

British Model Flying Association

Members' Handbook 2021 Issue

Welcome to the 2021 issue of the BMFA Members' Handbook.

The BMFA is constantly reviewing its advice to model flyers and it works in close liaison with the Civil Aviation Authority (CAA) on model flying matters. Following changes to the UK regulations on 31st December 2020, the BMFA now operates under an 'Article 16 Authorisation' from the CAA, which defines the operating parameters for model aircraft operated by members. Details of how this applies are included throughout this book for your information.

All changes since the last edition (except typographical errors) have been 'side barred' as this paragraph..

The Member's Handbook is an active document that is constantly kept under review and we are very happy to receive input from anyone concerned about model flying matters.

Several sections have been removed into two Annexes. Annex A is the Model Flying Display Handbook (amalgamating the Display Section and the Display Organisers Handbook) and Annex B is the Model Flying Technical Handbook which includes sections on radio control, hazardous materials and the Noise Code.

We would encourage anyone with comments, suggested additions, or amendments to contact the Technical Secretary or CEO via the BMFA Leicester office.

Please note that the BMFA Website – www.bmfa.org is the major source of information for the BMFA. It is regularly referred to throughout this document as there are many specialist booklets now available for downloading (also available from the Leicester office).

Words of masculine gender should be taken to include the feminine gender unless the context indicates otherwise.

Where the term 'model aircraft' is used it should be taken to include drones/multi-rotors.

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Annex A – BMFA Model Flying Display Handbook

Annex B – BMFA Model Flying Technical Handbook

1. INTRODUCTION

1.1 SMAE and the BMFA

Welcome to the British Model Flying Association (BMFA) which, as the Society of Model Aeronautical Engineers (SMAE), was established in 1922 as the national body for model flying.

It is a non-profit making association of model flying clubs and individuals who agree to join together and pool resources for the benefit of all. In almost a century of existence it has built up a fund of knowledge, experience and has accumulated benefits for its members which add up to an unbeatable membership package for you.

The SMAE's recognition by the Royal Aero Club dates from 1922, but its roots can be traced back to 1909, the year in which the Kite Flying Association was formed. Its name was changed to the Kite and Model Aircraft Association shortly thereafter and in 1921 it was replaced by the London Aeromodellers' Association which a year later became the Society of Model Aeronautical Engineers (SMAE). Many British aviation pioneers have been members, including Sir Frank Whittle, Sir Thomas Sopwith and Sir Alliot Verdon Roe founder of Avro.

Since 1948 the SMAE has been a Company Limited by Guarantee as are most of sport's governing bodies in the UK. In 1987 the Annual General Meeting of the SMAE voted to adopt a working title, the **British Model Flying Association (BMFA)**. The SMAE still exists as the parent body and its title is still used on all legal documents and for many functions of the Society.

Although both titles may be used throughout this handbook where appropriate, member clubs and individuals should use the BMFA title. The colours of the SMAE are silver and blue and those of the BMFA are red, white and blue.

Much of the BMFA's time and resources are taken up in working with government bodies, local authorities and other organisations in order to safeguard your model flying interests. The BMFA also spends much time promoting and encouraging all facets of model flying.

Please read this booklet carefully and familiarise yourself with its contents as it will help you gain the maximum benefits from your membership of the Association.

1.2 Organisation

The BMFA is controlled by its Annual General Meeting and it is administered by a Council of Management elected from its members (details in Section 25 of this Handbook), and Area Committees (see Section 1.4)

It also has a full-time staff including the Chief Executive, Development Officer, Club Support Officer, and other support staff who all work from the permanent office in Leicester, to further the running of the Association. They are available to answer your queries or put you in touch directly with BMFA Officers if necessary.

1.3 Objectives

The following are the main objectives of the BMFA and many of them stem from the original SMAE's 1948 Memorandum of Association and still apply today.

- The promotion, protection, organisation and encouragement of model aircraft building, flying and development in all its aspects in the United Kingdom, through the medium of clubs and individual members; assistance and guidance to model aircraft clubs or individuals; collaboration between members of the Society; and co-operation on behalf of members with the Civil Aviation Authority or other government departments and any other bodies and organisations in the United Kingdom and overseas.
- To produce collect and distribute information in connection with model aircraft or the model aircraft movement on such terms as the Council shall think fit.

- To encourage and support research in model aircraft design, theory and construction.
- To control and record model aircraft performance within the areas under the jurisdiction of the Royal Aero Club.
- To act as promoters of National and International model aircraft meetings, contests and exhibitions; as publishers, stationers and booksellers, general traders, dealers, agents and manufacturers, both wholesale and retail, of any articles of any description which may assist the development of model aviation.
- To establish and support, financially or otherwise, or aid in the establishment and support of any educational scheme or establishment with benefit to the model aircraft movement.

Our motto is: “UNITED WE ACHIEVE”

1.4 BMFA Areas

The country is divided into thirteen geographic Areas plus the Royal Air Force Model Aircraft Association (RAFMAA) who also act as an area. Every club in an Area is automatically a member of their Area Committee and the officers of the Area Committee are elected from the club delegates who attend the Area meetings. One of these officers will be the Area's Delegate to the BMFA's Council of Management (CoM).

It is through the Area structure that clubs are able to put forward and to debate suggested changes to the way the BMFA functions and to instruct their delegate on how to vote at the CoM meetings. The delegate also reports back to Areas on the happenings at CoM meetings.

Individual BMFA members do not have a vote at CoM meetings. If you are not a club member you do not have representation at Area meetings and therefore no representation at CoM meetings. You are therefore advised to join a club.

At any Area meeting your representative can hear the viewpoint of the elected Area officers and the representatives of other clubs as well as expressing your own club's opinion.

In addition, each Area sends a delegate to attend the Areas Council, a sub-committee of the BMFA Council of Management. Areas Council has direct responsibility for many vital aspects of BMFA operations including all the Achievement Scheme (see Section 22 of this Handbook).

If your club is not making its presence felt at Area level, why don't you consider becoming its representative? Details of Area Meetings can be obtained from the Association's Leicester Office.

1.5 Relations with the General Public.

It is important to remember that although our chosen sport is one of the larger of the minority sporting activities, we are still vulnerable to the negative aspects of public opinion.

The BMFA spends considerable time and effort creating the best possible public impression of model flying but all this work can easily be wasted if you fly in a thoughtless manner. Your enjoyment of model flying, now and in the future, depends on developing and displaying a highly conscious 'safety first' attitude towards your equipment and the flying site you use. The best publicity the sport can receive is through your actions and your responsible and safe attitude to flying at all times.

There is no place in model flying for those who do not consider other people's safety; nor is there a place for those who are inconsiderate about noise. One person's thoughtless actions can jeopardise the enjoyment and pleasure of those many others who adopt a responsible approach. Considerate and careful model flying must always be our aim.

Clubs and members enjoy the benefits of flying from many varied sites throughout the UK. Everyone should remember that it is a common courtesy to make sure that they have the landowner's permission before flying on any site.

Wherever and whatever you fly, BMFA expertise can help you liaise and negotiate with local councils, government agencies and other public and private landowners so that you can have the best and safest possible model flying facilities.

1.6 The Contest Scene.

The BMFA organises numerous contests at venues all over Britain, covering all the varied disciplines of the sport from indoor flying through thermal soaring to large radio controlled scale models. Details of forthcoming competitions and events are published on the BMFA's website, in its own publications and in the commercial model flying press.

Newcomers to contests are always welcome and should not be afraid to participate. There is no doubt that competition will improve your skills, and even the experts can be beaten. Taking part in competitive events can add a great deal of enjoyment to model flying and it will also give you the opportunity to see some of the country's best models and flyers in action.

Contest organisation is the responsibility of the Technical sub-committees of the BMFA and updated rules for the various classes are published annually. Section 26 lists the range of competition classes and the details can also be found on the BMFA Contests website (<https://contests.bmfa.uk>).

1.7 National and International Status

The BMFA is the body delegated by the Royal Aero Club to be responsible for all aspects of model flying in the UK.

Model flying is recognised by Sport England as an official sport. It is also recognised as the sole representative organisation for the sport in the UK by the Federation Aeronautique Internationale (FAI), the world governing body for all forms of sporting aviation including model flying. The FAI has numerous international committees relating to its various disciplines and the Commission Internationale d'Aeromodelisme (CIAM) is the committee responsible for our sport of model flying. The BMFA is represented each year at the annual plenary meeting of CIAM by a small team of specialists who are delegated to speak for the UK.

The SMAE pioneered the present world programme of model flying and as a result is the holder of an Honorary Group Diploma of the FAI, an honour given to those who have contributed greatly to the progress of aviation.

The BMFA was also a founding member of the European Model Flying Union (EMFU), bringing together model flyers from throughout Europe to ensure that their collective interests are represented when new international regulations are being developed.

The benefits of our FAI and EMFU memberships are two-way, since we can learn much from the way the problems of model flyers are tackled by other countries, as well as giving them the benefit of our own experience.

The BMFA is empowered by the FAI to issue international sporting licences to individuals and this document is essential for anyone competing abroad or in any FAI international event. They are available at reasonable cost on request from the BMFA office. An FAI Licence can also be of great help to anyone flying a model abroad as it is an internationally recognised document. It can also be of help when dealing with airlines over the carriage of models and equipment and it could help if you seek to fly with a foreign club or have to deal with local authorities abroad over model flying matters. If you are planning on model flying abroad then, for the small cost involved, it would be well worth considering obtaining your own FAI licence.

1.8 The Education Initiative

The BMFA is extremely concerned about the lack of exposure of school children to model flying. Increasing competition from other activities and the lure of the computer game has led to a situation where very few children have had the opportunity to fly a model.

The long term future of model flying in the UK may well depend on positive action being taken to counter this trend. Therefore the BMFA has produced a package that has been designed to integrate into National Curriculum Design and Technology courses and which enables any teacher or youth leader of nine to thirteen year olds to make use of a structured course as an introduction to aviation subjects. The practical side of this course uses the BMFA Dart and other easy-to-build model aircraft as demonstration tools.

The scheme is not aimed at recruiting junior members but rather to give children who may never have even held a model aircraft the thrill of that first successful flight that we all remember.

The BMFA Education Working Group co-ordinates the efforts of all who wish to be involved in this vital work. If you think you can help or you would like details of the package for your school, please contact the BMFA's Leicester office for details. For those schools with existing model aircraft clubs or those who are considering setting up such an activity, the BMFA Youth Group Scheme will be found to be invaluable; see the section on BMFA Membership for details.

1.9 Codes of Practice and Achievement Scheme

The BMFA, as the national body for model flying, gives the best advice it can to all model flyers and other interested parties, not only on specific flying matters but also other legal responsibilities that members might encounter. It has gathered a great deal of experience in such matters and this is freely available to anyone who requires it.

In some cases, it has published Codes of Practice on specific subjects and details of these are included in this Handbook where appropriate and are available for download from the website at www.bmfa.org.

For instance, as a practical means of improving radio control model flying standards, the radio control achievement scheme provides national standards and tests at various levels, across a wide range of disciplines, including power fixed wing, helicopter, multi-rotor, camera drones and silent flight thermal, slope and electric. Further details can be found in section 22, later in this handbook, and on the BMFA Achievement Scheme web site (<https://achievements.bmfa.uk>).

1.10 Contests and Records.

The BMFA provides and maintains Individual contest rules for all the model aircraft disciplines, including Indoor and Outdoor Free Flight, Control Line, R/C Power, Scale, Silent Flight, Electroflight and Rocketry. International Class rules (the 'F' classes) are not included as such although the national variations to these rules are included. Copies of these various sets of rules are available from the Leicester Office or as downloads from <https://contests.bmfa.uk/> for the BMFA classes or www.fai.org/ciam-documents for the international 'F' classes.

The BMFA is also responsible for documenting and overseeing all model flying records set in the UK, whether they are National or World Records. There are over 80 categories of FAI World Records plus many more categories of British National Records, both contest and non-contest.

Two booklets are available free of charge from the Leicester office or as downloads from <https://contests.bmfa.uk/>. The first (No 2A) is the rule book and is required reading for anyone considering making a record attempt and the second (2B) is a full list of the current British records and record holders. A list of the current World records is also available.

If you are serious about wanting to set a record then a chat with the BMFA's Records Officer is essential.

2. TYPES AND CONDITIONS OF MEMBERSHIP

2.1 BMFA Membership

Membership is available to all applicants. Those over 18 years of age on the 1st January of the year of membership are Senior members, those younger than this are Juniors (but have full membership status).

Note: In exceptional circumstances, the BMFA Council reserves the right to refuse membership applications.

2.2 Country Members.

These are Individual members not belonging to a BMFA Affiliated club and are known as Country Members.

Note: Due to the structure of the BMFA, only Affiliated Clubs have a vote at the AGM or any EGM (number of votes based on number of club members). For the election of Officers, one vote per member applies. So, to have your full say in all matters, you will need to join a club.

2.3 Family Membership

This is available to families living at the same address. To qualify for family membership, one senior member must register as 'Head of Family'; a spouse/partner and all children 18 years old or less on the 1st January of the year of membership can then register as family members at a reduced fee. Family membership is open to both club and country members. All family members have full membership status but only the 'Head of Family' receives a copy of BMFA News.

2.4 Fellowship and Honorary Membership

These are two different classes of membership which are awarded to a few people in cases of special merit. Fellowship is the highest honour awarded by the Association and is awarded for meritorious work within the BMFA to a maximum of two people each year by the Annual General Meeting.

2.5 Membership Period.

The normal period of membership is from 1st January to 31st December in each year. Applications for membership part way through the year may be subject to a reduced membership fee as decided from time to time by BMFA Council. The membership fees are agreed each year at the Annual General Meeting of the Society.

2.6 Competition Entry.

Full members of the BMFA may enter the contests and events organised by BMFA on payment of the entry fee. Evidence of membership must be shown to an authorised BMFA official if requested.

2.7 Fees and Benefits.

The categories, term and benefits of membership are occasionally modified as the Association develops. When in doubt about the current fees or benefits, please contact the BMFA's Leicester office where the staff will be pleased to provide you with all the information you or your club require about joining the Association

3. BMFA AFFILIATED CLUBS

3.1 Affiliated Club Membership

Open to clubs and model flying groups consisting of not less than five persons. All current club members who fly and/or who are involved in any organising function within the club whatsoever must be registered with the BMFA as fully paid-up individual members and at least one of them must be a senior member.

Affiliation is a partnership between the BMFA and the club and brings many valuable benefits, for a full details of the affiliation partnership see <https://clubsupport.bmfa.uk/affiliation-partnership>.

3.2 Schools and Youth Group Membership

Open to bona-fide school model flying clubs and clubs organised by recognised youth organisations such as the ATC, the Young Engineers or the Scouts etc. The minimum number of club members is one individual senior and four juniors. The juniors need not be named and their membership fee will be one third of the current junior fee, rounded to the nearest pound.

This gives the club full affiliated membership of the BMFA and at General meetings such clubs carry one vote for the senior member and one vote for every three reduced rate juniors, subject to a minimum of five votes.

Any reduced rate junior may become a full member of BMFA by paying the balance of the full junior membership fee. Any such full junior member is not disqualified from membership of his youth group.

4. GENERAL MEETINGS

4.1 General Meetings

These consist of the Annual General Meeting of the Society, normally held in November, plus any Extraordinary General Meetings which may be called from time to time to consider particular matters.

4.2 Voting rights at General Meetings.

Fellows of the SMAE and all clubs affiliated to the BMFA have the right to vote at general meetings of the SMAE. Each shall have one vote, the affiliated club's being cast by its duly authorised representative. If a poll vote is called, an affiliated club shall have one vote for each registered full member and a Fellow shall have five votes.

Council of Management meetings do not come into this category and have their own voting system (see the section 18 of this handbook).

4.3 Voting rights in Postal Ballots

These are decided by BMFA Council from time to time. Depending on circumstances, all BMFA members may be eligible to vote in the postal ballot and voting forms will be distributed as required.

5. MEMBERS' INSURANCE

Please note that this is a summary of the covers provided. Further information can be found on the BMFA Website or may be requested from Tysers Insurance Brokers.

5.1 Liability Insurance

The primary insurance cover provided by the BMFA for its members is Third Party Liability. This covers you, the flyer, against any liabilities you may incur during your model flying activities. Note that, as with any other third party insurance, this is NOT an automatic cover for the 'injured party'. The person insured is the flyer and the policy will indemnify the flyer against any claim if negligence is proven whilst flying. Cover is also provided for personal accident insurance covering permanent disablement along with cover for clubs for loss or damage to club equipment only.

Title

It covers the BMFA, its employed, elected and co-opted officers, their committees and all registered clubs and individual members of the BMFA.

Activities

It covers the normal and lawful pursuits of the Association and its registered members.

Note: Any form of flying for commercial purposes, whether paid or unpaid, is not covered by the basic policy (See 'Exclusions').

5.2 Indemnity Limits for the Third Party Public and Products Liability

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

Territorial Limits

The whole of the UK and elsewhere in the world (except for USA/Canada) in respect of the Association's officers and registered members temporarily abroad.

Note: We regret that our insurer no longer covers flying in the USA or Canada and you are advised to check local requirements before you travel.

Models Covered

- (a) All classes of model aircraft of whatever size, weight or engine capacity (subject to compliance with the terms of the BMFA's Article 16 Authorisation or the 'Open Category' of CAP 722) except as noted in 'Exclusions'.
- (b) Model boats and cars.
- (c) Models powered by legal rocket propulsion systems up to and including 'M' size motors (operated within the terms of the Air Navigation Order).
- (d) Steam powered models except when used for passenger carrying purposes for hire or reward.
- (e) Kites (operated within the terms of the Air Navigation Order).
- (f) First Person View RC flying provided it is carried out in accordance with the BMFA's Article 16 Authorisation.
- (g) Model balloons (operated within the terms of the Air Navigation Order).

Exclusions

- (a) Any form of commercial or trade activities (whether paid or unpaid) including professional, semi-professional or sponsored display teams.
- (b) Pulse jet powered models except as specified in the BMFA General Rules, Section 1.2.3.1, Reaction Motors, parts (1) and (2) as noted later in this handbook.
- (c) Deliberately staged mid-air collisions at airshows and public displays.

Notes:

- (i) Money paid to clubs by organisers of fetes, shows, etc, where the club is giving a demonstration does not constitute 'professional use'.
- (ii) The carrying of Company or Organisation names or logos on models does not constitute a 'form of commercial or trade activity'.

Extensions

- (a) *Member-to-member* liability is covered including damage to property belonging to fellow members.
- (b) Indemnity is automatically extended to any Principals (*Landowners, Schools, Local Authorities, Government Departments* etc.) whose land or premises is used by any BMFA affiliated club or registered member.
- (c) The Indemnity is extended to the *Committee Members* of any affiliated club and lawful BMFA related club activities are indemnified.
- (d) Reduced rate membership is available to juniors under the '*Schools and Youth Groups*' membership scheme which provides cover to juniors flying under the supervision of their group leader(s). To obtain full BMFA membership benefits, any such junior must become a full junior member of the BMFA.
- (e) Indemnity is provided for paid flying instruction provided the conditions laid down by the Association are complied with (see '*Flying Training Cover*' section).
- (f) In the '*Airside Cover*' special provision, indemnity is provided for members operating their private motor vehicle 'airside' on an airfield or aerodrome, in pursuit of any activity associated with model flying where the members own private motor vehicle policy makes a specific exclusion in this respect.
- (g) Club indemnity is extended to cover first time visitors to a club who have no previous experience but are seeking to try out model flying prior to joining the BMFA and the Club. Indemnity under this '*First Time Inexperienced Flyer*' provision will only be in place when flights are being totally organised and supervised by a suitable club member approved by the Club Committee. The limit of this indemnity is 3 separate day visits for any single inexperienced flyer.
- (h) Club indemnity is extended to enable clubs to welcome *model flyers from overseas countries* to fly at their club sites during short visits to the UK. In the interest of promoting good international relations the BMFA will absorb the cost of providing this indemnity for a period not exceeding 30 consecutive days for any one overseas visitor in any single membership year. Club Secretaries are required to notify the BMFA, in advance, if this provision is required.
- (i) Employer's Liability Cover with a £10 million level of indemnity is provided to all affiliated clubs. This covers BMFA related legal liabilities for damages and legal costs arising from death or injuries caused to employees in the course of their 'employment'.

The definition of 'employee' in this context includes labour only sub-contractors and volunteers working within the club.

5.3 Conditions

- (a) When dealing with the injured/third party **you must not, under any circumstances**, admit liability or make or agree any financial settlement with respect to any incident which might give rise to a claim under the policy.

However, when dealing with the BMFA and its insurer, you should provide a full and honest account of events, especially when filling in an incident report form.

- (b) It is the duty of the insured to exercise reasonable care to see that their models are sound and in proper order and that all reasonable safeguards and precautions against accidents are provided and used.

5.4 Incident Reporting Procedure

- (a) Prompt notification of all incidents / accidents that may result in a claim on the policy is essential. This can be done using the BMFA's online reporting system (described in Section 21 or see <https://reporting.bmfa.uk/>) or by contacting the BMFA's Leicester Office within 24 hours of the incident. Reports made by telephone out of office hours will be recorded on the office answerphone.
- (b) Ideally, reports should be filed through the BMFA's online reporting system. Alternatively, the Leicester office will supply you with an incident report form and the office staff will give you any specific advice you need to help you complete this form.
- (c) It is important advice that, in the event of any incident that may have insurance implications, you should never admit any liability to any third party involved in the incident.

However, when completing the incident report form supplied by the BMFA office, **it is essential** that you provide a truthful account of events leading to the incident. If you believe that you have any responsibility or liability for the incident then you should declare this on the reporting form. Any declaration you make on the BMFA incident report form will NOT result in you being penalised in any way.

- (d) The CAA has set out procedures for reporting more serious incidents in our Article 16 Authorisation and CAP 722 and these are set out in Section 21, later in this handbook together with more advice from the BMFA on the subject.

5.5 Operative Dates

The liability cover is effective from the date of joining until the end of the current membership year being the 31st December. Note that 'date of joining' means, for members of affiliated clubs, the date that payment is made to the club's BMFA contact and, for all others, the date payment is received at the Leicester office.

5.6 Certificates

Individual insurance certificates are accessible to all registered members via their record on the BMFA's GoMembership system (see <https://bmfa.azolve.com>). To maintain continuous cover, it is vital that your membership renewal each year is prompt. Any changes to the personal information detailed on your certificate should be notified to the BMFA.

5.7 Product Liability

In any incident it is quite possible for blame to be attributed to a component or equipment failure which could well not be the responsibility of the flyer. The supplier of the component or equipment, who could possibly be a fellow member, could be held ultimately responsible and that could be you. Hence, product liability insurance is essential and it is a key element of the BMFA insurance protection.

5.8 Indemnity for Principals/Landowners (including the MoD)

The BMFA insurance provides Indemnity cover to clubs and members flying on land owned by third parties (Principals) including the Ministry of Defence (e.g. when using RAF airfields).

The formal procedure for securing the use of MoD lands usually starts with obtaining permission from the Commanding Officer, after which a licence can be applied for via Defence Estates.

The BMFA's Leicester office is very familiar with the procedure and will provide help and the necessary documents when needed. BMFA Area officials may also be able to help and advise you on this subject.

5.9 BMFA Register of Commercial Traders

(Formerly the Data, Development and Demonstration Membership Extension)

Following the recent change in regulations for unmanned aircraft, the CAA now categorises flights based on the level of risk rather than the purpose. As such, flights which previously fell within the scope of the DATA, DEVELOPMENT and DEMONSTRATION (D,D&D) membership extension can generally now be conducted within the scope of the BMFA's standard Membership Cover - provided they are conducted within the terms of the BMFA's Article 16 Authorisation or the 'Open Category' of CAP 722 and do not fall within the CAA's definition for commercial flights.

The D,D&D Membership Extension has therefore been replaced by the BMFA Register of Commercial Traders which provides a Membership Extension for current members, covering the limited number of activities which were previously covered by the D,D&D extension but which still remain outside the scope of the standard BMFA Membership Cover, including:

- Trade stands at Exhibitions, Model Shows or Displays
- The flying element of flight training schools
- Small scale manufacturers of model aircraft parts and kits

There is no fee for this, the only requirement being to register. Please contact the BMFA's Leicester Office for further details.

5.10 Personal Accident Insurance

- (a) BMFA Members 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. Reduced benefits apply to those over the age of 85.
- (b) Personal Accident Cover is extended to cover first time visitors to a club who have no previous experience but who are seeking to try out model flying prior to joining the club and BMFA. Indemnity under this '*First Time Inexperienced Flyer*' provision will only be in place when flights are being totally organised and supervised by a suitable club member approved by the Club Committee. The limit of this indemnity is 3 separate day visits for any single inexperienced flyer.
- (c) Further details of this cover are available from the Leicester Office or direct from the BMFA's broker.

5.11 Travel Policy

BMFA members can take advantage of an enhanced travel policy for Worldwide travel whilst the primary aim of the travel is to fly model aircraft. For details of travel rates please see the BMFA website or contact Tysers direct.

Members are able to buy cover themselves and it is set up as follows: -

- This would be non-advisory sale, although if required a member could telephone Tysers for advice;
- Member to download form from website and send a cheque and form to Tysers Insurance Brokers;

- 'Receipt' issued to confirm cover in place;
- Primary purpose of holiday has to be to fly, although family members can be included as well with costs shown as per person;
- Declaration will be kept by Tysers and provided to BMFA as required;
- Any queries on members 'purpose of trip' to be referred to BMFA for consideration.

5.12 Club Equipment Insurance

The BMFA have arranged cover which protects individual clubs against loss or damage to club equipment at the club premises. The policy provides cover against loss or damage to club equipment such as club buildings and grass cutting equipment etc.

For details of current levels of indemnity and cover, please visit the website or contact the Office.

Please note that the cover provided by this policy excludes:-

- Individual club members' equipment;
- Storm damage to open sided buildings;
- Theft or damage caused by attempted theft from any open sided building.

Theft Restriction

The policy does not cover damage caused directly or indirectly by or consisting of theft or attempted theft unless:

Involving entry to or exit from a building by forcible and violent means;

or:

As a result of or in connection with actual or threatened assault or violence or use of force at the premises against the insured or any employee of the insured or any other person lawfully on the premises.

Reasonable precautions

As we do not request risk information on each location, clubs must ensure they take reasonable precautions to protect their own property.

Members Property Exclusion

The cover provided by the policy specifically excludes any property belonging to individual club members.

6. ADVICE TO CLUBS

6.1 Flying Site Negotiations

The BMFA has, over many years, built up a unique depth of experience and expertise in negotiations with local government authorities and other landowners and this is available to any club needing such advice.

6.2 The BMFA Club Support Officer

The BMFA has the services of a full time advisor whose brief is to assist all BMFA affiliated clubs with site and planning problems.

Before your club enters into any form of dialogue with Local Authorities or anyone else on the subject of model flying it is essential, for your own benefit, that you discuss your problems or proposals with the BMFA Club Support Officer . There are also a number of booklets available from the Leicester Office and for download from the Club Support website (<https://clubsupport.bmfa.uk>), including an example Club Constitution, Flying Site Guide, Dealing with L.A.s, Dealing with Farmers, etc. See comprehensive list on the website.

Very early involvement is crucial in any negotiations.

This will enable the BMFA to build an information file on your circumstances which will be invaluable if you run into problems. All information will, of course, be confidential.

Independent action by clubs has, at times, led to the complete withdrawal of flying facilities for everyone using a site so the facts are clear – to give your club the best chance of success you should use the experience and expertise available through the BMFA. It is only a telephone call away.

Help and advice from BMFA has been instrumental in obtaining and retaining the use of many flying fields so call the BMFA's Leicester office for details of how to contact the Club Support Officer.

6.3 Club Assets and Grant Applications

If you are making grant applications (for instance, to Local Authorities) you may find that the award will depend on your Club Constitution clearly stating what will happen to assets in the event of the club winding up.

The usual requirement is that your members may not benefit directly and your Constitution may need to state that the Club assets would be transferred to, for instance, a charity or possibly to the BMFA.

The BMFA operates a Trust scheme to help clubs in these circumstances. All assets are held in trust for a period of ten years and will be administered by a Board of Trustees. The money may be used to assist the re-forming of the Club or the formation of a new Club in the immediate area.

For more details, contact the BMFA Leicester office.

7. EQUALITY, DIVERSITY AND INCLUSION POLICY

7.1 Our Commitment

The BMFA values a diverse membership and the contribution each individual makes. We are committed to promoting inclusivity, equality and diversity in model flying, our policies and procedures.

We also recognise the need to identify where and why inequality exists and how we can play our part in addressing it. Increasing diversity demonstrates that we are a Society capable of developing to meet the requirements of a changing world.

7.2 The Policy

This policy applies to all its dealings with its members as well as other engaged by or who work with the Society

The BMFA believes in treating everyone equally and with the same attention, courtesy and respect regardless of sex, gender reassignment, marital status/civil partnership, pregnancy and maternity, race (including ethnic origin, colour, nationality and national origin), disability, sexual orientation, religion and or belief and age.

The BMFA is committed to complying with all applicable anti-discrimination legislation and associated Codes of Practise, including the Equality Act 2010 and in developing and implementing our anti-discrimination policy.

7.3 Appropriate Behaviour

It is expected that every member, employee or person associated with the BMFA will conduct themselves in an appropriate manner, which can be characterised by:

- treating others with dignity and respect
- having an awareness of the effects one's behaviour may have on others
- communicating openly and honestly
- helping each other to achieve objectives.

Directors, Council Members, Fellows and Staff are expected to set an appropriate standard of behaviour and to lead by example, ensuring that others adhere to the Society's policy and promote our aims and objectives in relation to equal opportunity, diversity and inclusion.

7.4 Promoting and Communicating Equality and Diversity

This policy is published on the Society's website. All those who act on the BMFA's behalf will be informed of this policy and will be expected to comply with it.

In all its dealings with others, the BMFA will seek to promote the principles of diversity, inclusion and equality

The BMFA will make every effort to reflect its commitment to diversity, inclusion and equality in its marketing and communication activities where appropriate.

The BMFA will investigate any complaints of unlawful discrimination made by members, employees or other third parties in relation to the BMFA and take action where appropriate. All complaints will be investigated in accordance with the BMFA grievance or complaints procedure and the complainant will be informed of the outcome.

For more information on this policy please visit our website at <http://www.bmfa.org>.

8. LEGAL CONTROLS OVER MODEL FLYING

8.1 The Air Navigation Order

The UK adopted the EU regulations for model flying in 2019 and these came into effect on December 31st, 2020. This was the same day that we exited from the EU, but regulations in place at the point of departure were transferred directly into UK law.

For many years, model flying had been regulated by a selection of Articles from the Air Navigation Order (ANO). From 31st December 2020, the regulations for model flying changed with most of the relevant Articles in the ANO being deleted and superseded by the requirements contained within the Implementing Regulation for the new EU regulations (as detailed in CAP 722).

However, certain Articles of the Air Navigation Order do still apply, including;

Article 240 A person must not recklessly or negligently act in a manner likely to endanger an aircraft, or any person in an aircraft.

Article 241 A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property

Article 265 This is a new addition which defines a multitude of offences relating to non-compliance with the EU Implementing Regulations (such as failing to register as an Operator or have the required evidence of competency).

8.2 CAP 722

The new regulations allow for alternative sets of rules to be applied to unmanned aircraft. The 'Open Category' rules set out in CAP 722 can be used by anyone in the UK, regardless of whether they are members of any club or association and, amongst other things, include a ban on flying above 400ft. The Open Category requirements will not apply to BMFA members flying in accordance with the terms and conditions of our Article 16 Authorisation.

Model aircraft below 250g which are operated in accordance with our Authorisation are subject to the terms and conditions of the Authorisation. However, in most circumstances they may also be operated within the Open Category instead and so be flown in accordance with the basic requirements outlined in CAP 722 for an aircraft of less than 250g without a camera (i.e. no registration, competency or age requirements but operation limited to less than 400ft).

Whilst most BMFA activities will take place within the terms of our Article 16 Authorisation, there are some operations which could be carried out within the 'Open Category' of CAP 722. When flying within the terms of CAP 722, the following requirements apply:

- You will need a CAA Operator I.D. number if operating an aircraft weighing more than 250g (or an aircraft of any weight if fitted with a camera).
- You will need to have completed the CAA DMARES test to obtain a Flyer I.D. if operating an aircraft weighing more than 250g. BMFA competencies are only accepted for operations carried out under our Article 16 Authorisation – not those carried out directly under CAP 722.
- You will be limited to operating below 400ft.
- In some instances, the separation distances from uninvolved people will be greater than those defined in Article 16.

Full details of the requirements for operating within the 'Open Category' of CAP 722 are summarised in CAP 2012.

8.3 ARTICLE 16

Given the excellent safety record established by model flyers throughout Europe, the EU agreed that model flying conducted within the framework of Associations like the BMFA should be subject to more flexible regulation to allow us to continue largely 'as we do today'. The mechanism to facilitate this is referred to as an 'Article 16 Authorisation' (within the 'Specific Category') and this document provides a guide to how the Authorisation we have negotiated with the CAA applies to our members with effect from December 31st, 2020. You can find further details at <https://rcc.bmfa.uk/article-16>.

8.3.1 What type of unmanned aircraft operations does our Authorisation apply to?

Our Authorisation covers all existing activities including radio-controlled aircraft of all types (including helicopters and multirotor drones), free flight aircraft and physically constrained aircraft (control line and round the pole) up to a Maximum Take Off Mass (MTOM)** of 25Kg.

Aircraft with an MTOM of more than 25Kg will be subject to a separate Authorisation to be held by the Large Model Association (which replaces their existing over 20Kg scheme).

Aircraft with an MTOM of less than 250g operated in a manner that uses the privileges within this authorisation (for example, flown above 400ft), are subject to the limitations and conditions described throughout this authorisation. However, in many circumstances they may be easily operated within the Open Category requirements (for an unmanned aircraft with a MTOM less than 250g) as the requirements are not particularly restrictive for these very light aircraft.

The Authorisation does not apply to rockets (which were not included within the EU regulations) and it does not apply to any indoor operations either, as none of the rules apply to unmanned aircraft flown inside buildings.

**** Note: For all practical purposes the Maximum Take Off Mass or MTOM is the weight of your aircraft when it first becomes airborne on each flight. The MTOM now includes everything, including fuel, which is why the 7kg has gone up to 7.5kg and 20kg to 25kg.**

8.3.2 Essential requirements

(a) You must operate your aircraft within visual line of sight.

The Authorisation retains the long standing requirement for the remote pilot to maintain direct, unaided visual contact with their aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions, unless the aircraft is being flown in accordance with the specific conditions detailed in the 'First Person View' section.

(b) The purpose of the flight must be Sport, Recreation, Education or Demonstration.

The terms of our Authorisation do not cover any type of commercial operation.

8.3.3 Minimum Age

The introduction of Operator Registration imposed a minimum age of 18 on Operators and this does not change. There are no longer any age limits for 'Remote Pilots', but those operating unsupervised must have evidence of competency.

8.3.4 Safety Accountability

It remains the case that the remote pilot is directly responsible for the safe operation of their aircraft and should only fly if reasonably satisfied that the flight can be safely made. **For radio-controlled aircraft, this includes ensuring that a failsafe is set to prevent the aircraft flying away in the event of loss of signal.**

8.3.5 Operator Requirements

(a) Operator Registration

The existing requirements for Operator registration remain in place (although now extend to capture operators of control line/round-the-pole aircraft weighing more than 1Kg). It is a legal requirement that anyone operating an unmanned aircraft outdoors be registered as an Operator with the CAA unless:

- the aircraft weighs 250g or less and is not fitted with a camera; or
- the aircraft is a control line or round-the-pole (tethered) aircraft that weighs 1Kg or less; or
- the aircraft is a 'toy' as defined in the EU Regulations (i.e. a product intended to be played with by children under 14, excluding any product with a combustion engine).
- There is no requirement to register as an Operator if you only operate model aircraft indoors.

The BMFA has the facility for members to obtain their CAA Operator registration via the BMFA GoMembership system.

The Operator I.D. number must be clearly displayed on the aircraft or within a compartment that can be easily accessed without the use of a tool.

(b) Operator Responsibilities

Our Authorisation includes a requirement for Operators to comply with the following requirements (largely common sense):

- Ensure the remote pilot is in possession of the relevant remote pilot competence requirements
- Ensure that the model aircraft is sufficiently maintained, and that any repairs carried out to it are satisfactorily made, such that it is in a safe condition to be flown;
- Ensure that the remote pilot is aware of the limitations and conditions of this authorisation;
- Ensure that the remote pilot is aware of the rules and procedures of their relevant association;
- Ensure that any necessary additional permissions or authorisations are obtained for any specific flight;
- Ensure the remote pilot is aware of any relevant airspace limitations;

The CAA acknowledges that in many instances, the operator and the remote pilot will be the same person. In such cases, this person must discharge the responsibilities of both the remote pilot (see Section 6), and the Unmanned Aerial System (UAS) Operator.

8.3.6 Remote Pilot Requirements

(a) Remote Pilot Competence

The existing requirements for Remote Pilot Competence remain in place. It is a legal requirement to have evidence that you are competent to operate your aircraft for anyone who is operating in accordance with our Authorisation except for those who:

- only operate aircraft (without a camera) with an MTOM of less than 250g,
- only operate indoors or only operate a control line or round the pole aircraft; (but operators of control line and round the pole aircraft with an MTOM exceeding 1Kg must now register as Operators).

There are three acceptable methods for BMFA members to show evidence of Remote Pilot Competence

- Have a valid BMFA Registration Competency Certificate (RCC), or

- Passing the CAA online DMARES test and having a 'Flyer ID', or
- Have a BMFA Achievement Certificate that was obtained before 31/12/2020 and also have declared to the BMFA that they have read and understood the conditions and restrictions that apply when operating within our Article 16 authorisation. (N.B. Certificates gained after 31/12/2020 cannot be used) See section 14 below

Please note a Flyer ID is only required if you are using the CAA online DMARES test as your evidence.

The BMFA strongly recommend all members take and pass the updated Registration Competency Certificate as it is most relevant to how our members operate and is an excellent way of ensuring understanding of our Authorisation.

It is a requirement for anyone taking a new BMFA Achievement to show proof of one of the above methods. Any candidate who shows proof of a valid RCC obtained after 31/12/2020 will be exempt from answering the mandatory questions during the test.

The BMFA is required to keep a record of all Achievements (including the RCC) held by members for CAA audit purposes.

(b) Remote Pilot Responsibilities

It is a condition of our Authorisation that Remote Pilots comply with the following requirements (largely common sense):

- Be fit to fly. Don't fly under the influence of psychoactive substances or alcohol or when unfit to fly (e.g. due to injury, fatigue, medication, sickness or other causes)
- Have the appropriate competency (and evidence of it such as your membership card/document).
- Be familiar with manufacturer's instructions for your aircraft, if applicable.

Before flying, it is a requirement to:

- Make sure there are no relevant airspace restrictions in place where you intend to fly.
- Ensure that the operating environment is compatible with the limitations and conditions set out within this Authorisation.
- Ensure that your aircraft is in a safe condition to complete the flight safely.
- Ensure that any relevant information about the operation has been made available to the relevant air traffic service (ATS) unit, other airspace users and relevant stakeholders, when required.

During the flight, it is a requirement that you:

- Comply with the limitations and conditions set out within this authorisation;
- Avoid any risk of collision with any manned aircraft and discontinue a flight when it may endanger other aircraft, people, animals, environment or property; **For radio-controlled aircraft, this includes ensuring that a failsafe is set to prevent the aircraft flying away in the event of loss of signal.**
- Comply with any applicable airspace restrictions;
- Comply with the rules and procedures of your Association and/or Club;
- Do not fly close to or inside areas where an emergency response effort is ongoing unless you have permission to do so from the responsible emergency response services.

8.3.7 Where can I fly?

The Authorisation is valid throughout the UK at:

- Any established model flying club site. Clubs operating in a 'built up area' (This means an area substantially used for industrial, recreational, commercial or residential purposes) must conduct a risk assessment and have suitable mitigations in place within their 'Field Safety Rules'. The BMFA can assist with this.
- Any other suitable site which is not a 'built-up area'.
- Within a 'built up area' if the flying site is within an area which is only used substantially for recreational purposes (for example playing fields or sports pitches) and a risk assessment has been carried out. Again, the BMFA can assist with this.
- Within the Flight Restriction Zone of an aerodrome with the written permission/agreement of the aerodrome.

For guidance on conducting risk assessments to comply with Article 16 see <https://rcc.bmfa.uk/article-16-risk>.

8.3.8 How high can I fly?

The new regulations limit the operation of all unmanned aircraft to 400ft above the surface. However, our Authorisation permits members to fly above 400ft, subject to:

- The model aircraft is not a multi-rotor.
- The model aircraft is not automated. (The aircraft must be piloted rather than flown using fully autonomous or automatic flight capability. This does not include systems which are fitted for flight stabilisation purposes or flight termination purposes, such as free-flight termination devices).
- The model aircraft is not operating within the Flight Restriction Zone of an aerodrome, other than with the written permission/agreement with the aerodrome.
- The model aircraft remains within visual line of sight of the remote pilot.
- The model aircraft has a MTOM of not more than 7.5Kg.

Any slope soaring model glider with a MTOM exceeding 7.5kg but not more than 14kg may be flown up to 400ft above the remote pilot, even though it may then be flying more than 400ft above the surface directly beneath the glider.

Flights above 400ft by model aircraft exceeding 7.5Kg MTOM are also permitted if either of the following apply:

- The model aircraft is being operated from a Club Site which holds a 'BMFA Site Permit' which authorises the operation of aircraft with an MTOM exceeding 7.5Kg, but not more than 25Kg at heights above 400ft.
- The model is being operated under a 'BMFA Model Flying Display Permit' which authorises the operation of aircraft with an MTOM exceeding 7.5Kg, but not more than 25Kg at heights above 400ft as part of a Model Aircraft Flying Display (*this means any flying activity deliberately performed, by model aircraft for the purpose of providing an exhibition or entertainment at an advertised event*).

The operation of aircraft with a MTOM exceeding 25Kg will be subject to the LMA's Article 16 Authorisation and will require separate permission from the LMA.

When operating at heights which may exceed 400ft, it is essential that members maintain a good look out for manned aircraft. If a manned aircraft appears in the vicinity, their model aircraft should be brought down to under 400ft as quickly as is safely practicable.

8.3.9 Separation Distances from uninvolved persons

The stipulation of separation distances from uninvolved persons is a new requirement (the default distance within the EU regulations for most of our operations being 50m), but we have reached a compromise agreement with the CAA to ensure that the terms of our Authorisation are appropriate for our established operations.

There are no minimum separation distances for model aircraft with an MTOM under 250g.

(a) Model Aircraft with an MTOM between 250g and 7.5Kg

Our Authorisation stipulates that model aircraft (other than free flight aircraft) between 250g and 7.5Kg cannot be operated:

- Within 30m of any uninvolved person. (Uninvolved Persons are those who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator). This distance may be reduced to 15m for take-off and landing subject to adequate local mitigations to protect uninvolved persons and the completion of a risk assessment.
- Within a horizontal distance of 30m of assemblies of people. (Assemblies of people are gatherings where persons are unable to move away due to the density of the people present).

(b) Model Aircraft with an MTOM between 7.5Kg and 25Kg

Our Authorisation stipulates that model aircraft with an MTOM between 7.5Kg and 25Kg cannot be operated:

- Within 30m of any uninvolved person. (Uninvolved Persons are those who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator).
- Within a horizontal distance of 50m of assemblies of people. (Assemblies of people are gatherings where persons are unable to move away due to the density of the people present). This distance may be reduced to 30m for take-off and landing subject to adequate local mitigations to protect uninvolved persons and completion of a risk assessment.

8.3.10 Dropping of Articles

The new regulations prohibit the dropping of any materials from a model aircraft, but our Authorisation exempts us from this requirement subject to the following condition - The remote pilot must not cause or permit any article or animal to be dropped from an unmanned aircraft so as to endanger persons or property.

8.3.11 Provisions for 'trial flights'

Our Authorisation permits the continuance of 'trial flights' for non-members.

The non-member may operate the controls of the model aircraft and does not need to comply with the competency requirements whilst under the direct supervision of a member.

The member supervising the flight must be registered as an Operator and display their Operator I.D. on the aircraft.

8.3.12 Provisions for Overseas Visitors/Competitors

Overseas visitors/competitors are permitted to operate within the terms of our Authorisation provided that they hold a temporary membership of the BMFA and agree to comply with the terms of the Authorisation (including the remote pilot competency requirements).

Overseas visitors/competitors must also carry the Operator I.D. number of a UK 'Host' on their aircraft.

8.3.13 Provisions for permitting Model Flying Displays

Our Authorisation includes specific provisions for permitting model flying displays, which may include the operation of aircraft with a MTOM greater than 7.5 Kg at heights greater than 400ft. Further details can be found in Chapter 15.

8.3.14 Provisions for Permitting the Routine Operation of Larger Aircraft at Club Sites

Our Authorisation includes specific provisions for issuing permits to allow the operation of model aircraft with a MTOM greater than 7.5 Kg (but not greater than 25 Kg) at heights above 400ft. This procedure has previously been used primarily for sites used regularly for glider aerotow operations which have been subject to repeated NOTAMs/Exemptions to cover their activity. The application will need to justify the requirement and include a risk assessment and flying site rules. The operation of aircraft with an MTOM greater than 7.5Kg above 400ft will also require a NOTAM to be in place. For Clubs with a regular requirement for NOTAMs, the BMFA will liaise with the CAA to get the site listed in the AIP (Aeronautical Information Package) and ultimately on the VFR Navigation Charts. For further details, please see <https://rcc.bmfa.uk/exemptions/bmfa-flying-site-permit>.

8.3.15 Occurrence Reporting Requirements

Our Authorisation includes the requirement to report certain accidents, serious incidents and other occurrences. This builds on an existing requirement and further details can be found in Chapter 16.

8.3.16 Requirements for the operation of certain types of aircraft

Our Authorisation includes some provisions/requirements for the operation of certain types of aircraft (such as Free Flight and Control Line) and these are referred to in the relevant sections of Chapter 14.

8.4 Mandatory Model Flying Insurance

It is a legal requirement in the UK that all models with a maximum take-off mass (MTOM) exceeding 20Kg must carry at least £750,000 third party public liability insurance.

8.5 Planning Permission Considerations

Use of a site for model flying may in some circumstances require specific planning permission. In granting a planning consent a local planning authority may impose conditions designed to reduce the risk of disturbance by noise and any such conditions should be observed at all times.

If your Local Authority requests that you obtain planning permission, it is essential and very much to your advantage to contact the BMFA Club Support Officer, via the BMFA office. The success rate for planning applications is good but there is no doubt that early contact with BMFA will help you avoid the errors that can severely damage your case.

8.6 Byelaws

Local authorities may make bylaws, subject to approval by the Secretary of State, prohibiting or restricting model flying on certain municipally owned land or on land subject to certain provisions of the National Parks and Access to the Countryside Act, the Countryside Act, and the Countryside (Scotland) Act. Similar provisions apply in Northern Ireland.

8.7 Noise

Under the Environmental Protection Act (EPA) 1990, local authorities or individuals may apply to a Magistrate's court for a noise abatement notice which may restrict or prohibit model flying at a particular site if the noise caused by the activity is judged to amount to a statutory nuisance.

In Northern Ireland similar action may be taken by local authorities and magistrate's courts under articles 38 and 39 of the Pollution Control and Local Government (Northern Ireland) Order.

8.8 The Department of the Environment Noise Code

8.5, 8.6 and 8.7 above would normally entail the relevant authorities (Planning Authorities or Magistrates) consulting the Department of the Environment Code of Practice for the Restriction of Noise from Model Aircraft 1982.

The Code of Practice is not the law and, in fact, there are no direct legally enforceable noise level requirements for model aircraft. What IS legally enforceable, however, is a Noise Nuisance Notice which could be issued by a Magistrate against model flyers whom they consider are creating a statutory nuisance and which would stop any flying on the site immediately and permanently.

When a Magistrate is deciding if model flyers are creating a statutory noise nuisance, the document most likely to be referred to is the DoE Code of Practice which can be downloaded from <https://www.gov.uk/government/publications/code-of-practice-on-noise-from-model-aircraft>

9. THE BMFA GUIDELINES AND SAFETY CODES FOR MODEL FLYING

9.1 CAP 722

During 1996 the Civil Aviation Authority (CAA) issued Civil Aviation Publication 658 (CAP 658), Small (Model) Aircraft: A Guide to Safe Flying. This document provided advice for all model flyers, much of which was based on the existing BMFA Safety Codes.

However, CAP 658 has now been withdrawn as the CAA have agreed that the BMFA is best placed to advise members on the details of safe operation within the terms of our Article 16 Authorisation.

For those operating unmanned aircraft outside of our Article 16 Authorisation, the terms of CAP 722 apply. A specific Annex (F) to CAP 722 for model flying is in preparation, but the purpose is very different to CAP 658 and is limited to:

- Describing how the new regulatory framework for unmanned aircraft applies to the operation of model aircraft;
- Setting out CAA policy for model aircraft operations;
- Describing the boundaries between operations which require an authorisation and those that do not;
- Providing guidance to model aircraft associations when applying for an authorisation on behalf of their members.

9.2 Introduction to the Safety Codes

Accident statistics and the low insurance rates that BMFA Member's enjoy show that model flying is not a dangerous sport but, as with other sporting activities, hazards can arise if common sense rules are not applied. It is important that we all follow safe model flying practice and the BMFA Safety Codes are designed to help everyone achieve this.

The BMFA Safety Codes presented here are available to all model flyers and show you ways to fly your models safely, based on over half a century of experience.

Sections are available covering all model flying activities, including displays and competitions and there are many additional booklets on specific subjects giving detailed information. These can all be downloaded from the BMFA web site or obtained directly from the Leicester Office..

At some flying sites, circumstances may dictate that additional safety measures beyond those indicated in this handbook might have to be taken. Examples could be limiting the number of spectators or the number of models being flown at any one time.

With the advent of small electric models that can be flown from small sites, such as football pitches, you may also have to think carefully about the size and type of aircraft that you can safely fly from such sites.

As the pilot it is ultimately your decision as to what and where you fly but the range of types and sizes of model currently and easily available to you means that you may have to give the subject of suiting your model to your flying site much more thought than it needed in the past.

The Association wishes to encourage any safety initiatives wherever they may be thought necessary by the users of any site and, indeed, any suggestions about the contents of the Safety Codes and the Handbook in general will be welcomed.

Finally – remember that your attitude to safety can affect the whole image of model flying.

Model flying must not only BE safe – it must be SEEN to be safe.

9.3 Respect the Environment

Much model flying takes place in countryside locations and many clubs and individuals fly in places of natural beauty or Sites of Special Scientific Interest (SSSI). Wherever you fly you should take steps to minimise the impact on your surroundings.

Our aim as model flyers should be to leave any flying site in the same condition that we found it. Clearly, leaving litter or damaging property are not acceptable.

Model flyers should be familiar with the basic provisions of the Countryside Code which is compiled by Natural England and applies to all of the countryside in England and Wales. Most of it is just good commonsense as it is designed to help us all to respect, protect and enjoy our countryside.

9.4 'Mixed' Sites

Model flying does (and can continue to) take place safely on sites where other airspace users are operating at the same time close by.

Because, in all such cases, the other users always involve 'people carrying' aviation e.g. gliding, hang-gliding, paragliding, parachuting, light aviation etc. **the model flyer must accept that his needs are going to be secondary to the safety of the other user.** Indeed, this point is specifically covered by the Air Navigation Order.

On any shared site, it is extremely important that the model flying group have a robust and reasonable set of rules that are agreed by all users of the site and are rigidly applied. Anything less than this could lead to compromised safety.

These rules should always include the provision to set up a permanent lookout whenever model flying is taking place, either by individuals or by everyone present. Any airfield may be used by aircraft in emergencies or as waypoints for overflights, even when it is officially inactive.

Remember also that on such a site, there will always be a person on the full size side who will be in ultimate charge of airfield safety. This may be Air Traffic Control, the Chief Flying Instructor or even a Senior Instructor. Their instructions must be followed at all times.

In the particular case of hang-gliding and paragliding on slope sites, shared airspace is sometimes involved and the Association has a separate Code, agreed jointly with the British Hang and Paragliding Association (BHPA), which covers such situations and which is available on request from the Leicester office or for download from the web site (BHPA-BMFA Code).

9.5 Military Low Flying

Military aircraft may conduct low flying exercises over much of the UK on any weekday and the sudden appearance of a low flying military aircraft is difficult to anticipate. However, it is vital to be aware of the problem and to remember that one aircraft may be the first in a stream of three or four.

In areas known to be used for low flying a dedicated lookout is considered essential.

On **WEEKDAYS** only, on flying sites where low level flying by military aircraft is **KNOWN** to take place and where a club is planning a model aircraft displays or any other intense model aircraft activity (such as operating **FIVE or MORE** models at any one time), the CANP (Civil Aircraft Reporting Procedure) should be used. If possible, notification should be made the day before the planned activity, but an absolute minimum of four hours notice is required to allow full circulation of the information.

Notification should be emailed to SWK-MAMC-Lowflying@mod.gov.uk providing the following information;

Civil low flying – recreational activity

Model aircraft flying

Location (ordnance survey grid reference or position in relation to the nearest town).

Operating area (e.g. 500 metres radius).

Date and start/finish in local time.
Operating heights (lower and upper limits above ground level).
Number and type of models (e.g. 3 gliders and 3 aeroplanes)(sic).
Contact telephone number (ideally a mobile that will work on site).
Operator or club name and telephone number if different to above.

For more details of this service, clubs are advised to contact the BMFA's Leicester office.

9.6 Your Fitness to Fly

Under the 'Remote Pilot Responsibilities' of our Article 16 Authorisation, it states that you must "Not perform duties under the influence of psychoactive substances or alcohol or when you are unfit to perform your tasks due to injury, fatigue, medication, sickness or other causes"; This is a requirement backed by law (Article 265 of the ANO).

Many factors can affect your day-to-day ability not only to operate a model aircraft, but also to participate in other flying related activities such as the retrieving of free flight models or taking part as an organiser in competitions, club events or model displays and airshows.

Before operating a model aircraft of any type careful consideration should be given 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.

Some medications may render you unfit to fly and the effects of alcohol should not be ignored. As a guide, if you are fit to drive a motor vehicle then you are probably fit to fly an R/C 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.

9.7 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 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 alcohol at all.

As stated in 9.6, operating under the influence of alcohol now represents a clear breach of the ANO.

10. THE BMFA GUIDES TO THE SAFE OPERATION OF MODEL AIRCRAFT

10.1 General Club Information

Clubs or groups of flyers should draw up carefully considered safety rules for specific sites. It is recommended that the Codes in this Handbook are used as a basis for these rules but additions to cover local circumstances should always be considered too. These 'flying field' rules, should cover the club or group's normal operating procedures and safety measures.

Clubs should take care to keep their flying field rules separate from their Club Constitution. This will enable them to regularly review their operating procedures to ensure that, if any additional safety measures are needed, they are recognised and implemented.

Where byelaws restrict model flying to specific areas and times, model flyers should encourage local authorities to erect notices indicating the restrictions. On private sites with public access, suitable notices warning of model flying should be erected if possible and where appropriate.

The signs should say '**Please Be Aware. Model Flying Takes Place Beyond This Point**'.

On public sites, or sites where casual visits by the public are likely, then temporary notices as in (d) above may be helpful when flying. Always try to use the same take-off areas. Other regular users will then expect to see model aircraft operating from a particular place.

10.2 The Safety Marshal

On all sites with public access, and especially on sites where model flying activity and the public interact regularly, it is strongly recommended that a SAFETY MARSHAL be appointed at any flying sessions. His duties should include warning both the public and flyers of flight patterns, take-off areas and safety procedures and advising spectators of the safest area from which to watch.

Note that the person appointed will usually be appointed on the day and it may not be the same person all day. Many clubs operate the system successfully by having a rota system so that no one individual is expected to do too much. It may even be that every member on the field is tasked with acting as a Safety Marshall as part of their flying field responsibilities. The most important point is that all flyers are aware that care must be taken and that steps have to be taken to ensure public safety.

10.3 The Club Safety Officer

If it is considered to be appropriate, a Club should appoint a competent CLUB SAFETY OFFICER whose duties would be to ensure that both the BMFA and the Club Safety Codes are followed.

However, a Safety Officer acting alone has an almost impossible task and some form of infrastructure should be set up within the club to help the designated officer.

The most successful way to do this is to make the task of Assistant Safety Officer part of the duties of every Committee member. These Assistants then report to the designated Safety Officer when required. This will keep the Safety Group to a manageable size but will ensure that there is a recognised safety presence at most flying sessions.

If it is felt that this might not be enough, you can appoint other responsible club members as assistants too. Examiners, Instructors or senior club members might all be candidates.

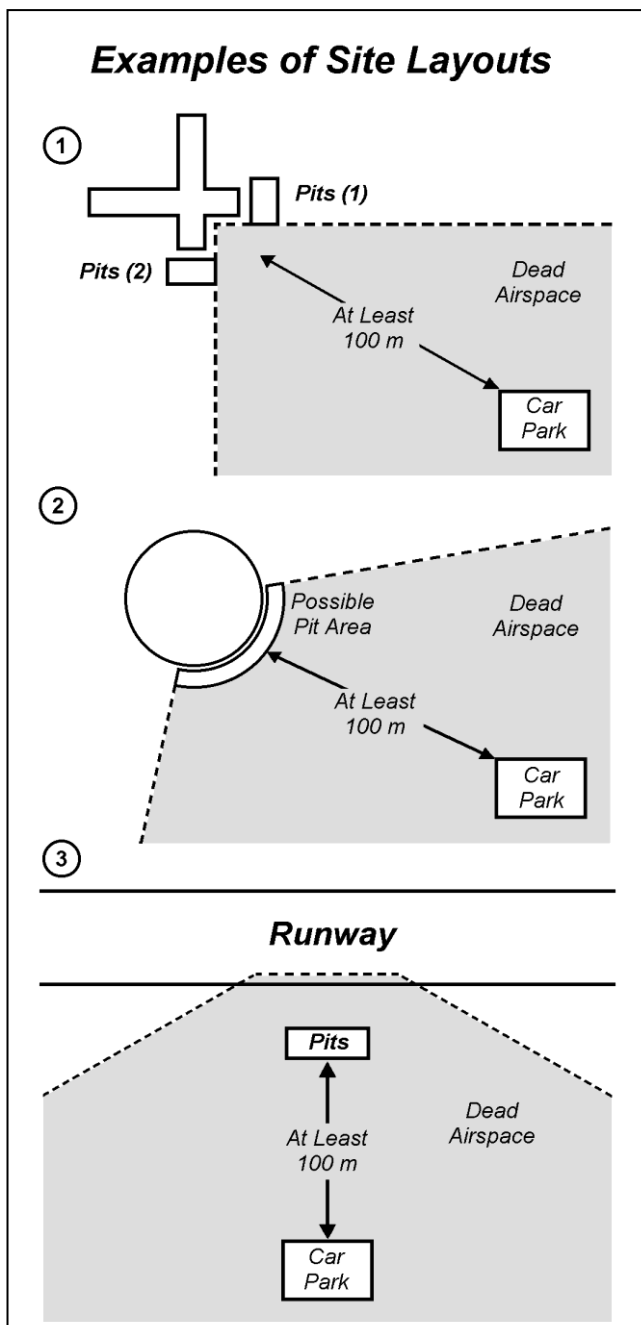
It is not recommended that you appoint 'all club members' as their own safety officers. Such an approach loses the focus of a smaller group and can become ineffective.

Clubs should educate and encourage their members, particularly new or junior members, to conform to Club safety requirements and should have no hesitation in disciplining persistent offenders.

10.4 Using Your Flying Site

- (a) All flyers must ensure that the site they intend to use is entirely suitable for the type and size of model they wish to fly before attempting to use it. You are personally responsible for the flights you make and the consequences of flying at an inappropriate site could be serious.
- (b) All flyers must ensure that the site is left free of any foreign objects or debris. This is particularly important where the use of active airfields is concerned or when livestock is likely to have access to the site at any time.
- (c) When flying any model aircraft flying, first choose an unobstructed site and always keep a safe distance from uninvolved persons, vessels, vehicles and structures in accordance with our Article 16 Authorisation.
- (d) Only fly in suitable weather, with regard for any other conditions such as local bylaws and with due consideration for other people and property. If light conditions or visibility are such that you might lose sight of your model then do not fly.
- (e) Take great care if you fly near any overhead cables. Telephone wires are dangerous and electricity cables can and have killed. Even the low level electricity lines on wooden posts carry lethal voltages. **KEEP CLEAR.**
- (f) Do not leave fuel, adhesives etc. where children or other spectators may get hold of them.
- (g) Flying alone should be avoided if at all possible. There are many cases on record where model flyers have been injured or incapacitated on the flying field and have only been saved from permanent injury or worse by the prompt actions of fellow flyers. If you do fly alone, take a mobile 'phone with you. There are risks of interference with a mobile but the safety factor of being able to summon help if you are injured is more important.
- (h) It is extremely unwise to let children wander on a flying site. If children are there make sure that they are under supervision and safe.
- (i) Dogs and model aircraft do not mix. If you take your dog to the flying field it should be on a lead and restrained at all times.

11. R/C POWER FLYING SITE LAYOUT AND FLIGHT PATTERNS



11.1 Introduction

A study of the incident reports received by the BMFA shows that many accidents are either caused or made worse by poor flying site layout, lack of thought about flight patterns or general lack of flying discipline.

The following section sets out the lessons learned in general terms and it gives a framework in which the general safety code can work to its best advantage. These guidelines are advisory as every flying site has its own particular circumstances.

It is strongly recommended, however, that all R/C power oriented clubs, both fixed wing and helicopter, study this section and see how their sites and practices compare with the guidelines, especially with respect to the provision of 'dead airspace'.

11.2 Layout

(a) Set up a car park separate from the pits area and, if possible, arrange for it to be at least 100 metres from the take-off/landing area, and behind the pits. Some sites do not allow the car park to be positioned this far away from the flying area but you should make an effort to position it as far away as practicable. If your site allows, you will find it useful to position your car park near some obstacle to flying such as trees or a high hedge.

(b) Enforce a strict ruling of no cars in the pits area. An exception could be made for any of your disabled members but only for loading and unloading.

(c) Have at least two recognised pits areas available so that the pits can be set up crosswind from the active runway whatever the wind direction

and, if possible, at least 30 metres from the take-off/landing path. Under no circumstances allow models to take-off from or land over or towards the active pits area.

(d) Some field layouts may mean that your approach road cannot be included in the dead airspace you define. In these cases you must take extra care to have a laid-down method of driving on to the field and you should make sure that all your members are carefully briefed and aware of the safety situation

11.3 Flight Patterns

(a) Do not allow flying all around the field 'control line' fashion. Lay out an area of dead airspace that takes in the pits area, the car park, the approach to the field and any noise or safety sensitive areas which you need to avoid. The dead airspace area will usually be a segment of at least 90° and could be up to 180° i.e. all flying takes place one side of a line through the strip with the pits, car

park etc. on the other side. It is vital to set up this area of dead airspace, even if your field is totally unobstructed all around.

(b) Enforce a strict rule that NO-ONE flies in the 'dead airspace' at ANY height.

(c) Specify that any flying actually over the take-off/landing area must be into wind only (except in an emergency or when practising with no other models airborne). This avoids conflicting flight patterns over the active runway but does not prohibit other styles of flying away from it.

11.4 Notes

Section 13.3 above has certain implications, the main one being that the circuit flown at any time will depend on the wind direction. For instance, if the prevailing wind is westerly and this gives you a left hand circuit on your field, a change in the wind to easterly means that you must fly a right hand circuit.

Because of this your members will have to become proficient in both left and right hand circuits and will have to be able to land either from their left or their right. None of this should bother most reasonably competent club flyers or any newcomer trained to fly like that from the start but a few flyers, even some quite experienced ones, may need encouragement and help to break old habits and begin flying in a slightly more disciplined style.

Once settled into this more disciplined style, your members may find that it is easier to fly this way.

Please note that this section refers to club flying sites only. Model flying displays have their own site safety code recommendations in a separate document available from the Leicester Office.

12. LEARNING TO FLY RADIO CONTROL

12.1 The benefit of joining a club

It is recommended that you contact and join a local model flying club. There is no doubt that this is the best way to learn to fly. Details of your local clubs can be obtained from the BMFA or your local model shop.

Most of the many hundreds of model flying clubs in the UK offer training in R/C flying to beginners.

The Achievement Scheme Review Committee (ARSC) also administer a structured instructor scheme and recognised flight training programme, which is detailed in the BMFA flight training manual 'A Flying Start'. Copies of which are available from the BMFA office or for download from the achievement scheme website at <http://acheivements.bmfa.org>.

It is not impossible to learn to fly without being a member of a club but it can be very difficult. If you are not able to join a club then try to get help from an experienced model flyer who will be able to guide your first efforts.

Some organisations offer commercial model flying training. Details can often be found in the model flying magazines.

12.2 Simulators and Simulator Leads

Flight simulators are becoming increasingly popular as a tool to help you learn to fly R/C models and there's no doubt that they also help develop and hone flying skills when you can't get out to fly.

Look out for depth perception problems when you move back to real models as there are differences.

Be aware that the frequent plugging and unplugging of simulator or training leads can lead to poor connections or damage to the host circuit board on some transmitters

13. GENERAL MODEL SAFETY

13.1 General Safety

- (a) Models should be built to a standard such that they will not fail under normal circumstances, giving particular attention to control surfaces and connections.
- (b) They should be thoroughly checked prior to each flying session and after any hard landing.
- (c) It is recommended that rounded spinners or safety propeller nuts of the domed type are fitted to internal combustion and electric powered models and that gliders and pusher powered aircraft noses should also be rounded (no needle noses)
- (d) Care should be taken by the operator that propellers are of suitable size and construction for their engine or motor's operating speed. All propellers should be carefully balanced. Cheap and efficient propeller balancers are available from your local model shop.
- (e) Do not use propellers on i/c engines that are designed for use on electric motors.
- (f) On internal combustion engines and electric motors, damaged propellers must not be used. Inspect your propellers regularly and replace any that are not in good condition
- (g) Metal propellers must not be used.
- (h) The use of locking prop nuts is recommended, especially for 4-stroke engines. A backfire or 'kick' can loosen a prop nut and locking nuts will prevent the propeller flying off. The safety factor of locking prop nuts on four-stroke engines is more important than the recommendation to use 'domed' safety nuts so, if you have to choose, go for the locking nuts.
- (i) Heavy ballast, or any other heavy part, subject to jettisoning in flight is prohibited. Jettisonable ballast must be of a safe nature e.g. water.
- (j) All R/C models are subject to in-flight vibration, landing knocks, transport damage etc. Be sure that receivers and batteries are well protected, servos are fixed securely, control linkages (pushrods, snakes, closed loop etc.) are robust enough for their purpose, are properly supported where necessary and are as slop free as possible and that all control surface hinges and horns are fitted correctly. Pushrod clevises should fit control horns cleanly with no sideways strain and they should be fitted with a plastic or silicone tube 'keeper' as a secondary closure.
- (k) When starting an engine make sure that the model is restrained and cannot move forward. Restraint is best done by either a helper or by some mechanical means.
- (l) Never put yourself in a position where your face is in line with a turning propeller. A broken propeller will fly out and forward so make all engine adjustments from the rear if possible. A broken propeller will also be a danger to anyone standing nearby so take care that no-one is in line with it when starting your engine.

13.2 A Safer Flying Field and You

When you arrive at a flying field and before you start flying, we recommend that you take a few moments to consider the surroundings and the flights you will be making.

Think **S.W.E.E.T.S.**

- S** - **Sun**
- W** - **Wind**
- E** - **Eventualities**
- E** - **Emergencies (Inc. Failsafes)**
- T** - **Transmitter Control**
- S** - **Site Rules**

Sun – Where is the sun in relation to where you will be flying? Will it affect your flight patterns? What actions will you take if you accidentally fly 'through' the sun? Should you be wearing sunglasses? Remember that low sun in winter can be a particular problem.

Wind – Consider the wind strength and direction. How will this affect your flights? Will you have to modify your normal take-off and, especially, your landing patterns? From your local knowledge, will there be any turbulence with ‘this’ wind direction and strength? And how bad might it be?

Eventualities – What will you do if you hear or see a full size aircraft or helicopter flying at low level near the field? What if the landing area is suddenly obstructed when you are on finals to land? What will you do if a nearby footpath or bridle path suddenly has walkers or horses on it?

Emergencies – You may have an engine cut at any part of a flight so consider where your deadstick landings might be safely made and which ground areas you should definitely avoid. How will you warn other field users if you have an emergency? You may also have a complete loss of signal and therefore before every flight you should check that the failsafe is working how you expect it to.

Transmitter Control – Is the site pegboard in operation? If not, why not? Where has the pegboard been placed? Are you familiar with the system and understand how it works?

Site Rules – Are there any specific site rules you should be aware of? Most importantly, where are the no-fly zones or dead airspace areas on the site?

The answers to most of these questions are contained within these Safety Codes and your local Club rules but you will be making the final decisions as to whether flights can be made safely. If conditions are poor or a site is unsuitable remember that a decision not to fly can be both valid and sensible. We would also recommend that you review the sections on the sun and wind throughout the day as they obviously change over time and this may affect some of the decisions you will be making.

13.3 Radio Control Flying Safety

- (a) Before you do anything else, make sure that you understand and are complying with the field frequency control system. NEVER switch on until you are sure it is safe. ALWAYS check the pegboard – on EVERY flight.
- (b) Before every flight, check that transmitter trims, rate switches etc. are in their correct positions and that each control surface on the model moves freely and in the correct sense and **make sure that a failsafe is set to prevent the aircraft flying away in the event of loss of signal.**
- (c) Immediately before take-off, flight controls must be checked for full, free and correct movement under full power if applicable. If there are any doubts as to their operation, **DO NOT FLY.**
- (d) Inexperienced R/C flyers should never fly without an experienced helper.
- (e) Unless positive controls are in force, all flyers should use the same take-off area at any particular flying session.
- (f) Do not taxi in or out of the pits area. Wheel or carry your model well clear of the pits before commencing taxiing and stop the model well clear when taxiing back after landing. Do not put other flyers at risk.
- (g) Before take-off, check that both ground and sky are clear and never take off or land towards other pilots, spectators or the pits area.
- (h) Always make the initial turn after take-off away from spectators and parking areas. Diving manoeuvres should always be pointed away from spectators, parking areas and other people.
- (i) Always maintain a clear view of the model and allow plenty of room between the flight path and spectators, other flyers or model pit areas.
- (j) **DO NOT OVERFLY** houses, domestic gardens, car parks, traffic, railways, organised games or spectators. You may not be able to control people walking by at a reasonable distance from the take off/landing area but you should take care not to overfly them at low level.
- (k) At any sign of malfunction or jettisoning of model parts, land as soon as it is safe to do so.
- (l) Do not distract pilots, particularly when they are controlling models taking off or landing.
- (m) Clubs should exercise strict control over the take-off/landing area used. Pilots about to take off should inform people already flying. Pilots landing should have priority but must call out their

intentions 'loud and clear' and must **NEVER** assume that they have been heard. A pilot going out to take off may not hear a call over the noise of his model's engine.

- (n) **NEVER** assume that the landing area is clear even if you have called landing. In emergency situations call for help from your fellow flyers and always be prepared to land in a safe place off the landing area if necessary. In **ALL** cases, the safety of people is paramount.
- (o) When using 35MHz care must be taken at all times to avoid overflying operating transmitters. Pilots should stand together and should not be allowed to wander over the flying area when operating transmitters. Clubs should take action to prevent operating transmitters being taken out on to an active flying area when, for example, models are being retrieved (see the section on 'Radio Control at your Club'). There are exceptions to this particularly in some silent flight operations, and extreme care should be taken not to overfly transmitters in these cases.
- (p) Under no circumstances whatsoever should you move to the far side of the flying area so that you can land your model between yourself and the pits area.
- (q) Under no circumstances whatsoever should you fly between yourself and the pits area.
- (r) Take extra care when flying in adverse weather conditions. It is easy to lose sight of your model in fog or low cloud. Strong winds and turbulence can be a stimulating challenge but can catch out the unwary. Flying in rain can give serious radio problems if water gets inside your transmitter.
- (s) The staging of deliberate mid-air collisions at airshows and public displays is banned and they are not covered by the Association's insurance.

13.4 Pre Flying Session Model Checks

On arrival at the flying site:

- (a) Check airframe for any transit damage.
- (b) Check that servos and linkages are secure.
- (c) Check undercarriage for secure fixing and correct alignment.
- (d) Check propeller for damage and secure fixing.
- (e) Check receiver aerial for damage and, with 2.4 GHz equipment, that the orientation is correct.
- (f) Carry out a range check if any changes or re-installation of equipment have taken place since the last session or if a history of range problems exists.
- (g) Carry out a failsafe check and make sure that it does what you expect.
- (h) Check that the receiver and transmitter batteries have sufficient capacity for the intended use.

13.5 Checks Before Each Flight

- (a) 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.
- (b) 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, require that the Rx be switched on first. If this is so take extra care.
- (c) Check that all controls operate freely and do not bind or stick at any point in their movement.
- (d) Check that all controls move in the correct sense. For conventional models, stand behind the model and look for;

Elevator stick back – Elevator comes up.

Aileron stick right – Right hand aileron comes up.

Rudder stick right – Rudder moves to the right.

- (e) Check that all control surfaces are in their correct positions with the transmitter trims at neutral.
- (f) Look for any minor radio malfunctions such as slow or 'jittery' servos, glitches etc. If in doubt, **DO NOT FLY**.
- (g) Check Rx and Tx battery capacity is sufficient for the intended flight with an added safety factor.
- (h) **With i/c models**
 - (i) After starting the engine and allowing it to warm up, check that the pick-up from idle to full power is satisfactory. Hold the model with its nose pointing upwards at a steep climbing angle for ten or fifteen seconds and check engine operation at full power. If the engine falters or cuts it is usually set too lean and must be re-tuned. Repeat the test until the engine runs correctly in the nose-up attitude.
- (k) **With electric models**
 - (i) The first and most important principle of electric flight ground safety is to understand that the instant you start to plug in the flight battery, the model you are holding may transform itself from a dead airframe into one with its motor running at full revs and all controls moving. No matter how good your other safety checks, you must be prepared for this to happen every single time you start to connect the flight battery. If a separate Rx battery is fitted then you have the opportunity to check the operation of the radio equipment before the flight battery is plugged in.
 - (ii) Since plugging in the flight battery is nearly always a two-handed job you must give serious thought to how your model will be restrained BEFORE it does something you don't expect. When plugging in, positive restraint, either by a helper holding the model or by some other method, and staying completely clear of the propeller must always be part of your regular routine.
 - (iii) Electric motors have very different power and torque characteristics to normal IC model engines. You must take very great care when setting up their control systems and handling them as an accident, such as the propeller hitting your hand, which would stall a glow engine, might just make an electric motor turn even harder.
 - (iv) Just before you go out to fly, **DOUBLE CHECK** that all transmitter trims, rate switches, mixers etc. are in their correct positions and that the transmitter meter is 'in the green' or that you have the correct model selected and that your aerial is extended.
 - (v) Finally, with the aircraft held securely (usually on the ground for i/c models but not if the failsafe is set to retract the undercarriage), open up to full power and re-check all flying controls again for full and free movement, also noting any glitches, hesitations or odd vibrations. If **ANYTHING** seems odd, **DO NOT FLY**
- (l) **Be S.M.A.R.T.** with your transmitter.
 - S.... Switch** on
 - M ... Model** selected is correct / **Meter** in the Green
 - A.... Aerial** secure / extended
 - R.... Rate** switches all in correct positions
 - T.... Transmitter** voltage good and Trims all in correct positions

13.6 Checks After Each Flight

- (a) Receiver OFF then transmitter OFF (Unless your equipment manufacturer specifies otherwise).
- (b) Clear the frequency control system.
- (c) Clean the aircraft down
- (d) Check propeller, airframe, undercarriage, wing fixing etc. for security of fastening and for possible flight or landing damage.
- (e) **REMEMBER** – Never fly with a damaged aircraft or propeller, or with any possible radio problem.

14. SAFETY ADVICE FOR SPECIFIC MODEL TYPES

14.1 Almost Ready to Fly Models

- (a) ARTFs are very popular and usually offer very good value for money but you should be aware that some airframes you may buy could have manufacturing or design defects. Close scrutiny of even a pre-covered airframe may pay big dividends if you can prevent a future failure.
- (b) All visible glue joints within the fuselage should be checked, especially the engine bulkhead, fuselage bulkheads, wing mounting plates or wing dowels, undercarriage mountings and servo mountings. If you have any concerns then the reinforcement of many of these joints using scrap balsa stripwood will significantly increase the strength and durability of the airframe for very little weight increase.
- (c) Take particular care when gluing wing panels together. Follow the manufacturers instructions and when adding such things as dihedral braces make sure that the whole joint is wetted out by the glue.
- (d) Check pre-fitted pushrods, snakes and clevises for suitability. Most will be fine but some have been seen that were inadequate for the job expected of them, either being too thin or too weak. The rule of thumb should be 'if I was fitting this, would I fit this'.
- (e) Always check flying surfaces for warps – don't assume that a wing will be straight because it was built for you. Minor warps can sometimes be removed by gently heating the covering, twisting the surface in opposition to the warp and holding until cool. Major warps are a reason for returning to where you bought the model.
- (f) The ONLY acceptable (and beneficial) warp on an R/C model is matched wash-out. That is, looking from the rear the trailing edge at each wingtip is twisted upwards a little compared to the root of the wing. If this is present then it MUST be even on both wings or it's just another warp.
- (g) On i/c powered models, have a good look at the fuel proofing around the engine and fuel tank bay. If you are looking towards something more than a throw away airframe then an extra coat of fuel proofer in and around the nose will certainly be worth while.
- (h) Extra care should be taken with second hand airframes as you will usually have no idea of their history. Close scrutiny of the whole airframe and any necessary repairs and strengthening are essential before you fly the model.

14.2 Ultralight R/C Models

- (a) There are numerous electric powered 'Slow Fly' or 'Park Fly' models on the market that may be classed as 'Ultralight' and this is encouraging the flying of R/C models in places that have never seen model flying or which have been out of bounds to flying for many years.
- (b) Although virtually all of these models are lightly loaded, great care must be taken when flying them as you can be led into situations that you would not face on a club field.
- (c) Read the Safety Codes contained in this handbook carefully as virtually all of them still apply to this type of flying, especially those concerned directly with radio control.
- (d) Be very careful to avoid flying near to existing model flying sites if you are using 35 MHz equipment. Find out where models are being flown in your area and check on a local map that your chosen flying area is far enough away to be safe.
- (e) Take special care to avoid putting members of the public at risk. Your activities, with quiet slow models will almost certainly draw the attention of passers by - they could appear from anywhere.
- (f) Park flyers have the possibility of introducing model flying to great numbers of the general public who may never have seen our sport close up before. Your behaviour and safety awareness could result in there being many new model flyers in the future.

- (g) Be aware that some Local Authorities have by-laws banning the flying of powered models from their open spaces. Check carefully to avoid trouble.
- (h) You may, however, find yourself in a situation where you are flying sensibly, safely and not causing a nuisance and are approached by someone who says he represents the Local Authority or some other official body and who tells you that you are not allowed to fly. You are within your legal rights to ask to see a copy of the by-law that bans flying on the area you are using.

If you still have trouble and you consider that your rights as an individual and a model flyer are being overridden, you should contact the BMFA office for help and advice as soon as possible.

14.3 Helicopters

- (a) It cannot be stressed enough that a model helicopter must have a higher degree of safety built into it than perhaps any other flying model. Because the BMFA feels so strongly about this the following comprehensive guide is set out below. This is in addition to the regular R/C safety code.

It is VITAL that you never fly or run up your helicopter in or near the pits area or near spectators.

Rotor blades must always be carefully balanced. NOTE: modern premium quality carbon fibre rotor blades come pre-balanced. You should always remember that vibration in helicopters can be very destructive.

- (b) **Electric Model Setup**

An electric model can start up with full power and torque immediately. The quickest / easiest method of making the model safe would be to disconnect at least two of the three motor wires which connect to the ESC. An alternative would be to remove the motor pinion / drive gear or belt so that there is no drive through the transmission or move the motor away from the drive gear. For some cases ie when adjusting the throttle end points on the ESC, the motor needs to be plugged in. In this instance ensure that you remove both the main and tail rotor blades. Be careful of loose clothing getting tangled in any rotating parts.

- (c) **For I/C Powered Helicopters**

When starting the model in the pits, hold the rotor head firmly. When the engine is running carry the model a sensible distance from other people before running up or flying. Do not release the rotor of the model until you are sure that it is safe to do so and NEVER FORGET the amount of energy there is in a spinning rotor.

Never hold the model overhead to run up the engine or run the engine with no rotor blades fitted.

- (d) **For Electric Powered Helicopters**

Electric helicopters should be carried out from the pits area with the flight battery disconnected and it should only be connected in a safe area away from people and not under the flightpath of other pilots. The model MUST be considered to be live as soon as this is done and great care is needed during this procedure.

- (e) **A MODEL HELICOPTER MUST NEVER, UNDER ANY CIRCUMSTANCES, BE FLOWN OR RUN UP:**

- (i) **IN OR NEAR** the pits area or close to any spectators.
- (ii) Directly towards the pits area or any spectators.
- (iii) With knife sharp leading edges on main or tail rotors.
- (iv) With damaged or out of balance rotor blades. Note that blades, especially wooden ones, should be reinforced at the root with hardwood, glass-fibre or some other suitable material.
- (vi) With radio equipment unproofed against shock and vibration.

- (vi) In the presence of spectators or at a competition or fly-in until properly tested and proved airworthy.
- (vii) Until thorough maintenance checks are carried out as set out in (f) and (g) below.
- (viii) Note that all helicopters must be operated within the terms of our Article 16 Authorisation. Permission must be obtained to operate within an FRZ and those weighing more than 7.5 kg with fuel are limited to a maximum height of 400ft unless authorised by the BMFA.

(f) Checks Before Daily Flying Session

(i) With carbon fibre blades: check blades by twisting opposite ways at each end to ensure there is no delamination. Look down the blades to make sure there are no deformations. Check the root of the blades and leading edge to make sure there is no damage or chips. With wooden blades the same checks apply but pay particular attention to make sure the lead is glued in securely, the root of the blade has sufficient reinforcement, and the covering is in good condition, shrunk tightly and has no loose edges. As wooden blades are generally hand-assembled, be sure that they are balanced both statically and dynamically before use.

- (i) Pull main blade grips in and out to ensure there is no play.
- (iii) Lift the head up and down to ensure there is no main shaft up and down play.
- (iv) Check blade grip arms in case they are loose. Tighten if necessary with loctite.
- (v) Check all ball links from top of the head to servos for excessive play. Change as necessary.
- (vi) Make sure there are no missing bolts or screws in the servos.
- (vii) Gently rotate the servo arms to make sure there are no notches in the gears.
- (viii) Make sure there is no slop in the ball links on the tail push rod.
- (ix) If there are any ball links anywhere else, check for excessive play and change as necessary
- (x) Check that the boom and boom supports (if applicable) check they are securely fixed.
- (xi) Check the tail blades as per the main blades.
- (xii) Holding the tail blade grip, pull in and out to make sure there is no play.
- (xiii) Check the tail fin is mounted properly and look over the whole tail to make sure all bolts are in place.
- (xiv) If your helicopter has tail gears: check all of them to make sure all the teeth are there and there is no substantial wear/damage. Make sure the drive shaft is engaged properly and there is no excessive back lash. Adjust or replace as necessary.
- (xv) If your helicopter has a tail belt drive: check all the teeth are in good condition and make sure the belt is tensioned correctly and all pulley screws are tight.

Checking motor primary drive (electric or i.c.)...

(xvi) With primary drive gears make sure that the back lash between the gear and motor pinion is adjusted correctly (if adjustable).

(xvii) If your helicopter has a belt primary drive, make sure the teeth of the belt are in good condition and that the belt is tensioned correctly. For electric helicopters, rotate the motor to make sure the bearings are in good condition and not rough and make sure that the motor is mounted correctly.

Make sure the wires from the motor going to the ESC are plugged in correctly and aren't rubbing anywhere.

(xvii) On your ESC (Electric Speed Controller) make sure that it is mounted securely, check the wires for any damage and the battery connectors for any corrosion / burn marks and replace as necessary.

(xviii) **Extra checks for i.c. engine.** Make sure the clutch rotates freely when rotating the main gear (without engine running). Ensure the motor is mounted firmly and correctly. Make sure the silencer is not loose and is mounted correctly. Ensure all fuel tubing is in good condition and change as necessary. (Fuel tubing becomes loose on its connections and can deteriorate and break up as it ages). Pay particular attention to the clunk fuel tubing inside the tank. Check fuel tank is in good condition and is not leaking.

(xix) Check all the wiring as a whole. make sure it is all plugged in properly and that none of the wires are rubbing anywhere.

(xx) Check the gyro / flybarless unit is mounted correctly and securely and where appropriate, make sure the aerals are in the correct position and have not sustained any damage.

(xxi) Check that the undercarriage is securely fixed and have a general inspection over the whole airframe for any loose fittings or bolts. Tighten and loctite as necessary.

(xxii) Carry out a range check if any changes or re-installation of equipment have taken place since the last session or if a history of range problems exists..

(xxiii) Perform a failsafe check.

How to check your failsafe is set correctly on an electric helicopter:

Prior to the failsafe test, make sure your transmitter is set to shut the motor off when the radio signal is lost as per your transmitter's instructions. Remove rotor blades, both main & tail or alternatively disengage the motor drive to the main gear. Initiate spool up of the motor making sure you are not too close or have any loose items of clothing that can get caught up in the mechanics. Switch off your transmitter and motor will now shut down if the failsafe is set correctly.

How to check your failsafe is set correctly on an i.c. helicopter:

Checking failsafe on an i.c. helicopter is much easier as you do not need to remove the rotor blades and can check the failsafe without the motor running. Prior to the failsafe test, make sure your transmitter is set to shut the motor off when the radio signal is lost as per your transmitter's instructions. Take a note of the idle position of the throttle on the engine. Put your transmitter to full throttle, switch off the transmitter and make sure the throttle returns to minimum idle or engine off position. Remember: THIS IS DONE WITHOUT THE ENGINE RUNNING.

(g) Checks Before Each Flight

- (i) If a helicopter suffers damage or a heavy landing, recheck all of (f) above.
- (ii) Check all controls before starting especially for binding of links or slowing of servos.
- (iii) Re-check controls are performing as expected prior to lift off.
- (iv) Check for vibration and eliminate before flight.
- (v) Check main rotor blades for true tracking in hovering flight.
- (vi) Check that the receiver aerial cannot become entangled with any moving or rotating part.

- (vii) Double check that all switches are in their correct positions before **EVERY** flight.
- (viii) Check that the gyro systems are responding in the correct direction (tail rotor and swashplate for flybarless models).
- (ix) Check receiver and transmitter batteries have sufficient capacity for the flight plus a safety margin.
- (x) i.c. model – make sure you have refuelled the model before flight.

For more information on the Association of Helicopter Aerosports, contact the BMFA's Leicester office.

(h) **Helicopter Rotor Blade Safety**

Wooden rotor blades- although they are not as common as they used to be, are still in use particularly for scale applications.

Rotor blade failures have five basic causes:

- (i) Most design and manufacturing faults seen are centred around the rotor fixing hole. Typical faults are the hole being drilled on the junction between two wood laminations and incorrect wood selection leading to the hole being drilled in a soft lamination.

Blades with this type of fault should not be used. Even root reinforcement may not stop a failure.

- (ii) Incorrect user assembly is commonly found in root reinforcements and in blades which have to have tip weight of some description added. In all cases you should take the greatest care that any components added are fitted correctly and with suitable adhesive. Incorrect glue joints and badly applied reinforcing components are probably the biggest single cause of blade failure so it is very important that you take the greatest care with any assembly work you have to carry out.
- (iii) Do not be tempted to undertake any repairs to damaged rotor blades.
- (iv) Any ground strike or boom strike will almost certainly cause damage to rotor blades and in many cases this may go unnoticed under the blade covering. If in doubt, have no hesitation in stripping off the covering for inspection. Re-covering and re-balancing the blades is a small price to pay for peace of mind.
- (v) Ageing of glue joints in wooden structures is common and the high stresses inherent in rotor blade operation mean that you should keep a close eye open for delamination in wooden blades. A problem sometimes seen in composite blades is heat damage. Blades left in a car on a hot day can suffer from softening of the resin and this, combined with an expansion of the foam filler, can make the blades unsafe. To summarise, keep a close eye on your rotor blades and do not hesitate to discard them if you are at all concerned over their condition.

(i) **Composite Rotor Blades**

Modern production carbon / Kevlar / fibre glass blades are generally manufactured to a high standard and come pre-balanced as a matched pair or set; it is therefore possible to use them straight from the box. Caution should be exercised on pairing blades which have not been made as a set / pair ie two crashed pairs with one good blade from each pair. It is possible to do this provided the blades are of the same type / size & are balanced statically and dynamically.

Checks to make on Composite blades: check blades by twisting opposite ways at each end to ensure there is no delamination. Look down the blades to make sure there are no deformations. Check the root of the blades and leading edge to make sure there is no damage or chips.

(j) **Metal Rotor Blades**

The BMFA has agreed with the CAA that the use of good quality hollow extrusion metal rotor blades

may be permitted on non-aerobatic models over 7.5Kg. Blades must be monitored for condition and withdrawn from use should there be any damage which would compromise their structural integrity.

14.4 Multi-Rotors

Advances in modern electronics has lead to the development of a wide variety of multi-rotor aircraft of various shapes and sizes, with varying levels of autonomous abilities. However, it must be stressed that a pilot should not simply rely entirely on electronic autonomy alone for flight. If using autonomous modes, the pilot **MUST** be able to take back manual control of the aircraft at any time. It is **VITAL** that the pilot of any multi-rotor is aware of the abilities of their aircraft and knows what flight functions are available, how they affect the aircraft and how to operate them. The pilot **MUST** also be able to identify what mode the aircraft is in at any given time. This may be done by a visual indicator on the aircraft such as a beacon LED or via the transmitter switch positions or screen. Please remember that multi-rotors may not be flown in excess of 400ft above ground level at the launch point.

- (a) Electric multirotors should be carried out from the pits area with the flight battery disconnected and it should only be connected in a safe area. The model **MUST** be considered to be live as soon as the battery is connected. As the position of multiple propellers is generally facing straight up at the pilot during arming, great care is needed during this procedure. It is worth remembering that electric models have the potential to go to full power the moment they are armed.
- (b) Propeller orientation and motor direction is **VITAL** for multirotors and special care should be taken to ensure that everything is correct prior to attempting any flight. While adjusting the settings on a multirotor or during programming, propellers **MUST** be removed to prevent any accidental losses of control.
- (c) Unlike fixed wing aircraft or helicopters that can glide or auto rotate after a power failure, a multi-rotor that loses a propeller, or suffers motor or esc failure in flight can become dramatically unstable with a total loss of control. Aircraft with six or more propellers may have an increased level of redundancy against total loss failures.
- (d) Compared to most other model aircraft, where the electronics are enclosed within an airframe, multi-rotors tend to have exposed components. Therefore care should be taken to ensure they are kept free of debris and that all wiring is securely routed and not in a position to be damaged by or entangled with any moving parts.
- (e) Multi-rotors require 3-axis gyros for stabilisation to enable flight and these are sensitive to vibration, so care should be taken to ensure all propellers are balanced and that correct anti-vibration materials are used where necessary.
- (f) If you are intending to use your multi-rotor for FPV flying, then the relevant section of this guidebook **MUST** also be given careful review. Importantly, attention should be paid to the frequency that the pilot intends to use for their FPV equipment. The pilot must comply with any local video frequency control system, where applicable. In addition they should understand that switching their FPV equipment on while other pilots are flying FPV could result in a pilot losing video signal, so they should check that the frequency/channel they intend to use is clear before switching on.
- (g) If you are intending to use your multi-rotor to carry a camera, then it is **VITAL** to understand the additional CAA regulations from article 95 (formerly article 167) of the Air Navigation Order.
- (h) Many modern cameras have wireless connection options such as WIFI or Bluetooth, this may need to be switched off to avoid potential interference with the radio control signal.
- (i) If using GPS on a multi-rotor it is **VITAL** that the system be given time to accurately locate the aircraft's position before attempting to fly, taking off before a full GPS lock is achieved may result in an uncontrolled fly away. Where appropriate, a pilot **MUST** also understand when and how to calibrate the aircraft's compass in line with the manufacturer's guidelines in order to ensure accurate control of the aircraft is maintained.

(j) Intelligent Failsafes – In order to use intelligent fail safe modes, the aircraft will need, as a minimum, to be fitted with a control board capable of self levelling, with the more advanced options also requiring GPS to be fitted. If the aircraft is not capable of intelligent fail-safe, then the fail-safe mode should be set to reduce throttle idle/off as a minimum.

(i) Loiter – In this mode the aircraft will attempt to stay in a fixed position and maintain altitude upon loss of radio signal. It is intended that the pilot will then have the chance to get closer to the aircraft in order to regain control. It is not advisable to use this mode without GPS, as the aircraft can drift away with the wind.

(ii) Controlled descent – Aircraft that can self-level may have the option to set the throttle to a soft point, such as to induce a smooth controlled descent on loss of signal.

(iii) Return to home – Aircraft capable of storing a take off point while using GPS may be set to return to their take off point and land autonomously upon loss of signal. It is important to note that in this mode the aircraft will typically fly a straight line from its current location to the take off point, so careful consideration should be given when flying near obstacles such as trees or buildings, which potentially may obstruct the return path. It is often possible to set the aircraft to climb to a 'safe' height, before returning. If 'return to home' is to be used, careful consideration should also be given to the location for the take off point, as the GPS modules may only be as accurate as 5 -10m from the original take off point.

(k) Checks before daily flying session:

(i) Check the propellers for damage and correct orientation, as well as ensuring that they are securely fixed to the motors or blade grips. This check should also include a careful examination of the propeller for any signs of stress, which is typically indicated by a 'whitening' of the plastic. This often occurs close to the hub and propellers showing any such damage should be discarded.

(ii) Check for loose or missing nuts and bolts

(iii) Check the motors for any signs of damage or debris

(iv) Check the airframe for any damage and ensure all components are secure.

(v) Check that the rotor arms are secure, especially in the case of collapsible/folding airframes.

(vi) Check all wiring is secure and routed safely to avoid snagging on any moving components.

(vii) Check that any gyro or flight controller is secure and that all aerials (including GPS) are secure and orientated correctly.

(viii) Check that the battery is secure and capable of supplying enough power for the duration of any autonomous flight stages planned.

(ix) Check that all aerials are securely attached, free from any damage or chafing and are orientated correctly.

(x) Ensure all transmitter switches are in the correct position for flight prior to initial arming.

(xi) Confirm the integrity/reliability of any FPV link, if appropriate.

(xii) If appropriate, check there is no backlash in the drive system apart from gear backlash, which should not be excessive.

(l) Checks before and after each flight.

(i) If the multi-rotor suffers damage or a heavy landing, recheck all of (k) above.

(ii) Check all controls before starting especially for binding of links or slowing of servos.

(iii) Check for vibration and eliminate before flight.

(iv) Check that all wiring is secure and cannot become entangled with any moving or rotating part, especially the receiver aerial.

(v) Before starting insure all switches are in the correct position for takeoff and the correct flight mode selected before EVERY flight.

(vi) If planning to use GPS at any point during the flight, confirm that you have a suitable lock

before taking off. (Method for this will vary from unit to unit, but is typically by way of a flashing indication LED)

- (vii) Check receiver and transmitter batteries have sufficient capacity for the flight plus a safety margin before the flight.

(m) Flight Modes

- (i) Manual** – The simplest of modes, the aircraft is still stabilised by the gyros, but only to enable flight. The aircraft will not self-level or fly autonomously in any way and can be rolled inverted.
- (ii) Self levelling** – More a feature than a full mode and can be used in conjunction with manual mode. The aircraft may still be manually inverted by rolling for example, however releasing the sticks will result in the aircraft automatically returning to an upright level position.
- (iii) Atti** – Sometimes referred to as ‘stabilised’. In this mode the aircraft cannot be rolled inverted, instead a full push and hold of the aileron or elevator stick will only result in the craft tilting to a set angle of approximately 30 degrees. Releasing the sticks to centre will see the aircraft self level to horizontal, however it will drift with the wind. This is often mistaken for manual mode, which it is not.
- (iv) GPS** – Sometimes called ‘position hold’. In this mode a GPS module is connected to the main controller and allows for additional autonomous aircraft control functions, such as ‘way point programming’ or ‘return to home’. Typically an aircraft flying in GPS mode will behave the same as one in ‘Atti mode’, however when the sticks are released the aircraft will no longer drift with the wind, but attempt to stay in one location.
- (v) Geo-Fencing** – Appearing in more and more controllers, geo-fencing is designed to prevent an aircraft flying in restricted areas, such as near a major airport. Pilots may find their aircraft either won’t take off at all, or will stop in the air as if it has reached an invisible wall.
- (vi) IOC** – ‘Intelligent orientation control’ (IOC) has a few different modes, such as ‘point of interest’ or ‘compass heading’. In these modes the basic controls of the aircraft can be changed at the flick of a switch to accomplish specific tasks, such as flying a perfect circle around a fixed point. A pilot should fully understand the different modes available via their chosen control board, how each mode will effect the controls of their craft and how to deactivate them quickly in case of an emergency. On some aircraft these modes cannot be used if the aircraft is within a set distance of the take off location.
- (vii) Hazard avoidance** – Some aircraft are now being fitted with sensors to prevent the aircraft flying in to obstacles, however these must never be relied upon in place of the pilot’s judgement.

14.5 Silent Flight – General

R/C silent flight models generally operate with low wing loading and low drag. Consequently, landing approaches may cover a lot of ground at low level. Check your landing approach path before you launch. Check again before you enter the landing circuit. Remember that people will not hear your model coming so take no chances.

When strong thermal or slope lift is encountered, beware of flying too high. At altitude, lift is often very strong and turbulent. Models fitted with spoilers or ‘crow’ brakes should have little trouble leaving such lift but do not try to dive out of strong lift if these are not fitted. Fly away from the lift and try to find sinking air. In an emergency, full up elevator and full rudder may give the safest descent.

Design considerations mean that many silent flight models are built light. Be sure that the design, construction and materials are adequate for the job.

Silent flight models are often flown at considerable distances from their pilots, therefore make sure that the failsafe is working properly before each session and a high visibility colour scheme can be a great safety factor. Be extra careful when flying at distance and/or height and beware of flying across the sun.

Remember also that both thermal and slope soaring flights can last for exceptionally long times. It is imperative that you ensure that both your receiver and transmitter batteries have sufficient capacity for the flight plus a safety margin.

14.6 Thermal Soaring

- (a) When using a towline, bungee or power winch, locate yourself and your equipment well away from car parking areas and ensure that there is no possibility of launching lines falling on buildings, persons, roads or where they might distress wild, domestic or farm animals. Stay well clear of overhead power lines.
- (b) Launch stresses can be severe. Be sure that wing joiners/attachments are strong enough to cope with the high loads imposed. The use of a 'weak link' of known breaking strain in launch lines is a measure that may safeguard model wing structures and should be considered.
- (c) Bungee (Hi-Start) anchorages must be very secure. Use a screw-in type of fixing and do NOT peg the end down with devices such as old screwdrivers. Consider using guy lines on the stake for extra security and always do so if the stake is in soft earth.
- (d) Electric winches should have an obvious, clearly marked master on/off switch accessible to anyone in an emergency. Shrouded plugs and sockets should always be used and the motor switching should be indirect, i.e. by relay.
- (e) Turn-round pulleys must be very securely staked and braced with guy lines. Remember that the load at the pulley is double that on the line and pulley carrier geometry may produce even more load at the stakes.
- (f) Whether you use winch, bungee or hand tow, make sure that spectators cannot be endangered if the model veers to one side on launch.
- (g) Soaring pilots may tend not to stand together when flying. If this happens on your site then avoid overflying other transmitters at any distance from your own. It is your model that will suffer from interference and it could easily be damaged.
- (h) **Aerotowing** 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 as they may have taken advantage of the CAA scheme which allows site permission to be granted, but check before you fly. In controlled airspace contact the appropriate Air Traffic Control Organisation. Never tow to any height without making sure that you are legal.

14.7 Slope Soaring

- (a) Slope sites are often used by many people other than model flyers. Always ensure that flying is permitted on your selected site. Note that an increasing number of slope sites are being used on an exclusive basis by clubs who may be paying considerable fees for the privilege. Keep away from paths used by ramblers and climbers and make sure that you do not frighten or disturb any animals.
- (b) If the site is regularly used or overflowed by full size gliders or hang gliders, then you should attempt to contact them and arrange shared use of airspace and land. We all have airports participation in common and discussion is better than confrontation. Advice is available from the Association's Leicester office along with details of an agreed code of practice for shared sites.
- (c) If a frequency control system is operating on the site, you **MUST** use it. If no control is operating you must not switch on your radio until you have checked that it is safe to do so.
- (d) To avoid possible interference, pilots should attempt to keep reasonably close together. If this is not possible (i.e. if a pilot does a cross-country flight) then everyone on the slope should be made aware of the fact.

- (e) Be aware of the turbulence immediately behind the apex of the slope. With high wind conditions and/or steep slopes this can be severe. If necessary, land either slightly down-slope or well back in the lee of the hill.
- (f) Specific guidelines for the flying of slope combat, covering models, flying sites and legal requirements, are available from the BMFA Leicester office. These contain important advice and information for the slope combat flyer and should be considered essential reading if you fly this type of model. Be aware, though, that this is a legal activity if carried out on suitable sites and with care taken to avoid the endangering of other people on the slope.

14.8 Electroflight

- (a) The first and most important principle of electric flight ground safety is to understand that the instant you start to plug in the flight battery, the model you are holding may transform itself from a dead airframe into one with its motor running at full revs and all controls moving. No matter how good your other safety checks, you must be prepared for this to happen every single time you start to connect the flight battery.
- (b) Since plugging the flight battery in is nearly always a two-handed job you must give serious thought to how your model will be restrained BEFORE it does something you don't expect. When plugging in the flight battery, positive restraint, either by a helper holding the model or by some other method and staying completely clear of the propeller must always be part of your regular routine.
- (c) Electric motors have very different power and torque characteristics to normal i/c model engines. You must take very great care when setting up their control systems and handling them as an accident, such as the propeller hitting your hand, which would stall a glow engine might just make an electric motor turn harder.
- (d) Developing technology has made it much more acceptable to use battery eliminator systems (BECs) to save the weight of a receiver battery, especially in lightweight installations using two or three small servos. You should not use BEC in an installation where servo battery drain may be high or prolonged, for instance with four or more servos or with standard servos in a thermalling electric glider. Also, many older BEC systems are not as reliable as the modern equipment and in all these cases the use of a separate battery is still considered to be the safer choice. The decision is yours but if you have any doubts then you should use a separate battery. It should be noted that the use of BECs will not invalidate your insurance.
- (e) Always check that motor operation does not interfere with the R/C equipment in the model. Range checks with the motor off and with it on will highlight any problems. Suppression of a brushed motor is a simple task and you should seek the advice of an experienced flyer on the subject.
- (f) All connectors and cables should be robust enough to carry safely the current for the motor/s used. Wiring used for small motors will reduce the power of larger motors and may run dangerously hot. If you change a motor, check that the wiring is adequate for the new one.
- (g) **Batteries**:- Ni-Cd or Ni-Mh fast charge cells and larger Li-Po packs can be discharged at very high currents (up to 100 amps and more). Short circuits, faulty wire insulation or loose contacts can result in very considerable heat generation and may cause fires.
- (h) The standard two pin polarised connectors supplied with many 'buggy' type battery packs are only suitable for small to medium current draw as they can offer significant resistance at times and have been known to overheat badly. There are other specialist connectors, especially the readily available gold plated 'bullet' connectors (available in various sizes from 2mm upwards), which are much better as they offer very low resistance and are designed to carry high currents.
- (i) Always ensure that flight batteries are securely fixed and that they cannot move in flight.
- (j) Many speed controllers have a specific 'arming' sequence, which is a pre-programmed sequence of actions that have to be followed before the motor will respond to throttle stick movements. For instance, after switching on the transmitter and receiver and then plugging in the main flight battery, one type of controller requires that you move the throttle stick from low to full throttle and then back

to low before the motor is 'armed' and ready for flight. You must be fully familiar with the system fitted to your model.

- (k) You must pay particular attention to the 'throttle to low – transmitter on – receiver on' sequence and be aware that the model you are holding will be 'live' as soon as you start to plug in the flight battery, no matter what controller arming sequence you may then have to go through.
- (l) The setting of the failsafe to, as a minimum, reduce the engine(s) speed to idle, obviously applies to all electric models too. However, given the ability to re-start the motor(s) at will, it makes sense to have the failsafe cut the motor(s) completely. This will give you the desired 'minimum power' situation and will avoid you having to decide on what idle speed you might need to set.

14.9 Control Line

Control line model aircraft are physically constrained and therefore exempted from the requirements of CAP 722, including Operator Registration and Remote Pilot Competency, provided that:

- The length of the tether line(s) does not exceed 25m
- The MTOM is less than 1Kg
- The aircraft is not capable of vertical take-off/landing or hovering (such as helicopters or multi rotors).

In addition, our Article 16 Authorisation exempts Remote Pilots of control line aircraft from the competency requirements altogether, though they will still be required to register as an Operator if their aircraft has an MTOM greater than 1Kg.

Control line aircraft may be operated within an aerodrome Flight Restriction Zone (FRZ) without permission, provided that:

- The length of the tether line is less than 25m
- The flight does not take place within the Runway Protection Zone
- The MTOM is less than 7.5Kg
- The flight does not take place over or within the boundary of the protected aerodrome, unless permission has been obtained (in accordance with Article 94A of the ANO).

Additional considerations for safe operation include:

- (a) Always use steel lines of sufficient strength for the type of model you are flying. Where possible, stranded lines should be used when flying over grass or when the model is going to be manoeuvred.
- (b) If swivels are used between the control handle and the lines they must be of substantial construction. Do not use the thin bent wire type.
- (c) Before each flying session and after any heavy landing, the model should be subjected to a pull test of at least 10 times the model's weight.
- (d) Before every flight check the lines and linkages thoroughly. If any damage is found, **DO NOT FLY** until it has been rectified and re-tested to your satisfaction.
- (e) Ensure that there are no spectators near to the circle before you release the model.
- (f) Do not fly near **ANY** overhead cables. Even the low level distribution cables on wooden posts carry lethal voltages which can 'jump' many metres to your control lines. **KEEP WELL AWAY.**
- (g) Control lines make good lightning conductors. Do not fly in thundery weather.
- (h) Whenever high pulls are expected, use a safety strap connecting the handle to your wrist.
- (i) Never release the control handle when the model is flying.
- (j) Encourage spectators to stand upwind of the circle.

- (k) Always mark a centre spot for your circle, ensuring that adjacent circles are not too close to each other.
- (l) Always stay on the centre spot when flying.
- (m) If someone strays into the circle whilst you are flying, fly high to avoid them and stay high until the circle has been cleared.
- (n) Always 'ditch' your model rather than hitting someone.

14.10 Free Flight

Our Article 16 Authorisation defines free flight as:

A free flight model aircraft cannot be remotely piloted and does not have software or systems for autonomous control of the flight path. A flight termination device may be fitted. The aircraft trim is adjusted prior to flight. The aircraft is trimmed (and fuelled if applicable) with the intent that it will follow a substantially circular path relative to the air and ultimately glide to a low velocity landing. A free-flight unmanned aircraft will drift relative to the user depending upon the speed and direction of the wind. The person in charge of the free-flight unmanned aircraft is deemed to be the remote pilot for the purposes of this authorisation.

- (a) Prior to launching their aircraft, the remote pilot should take into account the expected performance of the aircraft, the weather conditions and the availability of any flight termination device and must be reasonably satisfied that the expected flight path will not infringe an FRZ (unless prior permission has been obtained) or other airspace restriction.
- (b) The operation of a free flight model aircraft must only be carried out within the limits of our Authorisation (or alternatively within the requirements of the Open Category, especially for those aircraft with an MTOM of less than 250g).
- (c) A free flight model should not be deliberately flown beyond visual line of sight.
- (d) A free flight model aircraft must only be launched:
 - From an area free from uninvolved persons (Uninvolved persons are those who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator).
 - When the remote pilot has identified an area (the 'flight volume') within which they believe the aircraft will remain.
 - When the remote pilot is reasonably satisfied that the aircraft will remain within the flight volume.
 - When the remote pilot is reasonably satisfied at the point of launch that no uninvolved persons will enter the flight volume and be endangered.
- (e) Always launch models, particularly powered ones, well away from and downwind of any spectators or vehicles.
- (f) When a fuse type dethermaliser is used, always use a snuffer tube.
- (g) Check flying surface alignment and, if your model employs them, the dethermaliser and any automatic systems fitted thoroughly before launching.
- (h) All glider launches should be undertaken with the towline detached from the hand winch.
- (i) The use of radio dethermalisers (RDT) in free flight models is positively encouraged. Having control of when the model is DT'd provides the benefits of bringing the model down away from trees, buildings and other hazards. It also helps to keep the model within the confines of the flying site.

14.11 Indoor Free flight

- (a) Free flight aircraft operated indoors or in a location in which there is no possibility of it escaping into the 'outside' airspace are physically constrained and therefore outside the scope of our Article 16 Authorisation or CAP722.
- (b) Take care when launching that no one is standing in the flight path of the model.
- (c) If your model hangs up at height, take great care when retrieving. If you have to climb to get the model, use ladders and get someone to hold them steady. Do not over-reach, take foolish risks or take on tasks that are beyond your ability. If you are flying in the larger sites such as the Cardington airship sheds, professional help is usually available and should be used.

14.12 Indoor Radio Control

- (a) Radio control aircraft operated indoors or in a location in which there is no possibility of it escaping into the 'outside' airspace are physically constrained and therefore outside the scope of our Article 16 Authorisation or CAP722.
- (b) Many of the precautions for outdoor R/C club flying can be used to ensure safety.
- (c) It is not advisable, except under exceptional circumstances, to have free flight and radio control flying at the same time.
- (d) Active transmitter control should be in operation throughout the meeting and at larger events a transmitter pound should be used.
- (e) You should take note that some indoor specification receivers may not have the performance of standard receivers and should be prepared to limit the available frequencies to 20 kHz spacing for some sets.
- (f) The pits area should usually be situated along the shorter wall next to the door and you should, if possible, use netting to isolate the pits area from the flying. Pilots should stand together in front of the nets.
- (g) A 'duty pilot' should always be on duty to act a flight marshal. This may not be the same person for the whole event but, whoever it is, they must have the authority to ground any persistently unsafe pilots.
- (h) The duty pilot should decide on the number of aircraft to have safely in the air and which direction the circuit to be flown should be.
- (i) A written event briefing sheet should be given to all pilots if staggered arrivals make a pilots briefing impractical.
- (j) The size of the venue will limit the size of model allowed to fly but as a general rule for a larger hall you might consider a maximum weight of 200 grams and a maximum wing loading of 15 grams per square decimetre (just over 7 ounces and 4.5 ounces per square foot).

14.13 Models Between 7.5 kg and 25 kg – General (Large Models)

- (a) Any model aircraft (**that is, either power fixed-wing, glider or helicopter**) with a maximum take-off mass (MTOM) between 7.5 Kg and 25 Kg may be operated within the terms of our Article 16 Authorisation.
- (b) Pilots of large radio control models should be aware that such models may have different operating characteristics to smaller models, several of which may not be initially apparent.

The greater mass and inertia of the large model, its generally more robust (less compliant) structure and the differences in aerodynamic efficiency of larger flight surfaces can mean handling characteristics nearer to full size aircraft than to models. You may be caught out if you are not aware of this.

You may also have visual perception problems caused by the size of the model. This usually takes the form of the aircraft being much further away than you think and can cause positioning problems in flight and danger on landing due to the large 'swept' area on the approach. Be aware of this problem, especially when flying at low level.

- (c) When constructing the model ensure that all parts have adequate strength for the task they perform. Pay special attention to the way in which wing load stresses are transferred between the wing structure and the fuselage. Tailplane members, if detachable, should have a positive lock to their mounting so that they cannot be shed in flight.
- (d) Never use long unsupported control rods to the control surfaces or plastic clevis connectors as control forces will be high. Wherever possible each aileron should have its own servo and the elevator should preferably have two independent servos with either (a) mechanical interconnection so that either can drive the control surface (with reduced movement) should the other fail or (b) each servo should drive one half of the elevator through separate pushrods.
- (e) Pay particular attention to the state of the battery and the switch harness. Ensure that the batteries in both the model and the transmitter have adequate capacity for the flight to be undertaken and are fully charged for each flying session. Don't expect a standard receiver battery pack to cope with the demands of high power servos and large control forces. Loss of battery power is the most frequent cause of system failure. There are commercial battery back-up systems available and circuits have been published for similar systems. These should be seriously considered if overall servo current drain is likely to be very high.
- (f) A radio fail-safe device must be fitted and operational to all models over 7.5 Kg. Remember that the purpose of the device is not to land the model but to prevent it from flying away in the event of radio failure. You should test it regularly as part of your pre-flight checks.
- (h) It is recommended that all 'large model' pilots should hold the BMFA 'B' certificate or a similar qualification (e.g. SAA Silver Wings or LMA Proficiency Test), and should ensure that both adequate third party insurance is operational and that all flights made comply with our Article 16 Authorisation.
- (i) Only operate large models at appropriate sites which allows safe separation distances from uninvolved people to be maintained in accordance with our Article 16 Authorisation.
- (j) Above all always fly sensibly, safely and within your own limits.

14.14 Large Power Fixed Wing

- (a) The fail-safe device fitted must, as a minimum, bring the engine to idle speed.
- (b) Pay particular attention to vibration proofing the airframe. Larger engines may produce high amplitude low frequency vibration unlike that normally associated with model aircraft engines. Ground test the airframe under full power until you are satisfied that nothing will loosen in flight.
- (c) Take No Chances With a Running Engine. The greatest care should be taken when running the engine of a large model. Full-size aviation standards of safety and awareness must be exercised whenever you start, run and adjust the settings of the engine.

14.15 Large Helicopters

- (a) The fail-safe device fitted must, as a minimum, bring the engine to idle speed.
- (b) The greatest attention must be paid to the effects of vibration on the airframe and radio installation. Linkages must be regularly checked and any that are suspect must be renewed.
- (c) Because of the high airframe density and lifting power of modern helicopters, it is very easy to be operating a model weighing over 7.5 kg without being aware of the fact. Pilots are recommended to weigh all helicopters powered by '40' sized engines and above and to make certain that you are complying with any current CAA regulations if necessary.

14.16 Large Gliders – Slope and Thermal

- (a) Considering that the purpose of the fail-safe device fitted is to avoid a flyaway, it is recommended that it should be set with that in mind. Activation of spoilers, crow brakes or even the elevator to full up and the rudder to full left (or right) would be appropriate.
- (b) Many large gliders have scale 'bolt on' wing fixings. Pay strict attention to how the wing load stresses are passed from the wing skins and spars through any such fixings to the fuselage.
- (c) When flying from the slope be sure that you give audible warning to spectators, assistants and other pilots when about to launch or land. Agree a flight pattern to be used along the slope with other pilots or follow local rules. Always turn away from the hill at the end of each pass.
- (d) Do not operate large gliders in the same airspace as other users, e.g. full-size gliders, aircraft, hang gliders etc. (see the earlier section on 'mixed sites').
- (e) Always perform aerobatics well away (not less than 50 metres) from people or property and never, under any circumstances, overhead.
- (f) In accordance with the terms of our Article 16 Authorisation, large gliders over 7.5 Kg (but not exceeding 14 Kg) may not be flown at a height greater than 120m above the remote pilot but may be flown at a height exceeding 120m above the surface directly beneath the glider.

14.17 Models Over 25 kg

Models over 25 kg are subject to the issue of an LMA 'Certificate of Design and Construction' exemption certificate before they may be test flown within the conditions defined in the LMA's Article 16 Authorisation.

Subject to satisfactory completion of the test flights, the LMA will then submit the certificate of design and construction and flight test certificate to the CAA who will issue a full authorisation.

Only the pilots named on the authorisation may fly the aircraft in public and each named pilot is required to complete the flight test schedule on the aircraft separately.

It is extremely important that anyone building or thinking of building a model that may exceed 25 kg liaises with the LMA at the earliest opportunity to ensure that they remain within the law.

14.18 Space Models

NOTE: Article 240 of the ANO 2016 (Endangering Safety of an Aircraft) applies to all rockets: the operator of a model rocket must ensure that it does not endanger a real aircraft. Article 241 also applies: the operator of a model rocket must not endanger any person or property.

- (a) **General** – Only fly on sites that are clear and open with adequate open space downwind of the launch point and in good visibility. No person shall launch a rocket unless he has reasonably satisfied himself that:
 - (i) the flight can be safely made; and
 - (ii) the airspace within which the flight will take place is, and will throughout the flight remain, clear of any obstructions including any aircraft in flight. Models should be constructed of lightweight materials capable of meeting the minimal structural loads expected during flight. The use of metal components should be limited to the absolute minimum necessary to ensure the integrity of the rocket during flight and recovery.
 - (iii) Models should, for the most part, use commercially available factory-produced motors, otherwise non-commercial motors must follow the United Kingdom Rocket Association (UKRA) approved safety code. Only motors that are compliant with all relevant UK legal requirements shall be used. For further information contact either the BMFA or the UKRA.

- (iv) Models should be equipped with a suitable recovery system to ensure a safely retarded descent.
- (v) Motors should be ignited electrically in such a way that the operator is at least five metres from the launch point.

(b) Rockets between 160 newton.seconds ('G' Rating) and 10,240 newton.seconds ('M' Rating).

In addition to the above, article 96 of the ANO 2016 (Rockets) applies to all rockets with motive power exceeding 160 newton.seconds ('G' Rating) and the requirements of the article are summarised below.

No person shall launch a rocket with a motive power that exceeds 160 newton.seconds ('G' rating) unless he has reasonably satisfied himself that:

- (i) the flight can be safely made; and
- (ii) the airspace within which the flight will take place is, and will throughout the flight remain, clear of any obstructions including any aircraft in flight;

And unless:

- (iii) for a flight within controlled airspace, he has obtained the permission of the appropriate air traffic control unit for aircraft flying in that airspace;
- (iv) for a flight within an aerodrome traffic zone he has obtained the permission of the air traffic control unit, the aerodrome flight information service unit at the aerodrome or the air/ground communications service unit as appropriate; and
- (v) for a flight for aerial work purposes the flight is carried out under and in accordance with a permission granted by the CAA.

(c) Rockets over 10,240 newton.seconds ('M' Rating)

Large rockets exceeding 10,240 newton.seconds must not be launched unless in accordance with a permission granted by the CAA. Further details can be obtained from the Airspace Utilisation Section of the CAA (Contact the BMFA for contact details).

BMFA Notes In addition:

- (i) Models must be launched from a stable platform equipped as a minimum with a launch rod for initial guidance and must not be launched at an angle of more than 30° from the vertical.
- (ii) A clearly audible countdown of at least 5 seconds must be given by the launch supervisor. In the event of a misfire, do not approach the model until it is certain that ignition will not occur.
- (iii) Where spectators are present, a Range Safety Officer should be appointed to take responsibility for all flying activity.

(d) Large Scale Rockets, 'H' to 'M' Motors.

Details of the operating and safety procedures for large scale high powered rockets are naturally more extensive and involved than for the lower powered ones.

A comprehensive safety code has been written by UKRA to cover such operations and is published by the BMFA. It is required reading if you are interested in large scale rocketry.

(e) Space Modelling Specialist Bodies

The BMFA Specialist Bodies covering space models are Federation Aeronautique Internationale Rocketry (FAIR) and the United Kingdom Rocketry Association (UKRA). These bodies can be contacted via the BMFA's Leicester office.

14.19 Gas Turbines

A 'Code of Practise for the Operation of Gas Turbines' has been prepared by the Gas Turbine Builders' Association and the Jet Modellers' Association. Anyone intending to build and fly a gas turbine model should obtain and read this document before proceeding, as it covers all the essential safety procedures and additional legal liabilities concerned with this type of model. It is available for download from the BMFA web site (www.bmfa.org) or directly from the Leicester Office.

(a) General

- (i) The operation of gas turbines requires special care and the manufacturer's operating instructions must be understood and closely followed. All pilots and helpers must be fully briefed on the operation of the engine before any starts are attempted.
- (ii) Never run an engine in excess of the manufacturer's recommended power rating. Always follow the manufacturer's recommendations on pipework and fittings, especially with regard to periodic renewal.
- (iii) Take extra care during the engine's initial operating period. Until the unit is proven, do not operate it near people.
- (iv) Pressurised gas fuels, such as Propane, require care in handling; spill dispersal rates can be slow and the gas can 'pool' in hollows or in void areas in fuselages. The liquid can also cause frostbite, if allowed to come into contact with skin.
- (v) Ensure that all fuel is stored in labelled containers fit for the purpose. These containers should be no larger than necessary.
- (vi) Model jet turbine installations may produce significant amounts of RF interference. In particular, fuel pumps, if they use brushed motors, and the turbines themselves, which have been known to produce significant static interference, especially if ceramic bearings have been incorporated. Make sure that you do not install receivers or servos or run aerials near to the engine installation.
- (vii) All gas turbine models are required by the CAA to be fitted with a failsafe. This must, as a minimum, bring the engine to idle in the event of radio interference or failure. The fuel system must be capable of manual shut off via a fuel valve or fuel pump switch.
- (viii) The use of 3D printed rotating parts is not recommended in any gas turbine operated where third parties may be put at risk. Whilst the 3D metal printing technology is advancing fast, the concern is that any contamination in the material used to 3D print a component, may significantly compromise its structural integrity/safety.

(b) Before Starting

- (i) Smoking or naked flames must not be allowed near the engine and the fuelling area.
- (ii) A suitable fire extinguisher (CO₂ or dry powder but not water) should always be present at Start Up and for any period during which the engine is running.
- (iii) The Start Up area should be kept clean and free from any loose items that may get sucked into the fan or turbine.
- (iv) Ideally, the Start Up area should be on a paved surface, but if this is not possible the grass should be short and clear of all loose material.
- (v) Check the integrity of any compressed air hoses, clips etc, prior to turning on the air. Manufacturer's instructions should always be followed, particularly those relating to safety.
- (vi) Gas fuelled models must never be left in the pits area fuelled up. Once fuelled up they should be moved directly to the designated start-up area.

(c) **Starting**

- (i) The engine should normally be started facing into wind but make sure that it is not pointed at people or the pits area. The effect of the jet blast must always be kept to the absolute minimum.
- (ii) Beware of 'wet' starts with liquid fuels.
- (iii) After starting the engine, wherever possible, check the oil flow to the bearings and the exhaust gas temperature. You should also keep a constant watch for any new noises or vibration. Any deviation from normal could indicate trouble. Do not run the engine if you are not sure.
- (iv) Whenever possible a reliable helper should assist with the start. The helper should be close by and fully briefed on the operation of the engine. The helper should ensure that you are not distracted during the start sequence.
- (v) Models must be physically restrained during start up. The use of wheel brakes alone is not sufficient.

(d) **Shutdown**

After every flight ensure that the engine is fully shut down, the fuel shut-off has been operated and that any hatches are opened to assist engine cooling.

(e) **Turbine Model Flight Safety Information:**

- (i) Adverse runway conditions can have an adverse effect on the aircraft's performance on take-off. E.g. wet or long grass will significantly increase take-off distance.
- (ii) The rate of climb at take-off weight may be significantly less than that of a propeller driven model aircraft. Care must be exercised to ensure safe clearance of any obstacles immediately after take-off.
- (iii) The lack of "prop wash" over the control surfaces of a jet propelled model aircraft will result in less control surface effect particularly at low speed.

14.20 First Person View R/C

Our Article 16 Authorisation defines first person view aircraft as follows:

In First Person View operations the remote pilot flies the aircraft using images provided by cameras aboard the aircraft. When flying FPV the remote pilot cannot monitor the flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions to the same extent as a remote pilot maintaining external direct, unaided visual contact with the aircraft.

Our Article 16 Authorisation incorporates the terms of our previous FPV exemption, but also includes specific provision for FPV 'drone racing' which the BMFA had been discussing with the CAA for some time.

(a) FPV Drone Racing

A model aircraft may be flown by a remote pilot using first person view subject to the terms of our Authorisation and provided that the aircraft is operated:

- Within a sterile area – meaning a cordoned off, closed area that uninvolved persons are excluded from. (Uninvolved persons are those who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator).
- The aircraft is not flown in excess of 160ft (50m) above the surface.
- In accordance with procedures set out for the purpose of the event and in accordance with the instructions of the race director or other nominated person, including provision of a 'terminate race and land immediately instruction.
- Any observers are suitably briefed and aware of their responsibilities, including the monitoring of people or aircraft entering the sterile area.

Individual remote pilots do not require their own 'competent' observer when operating under this provision.

Further detailed guidance on the rules and requirements for FPV Drone Racing can be found in the BDRA rules (<https://bdra.uk/rules/>) and the FAI Sporting Code, Section 4, Volume F9 – Dronesport. BMFA variations to the FAI rules can be found in Section 5 of the BMFA Contest Rule Book.

(b) General FPV Flying

A model aircraft may be flown by a remote pilot using first person view subject to the terms of our Authorisation and provided that:

- The remote pilot is accompanied by a competent observer who maintains direct unaided visual contact with the unmanned aircraft 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 remote pilot accordingly.
- The MTOM of the aircraft does not exceed 3.5Kg.
- The aircraft is only operated in the areas defined in the 'Where can I fly' section (8.3.7).
- The aircraft is only operated in accordance with the 'Separation Distances from Uninvolved Persons' defined in section (8.3.9). (Uninvolved persons are those who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator).

And the aircraft is not flown:

- Within an aerodrome FRZ, unless appropriate permission has been obtained.
- At a height of more than 1000ft above the surface, unless it is a rotorcraft with more than 1 lift generating rotor or propeller in which case the height shall not exceed 400ft above the surface.
- Over or within 150m of any assemblies of people (Assemblies of people are gatherings where persons are unable to move away due to the density of the people present).
- Within 50m of any vessel, vehicle or structure which is not under the control of the remote pilot.

14.21 Round the Pole Flying

A round-the-pole model aircraft is an unmanned aircraft that is tethered to a fixed point by one or more lines so that its flight is constrained to the surface of a hemisphere around a central pylon/tether point with a radius equal to the length of the lines (which generally also carry the electricity to power the aircraft).

Because they are physically constrained, they are therefore outside the scope of our Article 16 Authorisation or CAP722.

Unlike control line aircraft, the remote pilot controls the aircraft from outside the operating circle with control often limited to throttle control.

Most RTP flying is conducted indoors with lines not generally exceeding 6 metres. It is therefore outside the scope of regulation.

In the unlikely event that an aircraft exceeding 1Kg were to be operated outdoors, then the Operator would be required to register with the CAA.

The remote pilot should ensure that the flying area is free from spectators and/or other obstacles prior to commencing their flight

15. MODEL FLYING DISPLAYS

If you or your club intend to hold a public model flying display it is essential that you obtain the BMFA Model Flying Display Handbook (Appendix A to the Members' Handbook) and apply to the BMFA for a Display Permit (as a condition of our Article 16 Authorisation).

Full details of the proposed display (and a copy of the risk assessment and other supporting documentation) must be submitted to the BMFA to obtain a BMFA Display Permit (the CAA no longer issue permissions for model flying displays and have delegated the responsibility to the BMFA). Applications may be submitted via the BMFA website (<https://rcc.bmfa.uk/>) or the Leicester Office.

Display feature aircraft with MTOM's greater than 25Kg will also require a LMA Display Permit too.

Guidance and templates for conducting a risk assessment are also available at <https://rcc.bmfa.uk/>.

16. MANDATORY OCCURRENCE REPORTING

Our Article 16 Authorisation includes the requirement to report certain accidents, serious incidents and other occurrences. This is based on pre-existing legal requirements previously included in the BMFA Members Handbook and CAP 658. However, the CAA are wanting to reinforce the requirements (full details can be found in CAP 722, Section 2.9).

Occurrence reporting systems are not established to attribute blame or liability, they are established to learn from occurrences, improve aviation safety and prevent recurrence.

The purpose of occurrence reporting is to improve aviation safety by ensuring that relevant safety information is reported, collected, stored, protected, exchanged, disseminated and analysed. Organisations and individuals with a good air safety culture will report effectively and consistently. Every occurrence report is an opportunity to identify root causes and prevent them contributing to accidents where people are harmed.

The CAA state that:

“The safe operation of a model aircraft is as important as that of manned aircraft, and third-party injury and damage to property can be just as severe when caused by either type of aircraft.

Proper investigation of each accident, serious incident or other occurrence is necessary in order to identify causal factors and to prevent repetition.

Similarly, the sharing of safety related information is critical in reducing the number of occurrences”.

The AAIB state that:

“Any accident involving fatal or serious injury will be investigated.

Accidents/serious incidents involving aircraft operating under an approval or CAA Authorisation (including an Article 16 authorisation) will be assessed to determine the AAIB’s response and level of investigation. This could range from a full “field” investigation in the worst case down to, at the lowest level, just recording the details of the event on our database and taking no further action”.

Therefore, it is a condition of our Article 16 Authorisation that correct reporting to the AAIB and the CAA must be carried out. In addition, if the occurrence involves injury to a third party or damage to their property, then it must also be reported to our insurers to notify them in case a claim arises.

The definition of what constitutes an OCCURRENCE should be considered to determine whether a report must be submitted:

An **OCCURRENCE** is any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person. **ACCIDENTS** and **SERIOUS INCIDENTS** are classifications of **OCCURRENCE**.

16.1 Mandatory reporting to the Air Accident Investigation Branch (AAIB) and CAA

The following **OCCURRENCES** must by law be reported to the AAIB as soon as possible by telephone on 01252 512299 (manned 24 hours/day) and to the CAA (this can be done via the BMFA's online reporting portal - see <https://reporting.bmfa.uk>).

- **ACCIDENTS** - defined as an occurrence which takes place between the time the aircraft is about to take off until it comes to rest at the end of the flight with its propulsion system shut down, in which
 - a person is fatally or seriously injured;
A serious injury is defined as an injury which is sustained by a person in an accident and which involves one of the following:
 - a. hospitalisation for more than 48 hours, commencing within 7 days from the date the injury was received;
 - b. a fracture of any bone (except simple fractures of fingers, toes, or nose);
 - c. lacerations which cause severe haemorrhage, nerve, muscle or tendon damage;
 - d. injury to any internal organ;
 - e. second- or third-degree burns, or any burns affecting more than 5 % of the body surface;
 - f. verified exposure to infectious substances or harmful radiation.
 - the aircraft sustains damage or structural failure in operation which results (or may result) in endangering;
 - the aircraft goes missing or becomes completely inaccessible in manner which could result in endangering;
- **SERIOUS INCIDENTS** – defined as an occurrence where there was a high probability of an **ACCIDENT** associated with the operation of the aircraft.

16.2 Mandatory reporting to the CAA

In addition to **ACCIDENTS** and **SERIOUS INCIDENTS**, it is a legal requirement to report any OCCURRENCES involving manned aircraft to the CAA (this can be done via the BMFA's online reporting portal see <https://reporting.bmfa.uk>).

Our Article 16 Authorisation also adds the requirement to report to the CAA any **SERIOUS INCIDENTS** or other **OCCURRENCES** which involve;

- Operating above 400ft
- Operating less than 50m from uninvolved people
- Operations at a 'model aircraft flying display'.

It is also a requirement to report any instances of flights which go beyond the visual line of sight of the remote pilot.

16.3 General

First of all, you should bear in mind that any reportable incident might well trigger an inquiry, run by the Air Accident Investigation Branch (AAIB).

The possibility of a future inquiry will usually depend on the severity or potential severity of the incident and your actions regarding collection of evidence, etc. should be with this in mind.

A fatal accident is certain to result in such an inquiry.

Previously, all such inquiries conducted by the AAIB have involved the BMFA, so there is an assurance that an experienced modeller will be involved and not someone who is unfamiliar with model operations.

16.4 General Flying

In the event of an accident involving a model aircraft which causes injury to a third party, those present on the flying field will have to decide very quickly on their course of action.

In the case of a fatal incident or serious injury, there is no doubt that the first course of action will be to alert the emergency services, e.g. ambulance and police. The AAIB must also be notified by telephone on 01252 512299.

The model, radio equipment and any other items involved should not be moved or even touched, if possible. If any transmitters operating during the incident are switched off later this should be noted.

All other transmitters, the pegboard and the pits area should be left untouched until full details have been recorded.

Photographs of the area will be extremely useful and, if a camera is not available, mobile phone pictures will do; as many as possible.

Names and addresses should be taken of all those present and no one should be allowed to leave the field until a police presence has been established.

When operating on a club field, if there are no Committee members on the field then, at some point, Committee officers must be contacted. This should obviously be done as soon as possible but Club members on the field should not wait for a Committee presence to take care of the steps outlined above, many of which need to be done quickly.

For any incident that has not resulted in a fatality but is still serious, a police presence will probably not be required and the level of evidence collection may be reduced but you should always remember that an inquiry might be held into the incident.

Plenty of photographs of the scene, possibly impounding the model and radio equipment, names and addresses of witnesses and notes taken at the time will all be extremely helpful if you consider that you may be involved in an inquiry. It will also help in any insurance related queries that might arise.

16.5 Contact Details

The BMFA maintains a list of contacts who are authorised to act on behalf of the Association on notification of an accident or serious incident occurring.

Accident reporting to the AAIB is on 01252 512299.

16.6 Public Events (Displays or Competitions)

These events have more stringent requirements details of which are in the Display Organisers Handbook downloadable from the BMFA web site or direct from the Leicester Office.

Do not be complacent about this matter. Any incident, serious or potentially serious, that occurs in front of the public will almost certainly be reported to the press, probably before the dust has settled, and the press will almost certainly contact either the AAIB, CAA or the BMFA for comment.

Consider the consequences of a telephone call from the press to the AAIB or CAA on a Monday morning asking for details of the 'model aeroplane crash' that turns out to be a serious one and neither the AAIB, CAA or the BMFA has any knowledge of it!

17. THE RADIO CONTROL ACHIEVEMENT SCHEME

17.1 Introduction

The RC Achievement Scheme is run by the BMFA as a National Scheme and it is open to all RC model flyers, including non-members. The scheme provides tests at various levels, across a wide range of disciplines, including power fixed wing, helicopter, multi-rotor, camera drones and silent flight thermal, slope and electric.

The aim of the Scheme is to encourage RC model flyers to improve their standard of flying and safety, and to prove that standard to an Examiner.

It is important to appreciate that the scheme is not about permitting or licensing. Fundamentally, the scheme is all about personal goals and challenges. It is intended to provide every RC flyer with something to aspire to and aim for, should they so wish. The scheme is not compulsory!

17.2 Scheme Control

The scheme is administered nationally by power and silent flight Scheme Controllers, although these roles may be combined in a single Scheme Controller. The Achievement Scheme Review Committee (ASRC) has ownership of all Achievement Scheme materials, which are reviewed on an annual basis.

BMFA Areas control and co-ordinate the activities of all Area Chief Examiners and Instructors, within their Area. Individual clubs administer their Club Examiners and Instructors.

17.3 Qualifications

The scheme provides proficiency certification and achievement awards at Basic Proficiency (BPC) and 'A' certificate (basic) and 'B' certificate (advanced) levels for a wide variety of disciplines. Specialist 'C' certificate endorsements are also available to 'B' certificate holders.

Full details of the scheme and the wide variety of achievements available are detailed in the dedicated 'Achievement Scheme Handbook', along with information on the various Instructor and Examiner ratings.

This Handbook is available from the Leicester Office or for download from the achievement scheme website at <http://achievements.bmfa.org>.

18. THE BMFA COUNCIL OF MANAGEMENT

Otherwise known as FULL COUNCIL

18.1 Members of Council

The Council comprises the following members:

(a) **Elected Officers:**

Chairman	Vice-Chairman
Honorary Secretary	Honorary Treasurer
Technical Secretary	Records Officer
FAI Delegate	Competition Secretary

These posts are for two years and are directly elected by postal ballot just before the AGM each year. To retain continuity, roughly half of the Elected Officers retire each year but may re-stand if they wish.

(b) **Area Delegates**

One accredited representative from each of the thirteen BMFA geographic Areas plus the RAFMAA, which operates as an Area. Each of these posts is elected by their individual Areas, usually at the Area AGM.

(c) **Co-opted Members**

Up to 9 co-opted additional members as determined by Council. The Council usually co-opts a representative from each of the Technical Committees to fill 6 of the co-options available.

(d) A delegate nominated by the Royal Navy Model Aircraft Association.

(e) A delegate nominated by Council to represent BMFA at the Royal Aero Club.

Additionally, the Royal Aero Club is itself entitled to nominate a delegate to sit on Council. Normally, this post is filled by the same person that is sent as the BMFA delegate to them (see (e) above).

(f) **Visitors**

Any BMFA affiliated club may apply to send an observer to any Council meeting. Application must be made in advance to the Chief Executive who will select two from those applying.

In addition, the Chairman of a meeting may invite whoever he wishes to attend. Standing invitations to Full Council exist for the Hon. Solicitor, the BMFA Newsletter Editor and up to two club representatives

18.2 Dates of Council Meetings

Council usually meets three times per year. Dates of the meetings along with agendas and reports of the previous meeting are carried in the Club Bulletin or they may be obtained from the Leicester office on request.

18.3 Council Sub-Committees

Some of the responsibilities of BMFA Council have been delegated to several Sub-Committees of Council, each of which has its own terms of reference.

The procedures for having items discussed by these Sub-Committees is exactly the same as for the full BMFA Council meetings and, unless the matter is urgent, proposals are allocated to the next most appropriate meeting. Voting rights at these meetings are given to those specified in the terms of reference of the meeting as laid down in the Council Handbook. The Sub-Committees are:

(a) **Areas Council**

Meetings take place three times per year and are attended by all Area Delegates and Area Chairmen, plus representatives of RNMAA. The meeting is Chaired by the Honorary Secretary with the Achievement Scheme Controller as Vice-Chairman.

Its main responsibilities are all Club and Area related business and the Achievement Scheme.

The Achievement Scheme Review Committee is a sub-committee of Areas Council and it advises the Council on all matters concerned with the operation and regulation of the Achievement Scheme.

(b) **Technical Council**

Meetings take place two or three times per year and are attended by delegates from all the Technical Committees. The meeting is Chaired by the Technical Secretary with the Competition Secretary as Vice-Chairman.

Its main responsibilities are all competition and safety matters.

(c) **Executive Committee**

Meetings take place as necessary but at least three times per year. They are attended by the Association's Elected Officers and the Chief Executive and are Chaired by the Association's Chairman.

Its main responsibility is the running of the Association's business affairs.

18.4 Proposals to Council

A great many of the ideas discussed by Council are generated by you, the members and clubs of BMFA, and any member can affect the Association's policies.

This section sets out how you go about having your ideas put forward as proposals or discussion items to a BMFA Council. It is not a difficult process and anyone can have their say on how model flying is run in the UK.

Constitutionally, only Council Members, Area Committees or Technical Committees may place proposals before Council but there are several ways that you as a BMFA member or club can have your point of view put forward.

You can attend your local Area meeting and discuss your ideas there. If you make a good enough case the Area will make the proposal for you and it will be presented to Council by the Area Delegate. On important matters you might be invited to attend the Council meeting but in any case you can apply to be an observer at the meeting through normal channels. Dates and contacts for your Area are available from the Leicester office.

If your ideas are more in line with the work of a Technical Committee, you can approach it directly and ask it to act for you. If the Technical Committee agrees then it will put the proposal forward to Council. Technical Committee contacts are available from the office.

If these two approaches fail, and you are still convinced that your point is valid, you can approach ANY Council member for help. They each have the power as individuals to put proposals forward to Council and will do so if your ideas have merit. Again, contact addresses are available from the office.

Finally, if all else fails, a letter to the Chairman of the Association will sometimes work.

You should be aware, though, that having what you think is a good idea might not be enough to have the idea placed before Council and agreed.

If you read this section carefully you will see that there is a natural filtering process in the system and you will have to convince a number of other people of the worth of your idea before it can progress.

19. THE COMPETITION RULE BOOKS

19.1 BMFA Rule Books

All the following rule books are available as free-of-charge downloads on the BMFA contest website (see <https://contests.bmfa.uk>) or they may be obtained pre-printed from the BMFA Leicester office at a cost of £3.00 per book (books 3 to 7), plus an A5 SAE.

FAI Class rules are now excluded from these rule books, but they do include variations to the FAI rules where implemented in the UK. See below for full FAI rules.

Section 1 & 2 General Regulations and Rules

This section is issued free with sections 3 to 8.

Section 2a Records Rules

This section contains detailed regulations concerning record attempts and it is available free on request.

Section 2b UK Records List

This section contains details of all ratified UK records including the current records and holders and it is available free on request.

Section 3 Free Flight

All Outdoor and Indoor classes.

Section 4 Control Line

Speed and Aerobatics', Team Racing, Combat and Carrier classes

Section 5 Radio Control Power

Aerobatics (GBRCAA and IMAC), Helicopters, Pylon, Waterplanes, Sam 35 Vintage, Fun-Fly and Drone (FPV) Racing.

Section 6 Scale

Free Flight, Control Line, Radio Control, Indoor and Helicopters

Section 7 Radio Control Silent Flight Book 1

Glider and Electroflight classes

Section 8 Space Models

All Classes

19.2 FAI Sporting Code

Each section contains all the FAI rules for the discipline, including FAI Provisional rules.

CIAM General Rules	£4	Volume F3 R/C Helicopters	£5
Records	£4	Volume F3 Pylon	£5
EDIC – Electronic Devices in Competition	£4	Volume F3 R/C Soaring	£5
Volume F1 Free Flight	£5	Volume F4 Scale	£5
Volume F2 Control Line V2 plus Annex 4J	£5	Volume F5 R/C Electric Powered Models	£5
Volume F3 R/C Aerobatics	£5	Volume F7 Aerostats	£5
Volume F3 R/C Drone Racing	£5	Volume S Space	£5
		Buy one discipline and each additional discipline is	£3

20. BMFA NEWS, WEBSITE AND SOCIAL MEDIA

20.1 BMFA News

The BMFA News is published six times a year and is delivered direct to every full member's door. It has the highest circulation of any UK model flying publication and carries articles and photos of general interest, plus news of BMFA activities.

It is also used to inform you of changes to the Achievement Scheme and many other areas of interest in addition to the official announcements that it contains. It will be to your advantage to read each issue carefully.

20.2 BMFA Websites

The main BMFA website at www.bmfa.org is now the major source of up to date information for the BMFA and links to a number of BMFA specialist websites containing in depth information on specific areas of interest. The current sites are as follows:

Main BMFA website	www.bmfa.org
Lawful and Safe Operation	https://rcc.bmfa.uk
BMFA Club Finder	https://bmfa.azolve.com/clubFinder.html
BMFA Achievement Scheme	https://achievements.bmfa.uk
BMFA Club Support	https://clubsupport.bmfa.uk
BMFA Contest Resources	https://contests.bmfa.uk
BMFA Events Calendar	https://events.bmfa.uk
BMFA National Centre	https://nationalcentre.bmfa.org
BMFA Education Program	https://education.bmfa.org
BMFA Trial Flight Finder	https://try-flying.bmfa.uk

The sites are updated on a regular basis and carry an ever-expanding list of the latest versions of many BMFA publications including advice on most aspects of model flying, all the booklets and leaflets mentioned in this Handbook, clublists, contacts, links to clubs, other modelling organisations, commercial sites, one of the busiest 'small ads' sections on the web and the most comprehensive contest and events calendar and results lists in the UK.

There is a facility for members to subscribe to the News feed and they will then get updates e-mailed to them. You will also find links to the Area websites where again you can subscribe to get local updates.

New features are constantly being added to the website so please check it regularly.

20.3 BMFA Facebook Page

The BMFA Facebook page (<https://www.facebook.com/BMFAOfficial>) is updated several times each day and is used to publish BMFA updates as well as items of general interest to our members. It also provides a 'shop window' for our activities and reaches over 2 million people each month.

20.4 BMFA on Instagram

You can also follow the BMFA on Instagram. Please see: (<https://www.instagram.com/britishmodellflyingassociation/>)

20.5 BMFA YouTube Channel

The BMFA has an increasing number of videos available on its YouTube channel, including Achievement Scheme videos and recordings of our 'In the Air Tonight' online seminars and 'Question Time' sessions. You can subscribe at: <https://www.youtube.com/c/BritishModelFlyingAssociation>

21 TAILPIECE

If you have any comments or suggestions for the updates or the next revision, please contact the CEO via the Leicester Office.

David Phipps - BMFA CEO

(with thanks to Andy Sephton, Andy Symons, Julie Fisher, Duncan McClure and Ian Pallister FSMAE)

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