



# BRITISH MODEL FLYING ASSOCIATION

## CONTENTS

Introduction to the Association .....	2	Control Line.....	27
Society of Model Aeronautical Engineers .....	2	Free Flight .....	27
BMFA Areas .....	3	Indoor Free Flight .....	27
FAI Licences .....	5	Indoor Radio Control.....	27
Sports Council Recognition.....	5	Models Between 7 kg and 20 kg .....	28
The Education Initiative .....	5	Power Fixed Wing .....	29
Types of Membership .....	6	Helicopters .....	29
Family Membership.....	6	Gliders, Slope and Thermal .....	29
BMFA Affiliated Clubs .....	6	Models Over 20 kg .....	29
Youth Groups .....	6	Space Models .....	30
Member's Insurance .....	6	Gas Turbines .....	30
Incident Reporting.....	8	BMFA Safety Code for Model Flying Displays .....	31
Personal Accident Scheme.....	8	The Radio Control Achievement Schemes .....	34
Products Liability.....	8	General Information .....	34
Flying on Ministry of Defence Property.....	9	The Fixed Wing A and B Certificates .....	36
Legal Controls over Model Flying .....	9	The Helicopter A and B Certificates .....	38
Advice to Clubs .....	10	Silent Flight Thermal A and B Certificates .....	39
Flying Site Negotiations .....	10	Silent Flight Slope A and B Certificates .....	41
The Children Act and Junior Members.....	10	Silent Flight Electric A and B Certificates.....	42
BMFA Guidelines and Safety Codes .....	12	Administration .....	43
Introduction .....	12	Silent Flight Personal Achievements .....	44
Mixed Sites .....	12	Thermal Soaring .....	44
Military Low Flying .....	13	Slope Soaring .....	45
Guide to the Safe Operation of Model Aircraft .....	13	R/C Fixed Wing Instructor Scheme.....	46
General .....	13	Introduction to the DoE Noise Code .....	47
R/C Flying Site Location .....	14	Department of the Environment Code of Practice	
R/C Power Flying Site Layouts .....	14	for Minimising Noise from Model Aircraft .....	47
Learning to Fly .....	15	Noise Measurement - Fixed Wing.....	51
Radio Control and You .....	15	General Advice on the Noise Test .....	51
Radio Control and Your Club .....	18	Noise Measurement - Helicopters.....	51
Frequency Control at Club Sites.....	18	Noise and Gas Turbines .....	51
Frequency Allocation at Club Sites.....	19	Radio Control Technical Information .....	52
Interference .....	20	Radio Control Frequencies .....	52
General Model Safety .....	21	Frequency Band Overview .....	53
Hazardous Materials .....	22	R/C Equipment Type Approval .....	53
Radio Control Flying Safety .....	22	Synthesised Frequency Equipment .....	54
Pre and Post Flight Checks .....	23	BMFA Council of Management .....	55
Almost Ready To Fly Models .....	23	Areas Council .....	55
Park Flyers .....	24	Technical Council .....	55
Helicopters .....	24	Executive Committee .....	55
Helicopter Rotor Blade Safety .....	25	Proposals to Council.....	55
R/C Silent Flight .....	25	General Regulations and Contest Rules (Part 1).....	56
Thermal.....	25	The BMFA Competition Rule Books .....	58
Slope.....	26	Directory of Publications .....	59
Electroflight.....	26	Address Directory .....	60

## AN INTRODUCTION TO THE BRITISH MODEL FLYING ASSOCIATION

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

In its eighty years of existence, the Association 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 BMFA 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. It is controlled by its Annual General Meeting and it is administered by a Council of Management elected from its members.

Model flying in the UK is under increasing pressure from legislative and environmental bodies and the BMFA, the world's oldest model flying body, is involved in ever increasing fields of activity to protect model flying on your behalf.

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. As well as these efforts at national and local level, the BMFA also spends much time promoting and encouraging all facets of model flying.

The BMFA has a full time staff working from the permanent office in Leicester. The Chief Executive, Development Officer, Membership Secretary and other staff are there to further the running of the Association. They can answer most of your queries or put you in touch directly with BMFA officers when necessary.

Both staff and voluntary officers are always pleased to hear from members and to help where they can.

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.

All new text in this issue is marked with a side bar thus.

## THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

In 1987 the Annual General Meeting of the Society of Model Aeronautical Engineers (SMAE) voted to adopt a working title, the BRITISH MODEL FLYING ASSOCIATION.

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 controlled by the Articles of Association.

Throughout this handbook both titles will be used where appropriate, BMFA in most cases but SMAE where a reference has implications as noted above.

## The title BMFA should be used by any member club or individual.

We are sure that you will find that the use of the BMFA title will be especially useful when dealing with outside bodies and people who are not model flyers. Having a title that says exactly who you are and what you do means that you have far more time to explain to them what you really want before they lose interest.

BMFA Affiliated Clubs are encouraged to use the BMFA logo and the words 'Affiliated to the BMFA' (or similar) on letterheads and other club stationery.

## THE SMAE's ORIGINS

The SMAE was originally set up in 1922 and its recognition by the Royal Aero Club dates from then but its roots can be traced back to 1909.

In that year the Kite Flying Association was formed and, shortly after an exhibition at Olympia where model aircraft were shown, its name was changed to the Kite and Model Aircraft Association. In 1921 this association was replaced by the London Aeromodellers Association which, a year later, changed its name to the Society of Model Aeronautical Engineers.

Many British aviation pioneers have been SMAE members including Sir Frank Whittle, Sir Thomas Sopwith and Sir Alliot Verdon Roe, founder of Avro.

Since 1948 the Society of Model Aeronautical Engineers has been a Company Limited by Guarantee, as are most governing bodies of sport in the UK.

## THE ASSOCIATION'S OBJECTIVES

It would be appropriate to list a few items from the SMAE's original 1948 Memorandum of Association (see Directory of Publications), which still applies to the BMFA and which explains its aims.

### The main objectives are;

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 of the Society 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 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"**

## IT'S YOUR ASSOCIATION

Every single member of the Association counts and has the full back-up of the organisation but to gain the full benefit from your BMFA membership it is important that you belong to a BMFA affiliated club.

As a club member you will be able to influence the vote for the election of officers on the Society's governing Council of Management and can also ensure that your opinion is made known in the same way at any of the many regional meetings that are held regularly by the BMFA Areas.

As a member of an affiliated club your vote can also be used by your club delegate to influence decisions taken at General Meetings of the Society on such subjects as policy and finance.

## BMFA AREAS

The country is divided into thirteen geographic Areas. Every club in an Area is automatically a member of that Area Committee and the officers of the Area Committee are elected from the club delegates who attend the Area meetings.

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

The Area Committee can be a powerful influence for the benefit of model flying, both locally and nationally particularly as one member of each of the thirteen Area Committees has a seat on Council. These Delegates also attend their own Area's meetings, of course, and are the link between the Area and Council through which information can flow; yet another reason for your club to send a representative to attend Area meetings.

In addition, two delegates from your Area (usually the Area Chairman and the Council Delegate) will represent you at Areas Council, a powerful sub-committee of the BMFA Council of Management. Area Council has direct responsibility for many vital aspects of BMFA operations including all the achievement schemes.

If your club is not making its presence felt at Area level, why don't you consider becoming its representative? Details of Area meetings are sent out to each club by the Area or information can be obtained from the Association's Leicester Office. It's your Association and any member can influence its actions and attitudes through the Area structure.

## BMFA BACK-UP

Whatever your particular model flying interest you will find that the BMFA has been working on your behalf for many years.

If you fly radio controlled aircraft the Association has already been of help to you, possibly even before you knew it existed. The BMFA, for example, played a large part in obtaining the frequencies you currently fly on and it is still working actively to protect and extend them.

We have recently had an increase in the allocation of model flying frequencies in the UK with ten new 35 MHz channels. In addition, an EEC directive setting up a pan-European 35 MHz band of 23 channels (60 to 82) devoted to model flying has come into force, making Europe the largest world market for model flying R/C equipment. Both of these very significant events for UK model flyers would not have happened without dedicated work by BMFA officers.

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.

To protect your interests the BMFA has adopted a forthright attitude towards those who seek unreasonably to restrict the facilities we all need for safe model flying. To this end the BMFA is an active and vocal member of the Central Council for Physical Recreation (CCPR) and many Areas and clubs have representatives involved with regional and local sports organisations.

As the membership of the BMFA grows its influence with such bodies increases. However, the national voice of model flying would be much stronger if all model flyers joined the BMFA instead of trying to solve their problems in isolation. As a member, you can help by encouraging fellow flyers to join the Association.

You, and they, will find the BMFA is especially useful to the ninety percent of the membership who do not take part in our sport at a competitive level. The

major part of the BMFA's work consists of keeping you and your clubs in touch with model flying locally and nationally and, most importantly, being there with help and unbiased advice whatever model flying problems arise.

The full time staff of the BMFA make a very significant contribution to the work done by the BMFA at both area and national level but, in addition, a great deal is done entirely voluntarily by model flyers like you. This applies whether the work is of general benefit (publicity, local and national government liaison etc.) or more specialised (such as the various technical committees).

## RESPONSIBLE FLYING AND 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.

## THE CONTEST SCENE

The BMFA organises numerous contests at venues all over Britain, covering all aspects of the sport from indoor flying to large radio controlled scale models.

Details of forthcoming competitions and events are published in the BMFA's own publications and in the commercial model flying magazines.

Newcomers to contests are always welcome and should not be afraid to participate, for 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.

Selection trials are held each year to pick teams to represent the UK at World and European Championships for each of the many classes of competition model flying.

Contest organisation is the responsibility of the technical sub-committees of the BMFA and up-to-date rules for the various classes of flying are published annually. See the index of contest rule books at the end of this handbook for more details.

## 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, and is in an identical situation to, for example, the Microlight Aircraft Association, the British Gliding Association or the Popular Flying Association.

It is 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 interests, such as gliding, aerobatics, space and model flying and the Commission Internationale d'Aeromodelisme (CIAM) is the committee responsible for our sport. The BMFA's reputation and contribution to the work of CIAM has been, and is, second to none.

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 has provided many of the officers of the organisation over the years and BMFA members still hold many important posts in the organisation.

The Society is the holder of an Honorary Group Diploma of the FAI, which is an honour given to those who have greatly contributed to the progress of aviation or astronautics during the previous year or years.

The benefits of our FAI and Royal Aero Club 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.

## FAI LICENCES

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, however, could be of great help to anyone considering model flying abroad, not just competitors, as it is a document that is recognised world wide. It may be of help when dealing with airlines over the carriage of models and radios 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. For the small cost involved it would be well worth considering obtaining yours.

## SPORTS COUNCIL RECOGNITION

Model flying is recognised by UK Sport as an official sport. Although not specifically recorded as a separate entity in the UK Sport composite list of sports, model flying is one of the three categories of air sports encompassed under the single heading 'Flying'.

As a consequence of official policy being to support only 'Olympic' sports, we do not currently receive any financial assistance from UK Sport. This is a situation that is unlikely to change in the near future.

## THE EDUCATION INITIATIVE

The BMFA is extremely concerned about the increasing lack of exposure of children of school age 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.

BMFA has produced a package that has been designed to integrate into National Curriculum Craft, Design and Technology (CDT) 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 and, with the help of the scheme, many thousands of children have gained 'hands on' model flying experience in the past few years. It is expected that the scheme will expand considerably in the future.

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.

## RECOMMENDED CODES OF PRACTICE AND ACHIEVEMENT SCHEMES

Over the years the BMFA has gathered much experience on model flying and has tried to act responsibly in giving good advice to all flyers and interested parties. In some cases this has resulted in specific Codes of Practice being issued by the Association on certain important subjects. Details of these codes are included throughout this handbook.

For instance, as a practical means of improving radio control model flying standards, achievement schemes for radio control power fixed wing, helicopter, silent flight thermal soaring, silent flight slope soaring and electric flight have been introduced and you will find full details later in this handbook.

## GENERAL REGULATIONS AND CONTEST RULES

The General Regulations (Part 1) which appear later in this handbook are, in effect, Section 1 of the contest rule books. They affect all contest flyers and their models and are printed in this handbook because of their general application.

The more complex and detailed individual contest rules are published separately and can be obtained from the Leicester office (see BMFA Contest Rule Books).

## MODEL FLYING RECORDS

The BMFA is 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 in which a British record can be obtained, both contest and non-contest.

A records booklet is available free of charge from the BMFA's Leicester office; ask for the Contest Rule Book, Section 2a, Records. A list of the current World records is also available. The records booklet is required reading for anyone thinking about record attempts and you should not consider making an attempt without obtaining a copy.

Further advice to anyone contemplating an attempt on a model flying record of any type is available from the BMFA's Records Officer who can also be contacted via the Leicester office.

If you are serious about wanting to set and claim records then a chat with the BMFA Records Officer is essential.

## TYPE AND CONDITIONS OF MEMBERSHIP

1) **BMFA 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).

2) **COUNTRY MEMBERS.** Individual members not belonging to a BMFA Affiliated club are known as Country Members.

3) **FAMILY MEMBERSHIP** 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 under 18 years old 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.

4) **FELLOWSHIP and HONORARY MEMBERSHIP** are two different classes of membership which are awarded to a few people in cases of special merit. Fellowship is, in fact, the highest honour awarded by the Association and is awarded to a maximum of two people each year by the Annual General Meeting.

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. In any case those applications which are received after 1st September in any year will have a part of the fee paid credited to the following year. The membership fees are agreed each year at the Annual General Meeting.

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 official of the BMFA if requested.

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 and 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.

## BMFA AFFILIATED CLUBS

1) **AFFILIATED CLUB MEMBERSHIP** of the BMFA is open to clubs 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.

2) **SCHOOLS AND YOUTH GROUP MEMBERSHIP** is 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 their youth group. See also the section on insurance.

3) **VOTING RIGHTS.** 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.

**Note:** General meetings of the SMAE consist of the Annual General Meeting of the Society plus any Extraordinary General meetings which may be called from time to time.

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

## MEMBER'S INSURANCE

The primary insurance cover provided by the BMFA for its members is Third Party Public and Products Liability. In addition, a 'no fault' personal accident insurance covering major disablement is included.

### 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.

### Notes:

(i) Any form of flying for trade or commercial enterprises, whether paid or unpaid, is not covered by the basic policy (See 'Exclusions' and the section on 'Model Traders Insurance').

(ii) Any individual member flying at a display should take care that their insurance cover is not jeopardised by potentially unlawful flight patterns and flying. In particular Articles 64 and 63 of the Air Navigation Order, which apply to all model aircraft, should be considered.

(iii) Article 64 states that 'A person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property' and Article 63 states that 'A person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or any person therein.'

(iv) You should also note that, for models between 7 and 20 kg and models over 20 kg, the Articles of the Air Navigation Order referring specifically to model aircraft in those weight bands are legal requirements (see 'Legal Controls over Model Flying').

### Indemnity Limits for the Third Party Public and Products Liability

£5,000,000 any one accident, unlimited for period of insurance, subject to a £20 property damage excess.

### Territorial Limits

(1) The whole of the UK and

(2) Elsewhere in the world in respect of the Association's officers and registered members temporarily abroad.

Note - Although the BMFA insurance cover is fully valid in the USA and Canada, it is required that you inform the BMFA office if you intend to fly in those countries on your BMFA insurance.

### Models Covered

(a) All classes of model aircraft of whatever size, weight or engine capacity (subject to compliance with CAA regulations) except as noted in 'Exclusions'.

(b) Model boats and cars.

(c) Models powered by approved solid fuel rocket propulsion systems up to and including 'M' size motors.

(d) Steam powered models except when used for passenger carrying purposes for hire or reward.

(e) Kites (subject to compliance with CAA regulations).

### Exclusions

(a) Any form of commercial or trade activities including professional, semi-professional or sponsored display teams.

(b) Pulse jet powered models except as noted in section 1.2.3.3, Reaction Motors, in this handbook.

(c) Deliberately staged mid-air collisions at airshows and public displays.

### Notes:

(i) Money received by clubs from organisers of fetes and shows, etc., where the clubs are 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 but generally excluding damage to models, radio equipment, engines, tools etc.

(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 all lawful **club activities** are also indemnified.

(d) The reduced rate insurance cover available to juniors under the **Schools and Youth Groups** membership scheme only applies when such juniors are flying under the supervision of their group leader(s). To obtain the full unlimited BMFA insurance cover, 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 BMFA **Airsides 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. A higher excess is applicable to any claim made under this special provision.

(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 club member approved by the Club Committee. The limit of this indemnity is 3 days 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.

#### Conditions

(a) **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.

(b) It is the duty of the insured to at all times 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.

#### Incident Reporting Procedure

(a) Prompt notification of all incidents / accidents that may result in a claim on the policy is essential. Initial telephone contact with the BMFA's Leicester Office should be within 24 hours of the incident. Reports out of office hours will be recorded on the office answerphone.

(b) The Leicester office will supply you with an incident report form which will become the basis of an initial report of an incident to the Insurer if required. The office staff will give you any specific advice you need to help you complete this form.

(c) Regardless of how serious an incident may be, the reporting procedure outlined above will nearly always be adequate. If the incident is very serious and external Authorities are involved, they will have their own emergency procedures for contacting the Association. You should still follow the normal reporting procedure.

#### Operative Dates

The basic public liability cover is effective from the date of joining until the end of the current membership year. 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.

#### Certificates

Individual insurance certificates will be provided to all registered members of the Association from the Leicester office with your membership card.

To maintain continuous cover it is vital that your membership renewal each year is prompt.

### PERSONAL ACCIDENT SCHEME

Members of the BMFA 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.

The benefits payable under this policy are £5000 in respect of accident death and up to £25000 for permanent disability (current as at 1st January 2003); however, the level of benefits payable may change from time to time.

In addition to the above benefits the Association has been able to negotiate a special additional provision within the policy conditions which provides for a benefit to be payable for a range of other major injuries. Payments under this section of the policy are established as a percentage of the Capital Benefit for permanent disablement in force at the time a qualifying injury occurs. Again, the scope and level of benefits payable under this special provision may change from time to time. The Association will retain a composite listing of the percentage payments payable for each category of major injury and will notify members of any changes through BMFA News.

Unlike other personal accident policies the Association has been able to negotiate an extension in cover for members aged 65 to 75 years. However, for these members the Capital Benefit is reduced by 50%.

### 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.

### FLYING TRAINING COVER

The BMFA insurance policy contains indemnity cover for any member who accepts a fee for the teaching of R/C flying. This cover is only available for instruction carried out in the environment of a BMFA affiliated club and only if the following conditions are met.

(a) The club must register with the BMFA that such paid instruction will be taking place.

(b) Both the instructor and the pupil must be BMFA members.

(c) The instructor must be qualified under the BMFA Instructor Scheme and must work to the BMFA training manual (Up and Away).

(d) Any fees paid must first be paid direct to the club who will pass them on to the instructor concerned.

This cover has been made available at the request of a number of member clubs who were having problems with flying instruction. It is acknowledged that most clubs in the Association will not wish to make use of the indemnity.

### MINISTRY OF DEFENCE INDEMNITY AND FLYING ON MoD PROPERTY

An exclusive feature of the BMFA insurance is the vital Crown Indemnity cover given to clubs and members flying on land owned by the Ministry of Defence (e.g. RAF airfields).

In order to fly on Ministry of Defence property you will require three things:

1) Third party insurance, as provided by the BMFA for its members.

2) Crown indemnity insurance which is a special cover provided by the Association and which is invoked as in 3) below.

3) A licence issued by the Defence Estate Organisation (DEO) which, when obtained, must be submitted to the BMFA General Secretary for countersignature to the effect that the applicant is a BMFA affiliated club or member, thus invoking the special BMFA Crown Indemnity insurance cover.

Only BMFA members will be permitted to fly on the site and, since random military security checks operate, model flyers using MoD land must carry their card identifying them as BMFA members.

The formal procedures for obtaining access to MoD lands are contained in Defence Council Instructions and will be referred to by the Commanding Officer or Defence Estate Organisation office concerned.

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.

### OPTIONAL INSURANCE SCHEMES

To obtain full details of any of the schemes outlined below, contact the BMFA's Leicester office.

#### Commercial Flyer/Model Trader's Insurance

The Association has made available a special insurance to indemnify model traders flying at displays, shows etc. and for BMFA members who participate in aspects of commercial model flying such as aerial photography, survey work or flying training. The following conditions apply:

(1) The model trader/commercial flyer be registered with the BMFA.

(2) All persons flying for the model trader/commercial flyer must be a member of the BMFA and must hold a BMFA 'B' Certificate.

The Registered model trader/commercial flyer will also have access to a range of other trader insurances offered by the BMFA's Insurance Broker.

#### Models in Transit

An optional insurance is available to all members to cover models and equipment in transit.

### LEGAL CONTROLS OVER MODEL FLYING

The sport of model flying is subject to various legal controls which should be carefully observed at all times.

#### (1) THE AIR NAVIGATION ORDER (ANO)

Article 64 of the Air Navigation Order (ANO) requires that:

**"A person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property".**

Article 63 of the Air Navigation Order requires that:

**'A person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or any person therein.'**

These apply to **ALL** model aircraft at **ALL** times, whatever their weight or size.

In addition, Article 87 of the ANO requires that:

(1) A person shall not cause or permit any article or animal (whether or not attached to a parachute) to be dropped from a small aircraft (defined by the CAA as a model up to 20 kg without fuel, Ed) so as to endanger persons or property

(2) A person in charge of a small aircraft which weighs more than 7 kg without its fuel but including any article or equipment installed or attached to the aircraft at the commencement of the flight shall not fly such an aircraft :

(a) unless the person in charge of the aircraft has reasonably satisfied himself that the flight can safely be made;

(b) in Class A, C, D or E airspace (effectively any airspace down to ground level, Ed) unless the permission of the appropriate air traffic control unit has been obtained;

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

(d) at a height exceeding 400 ft above the surface unless it is flying in airspace described in sub-paras (b) or (c) and in accordance with the requirements thereof;

(e) for aerial work purposes other than in accordance with a permission issued by the Authority which may be issued subject to such conditions as the Authority thinks fit (this doesn't affect you unless you are flying your model commercially for 'valuable consideration', Ed).

#### (2) 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.

### (3) BYLAWS

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.

### (4) 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.

### (5) THE DEPARTMENT OF THE ENVIRONMENT NOISE CODE

(2), (3) and (4) 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 which follows this section.

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 the Magistrate is deciding if the model flyers are creating a statutory noise nuisance, the document they would be most likely to refer to is the DoE Code of Practice which is set out in full later in this handbook.

## ADVICE TO CLUBS FLYING SITE NEGOTIATIONS

To help your club in negotiations with local government authorities and other landowners the BMFA has, over many years, built up a unique depth of experience and expertise which is available to you.

### THE BMFA FLYING SITE PLANNING OFFICER

The BMFA now has the services of a full time planning advisor whose brief is to assist all BMFA affiliated clubs with planning and site 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 that you discuss your problems or proposals with the BMFA Planning Officer.

### Very early involvement is crucial in any negotiations.

Your initial contact with BMFA should be as soon as you suspect that you may be involved in negotiations or planning applications. This will enable the BMFA Planning Officer to build an information file on your circumstances which will be invaluable if you run into problems. All information will, of course, be confidential.

BMFA is aware that independent action by some 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 Flying Site Planning Officer.

## THE PROMOTION OF WELFARE AND CARE OF CHILDREN AND VULNERABLE ADULTS IN MODEL FLYING

The British Model Flying Association is committed to the care and welfare of children and vulnerable adults, particularly when it concerns protection from abuse. Everyone has a part to play whether they be a full time employee, elected officer, club officer, instructor or a member of the BMFA. However, the parents, guardians, carers, friends and not least those that we are caring for also have a vital part to play.

Accordingly, the BMFA has developed a robust policy in conjunction with the national authorities to promote the care and welfare of children and vulnerable adults. All BMFA clubs and member are strongly encouraged to adopt this policy and the

associated guidelines to ensure they are following good practice and their legal obligations, not only to protect children and vulnerable adults but also those working with them. Copies of the policy are available free of charge from the BMFA Leicester office.

Members are also advised that if they suspect a child or vulnerable adult is being abused in any way during their model flying activities they should contact the Chief Executive or the Development Officer at the BMFA Leicester office in the first instance or follow the alternative advice given in the policy. Any such contact will always remain strictly confidential.

## GUIDANCE ON CARING FOR JUNIOR CLUB MEMBERS

(a) Responsibility for junior club members is shared between the parents/guardians and the club members. This should be well publicised to ensure that all are aware of the division of responsibilities. Club rules should carry this information and a copy of the rules must be given to parents/guardians and their attention drawn to them.

(b) Junior members must be supervised at all times by a responsible adult. The level of supervision is to be commensurate with the junior member's age, maturity, capabilities and levels of experience.

(c) No senior member is to be expected to assume responsibility for a junior member unless they have been specifically requested to do so by the junior member's parent/guardian. If requested to do so, they are to assume complete and total responsibility for the junior member whilst they are in their charge.

(d) Should a member discover a junior member is unsupervised they must assume responsibility for the junior member's safety in the first instance. The situation should then be rectified as soon as possible by seeking out the junior member's parent/guardian or nominated supervisor. Any instance of such an occurrence is to be reported to the Club Committee as soon as possible.

(e) A junior member is usually defined as being under 18 years of age but particular care must be taken with the supervision of those juniors under the age of 14 years. A responsible adult is defined as a senior member or parent/guardian who has the experience commensurate with the type and degree of supervision required.

(f) Whilst supervising junior members, senior members should be aware of the requirements of The Children Act (1989) and avoid placing themselves in a position that could be open to misinterpretation or question.

(g) This guide is an abbreviated extract from the BMFA's Procedures And Guidelines on the Promotion Of Welfare And Care Of Children And Vulnerable Adults In Model Flying. This document provides a starting point for the formulation of club

policy and identification of responsibilities.

(h) It should be noted that any disclaimer concerning the care of any member, particularly junior members, is not acceptable in law.

## THE BMFA GUIDELINES AND SAFETY CODES FOR MODEL FLYING

Article 64 of the Air Navigation Order states

**'A person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property'.**

Article 63 of the Air Navigation Order states

**'A person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or any person therein.'**

These laws cover ALL model flying. The codes of practice contained in this handbook have been developed over many years in response to the implications of Articles 63 and 64 and, whenever model flying takes place, the BMFA strongly recommends that these codes are used

### CAP 658

During 1996 some changes were made to the Air Navigation Order which re-defined model aircraft as 'small aircraft' and which are covered in detail in the section 'Legal Controls Over Model Flying'.

At the same time the Civil Aviation Authority (CAA) issued Civil Aviation Publication 658 (CAP 658), Small (Model) Aircraft: A Guide to Safe Flying.

This document gives advice for all model flyers, much of which is based on the existing BMFA Safety Codes. CAP 658 will be referred to throughout this handbook whenever it adds to the existing BMFA safety codes..

Whilst the recommendations in CAP 658 are not regarded as legal requirements, one of the reasons why it is issued by the CAA is to provide a guide to what would be considered 'reasonable practice' in the event of a model flyer being prosecuted by them under the Air Navigation Order.

This makes CAP 658 an important document for all model flyers and, although all relevant clauses in it are covered in this handbook, it is recommended that all model flying clubs at least should obtain their own copy of the document from the CAA (see address and telephone number in the address directory).

## INTRODUCTION

Accident statistics and the low insurance rates that we 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. With the number of enthusiasts taking up our sport each year, it becomes more important that we all follow the same code of safe model flying practice.

It is intended that this Code should be adopted by model flyers for all flying activities except contests or displays. The BMFA has separate safety rules for

these which are usually more stringent.

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

This Code is not intended in any way to lessen the responsibility that model flyers have for introducing additional safety factors. The Association wishes to encourage such initiative wherever it 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.

### 'MIXED' SITES

Although it is not a widespread practice, model flying does (and can continue to) take place safely on sites where other airspace users are operating at the same time close by (in some cases sharing the same airspace).

Because, in all such cases, the other uses always involve 'people carrying' aviation e.g. gliding, hang-gliding, parachuting, light aviation etc. the model flyer is always going to have to accept that his needs are going to be secondary to the safety of the other user. Indeed, this point is specifically covered by those few articles of the Air Navigation Order which apply to all model flying.

Having made this point, it is clear that 'mixed' sites can operate perfectly safely provided that there is good preparation beforehand, involving all the user groups. The most usual practice is for arrangements to be made whereby, before each day's flying, the user groups representatives meet to determine their respective locations, take-off/landing paths etc. and to agree methods of attracting attention should changes be needed during the day or further liaison be necessary.

As a general rule, once the day's model flying location and flying area limits have been determined, the knowledge (and the confidence that the model flyers will adhere to the agreed limits) is sufficient to enable the other users to operate freely and safely within their own limits.

In essence, therefore, 'mixed' sites generally do not share airspace - instead, in consultation between users, segregated airspace is fixed by agreement and, usually, controlled by the wind direction.

It cannot be stressed too highly that a means of quick alert is needed in case of difficulties or required changes. 2-way hand held transceivers are probably the most effective but perfectly good arrangements are known to exist by simply running a flag up a prominent flagpole as a signal to 'stop

flying - come and talk'.

On any mixed site, special attention should be given to the methods of training novices and to maintaining the proficiency of established flyers. A high level of assurance is required that models will not go where they are not intended to go.

In the particular case of hang-gliding 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.

### 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 should be 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 to operate **FIVE** or **MORE** models at any one time, the CANP reporting procedures outlined in CAP 658 can be used. If possible call the day before the activity. A minimum of four hours notice is required to allow full circulation of the information.

**Telephone Freephone on 0800 515544 or Fax on 0500 300120** and give 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

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.

## THE BMFA GUIDES TO THE SAFE OPERATION OF MODEL AIRCRAFT

### GENERAL

(a) Clubs or groups of flyers should draw up carefully considered safety codes for specific sites to supplement this code. These codes, or site rules, should cover the club or group's normal operating procedures and safety measures.

(b) Clubs should periodically review their operating procedures to ensure that, if any additional safety measures are needed, they are recognised and implemented.

(c) Where bye-laws restrict model flying to specific areas and times, model flyers should encourage local authorities to erect notices indicating the restrictions.

(d) On public sites, or sites where casual visits by the public are likely, always try to use the same take-off areas. Other regular users will then expect to see model aircraft operating from a particular place.

(e) On private sites with public access, suitable notices warning of model flying should be erected if possible. The signs should say **'Please Be Aware. Model Flying Takes Place Beyond This Point'**.

(f) On any site with public access it is strongly recommended that a **SAFETY MARSHAL** be appointed at any flying session as laid out in paragraph (g) below.

(g) Clubs should appoint a competent club **SAFETY OFFICER** whose duties would be to ensure that both the BMFA and the club safety codes are followed.

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

(i) At large flying sessions or, in the case of R/C, when several models will be airborne at the same time or on ANY flying site that has a public presence when models are flown, a **SAFETY MARSHAL** should be appointed. His duties should include warning both public and flyers of flight patterns, take-off areas and safety procedures and advising spectators of the safest area from which to watch.

(j) 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.

(k) 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.

(l) **CAP 658** says;

• For any model aircraft flying, first choose an unobstructed site and at all times keep a safe distance from persons, vessels vehicles and structures.

• Then only fly in suitable weather, with regard for any other conditions such as local bylaws and with due consideration for other people and property.

(m) If light conditions are such that you might lose sight of your model then do not fly.

(n) 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.**

(o) Do not leave fuel, adhesives etc. where children or other spectators may get hold of them.

(p) 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.

(q) 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.

(r) 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.

### R/C FLYING SITE LOCATION

(a) As a general rule, clubs should not operate closer together than 2 miles unless an agreement has been negotiated between them giving an equitable and workable frequency sharing plan. The use of odds/evens split by power and glider clubs flying close together is an example of this practice and there are other arrangements that may be made (see the section 'Frequency Allocation at Club Sites').

(b) Please take note that negotiation in such circumstances (i.e. where interference is possible) is not optional. The use of our frequency bands and channels is legally granted to all of us but no one group or individual has the 'right' to reserve the use of any of our frequencies. If you continue to operate knowing that you may interfere or be interfered with then you may be considered to be endangering under the ANO. In the interests of safety, clubs should keep in close contact on these matters.

(c) It is recommended that each negotiating club or group sets up an inter-club liaison officer, possibly from its existing committee members. Efficient communications is important in these circumstances to avoid misunderstandings occurring and rumour spreading and to make sure that your flying is as

safe as possible.

(d) At flying sites very close to airports and aerodromes, liaison should be maintained with the airport authorities to determine any special precautions needed and, in special cases, to agree safe model flying heights.

**Note:** Models under 7 kg are not subject to any specific legal restrictions in this respect but you must always remember that Articles 63 and 64 of the Air Navigation Order apply at all times to all models and possible conflict with full size aircraft **MUST** be avoided.

### R/C POWER FLYING SITE LAYOUT AND FLIGHT PATTERNS

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 seeks to set 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 it is acknowledged that 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'.

(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, ideally crosswind from the prevailing wind. If your site allows, position your car park near some obstacle to flying such as trees or a high hedge. 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.

(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.

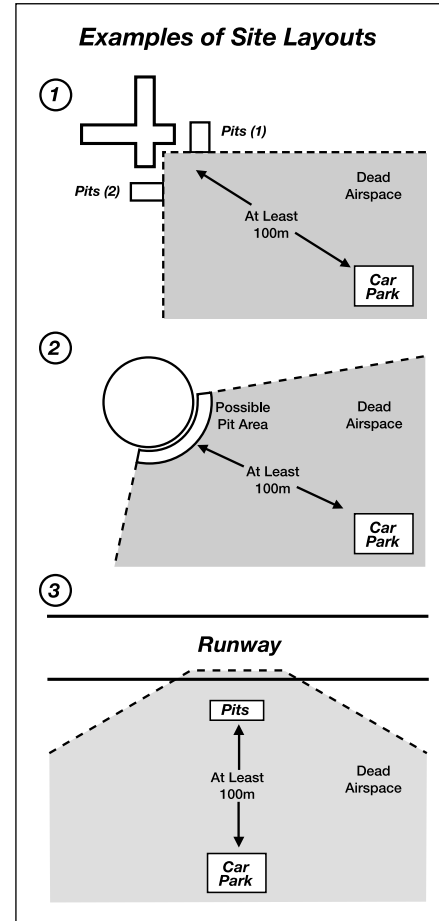
(c) Have at least two recognised pits areas available so that the pits can be set up crosswind from the active runway whatever the wind direction. Every effort should be made to site the pits area at least 30 metres crosswind from the take-off/landing path and under no circumstances allow models to take-off from or land over or towards the active pits area.

(d) 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 area should be a segment of at least 90o and could be up to 180o 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.

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

(f) Specify that any flying actually over the take-off/landing area must be into wind only, i.e. in the designated landing direction. This avoids conflicting flight patterns over the active runway but does not prohibit other styles of flying away from it.



### Notes

Sections (d), (e) and (f) above have 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 later section.

### LEARNING TO FLY RADIO CONTROL

**CAP 658** says

• If at all possible 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.

• 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 usually be found in the model flying magazines.

### RADIO CONTROL AND YOU

This section gives advice and guidance on the operation of your radio equipment which may not be covered in the manufacturers literature.

(a) There are many occasions when it is essential for others to quickly identify the frequency you are operating on and for this reason your transmitter should carry an easily visible channel identification pennant;

Most people use 35 MHz and an orange flag with one inch black or white numerals should be used

(b) It is strongly recommended that you only use rechargeable batteries in your radio control equipment. Dry batteries might be adequate for occasional use in transmitters but their use in airborne battery packs is strongly discouraged. They must never be used if you have four servos operating.

(c) When fitting rechargeable batteries to equipment designed and sold to take dry batteries, always ensure that the cells are soldered or welded into packs and that the packs are either hard wired or wired through a plug and socket into your transmitter and receiver systems. **NEVER** rely on the spring type battery contacts in battery boxes.

(d) BMFA publish a comprehensive guide to the care and maintenance of rechargeable batteries - The Battery Book. This is available from the Leicester office; see the directory of publications at the end of this handbook.

(e) The regular use of a receiver battery checker is a good idea and there are many cheap reliable units available, either hand held or on-board. The peace of mind in knowing that the last flight of the day will not be the last flight of the model is well worth having.

(f) Do not use standard inexpensive servos in any situation where flight loads are likely to be very high, i.e. virtually any flight control on a large or fast model. Standard servos have many uses and are usually very reliable and good value but they simply do not have the torque, precision and power of a servo designed to cope with very high loads. There is an enormous range of servos available so think about what you expect of the servo and choose carefully. If your model is large or likely to be fast then don't automatically fit the cheapest you can get or those that simply come to hand in your workshop.

(g) Many larger models feature long servo and battery leads and the trend towards separate aileron servos in each wing means that even quite small models might have extended servo leads fitted. These long leads make excellent aerials, feeding signals back into the receiver and possibly causing interference. Any extended lead should be decoupled either by a using a commercial opto-electronic de-coupler or by looping the lead several times through a small ferrite ring which may be obtained for the purpose from your local model shop.

(h) With a new or repaired radio control equipment, a ground range check is essential, preferably in a model and with the model's engine running if possible. Look for a minimum range of around 50 metres with the transmitter aerial down.

(i) It is good practice to carry out a routine range check on your equipment at regular intervals, at least every month or so, and a check is advisable if you have not flown for a few weeks. You should also be prepared to do a range check if you feel that you have a problem with your radio equipment or if you have removed and replaced crystals or a transmitter module.

(j) A dirty or oily transmitter aerial will degrade the range of your transmitter, sometimes quite severely, and may even affect the output frequency. Clean it every two or three months with methylated spirit or similar and never lubricate it.

(k) Although mobile telephones operate on frequencies far removed from our model control frequency bands they are a major addition to the increasing background radio 'noise' that our equipment has to filter out. In addition, there is some evidence that there may sometimes be an interaction between mobile 'phones and microprocessor controlled transmitters.

(l) Many mobile 'phones transmit powerful signals regularly even when on standby and BMFA recommend that they are not taken into the pits area and especially not on to the flying area. Your radio equipment has a hard enough job to do without you making it worse.

(m) The use of radio control equipment by heart pacemaker users has been investigated but no direct interaction problem has been identified. If you are a pacemaker user, however, and you require more information you are strongly recommended to speak to the Consultant who fitted your pacemaker. They should have all the technical specifications of the particular unit you use and can identify any problems you may have.

(n) Using different makes of transmitter and receiver is common practice, especially with the large range of aftermarket receivers available. There is a point you must be aware of, however, concerning manufacturers guarantees. A matched Tx and Rx will be warranted by their manufacturer both as individual items and to work together as a pair. If you 'mix and match', the individual warranties still apply but you have no guarantee that the pair will work together. In this case you take upon yourself the responsibility of making sure that your equipment operates correctly.

(o) It is essential that you use the correct specification crystals in any transmitter or receiver you are using. Not all crystals are the same and you should **NEVER** use one manufacturer's crystal in another's Tx or Rx. The only exceptions are many of the aftermarket receivers and their manufacturers actually specify which crystals are compatible.

(p) When buying crystals, always take care to specify what individual piece of equipment they are to be used in. Original manufacturer's crystals are always the best choice.

(q) If you use aftermarket receivers be aware that many are designed for indoor use, especially the very lightweight models. The range and ability to filter out interference of such receivers may not be suitable for outdoor use and you should take care that you are aware of the limitations of the equipment you are using.

(r) Take care to route your receiver aerial well away from any carbon fibre in your aircraft. Carbon fibre is electrically conductive and is a good aerial itself. Large quantities of it can blanket your receiver aerial completely and even a few strands used for strength can cause glitching in flight if they are close to the aerial and can affect the signal reaching it.

(s) When selecting which receiver to buy and use, remember that to a great extent you get what you pay for. Single conversion receivers are usually the cheapest and work well in most circumstances but they are not as capable as the more expensive high specification or dual conversion receivers at filtering out external interference.

(t) If you are operating in a busy radio environment (at a busy club site or on a site known to be subject to outside interference) then you should seriously consider only using higher specification or dual conversion receivers. The radio spectrum gets busier by the day and your transmitter signal has to be filtered out by your receiver from every other signal out there. This situation will only get worse and there are already some sites where only high specification or dual conversion equipment is safe to use.

#### **PCM Points**

(u) Users of PCM radio equipment should check fail-safe operation before each flight. With the model restrained, switch off the transmitter and ensure that all relevant controls on the model move to their pre-set fail-safe positions. Switch the transmitter on again and make sure that normal control operation returns within a few seconds. If the fail-safe does not re-set quickly there may be a fault so **DO NOT FLY**.

(v) The plug-in modules of PCM transmitters sometimes suffer from corrosion of the connecting pins, especially if the transmitter has been operated in a damp or humid atmosphere. Unplug it regularly and check for dirty connections. Carefully clean the pins with methylated spirit or similar (check that the solvent doesn't affect the plastic before you use it)

(w) Broken fixing lugs on the plug-in module is another problem that may affect a PCM transmitter. Never rely only on the connector pins to hold the module in. Modules in this state have been known to fall out of the transmitter at inappropriate times (e.g. take-off).

(x) If you are using a PCM transmitter and receiver pair then you are automatically using a failsafe and it is most important to make sure that it has been set to operate correctly. It should, as a minimum, be set to reduce the throttle to idle and you can also specify controls to neutral if you wish. Most failsafes default to 'hold last position' and this can be very dangerous if your radio goes into failsafe in a high throttle, high energy situation. You must take the positive step of specifying what it should do instead of leaving it set at default. Read your radio manual carefully for details of settings.

Note: If you have PPM equipment and are using an add-on failsafe, it too should be set as a minimum to low throttle.

#### **BLACK WIRE CORROSION**

(a) Systems fitted with rechargeable batteries can suffer from black wire corrosion. When this happens the surface of the copper strands in the core of the negative (black) wire in a circuit receive a coating of black material which, if left alone, works inwards until all of the copper in the wire has corroded. This black corrosion has a high electrical resistance so as it gets deeper into the wire it lets less current through until eventually your radio stops working.

(b) The wires which are most affected by this corrosion are the negative wires from the battery to the switch in both transmitter and receiver wiring but in severe cases the corrosion can go much further than this and in extreme cases has even been seen in servo leads.

(c) The causes of the corrosion are too complex to go into here but it seems worse on batteries in storage or which have been allowed to go flat or, possibly, have been kept in a damp atmosphere. Well used and maintained batteries certainly suffer much less but they are not immune to the problem.

(d) Unfortunately, there is only one practical way to find out if your wiring is suffering from black wire corrosion and that is a visual inspection of the core of the wire. If you are competent to do this, inspect the wire leading from the negative terminal of the battery. Stripping back a very short length of outer will show if you have the problem. Be aware that the corrosion is highly resistant to solder so if you have unsoldered the wire and it looks clear but you can't solder it back on to the battery easily then the wire has almost certainly started to corrode.

**(e) There is no cure for black wire corrosion other than removing the affected wire and replacing it with new.**

(f) If you find the black coating on the battery lead but the wire still looks sound then you should be able to clear the problem simply by replacing that lead. If you find bad corrosion, however, it will almost certainly have gone further into the wiring harness and you must investigate and eliminate all traces even if this means discarding an entire switch harness for instance.

(g) If you are unsure of any of this advice, it will be well worth sending your rechargeable batteries and switch harness back with your radio equipment when you have it serviced with a specific request that black wire corrosion is checked for. Several companies specialise in supplying batteries and they might also be able to help. Another source of advice could be your local model shop but failing all this you should ask an experienced modeller for assistance.

## RADIO CONTROL AND YOUR CLUB

(a) Before starting to use a flying site every effort should be made to determine if there is any radio interference present. Particular attention should be paid to other major users of the radio spectrum in the area, such as other model clubs or hospitals, factories etc. (who might be using paging systems or other high power radio frequency transmissions).

(b) All radio control clubs should have access to some means of frequency checking or monitoring. There are several 35 MHz monitors on the market which retail for about £200 and these are good value.

BMFA has several frequency monitors which are available to clubs on loan. Contact the Leicester office for details.

An alternative is a ham radio type programmable scanning monitor which will cover all the bands we use. These are about £400 to buy new but a second-hand unit in good condition could be a good investment.

Hand held **frequency checkers** are also available at reasonable cost and are a purchase that is highly recommended to any R/C club. They will enable you to keep a regular comparative check on your members' individual transmitters and are invaluable for spotting such things as faulty crystals, wrong frequency flags etc. One model even allows the checking of receiver crystals.

(c) It has been shown that Cellphone transmitter masts may cause short range interactions with the radio equipment we use. To be safe, do not allow models to fly within 100 metres of such masts. If there is a mast near your field, you should arrange your flying area so that the pilots have their backs to the mast and it is in 'dead airspace' if possible.

(d) The UK is crossed by many low level microwave communication beams and if one crosses your field it may cause problems with interference and glitching. If your club suffers from such interference regularly (usually in the same place on the field) then it may be a microwave problem and you can guard against it completely by simply wrapping your receiver in aluminium cooking foil. The interference affects the components of the receiver directly and doesn't work through the aerial.

### General Safety Precautions

To avoid the chance of a model suffering interference because it flies closer to an operating transmitter other than the one that is controlling it, you should:

(a) Ensure that all pilots stand reasonably close together when flying. The concept of a 'pilot's box' is useful, even though it will not usually be marked out.

(b) Ensure that operating transmitters are not overflown and care should be taken by the club to

ensure that flying field procedures make this very clear.

(c) Take action to prevent operating transmitters being taken out on to an active flying area when, for example, models are being retrieved. Transmitters should be handed to a helper on the flightline and should remain switched on until the model has been retrieved and switched off.

(d) Ensure that all transmitters in the pits area have their aerials retracted, whether they are switched on or off. The extension of the aerial should be one of the last actions taken when moving out to the pilot's box to fly and retracting the aerial should be one of the first actions when moving back into the pits area with your model and transmitter switched off.

## FREQUENCY CONTROL AT CLUB SITES

(a) All clubs should operate some form of frequency control system on the flying site, such as a peg-board

(b) At larger flying sessions the use of a transmitter pound should be considered in addition to the frequency control system.

(c) All transmitters should carry an easily visible channel identification pennant;

For 27 MHz, a correctly coloured ribbon.

For 35 MHz, an orange flag, approximately three inches by two inches with minimum height one inch black or white numerals.

## PEGBOARD RECOMMENDATIONS

### The Peg-Off System

The pegboard displays all used channel number/colours each with an appropriately numbered peg or marker clipped to it. To reserve a channel the flyer must take the correct peg off the board and, usually, clip it to his transmitter aerial.

Pegs must be returned to the board at the end of each flight or there can be confusion as to who has the right to fly. Flyers can easily forget this and it can then be difficult to find out who actually has the peg for a specific channel, especially at larger flying sessions.

Flyers sometimes take the peg home with them and the 'missing peg' can lead to a new peg being made. The problems when both pegs then turn up at the field can be imagined.

Even worse is the situation where it is assumed that a missing peg has been taken off-site and a new temporary peg is made for the rest of the day. You can very easily have two people both thinking that they have use of a frequency.

This system is useful for fixed base operations when

the board and its pegs can be left on site without being subject to vandalism.

### The Peg-on or Reversed Peg System

The pegboard is marked out with the channel numbers/colours as before but with no pegs. Each flyer carries his own named peg and to reserve a channel the peg is clipped on to the board before a transmitter is switched on. It is essential that pegs are removed from the board when a flight is finished and pegs must always carry the pilot's name. Under no circumstances may pegs be shared by pilots or blank pegs used. You must be able to identify whose peg is clipped to the board.

If you go to the pegboard to reserve a frequency and it is in use, you can easily see who is using it and can arrange with them to reserve it later.

Under no circumstances should you simply remove a peg that is reserving a frequency.

If, however, you suspect that a peg has been left on the board in error (the flyer may have gone home) then you should check with senior flyers on the field and the peg may then only be removed after stringent checks that it is no longer in use. The name on the peg helps again here and is yet another reason to make sure that all pegs are named.

This system is useful for sites where vandalism might be a problem as the pegboards can be made small enough to carry easily and each member of a club can have their own, only one being used at any flying session of course.

### The Double Peg System

The pegboard used is exactly the same as for the peg-off system, complete with a full set of numbered pegs. The pilot, however, also has a named peg that he carries with him as in the peg-on system.

In use, to reserve a frequency, the pilot takes the numbered peg off the pegboard and replaces it with his own named peg.

This system still has to be used carefully but it is recognised as probably the most reliable system as it avoids several of the potential problems with the two other peg systems. It can still be wrongly applied, however, and all the comments in the peg-off and peg-on systems should be noted and applied.

### The Individual Marker System

A further popular system is where each club member has their own small individual frequency marker board with their name and channel number marked on it. These are stuck side by side in the ground by the flyers as they arrive on the site making, in effect, one large pegboard. Flyers on the

same frequency place their markers one behind the other and use a peg or similar to reserve the channel between them.

This system has been known to be effective on beach and hill sites as the marker boards can carry 'permit to fly this year' details as well as name and frequency information.

There are other variations and clubs should select the system which they feel is most appropriate to their flying field situation and, whichever system is chosen, should ensure that the operation of frequency control is well understood by all their members and visiting flyers.

### Pegboard Problems

(a) Switching on without 'getting the peg' is the cardinal sin and can have very serious consequences so you should make very sure that your flyers do not slip into such bad habits. It cannot be emphasised enough that your club should insist on high standards of training in the use of your frequency control system. The move to the pegboard before even thinking about switching on should be second nature to all your flyers.

(b) Changing crystals, either on the field or at home, can also have very serious consequences if the flyer forgets that they have done it. It is very easy to then take your 'usual' peg and reserve a completely different frequency to that which you are using. The dangers are obvious.

If channels are changed, it is essential that channel flags are used and changed with the crystals. Pilots must discipline themselves to act correctly in these circumstances as it is very easy to make a mistake with the pegboard after a change has been made..

## FREQUENCY ALLOCATIONS AT CLUB SITES

### THE CONTEST BAND PLAN

The original contest band plan, dating from the first allocation of 35 MHz frequencies, is as follows:

R/C power . . . . . all odd frequencies

R/C silent flight . . . all even frequencies

The original allocation of competition channels was the responsibility of the BMFA Technical Committees but it was also used by most clubs as their standard 35 MHz frequency band plan. Increased demand for frequencies, however, has led to a widespread dilution of this system, both at club level and in competitions.

The 35 MHz frequency band is by far the most used by club flyers but, because almost every club operates in unique circumstances, it is not possible to recommend a fixed band plan for the regulation of those frequencies on every site.

There are, however, several different types of frequency allocation already in operation at club level, as laid out below, and all clubs should consider very carefully which method of frequency allocation they should use.

#### (1) Use of all frequencies at 10 kHz spacing

This is the most used system and it is operated successfully by most clubs. Modern equipment gives very few problems at 10 kHz spacing, especially when common sense precautions against self generated radio interactions are taken.

As one safeguard, it is important that, flyers regularly operating together on adjacent channels should perform an adjacent channel check every two or three months.

#### THE ADJACENT CHANNEL CHECK

The check is quick and easy to do. Flyer A switches on transmitter (with aerial down), then switches on his receiver and stands about 4 metres from his model. Flyer B, on an adjacent channel, switches on transmitter (aerial up) and stands alongside flyer A. No interference should be noted on A's model and it should be under the full control of A's transmitter. The test is then repeated using B's model and with his transmitter aerial down and A's extended..

Any interference noted indicates possible tuning or crystal problems and must be investigated further. The test may save your model as it will give early warning of problems beginning in your radio equipment, usually well before they become bad enough to cause control problems in the air.

Use of all the frequencies at 10 kHz spacing, combined with the Club General Safety Precautions and the Adjacent Channel Check is probably the safest way to operate. Modern equipment is quite capable of operating to this standard and when faults do develop (usually faulty crystals) you have the ability to spot them before they cause trouble.

#### (2) Use of the Contest Band Plan

With this system power flyers use the 'odd' channels and slope/thermal/electroflight flyers use the 'even' channels.

This system may still be useful for some 'silent flight' clubs and for some power clubs with sites near to known slope or thermal soaring sites. Its use has, however, been overtaken by frequency requirements and availability and the 'block frequency allocation' is now more appropriate in many cases.

#### (3) Use of a Block Frequency Allocation

Where a club has a large site and is able to set up two or more flight lines, or where two clubs operate closely together then the block frequency allocation should be used.

For example, if a power club, using all frequencies at 10 kHz spacing, has room to set up a separate helicopter flight line, the frequency allocations could be:

Main flight line channels 55 to 79

Second flight line channels 81 to 90

Leaving channel 80 unused as a safeguard although, depending on site considerations, this may not be necessary.

Each flightline then has its own pegboard, allowing only the agreed allocated frequencies to be used.

Similarly, two clubs operating in close proximity could arrange that one used 55 to 71 and the other used 73 to 90, leaving 72 unused as a buffer.

Again, each group would have their own pegboard showing only those frequencies that they had agreed to use.

Many combinations can be worked out to suit individual needs and the increased number of channels made available in recent years has made this type of frequency sharing much easier. The ability to have targeted pegboards on each flightline or site is very important in avoiding frequency clashes.

#### (4) Lone Flyers

Lone flyers, or people who fly in small groups of two or three, must take the greatest care that they are not operating in situations where they can cause interference to a local club or flying group. As a general rule, you should not fly within two miles of a recognised club flying site unless you have some arrangement with the club who fly there.

This is for the benefit of both parties as interference works both ways and could result in the loss of aircraft on either site.

If you wish to fly alone and are not sure if there are clubs sites local to you, contact your local model shop or the BMFA's Leicester office for information. You will usually be able to get into contact with clubs quite easily through these sources and it is essential that you do so to ensure safe flying for all concerned.

## INTERFERENCE

### INDIVIDUAL CASES

(a) It is a great temptation to claim interference whenever a model crashes but the plain fact is that outside radio interference is rare and causes very little trouble.

(b) If you have crashed a model and think you have been affected then run through this checklist first. These are the main causes of model crashes.

(c) Pilot error - this includes stall/spin incidents on final turns, tip stall incidents everywhere, not 'keeping up' with the model so that it doesn't seem to be doing what you tell it, disorientation, lack of awareness of where the model is in relation to ground features, flying over operating transmitters, the inappropriate use of low specification radio equipment and very many more.

(d) Airborne power failure - including receiver battery failure or lack of capacity, wiring, plug and switch failures, black wire corrosion etc.

(e) Airborne hardware failure - including individual servos and receivers, crystal failures, aerials breaking or being masked, linkage failures, airframe failures etc.

(f) Ground failures - transmitter battery failure or low capacity, transmitter crystal failure, module pins corroding, dirty, faulty or loose transmitter aerial, dirt and oil in transmitter electronics etc.

(g) Club interference - other members switching on without frequency clearance, other transmitters faulty, people wandering over the field with operating transmitters etc.

(h) The list is by no means exhaustive and you can add to it if you give it some thought but these are the things that you should think about very carefully. If you can honestly say that you can eliminate all of these then you MAY have suffered from interference.

(i) If so then you should report the facts to your club committee, setting down all the relevant facts, and your club will then be in a position to file a report with BMFA if necessary.

### CLUB CASES

(j) If your members are reporting regular cases of what seems to be interference then your first step is to conduct what on-field investigations you can.

(k) Look very carefully at the individual incidents to see if you can eliminate any. Try to collate the incidents you have to see if there is any pattern. Use your club scanner to see if you can pick up any specific interference.

(l) Investigate the equipment used by anyone suspected of suffering from interference. It may be that your site requires the use of high specification receivers and you can spot this quite easily if those affected are all using single conversion but no high specification receivers are affected. Read the section 'Radio Control and You' for more information. A new club site rule may be all that is required to solve the problem.

(m) When you are reasonably sure that you are suffering from interference then contact BMFA Leicester office and ask for an interference reporting form. When you have completed and returned this form, it will be cross-referenced with the BMFA interference database and appropriate action will be taken, usually in conjunction with the UK Radio Control Council - UKRCC (which was the JRCUC), of which BMFA is an active member.

(n) The action taken may range from setting up an independent on-field investigation with specialised tracking equipment to gain more information to directly reporting your problems to the Radiocommunications Agency for immediate action.

## GENERAL MODEL 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) Models should be thoroughly checked prior to each flying session and after any abnormally 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 you local model shop and you should ask an experienced modeller for help if you are unsure how to use them.

(e) 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

(f) On internal combustion engines and electric motors, metal propellers must not be used.

(g) The use of locking prop nuts is recommended, especially for users of 4-stroke engines. A backfire or 'kick' can loosen a prop nut and locking nuts will prevent the propeller flying off.

(h) 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.

(i) 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 silicon tube 'keeper' as a secondary closure.

(j) When starting an engine always make sure that the model is restrained and cannot move forward.

(k) 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.

## HAZARDOUS MATERIALS

(a) We come into contact with hazardous materials every day but there are some that we use in and around our models that you should be particularly careful about.

(b) Carbon (and sometimes boron) fibre is regularly used as strengthening and structural material in models. These fibres, when stressed or fractured give off clouds of ultrafine microscopic fibres which are immune to your lungs' natural cleansing mechanism. Long term exposure may have very serious consequences.

(c) 'Stressed or fractured' carbon fibre could be found when you are repairing a model but it must also include cutting and sanding of new material. Whenever working with such material, always wear an appropriate mask.

(d) Kevlar fibres may also give long term problems so equal care should be taken if using the material.

(e) Cyanoacrylate glues (superglues) are well known for causing severe allergic reactions in some people and it seems that such a reaction can build up over time. Work in a well ventilated area, avoid breathing superglue fumes and, if necessary, wear a fume proof mask.

(f) Epoxy and polyester resins are also known to build up allergic reaction in some people over time. It is likely that the main culprit is the fumes given off by the products as they cure so it is important that you heed the advice to work in a well ventilated area.

(g) Methanol is fairly safe to store in a cool place and out of sunlight. However, it is a poison and the ingestion of even small quantities can be dangerous. Don't let it stay on your skin if you spill any.

(h) Petrol is an increasingly used fuel and the ease with which its vapour ignites makes it one to be very careful with. A small spark can lead to a big explosion. Don't store it or try to transfer it between containers indoors. This is one where working outdoors is very good advice.

## 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.

(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.

(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) Flyers wishing to use adjacent frequency channels should first perform an interaction check.

Flyers regularly operating together on adjacent channels should perform the check every two or three months.

**See the previous section on Radio Control at Your Club for details of the simple check you should perform.**

(e) Inexperienced R/C flyers should never fly without an experienced helper.

(f) Unless positive controls are in force, all flyers should use the same take-off area at any particular flying session.

(g) 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.

(h) 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.

(i) 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.

(j) 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. NEVER fly between yourself and spectator or pit areas, especially when landing.

(k) **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.

(l) At any sign of malfunction or an unexpected jettisoning of model parts, land as soon as it is safe to do so.

(m) Do not distract pilots, particularly when they are controlling models taking off or landing.

(n) 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.

(o) 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.

(p) 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.

There are exceptions to this particularly in some silent flight operations, and extreme care should be taken not to overfly transmitters in these cases.

(q) 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.

(r) The staging of deliberate mid-air collisions at airshows and public displays is banned and they are not covered by the Association's insurance.

## PRE FLYING SESSION CHECKS

On arrival at the flying site:

(1) Check airframe for any transit damage.

(2) Check that servos and linkages are secure.

(3) Check undercarriage for secure fixing and correct alignment.

(4) Check propeller for damage and secure fixing.

## CHECKS BEFORE EACH FLIGHT

(1) After obtaining frequency clearance, switch transmitter ON then receiver ON. Check that all controls operate freely and in the correct sense. Check that all control surfaces are in their correct positions with the transmitter trims at neutral.

(2) Look for any minor radio malfunctions such as slow or 'jittery' servos, glitches etc. If in doubt, **DO NOT FLY**.

(3) 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.

(4) With the aircraft held securely on the ground, open up again to full power and re-check all flying controls again.

(5) **DOUBLE CHECK** that all transmitter trims, rate switches, mixers etc. are in their correct positions and that the transmitter meter is 'in the green'.

**Be S.M.A.R.T.** with your transmitter.

**S**...switch on

**M**...meter in the green

**A**...aerial secure and extended

**R**...rate switches all in correct positions

**T**...trims all in correct positions

## CHECKS AFTER EACH FLIGHT

(1) Receiver OFF then transmitter OFF.

(2) Clear the frequency control system.

(3) Clean the aircraft down

(4) Check propeller, airframe, undercarriage, wing fixing etc. for security of fastening and for possible flight or landing damage.

**REMEMBER** - Never fly with a damaged aircraft or propeller, or with any possible radio problem.

## 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 may be worth while.

## PARK FLYERS

(a) The number of electric powered 'Slow Fly' or 'Park Fly' on the market is increasing all the time 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 and may seem innocuous, 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. 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) Be aware that some Local Authorities have by-laws banning the flying of powered models from their open spaces. Check carefully to avoid trouble.

(f) 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 and they could appear from anywhere.

(g) 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.

## HELICOPTERS

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 Association 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. 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.

Rotor blades must always be carefully balanced and you should always remember that vibration in helicopters can be very destructive.

## A MODEL HELICOPTER MUST NEVER, UNDER ANY CIRCUMSTANCES, BE FLOWN OR RUN UP:

(a) **IN OR NEAR** the pits area or close to any spectators.

(b) Directly towards the pits area or any spectators.

(c) With metal rotor blades.

(d) With knife sharp leading edges on main or tail rotors.

(e) 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.

(f) With radio equipment unproofed against shock and vibration.

(g) In the presence of spectators or at a competition or fly-in until properly tested and proved airworthy.

(h) Until thorough maintenance checks are carried out as set out in (A) and (B) below.

(i) Note that all helicopters weighing more than 7 kg without fuel are subject to certain CAA regulations and must comply with those conditions when flown.

### (A) CHECKS BEFORE DAILY FLYING SESSION

(1) Check all ball links for slop and change as necessary.

(2) Check that all rotor blades are in good condition with no damage apart from minor tip damage.

(3) Check for loose or missing nuts and bolts.

(4) Check that there is no backlash in the drive system apart from gear backlash which should not be excessive.

(5) Check that servos are secure and free from oil.

(6) Check that the fuel tank and all piping is secure.

(7) Check that the receiver aerial is secure and in good condition with no chafing or damage.

### (B) CHECKS BEFORE EACH FLIGHT

(1) If a helicopter suffers damage or a heavy landing, recheck all of (A) above.

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

(3) Re-check controls at high rotor rpm just before lift-off.

(4) Check for vibration and eliminate before flight.

(5) Check main rotor blades for true tracking in hovering flight.

(6) Check that the receiver aerial cannot become entangled with any moving or rotating part.

(7) Double check that all switches on the transmitter are in their correct positions before **EVERY** flight.

For more information on the British R/C Helicopter Association, contact the BMFA's Leicester office.

## HELICOPTER ROTOR BLADE SAFETY

Rotor blade failures have five basic causes, (1) design and manufacture faults, (2) incorrect assembly, (3) incorrect repairs, (4) unnoticed accident damage and (5) ageing and weathering.

(1) 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.

(2) 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.

(3) Do not be tempted to undertake major repairs to rotor blades unless you know exactly what you are doing. Minor repairs to blade edges are permissible but you should always re-balance after completion.

(4) 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.

(5) 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.

## SILENT FLIGHT

### (THERMAL / SLOPE / ELECTROFLIGHT)

(a) 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.

(b) When strong thermal or slope lift is encountered, beware of flying too high. At altitude, lift is often very strong and turbulent. Do not try to dive out of strong lift if spoilers are not fitted. Fly away from the lift and try to find sinking air. If emergency action is required, full up elevator and full rudder may give the safest descent.

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

(d) Silent flight models are often flown at considerable distances from their pilots 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.

## 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.

(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.

## 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 used or overflowed by full size gliders or hang gliders, you must 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.

## 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) Always use a foolproof system for fast charging. Overcharging at high currents can ruin your cells and has been known to cause battery packs to explode violently. When using nickel hydride cells be sure to use a charger suitable for them. Use a charger with a timer, temperature or voltage controlled cut-off.

(e) 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.

(f) 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 at the motor is a simple task and you should seek the advice of an experienced flyer on the subject.

(g) Fast charge cells can be discharged at around 100 amps. Short circuits, faulty wire insulation or loose contacts can result in considerable heat generation and can cause fires.

(h) 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.

(i) 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 2mm and 4mm gold plated 'bullet' connectors, which are much better as they offer very low resistance and are designed to carry high currents.

(j) Always ensure that flight batteries are securely fixed and that they cannot move in flight.

(k) 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.

(l) 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.

(m) The BMFA Specialist Body covering electric flight is the British Electric Flight Association (BEFA). They can be contacted via the BMFA's Leicester office.

## CONTROL LINE

(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.

## FREE FLIGHT

(a) A model should not normally be launched from an area such that it would overfly houses, major roads, railways or similar hazards in its expected flight pattern.

(b) Always launch models, particularly powered ones, well away from and downwind of any spectators or vehicles.

(c) When a fuse type dethermaliser is used, always use a snuffer tube.

(d) Check flying surface alignment and, if your model employs them, the dethermaliser and any automatic systems fitted thoroughly before launching.

(e) All glider launches should be undertaken with the towline detached from the winch.

## INDOOR FREE FLIGHT

(a) Take care when launching that no one is standing in the flight path of the model.

(b) 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.

## INDOOR RADIO CONTROL

(a) Most of the precautions for outdoor R/C club flying will apply to indoor events.

(b) It is not advisable, except under exceptional circumstances, to have free flight and radio control flying at the same time.

(c) Active transmitter control should be in operation throughout the meeting and at larger events a transmitter pound should be used.

(d) 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.

(e) 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.

(f) 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.

(g) 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.

(h) A written event briefing sheet should be given to all pilots if staggered arrivals make a pilots briefing impractical.

(i) 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 10 grams per square decimetre (just over 7 ounces and 3 ounces per square foot).

(j) A Guide to Safe Indoor R/C Flying is available from the BMFA Leicester office on request.

### MODELS BETWEEN 7 kg AND 20 kg

(a) Any model aircraft (power fixed-wing, glider or helicopter) weighing between 7 kg and 20 kg without fuel are subject to regulation by the Air Navigation Order over and above Articles 63 and 64. Full details are included in the section 'Legal Controls over Model Flying.'

Pilots of models between 7 and 20 kg should take great care to comply with these regulations as their wilful or negligent breaking could result in their flights being illegal under the terms of the ANO and they may be liable to criminal prosecution.

The address of the CAA is listed at the back of this handbook and you can contact them for details of current regulations. In addition, BMFA will supply news of all the latest CAA conditions on request. Contact the Leicester office for more details.

The most important clause in the ANO regulations for these larger models is Article 87 which says 'An aircraft .... (weighing more than 7 kg but not more than 20 kg) .... shall not fly unless the person in charge of the said aircraft has reasonably satisfied himself that the flight can safely be made.'

This puts a legal requirement on the pilot to consider all aspects of safety before a flight is made. Pilots should take great care not to underestimate the importance of this clause.

(b) Large models may not be flown in any full-size air traffic control zone or special rules zone without the specific permission of the appropriate ATC authority. For information on such zones, contact your nearest airfield or airport air traffic control. They will be able to give you the permission you require if your flying site falls within such an area. If you have any problems with this process you should contact the Leicester office for advice.

(c) 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.

(d) 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.

(e) 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.

(f) 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.

(g) Where required by the CAA, a radio fail-safe device must be fitted and operational. Remember that the purpose of the device is to prevent the model flying away in the event of radio failure and test it regularly as part of your pre-flight checks.

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

(i) Do not operate large models at a site which allows public access to the take-off or landing area unless that access can be marshalled during the duration of the flight. Although you may be aware of the potential dangers, the general public, especially children, will not know these hazards.

(j) Above all always fly sensibly and safely.

### 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.

### 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 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.

### GLIDERS - SLOPE AND THERMAL

(a) The fail-safe device fitted must, as a minimum, operate on both the elevator and rudder, driving the elevator to full up and the rudder to full left (or right).

(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 structure.

(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.

### FLYING SITES FOR MODELS BETWEEN 7 kg AND 20 kg

Models between 7 kg and 20 kg are directly regulated by the Air Navigation Order and two of the main legal requirements are that they are not flown

in controlled airspace or in aerodrome traffic zones (ATZ) without Air Traffic Control (ATC) permission and that they are not flown at more than 400 ft agl without the permission of the relevant authority.

Within controlled airspace this is the appropriate ATC unit and outside controlled airspace it is the CAA itself.

### CAP 658 says;

- Models between 7 and 20 kg must be flown below 400 ft agl unless with ATC permission and should be flown well clear of any congested area of city, town or settlement; 150 metres is suggested. (note that the CAA definition of 'congested area' includes playing fields that are actually in use, i.e. if a football match is in progress. Ed).

- Arranging to fly on a site already cleared for model flying could save you some problems.

- Long term permission can be arranged for sites within controlled airspace and ATZs and you should liaise with your local ATC to arrange this. Such permission should be in writing and will probably be for one year.

This type of long term permission is endorsed by the CAA and BMFA and if your local ATC is not willing to give it in what you consider to be reasonable circumstances then you should contact the BMFA Leicester office. An arbitration procedure has been agreed with the CAA and the matter will be taken further.

### FLYING SITES FOR MODELS OVER 20 kg.

Such models are subject to the issue of a CAA exemption certificate before they may be flown. The certificate will set out any conditions required but you can certainly expect any restrictions to be at least based on those noted above for models between 7 and 20 kg and it is extremely unlikely that they will be less strict.

### MODELS OVER 20 kg

Models over 20 kg are subject to the issue of a CAA 'Permission to Test' exemption certificate before they may be flown. This certificate lasts for twelve months.

The CAA will not issue such a certificate unless the construction of the model has been monitored and 'signed off'. A UK wide building inspection system which is available to all who need it has been set up and details can be obtained from the BMFA office.

A full exemption certificate will then only be issued by the CAA on the completion of a witnessed test flight schedule. Only pilots named on the exemption certificate 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 20 kg should use the inspection service and test flight monitoring service.

If you don't then an exemption certificate will not be issued by the CAA. Flying the model will then be illegal (in the strict definition of the word) and you will be liable to prosecution if you do fly it.

## SPACE MODELS

### SPORTS ROCKETS UP TO 'G' MOTORS

(a) Model rockets must be constructed of lightweight materials, with no metal structural parts.

(b) Only unmodified factory produced motors may be used.

(c) All models must have a reliable recovery system (parachute/streamer) or suitable aerodynamic surfaces so that a safe return to ground is made on each flight.

(d) 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.

(e) Motors must be ignited electrically, with the operator and any spectators being at least 5 metres from the model. 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.

(f) Flying sites must be clear and open and models should only be flown in conditions of good visibility.

(g) Where spectators are present, a Range Safety Officer should be appointed to take responsibility for all flying activity.

(h) For more information plus a detailed set of safety rules, contact the Association's Leicester Office.

### LARGE SCALE ROCKETS, 'H' TO 'M' MOTORS

(a) 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 to cover such operations and is published by BMFA. It is required reading if you are interested in large scale rocketry.

### SPACE MODELLING SPECIALIST BODIES

The BMFA Specialist Bodies covering space models are the British Space Modelling Alliance (BSMA) and the United Kingdom Rocketry Association (UKRA). These bodies can be contacted via the BMFA's Leicester office.

## GAS TURBINES

(a) 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.

(b) Never run an engine in excess of the manufacturer's recommended power rating. Always follow manufacturer's recommendations on pipework and fittings, especially with regard to periodic renewal.

(c) Smoking must not be allowed near the engine and the fuelling area and a CO2 fire extinguisher should always be available. 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.

(d) The engine should normally be started facing into wind but make sure that it is not pointed at people or the pits area. Beware of 'wet' starts with liquid fuels.

(e) After starting the engine always check the oil flow to the bearings. It is also advisable to check the exhaust gas temperature each day and you should 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.

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

(g) If the engine is home-built or of a new design you should take extra care during its initial operating period. Until the unit is proven, do not operate it with large crowds of spectators present or in pit areas.

(h) The use of plywood or composite impellers is not recommended unless the builder has detailed and specific knowledge of the use of such materials.

(i) There is a detailed guidance booklet covering the safe operation of model gas turbines which is available from the BMFA Leicester office. This booklet is a joint GTBA / JMA / BMFA production and study of it cannot be recommended too highly for any gas turbine operator.

(j) The BMFA Specialist Bodies covering gas turbines are the Gas Turbine Builders Association and the Jet Modellers Association. These bodies can be contacted via the BMFA's Leicester office.

## THE BMFA SAFETY CODE FOR MODEL FLYING DISPLAYS

This code is issued for guidance only. The Association takes no responsibility for arrangements at particular events outside the Association's direct control.

### GENERAL

This code has been prepared to give guidance to organisers of, and participants in, public displays which include model flying as part of a demonstration or entertainment. The Code will assist the organisers in meeting their direct responsibility for the safety of spectators and nearby persons and property.

The recommendations contained herein are not intended to apply to

(a) competitive model flying events where spectators attend in the knowledge that model aircraft will be taking part in contest flying; for these events specific safety rules are included in the appropriate competition rules; or

(b) general model flying, the safety requirements for which are covered in the BMFA Safety Code for General Flying.

Article 64 of the UK Air Navigation Order which states that: '**A person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property**'. Article 63 of the UK ANO states that '**A person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or any person therein**'.

These apply to ALL aircraft flown in the United Kingdom, including unmanned ones. This, of course, includes all model aircraft, whether above or below 7 kg. Model aircraft of over 7 kg must also comply with other CAA regulations whenever they are flown including Article 85 of the ANO which contains an additional requirement to fly safely.

Clubs organising displays at which large models will be flown must take careful note of the CAA regulations in order that they do not lead the pilots of such models into breaking the conditions laid down by the CAA.

The following minima for sites, distances maintained from spectators and competence standards required from flyers of model aircraft at displays are recommended as a result of a number of years experience by the sport's national governing body, the British Model Flying Association. As there are several different types of model aircraft they each require different facilities and site conditions for safe and effective displays. The different types will therefore be treated separately below.

The BMFA is available to give advice to display organisers, insurance companies, local authorities, etc., in specific cases.

## ORGANISATION

One person should assume overall responsibility for the event; they will make arrangements for:

(a) Site assessment

(b) Spectator control or, in the case of an event at which model flying is part of a large function, the siting of the model flying area with respect to spectator enclosures, car parks etc..

(c) Verification of flyers' competence. The BMFA has a voluntary Achievement Scheme for R/C flyers and it is recommended that this is used to assess competence. Details are included in this handbook.

(d) In the case of R/C flying, establishing effective transmitter control and frequency monitoring.

(e) Airworthiness and safety checking of all model aircraft and equipment to be used in the display.

(f) Verification of third party insurance validity, covering individual flyers, the model flying club carrying out the flying and the display organisers.

(g) Liaison with police and local authorities or, in the case of model flying as part of a wider function e.g. fetes, traction engine rallies etc., written notification to the function organisers of any special requirements.

The appointment of a **FLYING DISPLAY DIRECTOR** who will be responsible for the safe conduct of the flying display and who will assume overall responsibility for the planning, organisation and subsequent running of the event.

(h) The appointment of a **FLIGHT LINE DIRECTOR** who will assist in the planning of the flying, the briefing of pilots and who will take full control of the model flying area (in modelling terms, a Contest Director or CD).

The appointment of a **FLIGHT LINE MARSHAL** who is responsible to the Flight Line Director and who will directly control the active model flying.

The Flying Display Director and Flight Line Director's posts can be held the same person but the Flight Line Marshal must be a separate post.

(i) The Flight Line Marshal must exercise authority over all flying matters as they are directly responsible for the flying safety of the display. They must not hesitate to discipline pilots if necessary and it cannot be stressed too strongly that theirs is the final say on all matters on the airside of the flightline.

This places a great deal of responsibility on the Flight Line Marshal and it almost defines their job. A very pro-active approach must be taken so that these responsibilities are fulfilled and all display organisers are urged to consider very carefully the quality of the personnel appointed to this task.

## SITE ASSESSMENT

### THE BMFA SITE ASSESSMENT SERVICE

BMFA offer a free voluntary site assessment service to all display organisers and you should contact the Leicester office for details. The use of this service is very highly recommended to you although the conclusions reached during the site assessment are not binding.

However, you may be very surprised at what a fresh pair of eyes can see in your plans and you should lose no opportunity to make sure that what you are going to do is as safe as possible; which is what the CAA expect of you as a display organiser.

### CONTROL-LINE AIRCRAFT

The flying area shall be substantially flat. The aircraft are tethered and fly in a circular path; the minimum radius of the area required is the maximum control-line length to be used during the display, plus 13 metres.

A three metre diameter circle should be marked in the centre of the flying area (emulsion paint is recommended for this purpose), and pilots should ensure that they do not leave this circle while flying.

Under no circumstances should the boundary of the flying area be less than 50 metres from ANY overhead cables or masts supporting such cables.

### RADIO-CONTROLLED AIRCRAFT

A minimum area for take-off and landing of 100 x 40 metres, with the 100 metre direction substantially parallel to the wind direction, shall be available, with a tarmac or mown grass surface.

To the upwind and downwind sides of this area there should be no spectators, parked or moving vehicles, or other obstructions within a minimum 150 metres of the boundaries of the take-off and landing area. Specific attention shall be paid to the possibility of turbulence caused by nearby tall buildings, trees, marquees, etc..

It is essential that the site be positioned so that all flying can take place without car parks and spectator areas being overflowed.

It is recommended that no radio-controlled flying displays should take place within 5 km of any airfield without prior consultation with the chief air traffic control officer of the airfield concerned. This consultation should be sought at least 30 days before the display is due to take place.

Clubs wishing to organise or participate in displays away from their normal flying site must take great care not to interfere with the legitimate flying of other clubs or groups near the display site.

Enquiries should be made (with the BMFA, with local club contacts and local model shops) and if any club or group is flying within 2 miles of the display site, the display may only take place with their agreement and co-operation.

## CONTROL AND SITING OF SPECTATOR AND CAR PARKING AREAS

### CONTROL-LINE AIRCRAFT

Spectators should be behind stout rope barriers or similar restraints surrounding the flying area, and sufficient marshals should be available to control them.

### RADIO-CONTROLLED AIRCRAFT

Spectators should be behind a stout rope or other barrier located parallel to the take-off and landing direction. They should thus be on only one side of the flying area for radio-controlled aircraft. In NO circumstances should take-off or landing be performed towards or over spectator or car park areas. Sufficient marshals should be appointed to ensure that spectators are appropriately controlled and supervised.

## PLANNING AND CONDUCT OF MODEL FLYING DISPLAYS

The organiser should himself preferably be an experienced flyer of the type(s) of model aircraft being used at the display, but in any case must be thoroughly familiar with the operating characteristics of the aircraft taking part. He is responsible for the postponing or cancelling of all or part of the display in case of adverse circumstances likely to cause a hazard to safety. It is also his responsibility to ensure that minimum nuisance is caused, and that no unauthorised flying takes place. All flyers should have had experience with the aircraft they are to fly and the types of manoeuvres to be performed. In the case of radio-controlled flying;

- all flyers should be BMFA 'B' Certificate holders.
- all helpers should be familiar with the Safety Codes within this handbook.

### CONTROL-LINE FLYING

Model, control-lines, handle and safety straps shall be subjected to the pull test specified for the type of aircraft in the contest rule book before each flight, and visually examined for damage. Safety wrist straps shall be used at all times. All helpers in the control-line flying area shall wear safety helmets and should be familiar with the safety codes within this handbook. All control lines shall be of steel.

### RADIO-CONTROLLED FLYING

All display pilots must have a helper/caller with them when they are flying.

All ground helpers should be familiar with the safety codes in this handbook.

All flyers should hold the BMFA 'B' Certificate or its equivalent (SAA Silver Wings or LMA Certificate of Competence).

When using the LMA Certificate of Competence in place of the BMFA 'B' Certificate, the following conditions must be complied with.

- The pilot must be a paid up member of both BMFA and LMA.
- The pilot may only fly the type of model which he is certificated for.
- All CAA regulations regarding model flying must be complied with.
- The pilot's helper/caller should be either a 'B' certificate or LMA Certificate holder.

It is strongly recommended that a frequency monitor shall be operated throughout the display and for half an hour before flying commences.

The number of frequencies in use should be kept to a minimum. At the planning stage enquiries should be made to ascertain whether any hospitals, factories, military or public service establishments in the vicinity may use radio equipment or any other electronic or electromechanical devices likely to cause interference on the radio frequencies to be used during the display.

If there is felt to be any risk of such interference, then no flying must take place. If any radio interference is suspected during flying all models shall be landed immediately and no further flying may take place until the interference source is identified and eliminated.

Strict control of transmitters MUST be enforced. A transmitter pound, together with a pegboard frequency control system, is essential, and the use of a frequency checker on all transmitters is highly desirable.

All control functions of each aircraft shall be checked before each flight (1) when the radio is switched on and (2) with the engine at full throttle before take-off. All power-driven aircraft flown at displays shall have throttle control.

Particular attention shall be paid to the state of both transmitter and receiver batteries - dry batteries must not be used and rechargeable battery packs shall be fully charged at the start of the display.

No flying will take place if the surface wind speed exceeds 25 knots, or if the visibility is less than 500 metres.

27 MHz radio control equipment must not be used for public displays owing to the danger of interference from other legitimate model users, industrial or medical installations.

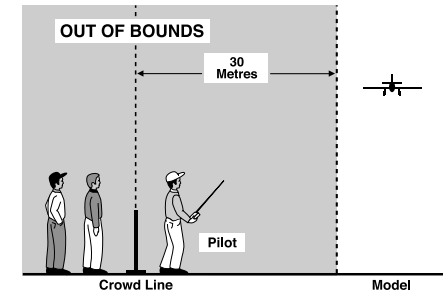
No turn should terminate with the aircraft on a heading towards the spectator enclosure.

No aircraft may be flown within 30 metres of spectators and for models over 7 kg and all gas

turbine powered models this distance should be 50 metres. This may be reduced to 30 metres for take off and landing only.

The organisers, especially the Flight Line Marshal, should also consider the need to add additional separation distance for models of exceptional dimensions, weight or performance.

The Flight Line Marshal must position the pilots so that they are between the spectators and the flying models.



**Note that the distance of 30 metres shown must be 50 metres when models over 7 kg or gas turbine powered models are flown.**

### TOFFEE BOMBERS

Models dropping toffees should not weigh in excess of 7 kg. The toffee bomber should fly alone. All other models should remain on the ground during the toffee drop and all transmitters should be switched off and in the care of Tx control. An area within the public enclosure should be provided for those children wishing to take part.

The toffee bomber should make its drop from as high an altitude as is practical. It should then circle at height upwind and should not fly over the area where the toffees have landed. If this is not possible without flying over car parks, houses, roads etc., no toffee drop should be included in the programme.

Children should be controlled by officials and/or PA, and prevented from leaving the enclosure until the toffees have been dropped and the model is away from the area. The field should then be cleared as soon as possible after the drop. All children must be safely back in the spectators enclosure before the pilot is permitted to bring the model back for its landing.

## GENERAL

It is important that a written description of arrangements for the model flying programme be circulated in advance to all people participating in the display. This should be reinforced and, if necessary, updated by a further oral briefing on the day of the display.

### THE BMFA DISPLAY PILOT'S LOGBOOK

To assist display organisers in their task of assuring themselves of pilot competence as required by the CAA in CAP 658, BMFA has introduced a Display Pilot's Logbook scheme.

The logbooks are free from the BMFA Leicester office and are also available from various show organisers. The only qualification needed to obtain a logbook is that you must hold a 'B' Certificate.

The logbook has spaces for pilots to fill in their show-by-show flying experience and for organisers to sign off each entry.

If you are a display organiser of flight line marshal and a pilot hands in his logbook, you will have a direct view of his experience (or lack of it) on the 'show circuit'. You will be able to see the types of aircraft they have flown and you should be able to come to a better informed conclusion about their competence than you could before.

If you are a regular or occasional display pilot and you haven't already done so then please think about getting your logbook started. Anything that might reduce the workload and responsibility of a display organiser has to be of benefit and a good logbook record is very impressive - It's your show flying CV already laid out for you.

## THE RADIO CONTROL ACHIEVEMENT SCHEMES

### General

**The Fixed Wing 'A' and 'B'**

**The Helicopter 'A' and 'B'**

**The Silent Flight Thermal 'A' and 'B'**

**The Silent Flight Slope 'A' and 'B'**

**The Silent Flight Electric 'A' and 'B'**

**The Silent Flight Thermal Gold, Diamond and Diamond Star Personal Achievements**

**The Silent Flight Slope Gold, Diamond and Diamond Star Personal Achievements**

**The Instructor Scheme**

### GENERAL

The main aim of the R/C Achievement Schemes is to encourage model flyers to reach a given standard of flying ability and safety and to prove that standard to an Examiner. There are two grades;

(a) The 'A' Certificate which may be equated to a 'safe solo' standard of flying.

(b) The 'B' Certificate which is designed to recognise the pilot's more advanced ability and a demonstrated level of safety suitable for flying at a public display'.

The scheme is open to all model flyers but non-members of the BMFA must produce evidence of Third Party insurance in the sum of not less than £5,000,000.

**The BMFA Achievement Schemes are intended to operate as National Schemes and not just within BMFA. Club Examiners may therefore be registered by both BMFA affiliated clubs and by non-affiliated clubs.**

### NATIONAL STANDARDS AND ADVICE TO CHIEF EXAMINERS, EXAMINERS AND CANDIDATES.

Chief Examiners are supplied with a leaflet detailing the nationally agreed standards that they should employ in testing candidates for Club Examiner. This leaflet is also available to examiner candidates and may be obtained from your Chief Examiner or from the Leicester office.

### THE ACHIEVEMENT SCHEME GUIDANCE LEAFLETS

Leaflets are available to Club Examiners laying down the nationally agreed standards for the testing

of candidates taking the 'A' and 'B' Fixed Wing certificates, the 'A' and 'B' Helicopter certificates.

These leaflets are also available to test candidates, either from your club examiner or on request from the Leicester office, on receipt of a SAE, and they are available for download from the BMFA website .

Candidates are very strongly advised to make every effort to obtain a copy of the relevant guidance leaflet as it explains every aspect of the test they will be taking in great depth.

Guidance Notes for the 'A' and 'B' Silent Flight Thermal, 'A' and 'B' Silent Flight Electric and 'A' and 'B' Silent Flight Slope certificates will be prepared in the near future and you should watch BMFA News or the BMFA Club Bulletin for notification that these are available.

### CHIEF EXAMINERS

#### (Fixed Wing, Helicopter and Silent Flight)

The Achievement Scheme will be run at Area level by Chief Examiners who will comprise persons nominated by Area Committees and ratified by Areas Council as Area Chief Examiners.

An Area may request that the Scheme Controller appoint a Chief Examiner for a probationary period of up to six months prior to their ratification. During this period the nomination must be submitted to Areas Council as the probationary period may not be extended.

A sufficient number of Area Chief Examiners should be nominated by each Area to ensure good geographic coverage for their clubs.

Chief Examiners must be senior members of the BMFA and may be appointed for fixed-wing, helicopter, silent flight or any combination of the three.

They must have long term knowledge and experience of any discipline they are appointed for and must also have full knowledge of the BMFA Safety Codes

Generally, all Chief Examiners must have held an Examiner rating in the discipline for which they are appointed for at least twelve months although exceptions may be allowed by the Areas Council in certain special circumstances.

The principal duty of a Chief Examiner is to test applicants for the post of Examiner and to promote and maintain the standards of the R/C Power Achievement Scheme by example and by visiting clubs who require their services.

### CLUB EXAMINERS

#### (Fixed Wing, Helicopter and Silent Flight)

Candidates for the post of Club Examiner must be senior members of the BMFA (i.e. over the age of 18 years) and must have held a 'B' Certificate in the relevant discipline for a minimum of 6 months (Fixed

Wing 'B' for Fixed Wing Examiner, Helicopter 'B' for Helicopter Examiner and either Thermal, Slope or Electric 'B' for Silent Flight Examiner).

They will be tested by a Chief Examiner and will be expected to demonstrate a high standard of flying and flight safety, based on the 'B' test.

Prospective examiners must show a long-term knowledge of R/C flying, particularly in the discipline for which they are being tested, and a full knowledge of the BMFA Safety Codes and local club rules.

The principal duty of an Examiner is to test applicants for 'A' and 'B' Certificates and to maintain the standards of the Achievement Scheme.

Examiners are appointed specifically to clubs and may not operate unless appointed or ratified by a club.

To initially request the appointment of an Examiner, the candidate's club must apply to the BMFA in writing, asking that the candidate be tested and giving, in advance, written acceptance of the candidate as a Registered Club Examiner should the test be successful.

Requests that Examiner candidates be tested will be accepted from both BMFA affiliated and non-affiliated clubs.

### QUALIFICATIONS

Chief Examiners and Club Examiners will be categorised as 'Fixed-wing', 'Helicopter', 'Silent Flight' or 'Multi Role' and all ratings will be shown on the individual's BMFA membership card.

### DURATION OF APPOINTMENTS

Chief Examiner appointments are for a period of two years only. After this time the qualification may be renewed by the scheme controller at the request of the appropriate Area Committee. Re-ratification of Chief Examiners by their Area should take place at the Area AGM.

If a Chief Examiner allows his membership to lapse then he will lose his status as a Chief Examiner and be credited with an appropriate 'B' Certificate at some time near the end of that membership year.

Club Examiner appointments are for a period of one year only. After this time the qualification may be renewed by the BMFA Leicester office on receipt of the annual club affiliation form or a letter from the club committee.

The two conditions for remaining as an Examiner must be fulfilled each year.

One of these is that you are a BMFA member. If your membership lapses then you will lose your Examiner status. This will be followed through near the end of the lapsed membership year when your status on the membership database will be changed and you will be credited with an appropriate 'B' certificate.

Regaining Examiner status on re-joining is not automatic and will be subject to certification by a Chief Examiner.

The other condition is that you are ratified by at least one club each year and if this is not done then your status on the database will eventually be changed to show a 'B' certificate. As with lapsed membership, regaining Examiner status on being appointed or re-ratified by a club is not automatic and will be subject to certification by a Chief Examiner.

### AREA ACHIEVEMENT SCHEME CO-ORDINATORS

Each of the thirteen BMFA Areas has appointed an Achievement Scheme Co-ordinator whose job is to oversee the running of the schemes in their Area and to liaise with the overall Scheme Controllers.

If your club does not have any Registered Examiners, does not have enough Examiners or has any problems with co-ordinating the work of your existing Examiners, then you should ask your club committee to contact your local Area Achievement Scheme Co-ordinator who will be able to help.

Names and telephone numbers of Area Achievement Scheme Co-ordinators are available from your Area Secretary or from the BMFA Leicester office.

### CHIEF EXAMINER'S AREA OF OPERATION

Chief Examiners operate within the Area for which they are ratified. If a Chief Examiner is

(a) requested to operate in another Area for any reason or

(b) asked to test Examiner candidates from a club in another Area

they must liaise with that Area's Achievement Scheme Co-ordinator before taking any further action.

### THE 'A' CERTIFICATE (FIXED-WING)

The examination for an 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner. The candidate must successfully carry out the following flying test and reference to the Guidance Notes is very strongly recommended:

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

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

(c) Fly a 'figure of eight' course with the cross-over point in front of the pilot, height to be constant.

(d) Fly a rectangular circuit and approach with appropriate use of the throttle and perform a landing on the designated landing area.

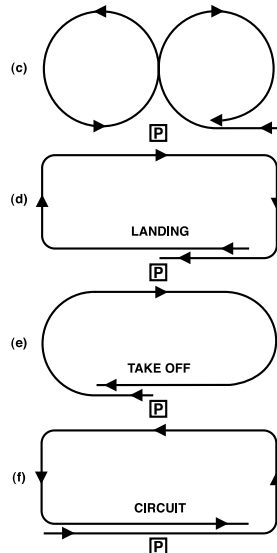
If the engine stops during the landing the model may be retrieved and the engine restarted to enable the remaining parts of the test to be completed.

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

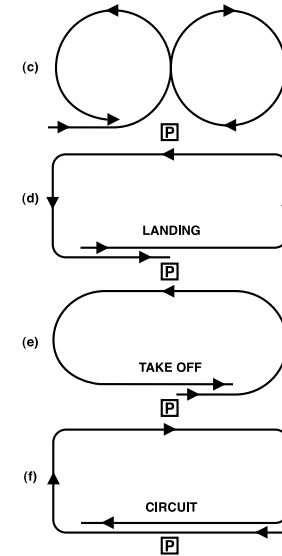
(f) Fly a rectangular circuit at a constant height in the opposite direction to the landing circuit flown in (d).

(g) Perform a simulated deadstick landing with the engine at idle, beginning at a safe height (approx. 200 ft) heading into wind over the take-off area, the landing to be made in a safe manner on the designated landing area.

#### WIND FROM THE LEFT



#### WIND FROM THE RIGHT



(h) Remove model and equipment from take-off/landing area.

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

All manoeuvres must be carried out in front of the pilot and, depending on the wind direction, (c), (d) and (f) may be flown as shown in the accompanying drawing.

The above schedule is treated as one test flight and must be completed in one attempt. Two attempts per examination will be allowed in any one day.

If, in the opinion of the Examiner the surface of the flying area is such that a rolling take-off would not be possible, hand launches may be permitted.

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

**Note** - The clear implication of the above change is that you must now turn up for your test with a model that is capable of taking off on it's own undercarriage or from a dolly.

### THE 'B' CERTIFICATE (FIXED-WING)

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

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

(b) A Fixed Wing Chief Examiner

If your club does not have any Registered Fixed Wing Examiners, you should contact your local Area Achievement Scheme Co-ordinator who will be able to help. Names and telephone numbers of Area Co-ordinators are available from the BMFA Leicester office.

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

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

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

(c) Fly a 'figure of eight' course with the crossover point in front of the pilot, height to be constant. This manoeuvre must be flown more accurately than the similar manoeuvre in the 'A' certificate test.

(d) Fly into wind and complete one inside loop.

(e) Fly downwind and complete one outside loop downwards from the top (i.e. a bunt).

For aircraft (scale aircraft specifically) which for reasons of structural strength or control limitations cannot perform an outside loop, a Split S or Reversal (from level flight, half roll to inverted, hold, then pull through half loop to recover in level flight) may be accepted by the Examiner.

(f) Complete two consecutive rolls into wind.

(g) Complete two consecutive rolls downwind using the opposite direction of roll rotation to that used in (f) above.

(h) Complete a stall turn either left or right.

(i) Gain height and perform a three turn spin. For aircraft which will not spin, a spin attempt resulting in a spiral dive (not necessarily of three turns), will be acceptable. In each case the initial heading and the recovery heading must be into wind and the model must fall into the spin (no 'flick' spin entry).

(j) Fly a rectangular landing approach and overshoot from below 10 ft. Note that this manoeuvre is an aborted landing, not a low pass.

(k) Fly a rectangular circuit in the opposite direction to that in (j) at a constant height of not more than 40 feet.

(l) Fly a rectangular landing approach and land (wheels to touch within a pre-designated 30 metre boundary).

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

Parts (d),(e),(f),(g),(h) and (i) must be performed in airspace designated by the examiner prior to the test flight. The schedule must be completed in one flight.

Exceptionally, at a pre-determined point in the flight an intermediate landing may be permitted for the sole purpose of refuelling or the fitting of a freshly charged flight battery. This landing may only be made with the prior consent of the Examiners. Two attempts per examination will be allowed in any one day.

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

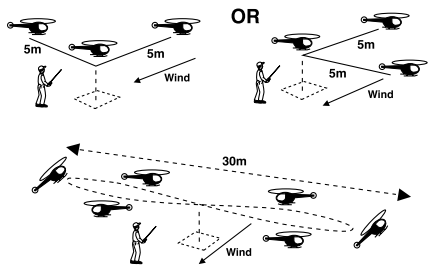
Depending on the wind direction, (j), (k) and (l) will be flown as EITHER left hand overshoot circuit, right hand rectangular circuit, left hand landing circuit OR right hand overshoot circuit, left hand rectangular circuit, right hand landing circuit.

In addition to the above flying schedule, the applicant must answer satisfactorily a minimum of eight questions on safety matters based on the BMFA Safety Codes for General Flying and Model Flying Displays and local flying rules.

### THE 'A' CERTIFICATE (HELICOPTER)

The examination for a helicopter 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner. The candidate must successfully carry out the following flying test:

- (a) Carry out pre-flight checks as required by the BMFA Safety Codes.
- (b) Take off and hover tail in over the take off point, with the helicopter skids at eye level, for approximately fifteen seconds.
- (c) Hover the helicopter slowly sideways, either left or right, for approximately five metres, stop, and hover briefly.
- (d) Hover the helicopter slowly sideways in the opposite direction to bring it back to its original position in front of the pilot, stop, and hover briefly.



(e) Fly slowly forwards for approximately five metres, stop, and hover briefly.

(f) Fly slowly backwards, bringing the helicopter back to its original position over the take off point, stop, hover briefly and land.

(g) Take off and hover briefly, turn sideways either left or right and fly forward to perform two 'lazy eights', each at least 30 metres on length. Each time the helicopter passes in front of the pilot it must be sideways on to the pilot.

(h) At the conclusion of the 'lazy eights', bring the helicopter to a halt above the original take off point, hover briefly and land.

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

The above schedule must be completed within one flight and two attempts per examination will be allowed in any one day.

In addition to the above flying schedule, the candidate must answer correctly at least five questions from the BMFA Safety Codes for General Flying and local flying rules.

### THE 'B' CERTIFICATE (HELICOPTER)

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

- (a) Two Registered Examiners (the 'lead' must be a Helicopter Examiner)
- (b) A Helicopter Chief Examiner

If your club does not have any Registered Helicopter Examiners, you should contact your local Area Achievement Scheme Co-ordinator who will be able to help. Names and telephone numbers of Area Co-ordinators are available from the BMFA Leicester office.

The candidate must successfully complete the following flying tests.

- (a) Carry out pre-flight checks as required by the BMFA Safety Codes.
- (b) Perform one hovering 'M'.
- (c) Perform one 'Top Hat'.
- (d) Take off and climb to a safe altitude.
- (e) Fly a left hand circuit.
- (f) Fly a right hand circuit.
- (g) Perform one stall turn.
- (h) Perform one twenty second nose-in hover.
- (i) Perform one double stall turn. Note that the stall turns must be performed with opposite rotation i.e. first one to the left, second one to the right or vice-versa.

(j) Perform an approach at 45° to the vertical, landing within a predetermined two metre square.

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

All manoeuvres must be carried out in front of the pilot in a similar manner to the fixed-wing 'B' Certificate and, in addition, parts (e),(f),(g) and (h) must be performed in airspace designated by the examiner prior to the test flight. The schedule must be completed in one flight.

Exceptionally, at a pre-determined point in the flight an intermediate landing may be permitted for the sole purpose of refuelling or the fitting of a freshly charged flight battery. This landing may only be made with the prior consent of the Examiners. Two attempts per examination will be allowed in any one day.

In addition to the above flying schedule the candidate must answer satisfactorily at least eight questions from the BMFA Safety Codes for General Flying and Model Flying Displays and local flying rules.

### THE 'A' CERTIFICATE (SILENT FLIGHT - THERMAL)

The examination for the thermal 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner. The candidate must successfully carry out the following test.

- (a) Carry out pre-flight checks as required by the BMFA Safety Codes. Particular attention should be given to airframe, tow hook, control linkages and surfaces.
- (b) Check the launching equipment is laid out correctly, securely and safely with respect to the field layout. Depending on the launch method, ensure that towlines are in good condition, that the bungee is securely anchored to the ground, that winches and turnaround pulleys are secure and a master on/off switch is fitted to the winch or that, if aerotow is to be used, the tug pilot is aware of the model he will be towing and that a launch plan is agreed.
- (c) Check that the launch area and landing area are clear both on the ground and in the air and, after complying with the site frequency control system, prepare the model for launch. If a helper is used to launch the model they should be fully briefed as to what is required.
- (d) Clearly announce "launching" and launch the model under full control, any deviation from the expected launch path must be corrected smoothly and quickly. Complete the launch by releasing the model from the launch line cleanly and level the model into wind without stalling.
- (e) Fly the model straight and level for at least 15 seconds while pilot and Examiner clear the launch area.

(f) At the Examiners call the model should be stalled into wind and recovered smoothly with minimum loss of height, heading into wind.

(g) Perform 3 consecutive 360 degree thermal turns to the right or left with minimum loss of height, ending on the same heading as the entry. The model must show no tendency to stall or enter a spiral dive.

(h) Perform 3 consecutive 360 degree thermal turns in the opposite direction to above with minimum loss of height, ending on the same heading as the entry. The model must show no tendency to stall or enter a spiral dive.

(i) Fly the model up wind to prepare the model for the landing phase. The model should be flown with no tendency to stall and with minimum loss of height.

(j) Call "landing" and fly a down wind leg, followed by a crosswind leg and final approach. The crosswind leg may be a continuous turn if preferred and it may be stretched past the centre line of the landing approach to allow control of height but the model must be flown back to the centre line for the final approach. The whole approach should be flown smoothly with no stalling and the turns should have a reasonably large radii.

(k) Land the model into wind within 20 metres of a predetermined spot.

(l) Retrieve the model from the landing area, informing other pilots that the landing area is clear.

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

(n) Repeat the above schedule twice more, giving a total of three flights.

(o) Answer at least 5 questions on safety matters from the BMFA Safety Codes.

If insufficient height is achieved at launch or very bad sink is encountered that will not allow the completion of the entire test schedule the Examiner may allow an additional flight. If in the opinion of the Examiner a poor launch height is due to pilot ability the test is failed.

All manoeuvres must be carried out in airspace pre-determined by the Examiner and Candidate prior to the commencement of the test flights.

Aerotow release height will be determined by the Examiner during the launch and should be approximately the same as a bungee, towline or winch launch.

The above complete multi-flight schedule is treated as one test attempt. Two attempts per examination will be allowed in any one day.

## THE 'B' CERTIFICATE (SILENT FLIGHT - THERMAL)

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

(a) Two Registered Examiners (the 'lead' must be a Silent Flight Examiner).

(b) A Silent Flight Chief Examiner

If your club does not have any Registered Silent Flight Examiners, you should contact your local Area Achievement Scheme Co-ordinator who will be able to help. Names and telephone numbers of Area Co-ordinators are available from the BMFA Leicester office.

The candidate must successfully carry out the following test.

(a) Carry out all relevant pre-flight checks as required by the BMFA Safety Codes. Particular attention should be given to airframe, tow hook, control linkages and surfaces.

(b) Check the launching equipment is laid out correctly, securely and safely with respect to the field layout. Depending on the launch method, ensure that towlines are in good condition, that the bungee is securely anchored to the ground, that winches and turnaround pulleys are secure and a master on/off switch is fitted to the winch or that, if aerotow is to be used, the tug pilot is aware of the model he will be towing and that a launch plan is agreed.

(c) Check that the launch area and landing area are clear both on the ground and in the air and, after complying with the site frequency control system, prepare the model for launch. If a helper is used to launch the model they should be fully briefed as to what is required.

(d) Clearly announce "launching" and launch the model under full control, any deviation from the expected launch path must be corrected smoothly and quickly. Complete the launch by releasing the model from the launch line clearly and level the model into wind without stalling.

(e) Fly the model straight and level for at least 15 seconds while pilot and Examiner clear the launch area.

(f) Fly the model through either a half loop or half roll to inverted, hold straight, controlled inverted flight for a minimum of five seconds and then half loop or half roll back to level flight.

(g) Fly the model on a thermal search pattern. The model is to pass over three points, agreed with the Examiner prior to the start of the flight (e.g. corners of the field).

(h) Fly the model through consecutive 360 degree thermal turns to a position a minimum of 100m down wind of the pilot. The model should gain height if in lift or be flown with minimum loss of height if no lift is found.

(i) Fly the model a minimum of 150m up wind of the pilot with minimum loss of height.

(j) Gain speed and perform a stall turn into wind.

(k) Fly the model across wind and stall, recover with minimum loss of height, still heading across wind.

(l) Turn the model down wind and stall, recovering with minimum loss of height on the same heading down wind.

(m) Call "landing" and fly a down wind leg, followed by a crosswind leg and final approach. The crosswind leg may be a continuous turn if preferred and it may be stretched past the centre line of the landing approach to allow control of height but the model must be flown back to the centre line for the final approach. The whole approach should be flown smoothly with no stalling and the turns should have a reasonably large radii.

(n) Land the model into wind within 10 metres of a predetermined spot.

(o) Retrieve the model from the landing area, informing other pilots that the landing area is clear.

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

The pilot must perform three flights and all sections (f) to (l) must be completed sometime during those three flights, nominating before each launch which parts will be attempted. Sections (a) to (e) and (m) to (o) apply to each individual flight.

If the pilot has completed all tasks in 1 or 2 flights they must still perform the total of three flights. In this case the Examiner may ask for any of tasks (f) to (l) to be repeated in the third flight. The cumulative flight time for three flights is to be more than 12 minutes.

Answer at least 8 questions on safety matters from the BMFA Safety Codes.

If insufficient height is achieved at launch or very bad sink is encountered that will not allow the completion of the test schedule the Examiner may allow an additional official flight. If in the opinion of the Examiner a poor launch height is due to pilot ability the test is failed.

All manoeuvres must be carried out in airspace pre-determined by the Examiner and Candidate prior to the commencement of the test flights.

Aerotow release height will be determined by the Examiner and should be approximately the same as a bungee, towline or winch launch.

The above complete multi-flight schedule is treated as one test attempt. Two attempts per examination will be allowed in any one day.

## THE 'A' CERTIFICATE (SILENT FLIGHT - SLOPE)

The examination for the Silent Flight Slope 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner. The candidate must successfully carry out the following flying test:

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

(b) Launch the model and gain height.

(c) Fly for ten seconds straight and level across wind.

(d) Fly for ten seconds straight and level across wind in the opposite direction to (c).

(e) Perform one 360 degree left hand turn.

(f) Perform one 360 degree right hand turn.

(g) Perform two consecutive 360 degree 'thermal' turns, either left or right.

(h) Fly into wind and perform a straight stall and recovery.

(i) Fly a rectangular circuit in front of the slope in the opposite direction to that chosen for the landing approach.

(j) Fly a rectangular landing circuit opposite to that flown in (i) and land within 20 metres of a pre-designated spot.

(k) Remove model from landing area.

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

All manoeuvres except the landing must be carried out in front of the slope.

The above schedule is treated as one test flight and must be completed in one attempt. Two attempts per examination will be allowed in any one day.

In addition to the flying schedule, the candidate must answer correctly a minimum of five questions on safety matters, based on the BMFA Guidelines and Safety Codes for Model Flying and local flying rules.

## THE 'B' CERTIFICATE (SILENT FLIGHT - SLOPE)

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

(a) Two Registered Examiners (the 'lead' must be a Silent Flight Examiner).

(b) A Silent Flight Chief Examiner

If your club does not have any Registered Silent Flight Examiners you should contact your local Area Achievement Scheme Co-ordinator who will be able to help. Names and telephone numbers of

Achievement Scheme Co-ordinators are available from your Area Secretary or from the BMFA Leicester office.

The candidate must successfully carry out the following flying test:

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

(b) Launch the model, gain height and complete one horizontal circuit (either left or right hand) in front of the pilot.

(c) Fly a horizontal figure eight with the crossover point in front of the pilot

(d) Fly two consecutive loops across wind.

Fly crosswind left to right and complete a stall turn away from the slope.

Fly crosswind right to left and complete a stall turn away from the slope.

(g) Complete 10 seconds straight and level inverted flight across wind.

(h) Perform one axial roll across wind, either from the left or right.

(i) Perform one axial roll across wind in the opposite direction to (h), rotating in the opposite direction to (h).

(j) Perform a three turn spin with exit in the same direction as the entry.

(k) Fly a left hand rectangular landing approach and overshoot.

(l) Fly a right hand rectangular landing approach and overshoot.

(m) Fly a rectangular landing approach either left or right hand and land within 15 metres of a pre-determined spot

(n) Remove model from landing area.

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

If the geography of the slope and/or safety procedures in force only allow landings and overshoots from one direction then (k) or (l) may be modified at the discretion of the Examiner and flown as a rectangular circuit out from the slope, opposite hand to the required landing circuit.

All manoeuvres except the overshoots and landing must be carried out in front of the slope.

The above schedule is treated as one test flight and must be completed in one attempt. Two attempts per examination will be allowed in any one day.

In addition to the flying schedule, the candidate must answer satisfactorily a minimum of eight questions on safety matters, based on the BMFA Guidelines and Safety Codes for Model Flying, the Safety Code for Model Flying Displays and local flying rules.

## THE 'A' CERTIFICATE (SILENT FLIGHT - ELECTRIC)

The examination for the electric 'A' Certificate may be taken on application to any Registered Club Examiner or Chief Examiner. The candidate must successfully carry out the following test.

(a) Carry out pre-flight checks as required by the BMFA Safety Codes. Particular attention should be given to airframe, control linkages and surfaces.

(b) After complying with the site frequency control system, prepare the model for launch. The motor start and stop switch/speed controller sequence must be demonstrated to the examiner

(c) Check that the launch area and landing area are clear both on the ground and in the air. If a helper is used to launch the model they should be fully briefed as to what is required.

(d) Clearly announce, "launching" and launch the model under full control. Any deviation from the expected launch path must be corrected smoothly and quickly. Climb to approximately 100m. Switch off power and transition to glide without stalling.

From this point on, power must not be used.

(e) Stall the model into wind and recover smoothly with a minimum loss of height.

(f) Perform 3 consecutive 360 degree thermal turns to the right or left ending on the same heading as the entry with minimum loss of height. The turns should be under control with no tendency to stall or enter a spiral dive.

(g) Perform 3 consecutive 360 degree thermal turns in the opposite direction to above ending on the same heading as the entry with minimum loss of height. The turns should be under control with no tendency to stall or enter a spiral dive.

**From this point on, power should be used as required.**

(h) Fly the model up wind to prepare the model for the overshoot/landing phase. The model should be flown with no tendency to stall and with minimum loss of height.

(i) Call "landing" and prepare the model for a landing with a down wind leg, followed by a base leg and final approach.

(j) Overshoot from below 10 ft and climb back to circuit height. Note that this manoeuvre is an aborted landing, not a low pass.

(k) Again, call "landing" and prepare the model for a landing with a down wind leg, followed by a base leg and final approach.

(l) Land the model into wind within 20 metres of a predetermined spot.

(m) Retrieve the model from the landing area, informing other pilots that the landing area is clear.

(n) Complete post-flight checks required by the

BMFA Safety Codes.

(o) Repeat the above schedule a second time, giving a total of two flights.

In addition to the flying schedule, the candidate must answer correctly a minimum of five questions on safety matters, based on the BMFA Safety Codes for General Flying and local flying rules, at least two of which must be specific to electric flight.

All manoeuvres must be carried out in airspace pre-determined by the Examiner and Candidate prior to the commencement of the test flights.

The above complete two flight schedule is treated as one test attempt. Two attempts per examination will be allowed in any one day.

## THE 'B' CERTIFICATE (SILENT FLIGHT - ELECTRIC)

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

(a) Two Registered Examiners (the 'lead' must be a Silent Flight Examiner).

(b) A Silent Flight Chief Examiner.

If your club does not have any Registered Silent Flight Examiners, you should contact your local Area Achievement Scheme Co-ordinator who will be able to help. Names and telephone numbers of Area Co-ordinators are available from the BMFA Leicester office.

The candidate must successfully carry out the following test.

(a) Carry out pre-flight checks as required by the BMFA Safety Codes. Particular attention should be given to airframe, control linkages and surfaces.

(b) After complying with the site frequency control system, prepare the model for launch. The motor start and stop switch/speed controller sequence must be demonstrated to the examiner

(c) Check that the launch area and landing area are clear both on the ground and in the air. If a helper is used to launch the model they should be fully briefed as to what is required.

(d) Clearly announce, "launching" and launch the model under full control. Any deviation from the expected launch path must be corrected smoothly and quickly. Climb to approximately 100 metres. Switch off power and transition to glide without stalling.

**From this point on, power must not be used.**

(e) Fly the model on a thermal search pattern. The model is to pass over three points, agreed with the Examiner prior to the start of the flight (e.g. corners of the field).

(f) Fly the model through consecutive 360 degree

thermal turns to a position a minimum of 100m down wind of the pilot. The model should gain height if in lift or be flown with minimum loss of height if no lift is found.

**From this point on, power may be used as required**

(g) Fly the model through either a half loop or half roll to inverted, hold straight, controlled inverted flight for a minimum of five seconds and then half loop or half roll back to level flight.

(h) Fly the model a minimum of 150 metres up wind of the pilot, gain speed and perform a stall turn into wind.

(i) Fly into wind and complete one inside loop.

(j) Fly the model across wind and perform an unpowered stall, recover with minimum loss of height, still heading across wind.

(k) Turn the model down wind and perform an unpowered stall, recovering with minimum loss of height on the same heading down wind.

(l) Fly the model up wind to prepare the model for the overshoot/landing phase.

(m) Call "landing" and prepare the model for a landing with a down wind leg, followed by a base leg and final approach.

(n) Overshoot from below 10 ft and climb back to circuit height. Note that this manoeuvre is an aborted landing, not a low pass.

(o) Again, call "landing" and prepare the model for a landing with a down wind leg, followed by a base leg and final approach.

(p) Land the model into wind within 10 metres of a predetermined spot.

(q) Retrieve the model from the landing area, informing other pilots that the landing area is clear.

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

(s) Repeat the above schedule a second time, giving a total of two flights.

In addition to the flying schedule, the candidate must answer correctly a minimum of eight questions on safety matters, based on the BMFA Safety Codes for General Flying and local flying rules, at least four of which must be specific to electric flight.

All manoeuvres must be carried out in airspace pre-determined by the Examiner and Candidate prior to the commencement of the test flights.

The above complete two flight schedule is treated as one test attempt. Two attempts per examination will be allowed in any one day.

## ACHIEVEMENT SCHEME ADMINISTRATION

### REGISTERED EXAMINERS

A register of BMFA Examiners will be maintained by Council and only those whose names appear on the register are authorised to conduct examinations. It is recommended that the number of club examiners should not exceed the following, although clubs may apply to exceed these numbers if necessary.

No. of club members	No. of club examiners
Up to 50	3
50 to 74	4
75 to 100	5
Over 100	6

Clubs should make every effort to ratify enough Examiners for their needs and your local Area Achievement Scheme Co-ordinator will be able to help. Contact them via the BMFA office.

### EXAMINATION FEES

No examination fees will be charged to either BMFA members or non-members.

### DISPLAYS AND COMPETITIONS

It should be noted that it is stated in the Safety Code for Model Flying Displays that a model flyer, using a radio-controlled powered model in a display before the public should produce evidence of holding a valid 'B' Certificate. Competitors in BMFA contests for radio controlled powered model aircraft must produce evidence of holding a valid 'B' Certificate.

### BADGES

Badges are available for some of the individual schemes for 'A', 'B' and Examiner grades. They are of 'wings' design, silver for the 'A', gold for the 'B' and gold with the letter 'E' for Examiners. They may be obtained direct from the BMFA Leicester office (call the office or check the BMFA website for the latest prices). Orders must include evidence of qualification by quoting your certificate number.

### PENALTIES

Where an 'A' or 'B' Certificate holder or an Examiner consistently disregards the requirements of the Safety Codes or local club rules his club is empowered to take the following action:

(a) In the first instance, a verbal warning to the offender by an officer of the club.

(b) In the second instance, a written warning from the club committee.

(c) Where these warnings fail to have the necessary effect, the club committee may formally request the Areas Council to withdraw the offender's Certificate or Examiner qualification.

In exceptional circumstances, a BMFA Area may formally propose to Areas Council that a certificate or qualification be withdrawn directly.

Once a certificate or qualification has been withdrawn by Areas Council, the offender will not be permitted to re-take the test for a period of 6 months from the date of withdrawal.

### CONTROLLERS

The Achievement Schemes are administered nationally by Controllers acting for the Areas Council and appointed by Full Council and locally by Area Co-ordinators appointed by each BMFA Area. The addresses of the Power Controller and the Silent Flight Controller may be found in the address directory at the back of this handbook. Contact details for Area Co-ordinators may be obtained from the BMFA Leicester office.

### BMFA MEMBERSHIP CARDS

Details of a member's Achievement Scheme qualifications will be shown on their membership card.

### EQUIVALENT QUALIFICATIONS

The SAA Bronze Certificate is accepted as equivalent to the BMFA 'A' Certificate, Fixed Wing.

The SAA Silver Certificate is accepted as equivalent to the BMFA 'B' Certificate, Fixed Wing.

Any holder of a BMFA or BARCS Silent Flight Thermal Gold, Diamond or Diamond Star will be assumed to hold a 'B' Certificate, Silent Flight Thermal.

Any holder of a BMFA or BARCS Silent Flight Slope Gold or Diamond will be assumed to hold a 'B' Certificate, Silent Flight Slope.

## THE SILENT FLIGHT PERSONAL ACHIEVEMENT SCHEMES

The Thermal Soaring and Slope Soaring Personal Achievement Schemes are aimed at giving flyers the satisfaction of achieving set levels of competence beyond the 'A' and 'B' Certificates and at their own flying fields without having to take part in contests. They are administered by BARCS in conjunction with BMFA.

The schemes are voluntary, are open to all model flyers and there will be no charge to either BMFA or BARCS members or non-members wishing to register their claims.

### THERMAL SOARING GLIDER

Once having passed the Silent Flight Thermal 'A' and 'B' Certificate, three further achievement levels have been set and the flyer is required to attain these in sequence, from the lowest level to the highest. As of 1st January, 2002, you cannot enter

for these achievement levels unless you have passed the appropriate BMFA 'B' Certificate. On passing the 'B' Certificate you will receive details of the next stage in the scheme.

Log books for the scheme are available free of charge from the Leicester office and from BARCS. And no charge is made for each claim registered.

To participate you simply have to attain the required tasks, obtain a confirming signature and send the appropriate part of the claim form together with an SAE to BARCS Achievement Co-ordinator or to the BMFA's Leicester office. Each level must be notified before the next is attempted.

### GENERAL RULES

Towline length not to exceed 150 metres.

High-start 150 metres max. unstretched.

Aerotow release at approximately 150 Metres.

Flights should be made on reasonably level terrain to exclude the possibility of slope lift.

Before each launch, the pre-flight checks required by the BMFA Safety Codes should be carried out.

Precision landings must terminate with the nose of the model with 12.5 metres of a nominated target. Each task within a level may be attempted on different days over any period of time.

### ACHIEVEMENT LEVELS

#### THERMAL GOLD

One flight of 15 mins. duration, plus

One flight of 20 mins. duration, plus

One flight of 25 mins. duration, plus

Precision landings on all flights

#### THERMAL DIAMOND

One flight of 45 mins. duration, plus

Five consecutive flights of 10 minutes duration in a 150 minute period

One flight of one lap over an equiangular course of 300 metres, the pilot to visit two corner points of the course, plus

Precision landings on all flights

#### THERMAL DIAMOND STAR

One flight of at least 60 minutes duration, plus

Five consecutive flights of 15 min duration within a 180 min period, plus

One flight of four laps over an equiangular course of 300 metres, pilot to visit two corner points of the course, plus

One goal and return flight over a 1.5km course i.e. distance covered 3km (approx. 2 miles), plus

Precision landings on all flights

## SLOPE SOARING GLIDER

Once having passed the Silent Flight Slope 'A' and 'B' Certificate, Three further achievement levels have been set and the flyer is required to attain these in sequence, from the lowest level to the highest. As of 1st January, 2002, you cannot enter for these achievement levels unless you have passed the appropriate BMFA 'B' Certificate. On passing the 'B' Certificate you will receive details of the next stage in the scheme.

Log books for the scheme are available free of charge from the Leicester office and from BARCS.

To participate you simply have to attain the required tasks, obtain a confirming signature and send the appropriate part of the claim form together with an SAE to the BARCS Achievement Co-ordinator or the BMFA's Leicester office. Each level must be notified before the next is attempted.

The purpose of this personal achievement scheme is to provide a varied series of tests at different levels of complexity to satisfy graded levels of slope soaring ability beyond the Silent Flight Slope 'B' certificate. Most of the tasks are to be conducted by BMFA Silent Flight Examiners although certain of the flights, as detailed on the scheme leaflet you will receive, may be witnessed by an appropriate BMFA or BARCS member.

Each task within a level may be attempted on different days over any period of time.

### ACHIEVEMENT LEVELS

#### SLOPE GOLD

Carry out pre-flight checks as required by BMFA Safety code on every flight

A Slope Soaring flight of 20 min maximum duration to include the following manoeuvres

- 3 consecutive axial rolls across wind
- One double Immelman
- 3 consecutive outside loops
- A vertical eight
- A Cuban eight
- Landing pattern - rectangular

3 spot landings, from a maximum of 10 consecutive attempts, within 15 metres of a pre-determined spot., measured from the model's nose

1 spot landing, from a maximum of 3 consecutive attempts, on the slope side within the slope lift area, within 20 metres of a pre-determined spot., measured from the model's nose

A flight of 1600 m, within 2 minutes, over a closed circuit course - turn points to be 80m apart

A slope duration flight of 45 minutes minimum duration

## SLOPE DIAMOND

Carry out pre-flight checks as required by BMFA Safety code on every flight.

A Slope Soaring flight of 30 min maximum duration to include the following manoeuvres

- Slow axial roll across wind to left immediately followed by slow axial roll to right.
- 3 consecutive axial rolls across wind
- Four turn spin.
- Four point axial roll across wind
- Figure M.
- Horizontal 8.
- Vertical 8.
- 3 minutes inverted flight.
- 4 consecutive inside loops across wind.
- 4 consecutive outside loops across wind.
- One double Immelman.
- Landing pattern - rectangular

3 spot landings, from a maximum of 6 consecutive attempts, within 8 metres of a pre-determined spot., measured from the model's nose.

1 spot landing, from a maximum of 2 consecutive attempts, on the slope side within the slope lift area, within 15 metres of a pre-determined spot., measured from the model's nose

A flight of 1600 m within 90 secs, over a closed circuit course - turn points to be 80m apart

A slope duration flight of 60 minutes minimum duration

### SLOPE DIAMOND STAR

Carry out pre-flight checks as required by BMFA Safety code on every flight.

A Slope Soaring flight of 45 min maximum duration to include the following manoeuvres

- One slow axial roll across wind to left in not less than 5 secs.
- One slow axial roll across wind to right in not less than 5 secs.
- One 4 point axial roll across wind in not less than 5 secs
- 4 consecutive axial rolls across wind
- Six turn spin.
- Figure M.
- Horizontal 8.
- Vertical 8.
- One double Immelman.
- 6 consecutive inside loops across wind.
- 6 consecutive outside loops across wind.
- 3 minutes minimum duration inverted flight including one left hand and one right hand 3600 horizontal circle of minimum 50m diameter
- Landing pattern - rectangular

3 spot landings , from a maximum of 5 consecutive attempts, within 5 metres of a pre-determined spot., measured from the model's nose

1 spot landing , from a maximum of 1 attempt, on the slope side within the slope lift area, within 10 metres of a pre-determined spot., measured from the model's nose

A slope duration flight of 90 minutes minimum duration

A goal and return flight of 2.5 km to goal, nominated before launch, total distance flown 5 km - landing to be within 25m of launch point.

## THE RADIO CONTROL INSTRUCTOR SCHEME

The R/C instructor scheme is an important step towards safer flying in several ways:

(a) Clubs participating in the scheme will be able to offer new pilots an approved flying training course leading to 'A' certificate qualification.

(b) The Club Instructors and the BMFA Approved Instructors in the club will, of necessity, have to maintain a high standard of personal flying in order to retain the respect due to their status.

(c) By training new R/C pilots in a safe and professional manner right from the start of their flying.

It is to the advantage of every club to participate fully in the instructor scheme and to enable the scheme to be easily available to all who need it.

**BMFA supplies a copy of the Up-and-Away manual to all new members free on request. A voucher is supplied with the first membership card which simply has to be filled in and returned to the Leicester office.**

### THE TWO-TIER SCHEME

The BMFA R/C Instructor Scheme is made up of two types of instructor,

- (1) The Club Instructor
- (2) The BMFA Approved Instructor

### CLUB INSTRUCTORS

The Club Instructor is simply put forward by his club for registration with the BMFA. There is no limit on the number of instructors a club may put forward and a registration form is sent to all clubs each year.

In return the instructor will receive a 'BMFA Club Instructor' sticker and the registration will be entered on their membership record at the Leicester office.

Club Instructors are not tested by a Chief Instructor and will only operate within the club that puts them forward. The intention of the scheme is to give recognition to the many hundreds of dedicated club

flyers who give freely of their time to instruct newcomers to model flying but who do not wish to take the step of becoming Approved Instructors.

### BMFA APPROVED INSTRUCTORS

BMFA Approved Instructors are the second stage in the Instructors Scheme.

They must be current members of the BMFA and initially be put forward by a club to be tested by an Area Chief Instructor, in much the same way that a Club Examiner is tested by an Area Chief Examiner.

They are free to move between clubs or to operate as country members and are expected to take the lead in maintaining the standard of instruction at club and individual level.

### AREA CHIEF INSTRUCTORS

The scheme will be run at Area level by Chief Instructors who will comprise persons nominated by Area Committees and ratified by Areas Council as Area Chief Instructors. A sufficient number of Chief Instructors should be nominated by each Area to ensure good geographic coverage for their clubs.

An Area may request that the Scheme Controller appoint a Chief Instructor for a probationary period of up to six months prior to their ratification. During this period the nomination must be submitted to Areas Council as the probationary period may not be extended.

Chief Instructor appointments are for a period of two years only. After this time the qualification may be renewed by the scheme controller at the request of the appropriate Area Committee.

Chief Instructors must be senior members of the BMFA and will have held a 'B' Certificate and been an Approved Instructor for at least twelve months. Their principal duty is to test applicants for the post of Approved Instructor and to promote and maintain the standards of the BMFA Instructor scheme by example and by visiting clubs who require their services.

### SELECTION OF INSTRUCTORS

The first step for a club wishing to participate in the Club Instructor scheme is to recognise which of their members are already acting as instructors and who are willing to take part in the scheme.

The club then simply submits their details to BMFA on the form provided to the club at the start of each membership year. If you don't have a copy of the form then a telephone call to the BMFA Leicester office will get you one by return.

If a club wishes to put forward members to become BMFA Approved Instructors, they should first select from their members those pilots who are both willing to act as Approved Instructors and who are sufficiently skilled in R/C flying.

A typical nominee will have considerable background of R/C model flying, be able to communicate flying skills, have a sound knowledge

of simple aerodynamics and be highly safety conscious. He must be willing to accept the Training Manual as the syllabus he will use to train new pilots and to follow its guidelines.

A letter of intent should be sent to the BMFA office or to your local Area Committee Secretary and you will be contacted by your local Area Chief Instructor who will make arrangements for testing of approved instructor candidates to take place

### LIMITS OF BMFA APPROVED INSTRUCTOR QUALIFICATION

BMFA Approved Instructors must be current members of BMFA. Lapsed members will have their BMFA Approved Instructor status removed after one year.

From time to time, Areas Council may request that a re-ratification of BMFA Approved Instructors be carried out. This will apply only to those BMFA Approved Instructors not being regularly re-ratified by their clubs.

### WITHDRAWAL OF BMFA APPROVED INSTRUCTOR QUALIFICATION

It may be felt at some point, for a variety of reasons, that BMFA Approved Instructor status should be removed from an individual. This may be done by Areas Council on the recommendation of the Area Committee concerned (either on the request of a Club or on their own behalf). The affected BMFA Approved Instructor has the right of appeal to Areas Council, via the BMFA Hon. Secretary.

## AN INTRODUCTION TO THE DEPARTMENT OF THE ENVIRONMENT NOISE CODE

In addition to the occasional scrutiny of model flying by Magistrates referred to in the section 'Legal Controls over Model Flying', Planning Authorities are constantly making decisions on whether to allow change of use for model flying sites or whether to issue clubs with a licence to fly on Local Authority land.

When they are taking these decisions they have a statutory duty to ensure that the activities on the site are not a potential nuisance to the surrounding area. When considering possible noise nuisance, the document they will be most likely to refer to is the DoE Code of Practice.

If a noise complaint is made against your flying site, the Local Authority will probably send an Environmental Health Officer (EHO) to investigate. He will arrive armed with his noise meter and a copy of the DoE Code of Practice.

The reason the DoE Code of Practice is set out in full in this handbook should now be clear;

**If the noise your models make is going to be judged by anyone, then the Code of Practice is most likely to be the standard that it will be judged against.**

**For this reason alone, you should take careful note of the conditions laid out in this document; you never know when it may be applied to you.**

Finally, the model flying knowledge of the EHO who may turn up will vary from nil to extremely good and, strange as this may seem, the same may apply to their knowledge of the Noise Code. Read and absorb the Code and it's likely that you will know as much (or more) about it as they do, which would certainly be to your advantage.

## DEPARTMENT OF ENVIRONMENT CODE OF PRACTICE FOR THE MINIMISATION OF NOISE FROM MODEL AIRCRAFT

### 1. INTRODUCTION

**1.1** The sport of flying model aircraft provides enjoyment for many. It can also create noise, some of it unavoidable, which is no part of that enjoyment and may annoy or disturb others. The purpose of this Code of Practice is to describe how such annoyance or disturbance may be minimised so that the sport may be pursued in a reasonable and considerate manner and coexist peacefully with other pursuits.

**1.2** The Code of Practice does not in itself create offences or have the force of law, but it is intended to be of assistance to local authorities and magistrates courts in the exercise of their powers and functions under the provisions described in the following paragraph, and in reaching informal agreement with model flying clubs on methods of noise control. The Code of Practice cannot however override any restrictions or requirements imposed under those provisions.

### METHOD OF USE OF THIS CODE OF PRACTICE

**3.1** This Code of Practice contains guidelines which, if followed, should ensure that undue disturbance is avoided in most circumstances. Its terms are not

intended as hard-and-fast rules to be applied to every site; local circumstances differ, and more stringent or less stringent controls may be appropriate in individual cases or on the same site over the years.

(a) Where a site has been used for some years without causing complaint, there will normally be no need to require the pattern of use to be modified,

unless external circumstances or the character of use alters significantly and disturbance is caused as a result.

**(b)** Where complaints have been received about existing sites, the Code is intended to guide local authorities, model flyers and others on the ways in which intensity and manner of use may be adapted to allow the use to continue, if possible, without causing further disturbance.

**(c)** Where the use of a new site is contemplated, the Code may be used to determine, before use starts, what constraints may be necessary to avoid a nuisance.

In both this case and that of an existing site which has caused complaints, it is recommended that the model flyers, the local authority and the near neighbours of the site should discuss, in the light of this Code, any limits which might be necessary to prevent undue disturbance being caused by noise. Since clubs can often exert very effective control over the type and manner of operation of model aircraft on a site, it is recommended that, wherever possible, those wishing to operate model aircraft should join or form a club to arrange their activities responsibly. Such clubs should then be given every encouragement to concentrate their activities on the most suitable sites.

## DEFINITIONS

**4.1** In this Code the following definitions apply:

### **(a) 'The Act'**

The Environmental Protection Act 1990 S.79 (1) (g) in respect of Scotland, England and Wales. The Pollution Control and Local Government (Northern Ireland) Order 1978 in respect of Northern Ireland. Words and expressions which are defined in the Act have the same meaning in this Code unless otherwise defined in a particular context.

### **(b) 'Model Aircraft'**

There are many types of model aircraft, and several of these are either silent or powered by rubber or electric motors, noise from which is insignificant. This Code is not concerned with them and in it the expression 'model aircraft' means only a flying machine which, owing to its size, is not capable of carrying a human being and which, being powered by an internal combustion engine, can give rise to a significant noise.

### **(c) 'Noise measurement' and 'dB(A)'**

These refer to sound measured by means of equipment complying with BS 5969:1981 Type 1 ('Specification for sound-level meters'), using the A-weighting response, and with the noise meter set to 'slow' response. Details of the appropriate method of measurement are given later.

### **(d) 'Noise-sensitive premises'**

Any premises, including surrounding gardens etc.

used as a dwelling, hospital, or similar institution, school (in school hours in term time or at other times when in use), or place of worship (during recognised times and days of worship) or used for any other purposes likely to be affected by an increase in sound level.

### **(e) 'Flying site'**

Any premises used for flying of model aircraft.

### **(f) 'Point of launch'**

The position of the operator, in the case of controlled models, or the point at which the model is released for flight in the case of free-flight models.

### **(g) 'Free-flight model'**

A model whose flight path is predetermined but which is not under the direct control of any person during its flight.

### **(h) 'Controlled model'**

A model whose flight path is under the direct control of the operator at all times.

### **(j) 'Muffler'**

A device which when fitted to a model aircraft engine has the effect of significantly reducing the noise emitted.

## GENERAL

**5.1** It is not the concern of the Code to go into detail of the various types of powered model aircraft. They may however be divided broadly into 2 types:

**(a)** 'Limited engine-run', where the engine runs for a short time (seldom more than 10 seconds) to raise the model into the air, the rest of the flight being silent as the model glides down. These models are normally of the free-flight type.

**(b)** 'Continuous engine-run', where the engine may run for the duration of the flight and the model is controlled. The method of control may be by flying the model on lines (control-line aircraft) in which case quite small premises such as small recreation grounds and playing fields will allow adequate space.

Alternatively, the control may be by radio and those models (radio-controlled aircraft) range over a greater area and are commonly flown from larger recreation grounds, parks and similar public spaces as well as airfields and private premises. They can, however, be operated from quite small areas.

**5.2** Model aircraft with continuous engine runs are in general more likely to give rise to a disturbance than types with limited engine run because the engine runs for longer periods.

## OPERATING GUIDELINES FOR REDUCING NOISE EMISSION

**6.1** The most effective and fundamental way of avoiding disturbance is to cut down the noise at

source. Like other internal combustion engines, those in model aircraft create a certain amount of unavoidable noise. It is possible, however, to reduce unnecessary noise by use of a muffler. The engines used are all basically the same and may normally be fitted with a muffler without undue reduction of operating power.

### **6.2 It is recommended that**

**(a)** Model aircraft should be fitted with a muffler wherever this is practicable, except in the case of competitive flying as described in c.(i) and c.(ii) below.

**(b)** Except for competitive flying as described in c.(i) and c.(ii) below, no model should be operated which gives a noise measurement at 7 metres of more than 82 dB(A).

**(c)** The exceptions referred to in sub-paragraphs (a) and (b) are cases where either:

(i) The operator is taking part in national or international competitions; or

(ii) the operator holds a current competition licence or permit issued by the British Model Flying Association (BMFA), the Scottish Aeromodellers Association (SAA) or any other UK body recognised by the Federation Aeronautique Internationale, and is practising for competitive purposes at times and on sites approved by the BMFA or the SAA where distance, natural or other barriers or a high ambient noise level make noise nuisance highly likely.

**6.3** Where substantial disturbance is caused by operating unmuffled model aircraft at any site, unmuffled flying should not be permitted to continue. Provided that intolerable disturbance would not be caused, muffled flying could be allowed to continue from the site at least for an experimental period to see whether it could continue, having regard to the nature of its surroundings, without causing a nuisance.

## REDUCING RECEPTION OF NOISE AROUND SENSITIVE PREMISES

**7.1** Because of the technical limitations on controlling noise emitted from individual model aircraft, additional precautions may be necessary to limit the model-flying noise heard by neighbours.

The following factors are relevant:

**(a)** separation distance

**(b)** times of operation

**(c)** numbers of model aircraft in operation simultaneously

**(d)** barriers between flying site and noise-sensitive premises

It is recommended that the combination of these factors appropriate to a site should be agreed between the local authority and those representing the model flyers. Not all sites will need requirements or restrictions under all these heads. Wherever possible, local practical tests should be made by

the local authority and the model flyers in order to determine reasonable limits for the overall noise from a site, these then being translated into limits on emission from each model, the number of models flown at one time, and the minimum distance from noise-sensitive premises.

**7.2** If circumstances change, it may be appropriate to review and amend the terms of the agreement, for example where the emission levels of models decrease markedly, or where a new or different club assumes responsibility for model flying from a site.

### **Separation distance**

**7.3** Even when muffled, a model aircraft may still sound noisy, and should not be flown too close to

noise-sensitive premises. The minimum distance from such premises at which a model aircraft should be flown depends on the exact nature of the premises and the surroundings.

**(a)** Where no direct supervision (e.g. by clubs) of flying is possible, it is recommended that the following should apply:

(i) the point of launch of control-line and model aircraft with limited engine run should not normally be closer to any noise-sensitive premises than 300 metres;

(ii) the point of launch of radio controlled models with continuous engine run (which range over a greater area) should not normally be nearer to any noise-sensitive premises than 500 metres;

(iii) models should not be flown closer to any noise-sensitive premises than 200 metres.

**(b)** Where more detailed supervision and control may be exerted (e.g. by clubs) and other factors (e.g. noise emission levels) can be varied to compensate if necessary, separation distances may be more flexible and be related to the time of day and type of surroundings. However, model aircraft should only very exceptionally be allowed to fly closer to any noise-sensitive premises than 200 metres.

### **Times of Operation**

**7.4** The hours of flying have an important bearing on the likelihood of disturbance; the type of model is less important since it is the existence of the noise rather than its intensity, or degree of continuity, which causes disturbance, if the hours of operation are unreasonable. Generally the points of launch and closest approach of model aircraft should not be as near to noise-sensitive premises as suggested in 7.3 at the times of day and days in the week when people consider that they have a particular right to peace and quiet in and around their homes; special problems may arise at weekends when noise from model flying may conflict with other quieter pastimes.

7.5 The times of day and days of the week when any model flying noise is unacceptable will differ between areas and are a matter for local determination. In general however it is recommended that where detailed control of numbers and separation distances is not possible, or is inadequate to avoid substantial disturbance at the more sensitive times, flying should not be allowed outside the hours of 9 am to 7 p.m. on weekdays and 10 am to 7 p.m. on Sundays and Bank Holidays. Longer hours may be possible in the evening if control can be exercised, e.g. by a club or site owner, and disturbance would not be caused.

7.6 If more than one site is available within reasonable distance, annoyance suffered by any individual may be minimised by alternating use between the sites; e.g. using one on Saturday and the other on Sunday. It should be borne in mind that some sites may be available to model flyers only at times when other users having higher priority do not require the land (e.g. industrial premises or airfield) and this may in itself curtail the available time for flying. To be reasonably fair, limits on flying time may in such cases need to be more flexible, if this is possible without causing disturbance.

#### **Numbers of model aircraft in operation simultaneously**

7.7 Two model aircraft each emitting the same level of noise may, if flown together, produce an overall noise level up to 3 dB(A) above that of the individual aircraft. The disturbance caused may be greater than is apparent from this simple change, owing to increased variations in sound level. If a particular type of model cannot reasonably avoid being near the limit recommended in 6.2.(b), it should be operated by itself unless the site is well protected, or remote, or its surroundings are insensitive to noise. Where the site is not so situated, more than one noisy model should be flown only if the distance from noise-sensitive premises can be increased.

#### **Barriers between flying site and noise-sensitive premises**

7.8 Topographical features such as hills can afford protection against sound, as can large buildings. Where it is possible, and on balance likely to lessen disturbance, flying sites should be chosen to take advantage of these, and less stringent minimum distances may then be practicable without risking undue disturbance. It should be noted however that belts of trees, unless dense and wide, have little attenuating effect on noise.

#### **MODEL AIRCRAFT NOISE IN OTHER NOISE-SENSITIVE AREAS**

8.1 People may be disturbed by noise from model aircraft in the countryside as well as indoors or in their own gardens, and the peace and quiet of rural areas should be respected. In addition there may be some urban open spaces, such as ornamental parks or children's play areas, where model flying would be inappropriate and should not take place at

all. Nature and wildlife reserves, country parks or other countryside areas where people go to relax in quiet and peaceful surroundings, should also be avoided by model flyers.

Preferably, model flying in country areas should be confined to specified locations where suitable provisions have been or can be made with the agreement of local farmers or landowners, and where the risk of disturbance is relatively slight. Noisy pursuits will usually be out of place in National Parks. Model flyers should therefore seek the agreement of the National Park Authority before operating from any site in a National Park, however remote it may be.

8.2 Most animals, whether wild or domesticated, are probably not unduly worried by model aircraft noise; it can however be distressing to some at sensitive times, for example to mares when in foal, sheep at lambing time or birds in the nesting season. It is recommended that model flying clubs or representatives should discuss with the owners of surrounding land, or local wildlife preservation bodies, any times and places where animals are likely to be unusually sensitive and would benefit from a temporary suspension or reduction of model flying activity.

#### **MAJOR MODEL FLYING EVENTS**

9.1 From time to time major model flying events are held, which are of interest to large numbers of participants and spectators. It is likely that such an event will mean a temporary intensification of use of a site. In considering the desirable scale and frequency of such events at any site the organisers and the local authority will be able to use the provisions of paragraphs 6 to 8 of this Code of Practice as a guide, but it should be borne in mind

that higher levels of noise resulting from occasional short intensification of use, may be more acceptable

than the same levels of noise would be if they arose regularly and frequently. If the site is well chosen, serious disturbance need not be caused.

9.2 The organisers should ensure that unnecessary noise is kept to the minimum where disturbance is possible, and should limit ground running of engines, which can add appreciably to the overall noise level.

9.3 The organisers of any projected major model flying event should notify the local authority in advance of their intention to hold the event; they should also be expected to publicise it locally well in advance, giving a clear estimate of the date, time and expected duration of the event.

#### **METHOD OF MEASUREMENT OF NOISE EMITTED BY A MODEL AIRCRAFT**

The model, working at maximum rpm, should be held between 1 and 2 metres off the ground in a bracket or by one person standing upwind of the

model. The microphone of the noise meter should, where necessary, be fitted with a windshield. It should be positioned downwind of the model, 7 metres away from it (measured horizontally), and 1.2 metres vertically from the ground. The wind speed should not be over 3 metres per second (force 2).

Measurements should be taken in the open air and away from reflecting surfaces such as buildings. The noise level emitted, for the purposes of this Code, shall be the maximum value of four readings:

- (i) model pointing directly at the meter;
- (ii) model pointing directly away from the meter;
- (iii) model pointing 90° to left of meter;
- (iv) model pointing 90° to right of meter.

The noise meter shall be in accordance with BS5969:1980 ('Specification of sound-level meters'), using the A-weighting response, and with the meter set to 'slow' response. The meter should be calibrated prior to use.

Note: Some local authorities may be willing to assist model flying clubs with noise measurements in order to establish the noise levels of aircraft being flown by club members.

#### **BMFA ADVICE ON THE NOISE TEST**

The noise testing procedure noted in the DoE noise code above should be followed carefully but to get the best results it is strongly recommended that you should take special note of the following:

Make sure that no noise reflecting surfaces are near the test site. This means not just buildings but cars, concrete, models, model boxes and even hard packed earth. Do the test over grass.

Do not take measurements when there is any appreciable background noise. Traffic on a nearby road, other models flying or being readied for flight and even people talking near the meter can affect the readings.

Wind blowing across the microphone has a big effect on readings. Do not test on breezy days and when you do test, use a microphone wind shield.

Make sure that the actual microphone is over the end of the seven metre tape, not your hand or the centre of the meter.

Think carefully about the four test positions of the model at the other end of the tape. As a suggestion, for the sideways-on readings put the fuselage on the seven metre mark, for the nose-on reading put the propeller over the mark and for the tail-on reading line the trailing edge of the wing up with it.

#### **HELICOPTER NOISE TESTING**

Because of the specific problems associated with performing noise tests on helicopters, it is recommended that a revised procedure be adopted.

Three markers should be laid out in a line on the flying area, one central, one seven metres to one side (crosswind) and one seven metres to the other side (crosswind). The helicopter which is being checked is held in a steady hover above the centre marker with the pilot standing downwind of it, as normal.

Noise readings are then taken with the meter positioned over each of the end markers in turn. For safety, when the meter is being carried from one end marker to the other, the checker must walk around behind the pilot flying the model.

The two readings obtained take the place of the four obtained in the fixed wing test and all other criteria are as noted in that test procedure.

Note - This method of testing is offered by the BMFA as a safe way of obtaining meaningful figures for helicopter noise levels on club sites by club flyers. It is not officially part of the DoE Noise Code.

#### **GAS TURBINES**

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

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

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

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

BMFA is in contact with the Jet Modellers Association and the Gas Turbine Builders Group and it is expected that a modified version of the DoE noise test will eventually be put forward for gas turbines. This will probably take the form of a ground noise test at some distance greater than 7 metres with a corresponding reduction in the expected (d)BA levels.

This has not been discussed in detail yet, however, and some experimental work needs to be done before any firm recommendations can be made.

At this time therefore, BMFA advice on this matter is that the DoE noise code should not be applied to model gas turbines.

## RADIO CONTROL TECHNICAL INFORMATION

The BMFA is an active member of the UK Radio Control Council (UKRCC) which used to be named the Joint Radio Control Users Committee (JRCUC). This is the body recognised by the Government's Radiocommunications Agency (RA) as representing all modelling use of radio frequencies in the UK.

For more information check out the UKRCC (JRCUC) website at [www.bmfa.org/jrcuc](http://www.bmfa.org/jrcuc) or [www.bmfa.org/ukrcc](http://www.bmfa.org/ukrcc)

### OFFICIAL FREQUENCY ALLOCATIONS

These and other information concerning modelling use of radio frequencies can be found in the Radiocommunications Agency document RA-60. You can view the latest copy of RA-60 on [http://www.radio.gov.uk/document/ra\\_info/ra60.htm](http://www.radio.gov.uk/document/ra_info/ra60.htm)

All our legal use of modelling frequencies stems from this document and if you have an interest in radio control then you should look at it if you can.

#### 1. THE 27 MHz BAND.

(a) Identification is by coloured ribbon attached to transmitter aerial in the colours as listed and/or a white flag with channel number in black.

(b) The channel spacing on this band is now 10 kHz and all modern sets, with the CE mark, should meet this specification. However, many older specification sets are still in use and these have a minimum channel spacing of 20 kHz. This situation will remain for a number of years so if you are operating narrow band 27 MHz then be aware of the danger.

(c) It is recommended that, with new equipment capable of operating on a 10kHz channel spacing, a white flag with black channel numeral be used to identify the channel you are using. If this coincides with one of the old colour frequencies then you should show that colour ribbon too.

(d) It is likely that crystals to meet the new intermediate frequencies may not be freely available but synthesised frequency sets may become available in the medium term.

(e) You must not use an old 20 kHz split crystal in a new set. Even if you wish to transmit on the same frequency, a new narrow band crystal will be required in a narrow band set.

(f) As a shared band, many of the 27 MHz frequencies are used by others but 26.995, 27.045, 27.095, 27.145 and 27.195 MHz are not shared and would seem to offer the best chance of interference free model flying operations but only on sites remote from other modelling applications (cars, boats etc.). These equate to the old 'solid' colours of brown, red, orange yellow and green.

CHANNEL	FREQUENCY	OLD COLOUR
1	26.965	
2	26.975	Black
3	26.985	
4	26.995	Brown
5	27.005	
6	27.015	
7	27.025	Brown/Red
8	27.035	
9	27.045	Red
10	27.055	
11	27.065	
12	27.075	Red/Orange
13	27.085	
14	27.095	Orange
15	27.105	
16	27.115	
17	27.125	Orange/Yellow
18	27.135	
19	27.145	Yellow
20	27.155	
21	27.165	
22	27.175	Yellow/Green
23	27.185	
24	27.195	Green
25	27.205	
26	27.215	
27	27.225	Green/Blue
28	27.235	
29	27.245	Blue
30	27.255	Blue
31	27.265	
32	27.275	White or Purple

#### 2. THE 35 MHz BAND.

(a) Identification is by orange flag with black or white channel numerals.

34.950	channel 55	35.130	channel 73
34.960	channel 56	35.140	channel 74
34.970	channel 57	35.150	channel 75
34.980	channel 58	35.160	channel 76
34.990	channel 59	35.170	channel 77
35.000	channel 60	35.180	channel 78
35.010	channel 61	35.190	channel 79
35.020	channel 62	35.200	channel 80
35.030	channel 63	35.210	channel 81
35.040	channel 64	35.220	channel 82
35.050	channel 65	35.230	channel 83
35.060	channel 66	35.240	channel 84
35.070	channel 67	35.250	channel 85
35.080	channel 68	35.260	channel 86
35.090	channel 69	35.270	channel 87
35.100	channel 70	35.280	channel 88
35.110	channel 71	35.290	channel 89
35.120	channel 72	35.300	channel 90

(b) To identify the channel number of an untagged crystal,

(1) If the crystal is marked 34.xxx you subtract 40 from the first two numbers after the decimal point of the frequency marking, (i.e. 34.960, subtract 40 from 96 giving channel 56)

(2) If the crystal is marked 35.xxx you add 60 to the first two numbers after the decimal point of the frequency marking, (i.e. 35.260, add 60 to 26 giving channel 86).

#### 3. THE 40 MHz BAND.

This is for surface vehicles only and band identification is usually by green flag with white channel numeral. The band will use the last three numerals of the actual transmitted frequency as the channel identification, for instance,

40.665 MHz will be channel 665

40.825 MHz will be channel 825

#### 4. THE 459 MHz UHF BAND.

Identification will be by channel numeral.

458.525	channel 1	459.025	channel 21
458.550	channel 2	459.050	channel 22
458.575	channel 3	459.075	channel 23
458.600	channel 4	459.100	channel 24
458.625	channel 5	459.125	channel 25
458.650	channel 6	459.150	channel 26
458.675	channel 7	459.175	channel 27
458.700	channel 8	459.200	channel 28
458.725	channel 9	459.225	channel 29
458.750	channel 10	459.250	channel 30
458.775	channel 11	459.275	channel 31
458.800	channel 12	459.300	channel 32
458.825	channel 13	459.325	channel 33
458.850	channel 14	459.350	channel 34
458.875	channel 15	459.375	channel 35
458.900	channel 16	459.400	channel 36
458.925	channel 17	459.425	channel 37
458.950	channel 18	459.450	channel 38
458.975	channel 19	459.475	channel 39
459.000	channel 20		

**Note - Many of these channels are shared with various telemetry users.**

### FREQUENCY BAND OVERVIEW

The 27 MHz band is legally shared by other users, in particular, model cars, model boats, citizens band operators and an increasing number of radio controlled toys. It may still be used for model aircraft but great care should be taken by model flyers, especially near urban areas.

Many clubs in this situation have found the need to ban this frequency band from their flying fields on the grounds of safety.

When you fly a model aircraft you are personally responsible for the safety of the flight and you should think carefully before using 27 MHz equipment because of the many sources of potential interference in the UK.

The 35 MHz band is SOLELY for model aircraft and under no circumstances must it be used for any other purpose, such as the control of surface vehicles.

The 40 MHz band is SOLELY for surface vehicle use and under no circumstances must it be used for the control of model aircraft.

The 459 MHz is shared with various telemetry operations which are used for specialised telemetry and users of these channels should be aware of the possibility of interference being present. The use of frequencies above 459.100 MHz (channel 24) is recommended.

You may see some equipment in the 49 MHz band but this is quite legal and is widely used for toys and low power devices with a transmitter output of 10 mw maximum, one tenth of our 35 MHz transmitters.

### 72 MHz EQUIPMENT

Contrary to some people's belief, 72 MHz IS NOT A LEGAL FREQUENCY FOR MODEL CONTROL IN THE UK. A manufacturers development license is available (under very strict conditions) to bona-fide designers/manufacturers from the DTI. Anyone using 72 MHz without such a current special licence is operating illegally and may face a fine and confiscation of the equipment. This licence is for genuine development work only and does NOT give the operator the right to use the frequency for normal R/C flying.

### R/C EQUIPMENT TYPE APPROVAL

In October 1998, harmonised standards for low power radio control equipment were introduced into European Union Countries. From that date all new equipment either manufactured or imported into the UK has to comply with the requirements for the issue of a CE marking. As the legislation is not retrospective, all 35 MHz equipment which has

previously been tested against the old SMAE/MHTF Type Approval standards remains legal to use.

The European standards which apply to all newly introduced R/C equipment are ETS 300 - 200 (Type Approved testing for short range devices) and ETS 300 - 683 (EMC testing).

It is therefore essential that any 35 MHz equipment you use carries either an SMAE/MHTF Type Approval sticker or an official CE marking. Equipment bearing either of these markings

indicates that the manufacturer or importer of the equipment has submitted a sample for independent testing and that the equipment conforms to the test specification applicable at the time the tests were conducted.

The SMAE/MHTF sticker or CE marking is your only assurance that the equipment you own, or are intending to purchase, complies with the standards laid down by the Government. If your 35 MHz equipment carries neither marking, contact either the shop where it was purchased, the manufacturer or the importer for details on your particular equipment. When purchasing your next R/C equipment, make a special point of looking for the SMAE/MHTF sticker or CE marking; this is the only way you can be sure the equipment you are using is legal.

#### Notes:

(a) From October 1998 all newly introduced 27 MHz equipment must also carry a CE marking and be capable of operating at 10 kHz spacing. 27 MHz equipment imported into or manufactured in the UK prior to the introduction of the new standards is exempt from this legislation.

(b) Current legislation allows the CE marking to appear on the equipment itself, the instruction leaflet or on the box.

## SYNTHESISED FREQUENCY EQUIPMENT

(a) Synthesised frequency equipment is legal in the UK as long as it has been tested and carries the CE mark. There is, however, a limitation to its use in the UK that has been agreed with the RA and also at international level by the FAI.

(b) This is that any synthesised transmitter must have a two stage switch-on process. The first switch-on stage must NOT transmit but must give a clear indication of the frequency that will eventually be transmitted. This is to enable you to select frequencies safely and, more importantly, to obtain clearance from the site frequency control system.

(c) Only after you have done this should you activate the second switch-on stage which enables transmission.

(d) Synthesised frequency equipment will give you much greater flexibility in your frequency selection but it also has many pitfalls and you should take great care if you use such equipment. Remember that most people you are flying with will not have the same facilities and your operations must fit in with what is accepted as normal operating procedures.

(e) For instance, you should be showing a frequency flag and be prepared to change it if you change frequencies. You must take extra care when using the frequency control system as your opportunities to reserve the wrong frequency will be much greater. You may find that the ability of your

transmitter to select any frequency will be viewed with suspicion by some and, in the event of interference being suspected, you could find that you are the first person checked. The only way to avoid problems is to be scrupulously careful in your operations.

(f) Finally, although synthesised sets have the potential to be more reliable and cheaper to produce than plug-in crystal sets, remember that they still use a fixed crystal in the transmitter module and the receiver and that any crystal can drift over time. You will still need to have your radio equipment checked occasionally as a master crystal drifting will affect all the other frequencies synthesised from it. Curing the problem will be a job for the importer/manufacturer and will not be as simple as just plugging in a new crystal.

## RADIO CONTROL LICENCE

From 1.8.1981, model control equipment is exempt from the requirement of a Licence under Section 1 (1) of the Wireless Telegraphy Act 1949 subject to the terms, provisions and limitations set out in parts 1 and 2 respectively of the Statutory Instrument 1980 No. 1848.

## AIRBORNE TELEMETRY

A frequency band that may be used to download telemetry from model aircraft has been allocated by the Radiocommunications Agency (RA).

The band is 433.05 to 434.79 MHz with a channel spacing of 25 kHz and a maximum Effective Radiated Power (ERP) of 10 mW. All equipment used must be type approved to EN 300 220-1. A list of available equipment can be obtained from the Low Power Radio Association, contact on 01422 886463.

This is an unprotected band and some of the frequencies are already used by radio amateurs so it would be wise to limit airborne use to 434.025 to 434.79 MHz.

## THE BMFA COUNCIL OF MANAGEMENT

### MEMBERS OF COUNCIL

The Council comprises the following members:

#### (a) ELECTED OFFICERS:

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

These posts are directly elected by postal ballot of all BMFA affiliated clubs.

#### (b) AREA DELEGATES

One accredited representative from each of the thirteen BMFA geographic Areas. 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.

**Note** - No elected member of Council serves for more than two years although at the end of their period of service they are eligible for re-election.

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

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

(f) One member may be appointed by the Royal Aero Club

## VISITORS

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

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

## 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.

## COUNCIL SUB-COMMITTEES

Some of the responsibilities of BMFA Council have been delegated to several Sub-Committees of Council, each of which have their 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:

### AREAS COUNCIL

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

It's main responsibilities are all Club and Area related business and the Achievement Schemes.

### 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.

It's main responsibilities are all competition and safety matters.

### 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.

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

## 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 them directly and ask them to act for you. If they agree then the Technical Committee 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.

## GENERAL REGULATIONS AND CONTEST RULES

### PART ONE: FORMAL JURISDICTION

#### 1.1.1. International Control of Competitions

The Federation Aeronautique Internationale (FAI) is the sole international authority entitled to make and enforce rules and regulations for the encouragement and control of aircraft competitions (including records) and is the final international Court of Appeal for the settlement of disputes arising therefrom.

#### 1.1.2. National Control of Competitions

The Royal Aero Club, being a member of the FAI and the 'Recognised National Aero Club' of the United Kingdom, having acquiesced in, and declared to be, bound by Statutes and the International Sporting Code of the FAI, now therefore declares its sole right to administer such Code and to draw up and administer rules for the control of, and to control, the sport of aviation throughout the United Kingdom and such Dominions, Colonies, Protectorates and Dependencies as are not affiliated direct to the FAI.

#### 1.1.3. General Competition Rules

So that the above powers may be exercised in a fair and equitable manner, the Royal Aero Club has drawn up its General Competition Rules, which are derived from the International Sporting Code of the FAI.

#### 1.1.4. Delegation of Control of the Sport of Model Flying

The Royal Aero club has, subject to its power of

veto, delegated its control of the sport of model flying to the Society of Model Aeronautical Engineers Limited (SMAE), now operating as the British Model Flying Association (BMFA), but retains its power of acting as a national court of appeal empowered to settle finally any dispute as to any decision pronounced by the BMFA, subject to the aforesaid right of appeal to the FAI.

#### 1.1.5. BMFA Contest Rules

These have been prepared in accordance with the foregoing requirements: All BMFA Contests will be run in accordance with the BMFA or FAI Contest rules, as relevant. All member clubs and BMFA Areas shall conduct all their contests under the BMFA General Regulations subject to any local or specialised rules applicable to such contest set out in the special regulations published in relation thereto.

In no circumstances may rule 1.2.3.2. be varied without consent of Council.

#### 1.1.6. Interpretation of Rules

The interpretation of the rules contained herein or any that may hereafter be issued shall rest entirely with Council or their appointees. The Council reserves the right to add to, amend, or omit any of the rules they think fit at any time.

#### 1.1.7 Final Decision

The decision of the BMFA Council must be accepted as final, subject to the right of appeal to the Royal Aero Club.

## BMFA GENERAL REGULATIONS

There are two definitions of model aircraft, one by the FAI and one by the CAA, as noted in 1.2.2.1 and 1.2.2.3 below.

Whatever the FAI definition, when flying in the UK the CAA regulations **MUST** be complied with.

For R/C models over 7 kg (without fuel), wilful failure to comply with 1.2.2.3 part (a) below will result in any flights being illegal under the terms of the Air Navigation Order.

### 1.2 Applicable to Contest and Non-Contest model aircraft.

#### 1.2.1 Definition of Model Aircraft

Aircraft which owing to their size are not capable of carrying a human being and which are constructed purely for sporting purposes.

#### 1.2.2. FAI Dimensions of Model Aircraft

1.2.2.1 Model aircraft, as defined by the FAI, shall be limited to the following dimensions and weights.

(a) The total surface of the wings and the horizontal stabilising surface(s) must be less than or equal to 150 sq. decimetres (16.14 sq.ft.). The surface taken

will be the total of the orthogonal projections of all flying surfaces onto the horizontal plane in the position of horizontal flight. In the case of wings or tailplanes attached to the body of the machine, the surface taken will include the complete centre of the fuselage(s), the normal contour lines of the surfaces being supposed to be extended until they meet the plane of symmetry of the machine in plan view.

(b) The total weight of the model aircraft in flying condition must not exceed 5 kg (11.023 lb.), complete with fuel, the exceptions to this rule being:

(i) Single engine control line scale models.....6 kg

(ii) Multi engine control line scale models.....7 kg

(iii) Radio control scale models.....12 kg  
(electric powered.....12 kg without batteries)

(iv) Radio control aerobatic models.....5 kg

(v) Radio control helicopters.....6 kg

All these exceptions, other than R/C scale electric models, are without fuel.

**Note - The above dimensions and weights refer specifically to competition classes and the FAI definition of a model aircraft. They do not prohibit heavier or larger models being flown (see 1.2.2.2 and 1.2.2.3)**

(c) Nose radius on R/C gliders should be of not less than 7.5 mm radius measured tangentially to all intersecting surfaces.

1.2.2.2. Contests to FAI rules which vary from regulation 1.2.2.1 may only be flown in the UK if the provisions of regulation 1.2.2.3 are complied with.

1.2.2.3. Model aircraft between 7 kg and 20 kg (without fuel) shall only be flown when

(a) their operation complies with the CAA regulations currently in force and as defined in the Air Navigation Order Article 87.

(b) the BMFA insurance requirements are met.

(c) any existing BMFA Codes of Practice are complied with.

#### 1.2.2.4 Models over 20 kg

The Civil Aviation Authority in exercise of its powers under Article 116 of the Air Navigation Order 1995, as amended, may exempt from this Order any aircraft or persons or classes of aircraft or persons either absolutely or subject to such conditions as it thinks fit. Application for Exemptions must be made to the Civil Aviation Authority directly.

This applies to over 20 kg models and it is illegal to fly them anywhere in the UK without a current CAA exemption certificate. The issue of such certificates is solely within the power of the CAA. A new certificate will not be issued unless the Authority is satisfied that the model concerned has passed through the laid down inspection procedures during building. Note that the passing of such procedures

does not mean that a certificate will automatically be issued.

#### 1.2.3. Motive Power

All types of motive power are permitted with the following limitations:

##### 1.2.3.1. Extensible motors.

Motor in which the power is obtained by the torsion or extension of strands of an elastic material.

##### 1.2.3.2. Mechanical motors.

Motors in which the motive force is obtained by combustion or expansion of gases acting on one or more reciprocating or rotary pistons or by the action of electromotive forces. All internal combustion engines employed in model aircraft must at all times be fitted with an exhaust muffler with the following exceptions and provided the Code of Practice for the minimisation of noise from model aircraft is met:

1. Control line competition model classes:

(a) Speed (all classes);

(b) Team Racing

(c) Combat

2. Free Flight models fitted with a device to limit the engine run to 20 seconds or less. For tailless models, with engine capacity not over 3.5 cm<sup>3</sup>, the engine run must be 30 seconds or less.

3. A Free Flight Scale model using diesel engine(s) of less than 1.5 cm<sup>3</sup> total capacity provided that they are fully cowled.

An exhaust muffler is defined as a device or devices fitted to, or built onto the engine such that it noticeably reduces the noise of operation. Commercial mufflers must be used as manufactured or, if modified, the effect must not increase the noise emitted by the unmodified unit. The use of specially manufactured or home-built units is permitted provided they meet the definition of a muffler above. In contests, the contest director has the right immediately to disqualify a competitor who fails to meet the foregoing requirements.

##### 1.2.3.3. Reaction motors

###### (1) Control Line

Control line pulse jets may be flown in the caged circles of the permanent control line site at Three Sisters, Wigan, which is a registered noisy sports site. Any other such flying may only take place with the special permission of Council.

###### (2) Radio Control

The flying of radio controlled pulse jets may only take place on sites which have been previously granted an annual site license which is available from the BMFA under the following conditions.

(a) That the express written permission of the owner/controller of the site is obtained in advance with due regard for noise considerations.

(b) That the express written permission of any model flying club using the site is obtained in advance.

(c) That monitoring of the area surrounding the licensed site for noise complaints is carried out on an on-going annual basis.

(d) That all operators of such models on the site shall hold a Power Achievement Scheme 'B' Certificate as a minimum and shall hold a BMFA Pulse Jet Pilot's Permit (available from the BMFA annually).

(e) That such CAA regulations as apply to the operation of the aircraft are followed.

### (3) General

Any regulation specifically concerning reaction motors does not apply to small solid-fuel units of the Jetex type, nor to approved and solid fuel rocket motors used in accordance with the BMFA approved code of practice for space models.

#### 1.2.4. Propellers

No model powered by mechanical motor(s) shall be operated with a propeller that is unsafe. The use of metal propellers is prohibited.

#### 1.2.5. Snuffer Tubes

All models using burning fuses shall be fitted with a device designed to ensure:

(a) that the burning fuse is not at any time ejected from the model whilst in flight or on the ground;

(b) that as soon as practical after the functioning of the operation for which the fuse is fitted, the lighted end of the fuse is extinguished.

#### 1.2.6 Radio Control Frequencies

With effect from 21.5.1987, Statutory Instrument 776/87 confirmed the following frequency bands for model control equipment:

(1) 26.96 MHz to 27.28 MHz. Maximum effective radiated power 100 mW. General use.

(2) 34.950 MHz to 35.300 MHz. Maximum effective radiated power 100 mW. Model aircraft use only.

(3) 40.665 MHz to 40.995 MHz. Maximum effective radiated power 100 mW. Surface vehicle use only.

(4) 458.5 MHz to 459.5 MHz. Maximum effective radiated power 100 mW. General use and telemetry.

These are the ONLY frequencies allowed for model control in the UK. Certain frequencies in the 49 MHz band are legally allowed for toy operation but the allowed power output is severely restricted.

## THE BMFA COMPETITION RULE BOOKS

Each of the five specialist competition activities has its own rule book. These are published by the BMFA and are available from the Leicester office at the prices noted, plus an A5 S.A.E.

The full list of rule books and their prices is shown below.

### (1) FORMAL JURISDICTION AND GENERAL REGULATIONS

This section of the rule books appears in this handbook and is also re-printed in Section (2).

### (2) GENERAL RULES

This section is issued free with sections 3 to 7.

### (2A) RECORDS

This section is available free on request.

It contains detailed regulations concerning record attempts and also contains an up to date list of all UK records categories and, where applicable, the current records and holders.

### (3) FREE FLIGHT

Outdoor and Indoor, All Classes  
Price £3.00 - Plus A5 SAE

### (4) CONTROL LINE BOOK 1

Speed and Aerobatics  
Price £3.00 - plus A5 SAE

### (4) CONTROL LINE BOOK 2

Team Racing, Combat, Carrier  
Price £3.00 - plus A5 SAE

### (5) RADIO CONTROL POWER BOOK 1

Aerobatics  
Price £3.00 - plus A5 SAE

### (5) RADIO CONTROL POWER BOOK 2

Pylon Racing, Helicopter, Waterplanes, SAM 35  
Vintage, Fun Fly  
Price £3.00 - plus A5 SAE

### (6) SCALE

All Classes  
Price £3.00 - plus A5 SAE

### (7) RADIO CONTROL SILENT FLIGHT BOOK 1

Gliders  
Price £3.00 - plus A5 SAE

## (7) RADIO CONTROL SILENT FLIGHT BOOK 2

Electroflight  
Price £3.00 - plus A5 SAE

## FAI SPORTING CODE

Each section is prefaced by the full General Section of the Sporting Code and contains all the FAI rules for the discipline, including FAI Provisional rules.

Free Flight Section	£5
Control Line Section	£5
R/C Power Section	£5
Scale Section	£5
R/C Silent Flight Section	£5
Buy one discipline and additional discipline is	£3
Supplement to the Sporting Code	£3
FAI General Statutes	£4

## DIRECTORY OF PUBLICATIONS

Available from the BMFA's Leicester office. Postage prices may vary so please enquire. Those marked \* are free on request with an appropriate SAE.

Saleable Goods List \*

Buying Your Own Flying Site booklet \*

Farmer's Guide \*

Planning Applications and Appeals booklet \*

Model Flying - An introduction booklet for Local Authorities etc. \*

MoD Land - A guide to obtaining permission to fly \*  
Risk Assessment guide \*

'Why Join' booklet \*

The Promotion of Welfare and Care of Children and Vulnerable Adults in Model Flying \*

The SMAE Constitution (Memorandum and Articles of Association) \*

The SMAE Constitution and its Implications for BMFA Areas \*

The SMAE Area Constitution \*

A Guide to the SMAE Area Constitution\*

Council Handbook \*

Special Interest Groups, guidelines for Affiliation and Association to the BMFA \*

Model Club Constitution \*

The Education Leaflet \*

The Teachers Guide

Dart Facts leaflet \*

Aerobatic Helicopter Association Safety Code\*

British Hang and Paraglider Association/BMFA joint safety code for slope sites \*

British Space Modelling Alliance safety code \*

Joint Gas Turbine Builders Group/Jet Modellers Association/BMFA Safety Code\*  
Slope Combat Guidelines\*  
UKRA Rocketry Safety Code\*

FAI Rule Changes Annual PrEcis Booklet\*

BMFA Rule Changes Annual Booklet\*

The Battery Book - Care and use of rechargeable batteries

The Noise Book - Guidance on the reduction of model aircraft noise\*

R/C Achievement Schemes booklet (extracted from the Member's Handbook)\*

Guidance to Fixed Wing Chief Examiners leaflet \*

Guidance to Silent Flight Chief Examiners leaflet \*

Guidance to Club Examiners and Candidates leaflets -

General \*

Fixed Wing 'A' \*

Fixed Wing 'B' \*

Helicopter 'A' \*

Helicopter 'B' \*

Up And Away (R/C power instruction manual) - £2

Up and Away (Electric instruction manual) - £2

(An Up-and-Away manual is free to all new members under the special voucher scheme)

Guidance for R/C Power Instructors Booklet \*

## BMFA NEWS

BMFA News is published to all members six times a year and is delivered directly to your 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 schemes and many other areas of interest in addition to the official announcements that are made in its pages. With all this going on it will be to your advantage to read each issue carefully.

## THE BMFA WEBSITE

If you are connected then check out the BMFA website at [www.bmfa.org](http://www.bmfa.org).

The site is updated at least once a month and carries an ever expanding list of the latest versions of many BMFA publications plus clublists, contacts, links to clubs, other modelling organisations, commercial sites and one of the busiest 'small ads' sections on the web. You can leave a message in the visitor's book or browse the latest update of the contest and events calendar.

The site has been designed to load quickly on any browser so you won't see lots of fancy pictures but

you will get one of the busiest and most informative modelling sites on the web.

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

## ADDRESS DIRECTORY

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Leicester. LE2 8RE

Telephone 0116 244 0028  
Fax 0116 244 0645  
E-Mail [admin@bmfa.org](mailto:admin@bmfa.org)  
Website <http://www.bmfa.org>

**Power Achievement Scheme Controller,  
Instructor Scheme Controller**  
Mr. Peter Spurway,  
Contact via the Leicester office.

**Silent Flight Achievement Scheme Controller**  
Mr Roger Bedford  
Contact via the Leicester office.

**Education Working Group Co-ordinator**  
Mr. Mike Colling, FSMAE  
Contact via the Leicester Office.

**Flying Site Planning Officer**  
Mr Roger Bellingham  
Contact via the Leicester Office.

**Civil Aviation Authority**  
Safety Regulation Group  
Aviation House  
Gatwick Airport South  
West Sussex RH6 0YR  
Tel:01293 567171

**CAP 658**  
Order from:  
Westward Documedia Ltd.  
37 Windsor Street,  
Cheltenham,  
Gloucestershire,  
GL52 2DG  
Telephone 01242 235151  
The cost is £4 plus £2 p&p, cheques payable to  
Westward Documedia Ltd.

The CAA may have CAP 658 on their website in the near future so check out [www.caa.co.uk](http://www.caa.co.uk)

**Contact addresses for the following organisations may be obtained from the Association's Leicester office.**

Aerobatic Helicopter Association (AHA)  
British Association of Radio Controlled Soarers (BARCS)  
British Electric Flight Association (BEFA)  
British Miniature Pylon Racing Association (BMPRA)  
British Space Modelling Alliance (BSMA)  
British Waterplane Association (BWA)  
Club 2000 Pylon Racing Association (CTA)  
Control Line Aerobatic Pilots Association (CLAPA)  
Gas Turbine Builders Association (GTBA)  
Great Britain Radio Controlled Aerobatic Association (GBRCAA)  
International Miniature Aerobatic Club (IMAC)  
Jet Modellers Association (JMA)  
Large Model Association (LMA)  
Northern Ireland Association of Aeromodellers (NIAA)  
Scottish Aeromodellers Association (SAA)  
Society of Antique Modellers (SAM 35) (SAM 1066)  
Sport 40 Pylon Racing Association  
United Kingdom Rocketry Association (UKRA)  
Vintage Team Race Special Interest Group (VTRSIG)

## TAILPIECE

This 2003 Edition of the BMFA member's Handbook is again much enlarged from previous issues and I hope that you will find it useful.

Addendum sheets will be sent out to members regularly until the next issue of the Handbook and an annually and fully updated version of the Handbook will be permanently available on the BMFA website at [www.bmfa.org](http://www.bmfa.org).

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

**Chris Bromley, FSMAE,**

**BMFA Technical Secretary**

**November 2002**



# Members' Handbook

## 2003 Edition



Published by British Model Flying Association  
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