



BRITISH MODEL FLYING ASSOCIATION

**The 2010 BMFA
Members' Handbook**

**Corrections and Additions
Addendum Booklet**

ISSUE TWO

May 2013

The 2010 BMFA Member's Handbook

Corrections and Additions

(Issue 2) May 2013

Page 10, Column 1, Indemnity Limits for the Third Party Public and Products Liability

Change Section to

£25,000,000 for any one claim, (in the aggregate in respect of Products Liability).

Note that claims are subject to a £50 administration charge, which is refundable after 12 months if no claim is forthcoming from the Third Party.

Page 12, Column 1, Personal Accident Scheme

Replace first two paragraphs

Members of the BMFA from the age of 3 are covered by a standard personal accident policy whilst participating in Association activities which include the building and flying of model aircraft for sport and recreational purposes as well as travel to and from the flying site.

The benefits payable under this policy are £35000 in respect of accidental death and up to £35000 for permanent disability (current as at 1st January 2013). Reduced benefits may be payable to members over the age of 70. Please contact the Leicester Office for further details of the benefits payable under this scheme

Page 12, Column 2, Model Trader's Insurance

Add new final paragraph

For further details, please contact the Leicester Office

Page 12, Column 2, Optional Insurance Schemes

Replace numbered paragraphs

(1) Model and Equipment Cover which provides cover for models and ancillary equipment whilst at home, in transit or whilst left unattended in a secured vehicle. Further details can be obtained via the BMFA website.

(2) Club Equipment Cover, which provides cover for items such as grass cutting equipment. Further details can be obtained via the BMFA website.

(3) Commercial Flyers Insurance which provides cover for aspects of commercial model flying such as aerial photography, survey work or flying training undertaken on a commercial basis. For further details, please contact Doodson Broking Group on 0161 4193000.

Page 16, Column 1, Modify Section

(2) Models Over 20 kg

Change Heading to

(2) Large Model Aircraft (Over 20 kg

Modify Second Paragraph

A large model aircraft can only be operated under the terms of an Exemption issued by the CAA.

Such models are subject to airframe and build inspection before an 'exemption to test' certificate can be issued by the CAA. This is valid for one year only and it allows the model to be flown in private by the named pilot to prove the airworthiness and safe operating criteria for the model.

If the model is satisfactory over a set number of logged flights, the issue of a full exemption certificate will be recommended to the CAA. If this is agreed, the model may then be flown in public.

Exemptions are valid for one year but may be re-issued by the CAA on application, providing that no changes or significant repairs have been made to the model. If any changes or significant repairs have been made, the model must be re-examined and a fresh 'exemption to test' certificate applied for, with the model going through the full test schedule before the issue of a new full exemption certificate.

It is unlikely that any exemption will be issued without the condition that the model must be flown within the 'control' of a recognised model association and at a suitable site.

Note carefully that the only person legally allowed to fly the model is the person named on the exemption certificate. There are some exceptions to this rule but these have to be agreed directly with the CAA.

Add New Paragraph

The maximum mass for a model aircraft to be treated under the guidelines of CAP 658 is 150 kg. Above this mass full airworthiness regulations may apply. Builders contemplating the construction of a model having a mass of more than 150 kg should contact the CAA prior to commencing construction.

Page 39, Column 1, Modify section

YOUR FITNESS TO FLY

Many factors can affect your day-to-day ability not only to ~~pilot~~ **operate** a model aircraft, but also to participate in other flying related activities (a good example of this would be **such as** the retrieving of free flight models **or taking part as an organiser in competitions, club events or even model airshows**).

Before operating a model aircraft of any type, careful consideration should be given ~~before flying~~ to ensure that you are not compromising your own safety and welfare or that of those around you. Be aware that you might occasionally be 'unfit to fly'.

When at the flying field take good care of yourself and make sure that you are equipped with any medication that you are taking. If you use an inhaler, make sure that you have a charged one with you at all times. In hot weather consider taking sun-block, a hat and fluids - the effects of de-hydration can be serious. In cold weather make sure that you are equipped with suitable clothing.

If you wear prescription glasses or contact lenses ensure that these are used along with appropriate eye protection for the prevailing conditions. Good quality sunglasses will help protect your eyes from harmful UV radiation at any time of the year.

You should also be aware that some medications may render you unfit to fly and the effects of alcohol should not be ignored. As a guide when flying R/C, if you are fit to drive a motor vehicle then you are probably fit to fly an aircraft. If you are in any doubt then do not fly solo. As always, however, the responsibility for the final decision on whether to fly rests with you, the pilot.

The effects of Alcohol

There is a mass of scientific evidence about the bad effects of alcohol in matters of judgement and on the type of motor skills we rely on when taking part in model flying.

Even small amounts of alcohol can have serious effects on your performance, with the added problem that you are nearly always unaware of the situation.

Whether you are operating models of any type or are responsible for organising the flying of models (as a competition CD or flight line organiser at a club event for instance) the best advice is not to drink at all. If you do drink it should be in moderation, bearing in mind the levels of alcohol that are considered appropriate to operate a motor vehicle.

In particular, you should be very aware of the cumulative effects of alcohol and you should avoid drinking at regular intervals during the day, even if

you limit yourself to small amounts. It takes longer that you might think for any alcohol intake to be neutralised by the body.

Page 30, Column 2, Add new Section

Telemetry

Many modern radios have the ability to downlink telemetry data from your model to suitable ground receivers such as laptops, tablet computers or smartphones. If you are using this facility, we strongly recommend that you have a helper to monitor the data and not to do it yourself as you are obliged by the ANO to remain in visual contact with your model.

If you use a smartphone as the receiver, you should ensure that it is switched to 'flight mode' as this will enable you to take it on the flightline with no risk that it will operate as a mobile 'phone whilst you are flying.

Page 30, Column 2, Transmitter and Receiver Issues

Add to paragraph (a)

.....and no servo 'jittering'.

Page 37, Column 2, Checks Before Each Flight

Replace paragraph (1) with,

(1) Obtain frequency clearance. Exactly what you do will depend on the rules of the site but be sure you understand exactly what you are doing and do not forget this step.

Pay particular attention to using the correct sequence appropriate to your model. For 35 MHz, this is usually 'get the peg, Tx on, Rx on'. For 2.4 GHz, you should be aware of any local transmitter usage limitations and if a flight peg is required, it must be obtained before the usual Tx on, Rx on sequence. Note that some radio equipment and, occasionally, a specific model set up, requires that the Rx be switched on first. If this is so take extra care.

With electric powered models, you must be aware that the model is 'live' as soon as the flight battery is plugged in and you should take appropriate safety precautions. If a separate receiver battery is fitted, you should have the opportunity to check the operation of the radio equipment before the flight battery is plugged in.

Page 40, Column 1, THERMAL SOARING

Add new sub-section after paragraph (g)

Aerotowing

CAP 658 says -

Aerotowing the glider requires careful handling of both the tug and the glider. Remember that to fly **ANY** model over 7 kg above 400 feet requires a permission. Your local club may already have such a permission.

BMFA Notes – It has been clarified that a tug / glider combination has to be viewed as two separate entities, even when they are connected.

Before towing any glider with a tug over 7 kg, or any glider over 7 kg, be very sure that you have the correct permissions as you will almost certainly want to go over 400 ft. In controlled airspace, contact the appropriate Air Traffic Control organisation and in uncontrolled airspace, check with your local club as they may have already taken advantage of the CAA scheme which allows site permissions to be granted.

Never tug to any height without making sure that you are legal.

Page 44, Column 1, MODELS BETWEEN 7kg And 20kg

Modify Paragraph (h)

(h) It is recommended that all 'large model' pilots should hold the BMFA 'B' certificate or ~~its equivalent~~ **a similar qualification** (e.g. SAA Silver Wings **or the** LMA Certificate of Competence), and should ensure that both adequate third party insurance is operational and that all flights made comply with CAA regulations.

Page 47, Column 1, First Person View R/C Flying

Modify the appropriate paragraphs in the section on FPV flying in the 1st addendum sheet to the Member's Handbook, dated December 2011

Replace Paragraph (3) and (4) with

(3) Safety Concerns

Images captured by a camera and displayed on a flat screen afford the pilot little by way of depth perception and no peripheral vision. This can make it difficult for the pilot to accurately judge speed and distance and to maintain sufficient awareness of the area surrounding the aircraft to effectively 'see and avoid' obstacles and other aircraft. The ability to control the aircraft and avoid collisions is also greatly affected by the quality of the video being displayed. Furthermore, in the event of a loss of the video data stream, which can easily

occur if the aircraft is flown beyond the range of the video transmitter, the pilot is likely to experience difficulty in locating the aircraft relative to his own position and visually acquiring it before loss of control occurs.

(4) Control Measures

The mechanism to address the safety concerns and to overcome the visual contact problem is already in place within R/C flying. This is the Buddy Box system which is regularly employed to train ab-initio pilots. In an FPV R/C scenario it enables the person in charge of the model to hold the master transmitter and maintain direct unaided visual contact with the model whilst another person flies the model by reference to the live video from the on-board camera. In the event of an emergency or problem the person in charge with the master transmitter must take control of the aircraft and take whatever action necessary to maintain safety.

Add new paragraph (5)

(5) In addition to the guidance already contained in paragraph 1 of this Chapter, consideration should be given to the following:

(a) **Pre-Flight Checks.** Ensure that the additional transmitters (data/video) are switched on whilst conducting the range check.

(b) **Battery Charge Status.** FPV can involve several more batteries than normal R/C flight. All batteries should be checked for full charge before each flight.

(c) **Training.** FPV flying means that the pilot controls the aircraft by reference to the horizon – just as with full-sized aviation. Before attempting a first flight it is a good idea for a novice FPV pilot to wear the goggles and view the video feed as a "passenger" whilst another pilot flies the aircraft.

(d) **Positional Awareness.** FPV flying differs from line-of-sight flying in that the pilot sees a completely different perspective and, during his first flights, it is easy to lose track of where the aircraft is relative to the flying field – especially when directly above it.

Re-number paragraph (5) to (6)

Delete Sub paragraph (i)

Change final paragraph to bold.

Add New Section

First Person View Pilot Exemption for Lightweight Models

The CAA have issued an exemption Which allows the solo flying of lightweight FPV models, subject to the following conditions.

(1) The Civil Aviation Authority, in exercise of its powers under article 242 of the Air Navigation Order 2009 ('the Order'), exempts any person in charge of a Small Unmanned Aircraft (SUA) from the requirement at article 166(3) of the Order to ensure that direct unaided visual contact is maintained with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.

(2) This Exemption only applies if the conditions at paragraphs 3 to 7 are met.

(3)

(a) The person in charge is the person piloting the SUA.

Note: The person in charge remains responsible for the safety of the operation and may only fly the SUA if reasonably satisfied that the flight can safely be made.

(b) The person in charge is accompanied by a competent observer who maintains direct unaided visual contact with the SUA sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions and advises the person in charge accordingly.

(c) The maximum take-off mass of the SUA does not exceed 1.8 kg for an aeroplane, or 2.5 kg for a rotorcraft, including any batteries or fuel.

(4) The person in charge must not fly the SUA:

(a) in Class A, C, D or E airspace unless permission of the appropriate air traffic control unit has been obtained;

(b) within an aerodrome traffic zone during the notified hours of watch of the air traffic control unit (if any) at that aerodrome unless permission of any such air traffic control unit has been obtained;

(c) at a height of more than 400 feet above the surface;

(d) over or within 150 metres of any congested area;

(e) over or within 150 metres of an organised open-air assembly of more than 1,000 persons;

(f) within 50 metres of any vessel, vehicle or structure which is not under the control of the person in charge of the aircraft;

(g) within 50 metres of any other person, apart from the competent observer, except when taking off or landing; or

(h) within 30 metres of any other person, apart from the competent observer, during take-off or landing.

(5) For the purposes of this Exemption, a 'competent observer' means someone whom the

person in charge of the SUA has designated as the competent observer.

(6) Before designating someone as the competent observer, the person in charge of the SUA must be satisfied that he or she:

(a) has been briefed in accordance with paragraph 7;

(b) is competent to perform the tasks which he or she may be called upon to perform in accordance with paragraph 7; and

(c) is competent, by direct unaided visual observation of the SUA, to assist and advise the person in charge with the safe conduct of the flight.

(7) The person in charge must ensure that:

(a) the competent observer is fully briefed on the planned flight and what is expected of him/her taking into account the prevailing conditions;

(b) the competent observer understands that he/she must stay directly adjacent to the person in charge and maintain direct unaided visual contact with the SUA at all times, to visually and aurally monitor the airspace for other aircraft and the take-off and landing area for any persons;

(c) the competent observer has been instructed on the actions to take in the event of another aircraft being spotted and a risk of collision is assessed; and

(d) the competent observer understands that he/she must advise if the SUA is proceeding beyond the point at which he/she is able to monitor its flight path sufficiently to identify a risk of collision.

(8) This Exemption has effect from the date hereof until 30 September 2013, unless previously revoked.

BMFA NOTE – The conditions that you must comply with to use this exemption are almost identical to those applied to models over 7 kg. In particular, you MUST take note of the requirement not to fly in any controlled airspace without the permission of the relevant Air Traffic Control authority. Considering that controlled airspace down to the ground is applied to many urban and semi-urban areas, you should check very carefully to avoid flying illegally and negating the exemption.

Page 53, Column 2, The Radio Control Achievement Schemes, General, Paragraph 6 of section (b)

Delete and add new paragraph

~~The Achievement Scheme is run by the BMFA.....~~

The Achievement Scheme is run by the BMFA as a National Scheme and it is open to all model flyers. To ensure that suitable levels of insurance cover

are in place for the candidate the BMFA insurance can be extended to the non member, for the day of the test, at no cost. For the cover to be extended to non-members an examiner conducting the test must inform the BMFA office no later than the day prior to the test of the candidates full, name and address and the date the test will be conducted. If this procedure is not followed the test will be invalid.

Page 59, Column 1, The 'A' Certificate (Fixed Wing), Para (i)

Add new paragraph after Paragraph 3

Exceptionally, at a pre-determined point in the flight an intermediate landing may be permitted for the sole purpose of either re-fuelling or the fitting of a freshly charged flight battery. This landing may only be made with the prior consent of the Examiners. The pre-determined point may be either after a specific manoeuvre or at a specific time of flight, whichever is requested by the candidate and agreed by the Examiners.

Page 61, Column 1, Add new sections before the 'A' Certificate (Helicopter)

THE 'C' CERTIFICATE (GAS TURBINE)

The examination for a 'C (Gas Turbine)' Certificate may be taken on application to your Area Achievement Scheme Co-ordinator. The examination will be carried out by either one Area Chief Examiner and One Club Examiner, both of whom must be **Power** Fixed Wing Qualified, or two Chief Examiners, one of whom must be **Power** Fixed Wing qualified. **The lead Chief Examiner involved in a test will be appointed by the PAS Controller.**

To apply to take the 'C(AE)' Certificate, the candidate must already hold the 'B' Certificate (Fixed Wing).

The applicant may use any type of Gas Turbine powered model capable of performing the manoeuvres set out in the following schedule. Reference to the appropriate Test Standards Booklet is very strongly recommended.

The selection of optional manoeuvres and the order in which all manoeuvres, including compulsory manoeuvres (d) to (i) are flown, must be proposed by the candidate and agreed with the examiners prior to the test. The examiners may request an explanation of the reasoning behind the sequencing of these manoeuvres.

(a) Carry out pre-flight checks as required by the BMFA Safety Codes, including failsafe operation

- (b) Start-up and Taxi to the take-off position
- (c) Take-Off and join the circuit in whichever direction is appropriate for the conditions.
- (d) Procedure Turn
- (e) Fly a "figure of eight" course with the cross-over in front of the pilot, height to be constant.
- (f) Fly a rectangular or race track circuit in the opposite direction to that in (i) at a constant height of not more than 100 feet.
- (g) Slow dirty pass
- (h) Fly into wind and complete one inside loop,
- (i) Fly a landing circuit and approach and overshoot from below 10 feet Note that this manoeuvre is an aborted landing, not a low pass.
- (j) The candidate will perform seven manoeuvres, selected from the list below.
 - (1) Two Derry Turns, one from each direction
 - (2) Split S (Reversal)
 - (3) Cuban Eight
 - (4) Fly Inverted straight and level flight for a minimum of 3 seconds below 50 feet with a half roll to inverted and from inverted.
 - (5) Wingover
 - (6) Knife edge pass, knife-edge flight in either direction, below 50 feet, for at least 3 seconds or longer
 - (7) Four point roll
 - (8) Perform a slow roll in either direction.
 - (9) Complete two consecutive rolls.
 - (10) Immelmann Turn
- (k) Perform a landing circuit appropriate to the site and conditions
- (l) Perform a landing, wheels to touch within 25 metres of a pre-designated point.
- (m) Taxi back, stop and shutdown engine
- (n) Complete post flight checks as required by the BMFA Safety Codes.
- (o) The test must be completed in one flight. Exceptionally, at a pre-determined point in the flight, an intermediate landing may be permitted for the sole purpose of re-fuelling. This landing may only be made with the prior consent of the Examiners. The pre-determined point may be either after a specific manoeuvre or at a specific time of flight, whichever is requested by the candidate and agreed by the Examiners.
- (p) Two examination attempts will be allowed in any one day.

(q) All manoeuvres must be carried out in front of the pilot.

(r) In addition to the above flying schedule, the applicant will be interviewed by the examiners and must display a satisfactory depth of knowledge of model flying in general and, in particular, of safety matters based on the BMFA Safety Codes for General Flying and Model Flying Displays.

THE 'A' CERTIFICATE (INDOOR AEROBATICS)

The examination for an 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner.

The candidate must successfully carry out the following flying test and reference to the Guidance Notes is very strongly recommended:

(a) Carry out pre-flight checks as required by the BMFA Safety Codes.

(b) Take off and complete a left (or right) hand circuit and overfly the take-off area.

(c) Fly one low level left hand circuit with a transition to one high level left hand circuit.

(d) Fly one high level right hand circuit with a transition to one low level right hand circuit.

(e) Fly a "figure of eight" course with the cross-over in front of the pilot, height to be constant and below 3 metres.

(f) Fly one inside loop.

(g) Fly one outside loop downwards from the top i.e. a bunt.

(h) Fly one double stall turn.

(i) Fly 1 circuit with 1 full roll on opposite sides of the circuit.

(j) Fly a rectangular approach and perform a landing on the designated landing area.

(k) Complete post-flight checks required by the BMFA Safety Codes.

The above schedule is treated as one test flight and must be completed in one attempt.

Two attempts per examination will be allowed in any one day.

In addition to the above flying schedule, the candidate then must answer correctly a minimum of eight questions on safety matters, based on the BMFA Safety Codes for General Flying, local flying rules and the BMFA indoor code of practice.

THE 'B' CERTIFICATE (INDOOR AEROBATICS)

The examination for a 'B' Certificate may be taken on application to a Registered Examiner. The examination may be carried out by:

(a) Two Registered Examiners (the 'lead' must be a Fixed Wing Examiner).

(b) A Fixed Wing Chief Examiner

The candidate must successfully complete the following flying tests and reference to the Guidance Notes is very strongly recommended:

(a) Carry out pre-flight checks as required by the BMFA safety codes.

(b) Take off and complete a left (or right) hand circuit and over fly the take-off area.

(c) Fly one inverted low level left hand circuit with a transition to one inverted high level left hand circuit.

(d) Fly one inverted high level right hand circuit with a transition to one inverted low level right hand circuit.

(e) Fly a "Cuban Eight" with half rolls.

(f) Perform a 2 turn inverted spin or 2 descending 360 degree inverted tight rudder turns.

(g) Fly 2 consecutive square loops.

(h) Perform a $\frac{3}{4}$ roll to knife edge flight for minimum 5 metres.

(i) Perform a 5 second prop hang, climb to maximum height and perform a stall turn. $\frac{1}{4}$ roll in climb, $\frac{1}{4}$ roll in descent.

(j) Fly a harrier pass.

(k) Perform a rectangular approach and land

Two attempts per examination will be allowed in any one day.

In addition to the above flying schedule, the candidate then must answer correctly a minimum of eight questions on safety matters, based on the BMFA Safety Codes for General Flying, local flying rules and the BMFA indoor code of practice.

Page 61, Column 2, The 'A' Certificate (Helicopter), Para (j)

Add new paragraph after Paragraph 3

Exceptionally, at a pre-determined point in the flight an intermediate landing may be permitted for the sole purpose of either re-fuelling or the fitting of a freshly charged flight battery. This landing may only be made with the prior consent of the Examiners. The pre-determined point may be either after a specific manoeuvre or at a specific

time of flight, whichever is requested by the candidate and agreed by the Examiners.

Page 75, Column 2, Gas Turbines

Delete Section and replace with:

Gas Turbines and Electric Models

The advent of model gas turbines and some higher powered electric models has presented an interesting problem in terms of noise levels and how they fit into the DoE Noise Code.

Although the gas turbine is, in scientific terms, an internal combustion engine, it is the BMFA's contention that the DoE Noise Code should not apply to it. The reason for this is that the noise code was written to cover the types of model i/c engines that were known at the time, i.e. piston engines, and the concept of model gas turbines was not even considered.

The fact is that model gas turbines are very quiet indeed in the air when heard from any reasonable distance, far quieter than most piston engines, and on that evidence you would expect them to be able to pass 82 (d)BA at 7 metres.

However, most of the noise they emit is very high frequency and the higher the frequency of any noise, the better it dissipates with distance. Consequently the problem is that a very quiet gas turbine in the air will not pass the DoE i/c engine noise code on the ground because the test is done at 7 metres and the high frequency noise it emits has not yet had a chance to dissipate.

The Noise Code clearly does not apply to electric models as it is specifically for i/c powered models. Again, most electric models are very quiet in the air and will cause no complaints.

However, there are certain turbine powered models and types of electric model that can sound very loud when in close proximity. EDF models and high speed pusher electrics can produce noise levels that can seem very loud at close quarters.

Although there is no meaningful test that can be applied directly to such models, a subjective assessment can be made with a little common sense.

Given that the high frequency noise produced by such models does dissipate quickly with distance, the question has to be whether a model will cause a noise complaint and you cannot judge this from on the flying field, close to the flight path of the model. The only way to check is to go to a reasonable distance from the flying field and listen to the model as a possible complainant would.

If a model is still considered to be too noisy for the field then it would not be unreasonable to ask the

pilot to either modify the flight patterns or not fly that particular model.

It should be noted that BMFA have no record of any electric models causing direct noise complaints on flying fields, in clear contrast to I/C models, which have to be built and operated with care to avoid such complaints.

Addendum Sheet 1, 2011. Page 9, THE 'C' CERTIFICATE (SCALE),

Modify Paragraph (m)

(m) The schedule must be completed in one flight. Exceptionally, at a pre-determined point in the flight, an intermediate landing may be permitted for the sole purpose of either re-fuelling or the fitting of a freshly charged flight battery. This landing may only be made with the prior consent of the Examiners. **The pre-determined point may be either after a specific manoeuvre or at a specific time of flight, whichever is requested by the candidate and agreed by the Examiners.**

NOTICE

This addendum sheet must be used in conjunction with the printed issue of the 2010 Members' Handbook.

Note should also be taken of Issue 1 of the Addendum Sheet, published in December 2011.

This will enable anyone to quote accurate page and column numbers if necessary, based on the 2010 Handbook. These three documents together will be the official and current version of the BMFA Member's Handbook.

The file will be also be published on the BMFA website alongside the existing 2010 Handbook entry and the 2011 Addendum Sheet.

There will also be a 2013 'website only' version of the Handbook published which will incorporate all of the items in this booklet and which will give you an up-to-date version to read.

However, please note that this 2013 website version will **not** be the official Handbook and you will not be able to quote accurate page and column numbers from it.

It will be published simply for your information and if you have any queries you should refer back and quote the official document for any page and column numbers.

**Chris Bromley, FSMAE
BMFA Technical Secretary
May, 2013**