacts, as these can generate electrical interference which can affect the receiver performance in flight.eg, in-line fuel filters touching the engine, or metal clevises on metal connectors.
- Put a small flexible sleeve on all clevises to stop them springing open, a small piece of fuel tubing makes a good sleeve. If you are using a clevis on both ends of a pushrod then use locknuts or the rod can spin when in use.

- Stretch the receiver aerial (35 MHz) out to its full length, but never cut any wire off or add any wire to it. The aerial is usually taken through the side or top of the plane and fastened to the tail fin, or, in many cases it can be run safely through the inside of the fuselage if desired. If the plane covering material is metallic (aluminium for example) or if there are any metal rods or wires running down the fuselage then an external aerial is essential.
- 2.4 GHz aerals are much shorter and require different mounting techniques
- Check the Centre of Gravity of your plane, it is most important that this is correct. If you have a copy of the manufacturers building instructions they will tell you where to fix the C of G, if not then a good “rule of thumb” for a trainer is $\frac{1}{4}$ to $\frac{1}{3}$ of the width of the wing measured from the leading edge. If the C of G is too far forward the plane will not fly well, if it’s too far back you’ll probably be taking it home in a bin bag ☹. If you need to move the C of G, try first of all moving the receiver battery since that is heavy and will therefor have a big effect, e.g. it is often necessary to put the battery in the fuel tank compartment to get a forward C of G. If after trying to balance the plane by moving things around inside the plane there is still a problem then lead weights will have to be added to front or back. In order to minimize the extra weight fit the lead as near to the front or back of the airframe as possible. Adding weight is a last resort, but essential if all else fails, because it adds to the overall weight of the plane which is something worth avoiding as a light plane generally flies better.
- Check that the deflection on all the control surfaces is as specified by the supplier.
- Is the propeller the correct size for the engine? Also, it must not be made of metal, or chipped or damaged in any way.
- You must have a spinner or rounded nut with a minimum radius of 7.5mm.

Before leaving home for the field

- Make sure that all your batteries, transmitter, receiver and field box have been fully charged overnight. It’s a good idea to check the output voltage before you leave home, and make sure that they are all switched off.
- Daft as it may seem, check that you have loaded everything you will need at the field. If you don’t then you will not be the first flyer to turn up without a transmitter, or without a wing or something.
You are going to need, (unless you fly electric) fuel with some means of filling the tank, a glow start and either a starter motor or a “chicken stick”. Don’t forget the wing bolts, or sufficient rubber bands for the Trainer.
Of course you wont forget, your frequency tag (with your full name on it as well as your channel number, your transmitter pennant and your BMFA membership card, will you?
While it’s not essential it’s a good idea to take along a spare prop, a spare glow plug and the tools you would need to change these items.

At the field-Checks before flying

When you get to the field there are a few checks, which you need to carry out before flying.

- Have you left your mobile phone in the car? Mobile phones are not allowed on the field as they may interfere with some of the latest computer radios.

- *Put your frequency tag on the board before switching on the transmitter.*
This is probably the most important single safety action, which you must take. In order to ensure that there is only one transmitter active at any one time on any frequency a transmitter must not be switched on until the associated peg is free and the owner has then put his peg on the board.
- Have your transmitter checked by one of the officers appointed to do this, before you fly for the first time and once per year (in December) thereafter. This check ensures that the transmitter frequency is correct (35MHz only). It may be wise to contact one of the frequency checkers to ensure they have the equipment to hand during your visit (and in fact that they will be there at the same time as you).
- Clean your transmitter aerial frequently as it will accumulate an oily film, which will reduce its range (27 + 35 MHz only). Surgical spirits are best for this but meths will do (as long as you don't drink it.)
- 2.4 GHz transmitters still require a peg to be displayed on the board and a black pennant attached to the transmitter
- Carry out a radio range check. With the transmitter and receiver on, but with the transmitter aerial down ensure that the control surfaces can be operated from a distance of about 50mtrs, and that the surfaces don't oscillate during the test. You will need someone to help with this test. If the test fails ask one of the "older hands" to look over things with you, as this may indicate that your flight will fail due to the radio having inadequate range (use the 'low power/test button for 2.4 GHz systems).
You should carry out this check on all new installations, after any very heavy landing (or worse) and every two or three months just to be sure that all is well.
- If you have a PCM receiver you should check that the failsafe is working before each flight, and in particular that the failsafe shuts down the throttle when the signal is lost.
- The position of the pits is important to minimize the chances of a faulty take-off or landing resulting in an aircraft crashing into the pits. All aircraft will always take-off and land in one direction, determined by the direction of the wind. If it is decided that all take-offs, at a particular time, are to be from left to right, then the pits can be set up anywhere between the frequency board and the left hand gate (looking at the field from the lane). If take-off is from right to left, then the pits will be set up between the frequency board and the right hand gate. On very busy days it will be necessary to go outside these limits but we should all keep as near to them as possible for our own safety.
- If you are flying on a frequency, which is adjacent to that of another flyer, i.e., the next channel number, then you should do an adjacent channel check to ensure that there is no interference between channels. Stand about 3 yards apart then switch one transmitter on with the aerial fully extended and switch on the other with the aerial down. The transmitter with the aerial down should be able to control its associated plane while the other transmitter should not interfere with this plane in any way. Now try reversing the roles of the two transmitters (27 + 35 MHz systems only).

Flying.

I bet that you thought that we would never get around to this section☺.

- Once at the field have a final look over the model. Check the airframe and covering, are the servos fixed well, look at all the linkages to the control surfaces, is the

under carriage fixed securely, is the engine securely bolted in and are the silencer bolts tight and of course is the prop undamaged.

- The BMFA handbook has a little mnemonic to help you to remember some important checks before you fly - SMART.

S - Switch on. Switch on the transmitter and then the receiver, BUT only after you have put your frequency tag on the board.

M - Meters. Check the voltage on the transmitter meter, and it's advisable to also check the receiver voltage at this stage.

A - Aerial. Make sure that the aerial is extended and that you are flying a pennant which displays your frequency channel number. (This is a mandatory requirement of our club).

R - Rates. Check that the rates switches are set to the correct sensitivity for your flying of this model.

T - Trims. Ensure that the trims are set correctly. On the initial flight you should set all the trims so that all control surfaces are exactly neutral.

Subsequently, unless your transmitter has a memory function it is worth writing down the position of the trims after your flight and checking against these notes when you fly again. (Your instructor will always trim the plane for you when you fly, but it makes everyone's life a little easier if the plane starts each flight as stable as possible).

- Securely restrain your plane down before attempting to start your engine or have a competent helper to hold it tightly. This is most important as once the engine starts the plane can cause serious damage to anyone in its path. Do not allow anyone to stand in front of, or level with the propeller when starting the engine, and make sure that you have not got any garments, neck straps or glow leads, which could get caught in the propeller. If you are going to start the engine by hand then use a "chicken stick" they are much easier to replace than fingers. It is well worth telling you again that the most common accident at the flying field is "finger in the prop". Once the engine starts, move behind the propeller to remove the glow start or carry out any adjustments.

- "Gentlemen start your engines". Initially your instructor will help you to start the engine, making sure that it will run well at full throttle and also tick-over reliably for ease of landing. Get your helper to hold the plane with its nose vertically upwards and see if it will run at full power for 10 to 15 seconds. If it fails then make the engine a little richer and try again. If the engine will not pass this test it is almost certain to let you down as you try to takeoff.

- Do not taxi the plane out of the pits, get a helper to carry it onto the strip and ask those who are already flying if it is OK to take-off.

(After the flight do not taxi back towards pilots still flying or into the pits).

- Always try to takeoff into the wind. This may not be possible under all circumstances, as there is an overriding consideration that you must never takeoff towards the pits. Your instructor will show you the optimum direction of takeoff, which will usually be from left to right or right to left, and at times angled at 45 degrees away from the pits. Always turn away from the pits soon after takeoff.

- Check again that all the control surfaces move freely and in the correct direction. Do this check with the engine at full throttle. Running at full throttle at this stage also helps to clear the engine after its long period of idling.

- If there is any doubt in your mind about the takeoff then shut down the engine and stop.

For instance if the plane stops tracking in a straight line don't let it chase all over the strip, or if the engine doesn't sound right or if the plane is reluctant to lift off. Aborting the take-off under these circumstances is good flying which will save your plane and which could prevent someone else from being injured

When you are at the controls doing your first takeoff, try to ensure that the climb out is not too steep. This is in order to ensure that the plane will not stall. Furthermore, should the engine fail then try to land straight in front of you. On any emergency landing if you can keep the wings level then you will have more chance of going home with an unbroken pride and joy.

- Once in the air there are some areas which should never be flown over. For safety reasons never fly over the pits or the car park. If there are horses or spectators near the field they must be avoided. For noise reasons we try not to fly near to the Red Brick House hotel.

- One point that your instructor will soon bring to your attention is that the directional controls will appear to reverse when the plane is coming towards you. Some learners find it helpful to think of moving the stick, which controls direction in the direction of the low wing, in effect to prop the low wing up.

- When you are ready to land (your instructor will land the aero plane for you initially) call "landing" loudly to let all other flyers know your intentions. If during the flight your engine stops then call "Dead Stick" Any flyer with a dead engine has priority for landing and all other flyers will keep away from the strip, even those who have already set up to land.

- Always land into the wind. There are similar qualifications to this as noted for takeoff. Never land towards the pilots still flying or the pits.

If you are not 100% happy when landing then open up the throttle and go around the circuit again.

- Once on the ground, do not taxi towards the pilots still flying or into the pits and do not take the transmitter onto the strip, ask your helper to recover the model. Switch off the receiver before switching off the transmitter in order to ensure that you still have control over the model.

- Now we are ready for a few post flight checks, but first since you have now finished with your transmitter for a while take your peg off the board and let someone else have a go.

- Look over the plane as you did before the flight, i.e. airframe, undercarriage, propeller, engine etc. Clean your plane. Washing up liquid suitably diluted does a good job.

Other hints and tips.

These tips are not in any particular order, we just thought that you might be interested.

- If you are mounting a switch on the side of a plane always mount it on the side opposite to the exhaust. If the switch is a push/pull type then use pull to switch on.

- Use a fuel proofer (e.g. clear enamel) in all areas of the airframe which will not be covered but can be exposed to fuel, (e.g. inside the engine bay and tank space). This will greatly increase the life of the airframe.

- When putting on film covering always use a very sharp blade, refills for the knives are about £1 for 5, so cost isn't a problem. Where two pieces of cover overlap,

paint a little “Primol” on the lower surface to help adhesion, and later put a little fuel proofer over the joint.

- For ease of flick starting an engine fix the prop such that it is at “10 past eight” when it comes up to compression.

- You should always try to keep the gap between the flying surfaces and the control surface to a minimum, as otherwise their effectiveness is reduced. If you find, for some reason, that the gap is too large then seal it. These gaps can be sealed using the same type of film used for covering (transparent film is very effective), or some types of masking tape.

- When putting fuel proofer on paint, try the combination on a piece of scrap wood first.

- There is a compatibility problem with foam and some types of glue. Most types of foam dissolve in CA glues while others work well with CA but dissolve in epoxy. If in doubt test a bit of scrap.

- Engine won’t start? Is the carburetor set to a working condition? Usually 2 to 3 three turns out from closed. Is there a glow? Test plug on glow start, and see if the plug or the glow start battery is at fault. Is fuel getting to the carburetor? Use transparent tube for the fuel feed, and then it is possible to check on the feed by putting a finger on the carb air intake and turning the prop (without the glow start attached of course). If fuel is not getting to the carburetor check that the clunk has not doubled up the feed tube inside the tank. To test this, hold the plane vertical and shake it, if there is no problem you should hear the clunk rattle. By the way, in order to prevent this it is a good idea to fit a little stiff tube in the centre of the tube inside the tank. Make sure that there are no pinholes in any of the tubes, feed, filler or silencer pressure feed. It is easy to put a small hole in any of these when pulling them off and on and this will lead to tank pressure loss. If the engine will not run, check that the fuel tank is at the right height in relation to the carburetor. The centre of the tank should be approximately level with the spray bar in the carburetor.

- Charging Gel cells. If you use a 12volt Gell cell in your field box you will find that, unlike a “lead acid” cell you cannot charge it directly from a car battery charger as it needs to be trickle charged. All is not lost however, if you have a car battery charger all you need to do is to put a car rear lamp bulb in series with either of the leads from the charger to the battery and this will act as a resistor to limit the current flow.

- Lost model alarm. You may feel that an optional investment in a lost model alarm is worthwhile in an environment such as ours, where the flying field is surrounded by wheat fields during the summer. If the plane goes down in these fields it is very difficult to find it. The lost model alarm is a device, which plugs into the receiver, and emits a loud noise when the transmitter is switched off with the receiver still on. This device is also useful if you should at any time accidentally switch on the receiver, either at home or on the field, as it prevents you flattening the battery.

- Aerial Directivity. Although you will not notice the effect very often, if at all, it is worth knowing that the transmitter aerial is directional, i.e. it sends out a stronger signal in some directions than others do. What may come as a surprise to you is that the signal is very weak along the aerial and strongest at right angles to the aerial. If therefore, you should ever find difficulty controlling the plane because it is too far away, do not point the aerial at the plane as that makes matters worse.

- Economy. I'm sure that you would like to know that you can always get 10% discount on modeling goods at Hobbystores and Gee Dee in Nottingham also Gliders in Newark if you show your BMFA membership card.

- Noise. All model flying clubs have to be careful not to annoy the public with noisy internal combustion engines, and we are no exception. In order to avoid becoming a nuisance there are maximum acceptable noise levels set down by the BMFA and we as a club try to abide by them. The Club has a number of elected marshals equipped with noise measuring meters that will test any aeroplane which appears to be noisy, and in the event of there being a problem, will suggest solutions.

If you are trying to reduce the noise output of an model, consider the following;

The silencer provided with a modern engine is usually designed to meet the required standards, but some older designs or specials may be inadequate. If the silencer is a problem then you could try a commercially available add on silencer (a mouse).

If the propeller is too small this can cause excessive noise, try a larger one.

Experiments have shown that some designs of propeller are much quieter than others, those manufactured by APC are found to be amongst the best.

This is by no means a finite list of hints, tips or requirements but your instructor along with other Club members are usually very approachable if you have any questions but preferably not when they are flying

HAPPY AND SAFE FLYING AND MIND THE TREE