The Aeromodellers Association (Scotland) Ltd.
trading as the :-

SCOTTISH AEROMODELLERS ASSOCIATION

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SAA Members Handbook

Safety Code & Guidance

Change Record

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Issue A	Prepared for Pre-release	B Widley	22/06/2022
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1 INTRODUCTION

The purpose of the Scottish Aeromodellers Association Safety Code and Achievement Scheme is to provide to all SAA Members a framework within which all flying should be conducted to ensure safe conduct whilst participating in the sport of model aircraft flying.

Many points may be considered as common sense and general courtesy to other participants but most importantly they form the basis of safe flying.

Model flying must be carried out within the laws that control these activities. It is administered by the Civil Aviation Authority (CAA) and has been ratified by Act of Parliament. This means that it, along with the Air Navigation Order is part of the body of law of the UK and if contravened, may lead to criminal prosecution.

As a remote pilot the individual operator is responsible for any flight undertaken and must be aware of the magnitude of those responsibilities when commencing any flight. Adherence to this Safety Code and the associated documents will ensure a safe environment in which to enjoy this sport.

The Scottish Aeromodellers Association abides by the “Equalities Act (Scotland) 2010” (www.gov.uk/guidance/equality-act-2010-guidance)

2 SAFETY COMMITTEE

The responsibility for setting the safety standards within the Scottish Aeromodellers Association lies with the SAA Council. (Hereinafter called the Council).

The Safety Committee (hereinafter called the Committee) is a group of members, appointed by the Council, to advise on matters of Safety, or any specific brief so given.

This Safety Code is the responsibility of the Council.

The Chairman of the Safety Committee will be responsible for production and maintenance of this Code, which must be available, on request, to any Club.

No amendments may be made to the Code without the approval of the Council.

In an emergency, the Chairman of the Committee may make a temporary variation to this Code, provided he obtains approval from Council, as soon as practicable, to ratify the change.

The Committee Chairman must be prepared and able to justify the emergency to the satisfaction of the Council and the CAA where it affects the Article 16 Authorisation.

The principal aim of the Committee is to give advice to the Council on any aspect of Safety.

The Committee must also keep the Council informed on any safety related matter that may affect the aims or credibility of the Association.

The only permanent member of the Safety Committee is the Chairman, and he/she will normally be the elected Safety Officer who is usually the SAA Vice Chairman.

The remainder of the Committee will be appointed by and will attend at the invitation of the Committee Chairman and with approval of Council.

The composition of the safety Committee members should be tailored to suit the matter for discussion and will consist of persons experienced in the fields to be discussed.

The frequency of the Safety Committee meetings is at the discretion of the Committee Chairman but will be such that a comprehensive report can be made to the Council at least once per quarter, or when requested. The Chairman will bring any new interim matter to the attention of Council in good time, so as to ensure timely action where required.

The Safety Committee is also responsible to the Council for:-

a) safety rules specific to any particular discipline.

b) the maintenance of the Training Scheme.

c) the maintenance, publication, and administration of the Achievement Scheme.

d) flying-site suitability.

e) promotion of and publicity for safety and achievement awards.

f) raising standards in any aspect of the aims of the Association (including building, flying, competition, ethics, and training.)

g) flying demonstrations and public displays.

h) the safety aspects regarding the introduction of new technology.

i) conducting safety audits.

3 NEW REGULATIONS FOR MODEL FLYING

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

Most of the regulations specific to model flying changed, with many of the relevant Articles in the ANO (Air Navigation Order) being deleted and superseded by requirements contained within the Implementing Regulation for the new EU regulations (as detailed in CAP 1789A (A Consolidated Version of the UAS Implementing Regulation) and the CAP 722 suite of documents). However, there are still ANO Articles that apply. Among them are changes to the Article 265 series that now identify offences relating to non-compliance with the EU Implementing Regulations regarding unmanned aircraft.

In order to achieve this, the CAA introduced the “Article 16 Authorisation”. This Authorisation applies within the Special Category.

The new regulations identify alternative rules to be applied to unmanned aircraft flown in the UK and can be found in CAP 722. The “Open Category” rules can be used by anyone in the UK. They do not have to be a member of a club or association, but they include a height restriction banning flight above 400ft (120m). The “Open Category” rules will not apply to those flying under the CAA Article 16 Authorisation.

Model aircraft below 250g operated in accordance with Article 16 Authorisation are subject to the terms and conditions of the Authorisation. In most circumstances they will operate within the “Open’’ category’ unless fitted with a camera. **If** fitted with a camera, they would come under the ‘’Specific category’’ rules and may fly under Article 16 Authorisation subject to the conditions therein.

4 ARTICLE 16 AUTHORISATION EXPLAINED

Article 16 is found in CAP1789A “UK Consolidation – Regulations (EU) 2019/947 (as retained in UK law). Article 16 is entitled “**UAS operations in the framework of model aircraft clubs and associations**”. It allows the CAA, upon application, to issue authorisations to model aircraft clubs or associations giving them certain privileges for UAS operations conducted within the framework of the club or association.
Note: UAS – Unmanned Aircraft Systems & UA – Unmanned Aircraft.

4.1 VALIDITY

The Article 16 Authorisation is valid for one year and is subject to a renewal process and a CAA fee. The SAA is subject to continuous oversight by the CAA to ensure continuing compliance with the Authorisation.

This may include ‘no-notice onsite’ visits to any SAA clubs.

4.2 Types of Unmanned Aircraft Covered by Article 16 Authorisation

The Authorisation issued to the SAA shall only apply to SAA members who are operators and /or remote pilots of the following types of model aircraft:

a) Any model aircraft in the following disciplines with a Maximum Take-Off Mass (MTOM) less than 25 Kg:

b) Radio Controlled (R/C) Power Fixed Wing.

c) R/C Glider

d) R/C Helicopter

e) Control Line (see Note* below)

f) Free Flight

g) Multi-rotor

All are subject to Maximum Take-Off Mass (MTOM see Note** below) limitations described later in this document. (See section - Maximum Take-Off Mass)

The Authorisation does **NOT** apply to rockets or aircraft flown indoors.

*Note** Control line models weighing not more than 7.5kg and constrained within a radius of not more than 25 metres are outside the scope of the UAS Implementing Rules (IR) and are instead regulated within the ANO Article 265E

*Note*** *see* Section "MAXIMUM TAKE-OFF MASS" of this manual.

4.3 MINIMUM AGE

Operator - 18 years is the minimum age for a UAS Operator. Therefore, SAA Junior Membership, being members less than 18 years of age, are prohibited from registering as an Operator.

Remote Pilot – There is no minimum age for a remote pilot. However, unsupervised pilots must have competency evidence

4.4 SAFETY ACCOUTABILITY

Remote pilots are responsible for the safety of the operation of the model and may only fly if reasonably satisfied that the flight can be safely undertaken.

4.5 REGISTRATION OF OPERATORS

To register as an Operator with the CAA the minimum age for applications is 18 years.

The requirement to register with the CAA in accordance with Article 16 of the UAS Implementing Rules applies to the following: -

a. Operators of a model with a maximum take-off mass (MTOM) greater than 250 grams (see exception for control line (d.) below): or

b. Operators of a model of 250g. MTOM or below that is equipped with a camera or other means of capturing data, and which is not defined as a toy (see note below*) (The Toys (*Safety*) Regulations 2011): or

c. Operators of control line aircraft with a MTOM greater than 7.5kg. (*Weight restriction changed by amendment to Article 14(5)(a) of UK Reg (EU) No. 2019/947)*

d. Control line model aircraft up to a MTOM of 7.5 Kg and models that are operated indoors **do not need to be registered.**

e. The registration number (Operator Identification) must be clearly displayed on the aircraft or within a compartment that can be easily accessed without use of a tool.

f. All operators who are members of the SAA must ensure that they are registered in accordance with the requirements identified in this section.

Note Toys are defined as: - Products designed or intended for use in play by children under 14 years of age. Products with combustion engines are specifically **excluded** from the definition of a toy.*

4.6 MAXIMUM TAKE OFF MASS (MTOM)

MTOM = the maximum aircraft weight, including payload and fuel, as defined by the manufacturer or the builder, at which the UA can be operated.

This authorisation applies only to model aircraft with a MTOM less than 25Kg.

The operation of model aircraft with a MTOM of 25 Kg or greater requires a separate authorisation and is not covered in the SAA Article 16 Authorisation. The LMA are responsible for models greater than 25kg.

Model aircraft below 250g operating in accordance with this authorisation are subject the limitations and conditions of the authorisation. However, most models of this weight may be operated within the limitations of the Open Category.

4.7 LOCATIONS OF OPERATIONS

The SAA Article 16 Authorisation may be used throughout the UK at:

a) Any established clubs operating in a ‘built up area’ (This means an area substantially used for industrial, recreational, commercial or residential purposes). The club management must conduct a risk assessment and have

suitable mitigations in place within their 'Field Safety Rules'. This must be made available to members and visitors flying at the site, so they are familiar with the predetermined club rules.

See Appendix A – The SAA recommended Risk Assessment, which is an ideal guide. See also CAP 403

b) Clubs should draw up carefully considered safety rules for their specific sites to cover local circumstances. These "'flying site' specific rules" should be sufficient to cover the clubs' normal operating procedures and safety measures.

c) At some flying sites, circumstances may dictate that additional safety measures might have to be taken. An example of this may be, limiting the number of models being flown at any one time. Club members may also have to consider the size and type of aircraft that can be safely flown from the site.

d) Flying site rules should be regarded as separate from the Club Constitution rules. This will allow the club officials to constantly review their procedures to ensure that any site safety measures are recognised, implemented and managed as required without delay.

e) Any other suitable site which is not a 'built-up area'.

f) Within a 'built up area' if the flying site is within an area which is only used substantially for recreational purposes (for example playing fields or sports pitches) and a risk assessment must be carried out. See Appendix A

g) Model flying is **NOT PERMITTED** within any Dangerous, Restricted or Prohibited airspace, unless flown in accordance with the relevant permission and requirements of that airspace. Apps such as ''Drone Assist'' will help confirm whether there are any such restrictions in place at the chosen flying location.

5 SITE CONTROL AND USE

It is recognised that it is difficult to obtain the use of ground on which the sport of model aircraft flying can be suitably conducted. Nevertheless, clubs or groups of flyers must ensure any site which is being considered meets the minimum safety requirements before any flying can be undertaken.

(See Para 6.3.1 Flying site layout with diagram.)

a. Flying sites must conform to the regulations governing the Air Traffic Control and Flight Restricted zones in the proximity of Operational Airports and Airfields.

b. Flying is not permitted within an Aerodrome or Flight Restricted Zone (nominally 5 Kilometres from the aerodrome or airfield boundary) unless with the prior

permission of the Air Traffic Control Unit or the Operator of the Aerodrome or Airfield.

c. If there is a possibility that a selected flying site lies within a controlled airspace, the appropriate Air Traffic Control Unit must be contacted before attempting to fly at that site.

d. Flying sites should be selected having regard to the ability to fly safely without having a potential to overflying public roads, houses, industrial buildings, electrical wires or pylons and public areas unless it can be accomplished at a height which will not create a hazard or compromise safety. (In line with the regulations stipulated by the Civil Aviation Authority (CAA) Air Navigation Order (ANO) CAP393 and Guidance in CAP 722F.

e. Any site with a potential hazard should be assessed for safety on an individual basis. Flying sites should also be selected giving consideration to the proximity to other model flying clubs or any other users of radio control or transmitting equipment, or where the flying and retrieval of the model constitutes a nuisance, or danger to, other users of the site. If a site is considered unsuitable a decision NOT to fly can be both valid and sensible.

f. Club officials or groups of flyers are required to make use of this Safety Code to control the flying activities at their flying site and to draw up carefully considered additions where necessary to govern local situations which may not be specifically covered within these guidelines.

g. It is the responsibility of local club management to ensure any local rules required in addition to those contained within this Safety Code are clearly worded and made known to all who use the site. A notice posted at the field is recommended for the advice of visitors.

h. The need to liaise with local authorities and/or site owners to review safety measures and implement updates accordingly should not be underestimated as this provides the basis of a well-managed flying site.

i. Where by-laws restrict model flying to specific times or geographical areas, notices should be erected indicating these restrictions. Bye laws, in Scotland are usually specific to a particular geographical area and details of boundary restrictions are held in the relevant local authority offices. For parks and open spaces, the Local authority will display details of community rules which are normally posted at strategic entrances to parks etc.

j. On public sites, or locations where casual visits by the public are likely, it is advisable to always use the same take-off area. This repetitive action will assist other regular users to anticipate that model aircraft may be operating from a specific location. On private sites with public access, suitable notices warning of model flying and the associated hazards should be erected.

k. All flyers should ensure that the site they intend to use is entirely suitable for the particular model type and model size they intend to fly, and this consideration should be undertaken on every occasion.

6 FLYING SITE LAYOUT

6.1 Powered Fixed wing & Helicopters

The following should be observed for setting out flying site layouts

a. For radio controlled powered fixed wing aircraft flying sites, the location and layout of the take-off and landing strips should be chosen where it would be possible for a novice pilot to reasonably avoid flying over houses, gardens, roads, railways, public and industrial buildings, power lines, public play areas or any other potentially hazardous areas.

b. A site for helicopters should follow similar guidelines. A separate area should be assigned for beginners and for hovering only. This should be positioned at a safe distance from the active runway and the model pits.

c. Movable hazards such as vehicles, spectators etc., should be located at a safe distance behind the take-off and landing area. i.e., “safe” meaning that flying over these hazards can be reasonably avoided by a novice pilot. This safe area should be beyond or behind the area used as a flight line. No models should ever be permitted to fly behind the pilot stance.

d. If spectators are regularly present, a barrier should be erected to restrict access and keep non- flyers at a safe distance from the flying area.

See Sketch of a typical layout Recommended Site Layout

6.2 Free Flight

A free flight site should ideally have all round sufficient space to allow the model to stay within bounds

a. A ‘free-flight’ flying site should only be selected if the expected flight pattern and the wind conditions prevailing at the time of any flight would not overfly houses, main roads, railways, gardens, public & industrial buildings, power lines, public play areas, or allow a model to come within 165ft (50meters) of uninvolved persons, etc.

b. If a site is only safe for use in a limited choice of wind directions, then this restriction should be written into the local rules and a notice posted to the effect that flying is not permitted out with these conditions.

6.3 Recommended Site Layout

Regular positions for the model pits and the pilot stance should be established and the pilot stance should be located towards the mid-point of the runway.

See below for diagrams of suggested flying site layouts for powered fixed wing models and helicopters. These diagrams are idealised and are recommended particularly when new flying sites are being constructed.

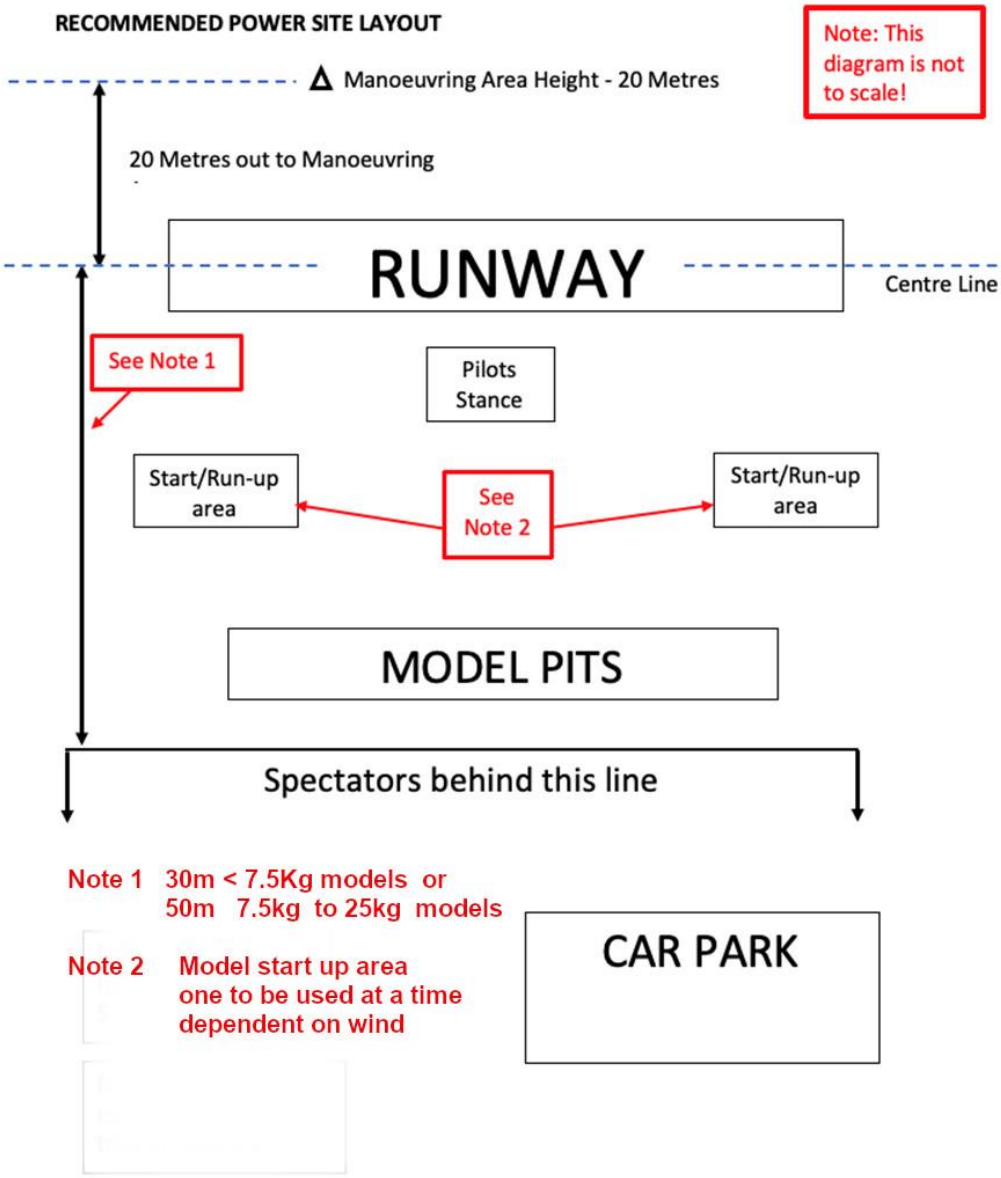
The main characteristics to be noted being:

a) The relationship of pilot stance, start-up area / model bench and model pits to the runway and flight line. *The diagram is not to scale as shown and the start-up areas may be close to the pilot's stance provided, they do not distract the pilots and are safe.*

b) The runway is positioned near the centre of the flying area, so no flying is conducted over restricted areas out with the boundaries of the flying site, and the same flying area is used regardless of wind or take off direction.

c) The following distances from spectators or uninvolved persons and vehicles must be achieved and strictly adhered to:

6.3.1 Recommended typical Site Layout



(Note 1) 30 metres minimum for models between 250g and 7.5Kg MTOM
(Note 1) 50 metres minimum for models above 7.5Kg up to 25Kg MTOM

(These distances can be reduced to 15 and 30 metres respectively for take-off and landing if required for practical operations following a local risk assessment and only if local mitigations are put in place to protect uninvolved persons.)

7 TYPES OF OPERATION

While flying a model aircraft the remote pilot must maintain direct, unaided visual contact with the aircraft (the use of prescription glasses is permitted) sufficient to monitor the flight path and avoid collisions with other aircraft, persons, vehicles, vessels, or structures.

The exception being when the aircraft is being flown in accordance with the 'First Person View' conditions as detailed in the relevant section of this manual and in line with CAA legal limitations.

The operation of any model aircraft under the conditions set out in this Safety Code must only be for the purposes of sport, recreation, education, or demonstration.

Any other operations will be outside the scope of the SAA authorisation.

7.1 OPERATING HEIGHTS / ALTITUDES / LEVELS

If all the following conditions are met, a model aircraft is permitted to fly at a height in excess of 400ft. (120m.) above the surface in accordance with the limitations of the SAA Article 16 Authorisation:

a. The model aircraft is not a rotorcraft with more than two lift-generating rotors or propellers (multi-rotor).

b. The model aircraft is not automated. *(This means a model aircraft with autonomous or automatic flight capability. This does not include systems that are fitted for flight stabilisation purposes or flight termination purposes, such as free-flight termination devices)*.

c. The model aircraft in not operating within the Flight Restriction Zone of an aerodrome, unless written permission/agreement of the aerodrome has been obtained.

d. The model aircraft remains within visual line of sight of the remote pilot.

e. The model aircraft has a MTOM of not more than 7.5Kg, with the exception of the circumstances below:

I. Slope soaring model gliders with a MTOM of not more than 14kg. MTOM may be flown up to 400ft (120m) above the remote pilot, even though it may then be flying more than 400ft (120m) above the surface directly beneath the glider.

II. Model aircraft exceeding 7.5Kg MTOM may be flown above 400ft (120m) if either of the following applies:

III. The model aircraft is being operated from a Club Site that holds an 'SAA Site Permit' that authorises the operation of aircraft with a MTOM greater than 7.5Kg, but less than 25Kg at heights above 400ft (120m).

IV. The model is being operated under a 'SAA Model Flying Display Permit' which has authorised the operation of aircraft with a MTOM greater than 7.5Kg, but less than 25Kg at heights above 400ft (120m) as part of a Model Aircraft Flying Display

Note:-

When operating at heights that may exceed 400ft (120m), it is essential that members remain vigilant and look out for manned aircraft. If aircraft are noted within the vicinity, the model aircraft must be brought down to under 400ft (120m) as quickly as is safely practicable.

8 REMOTE PILOT RESPONSIBILITIES

Remote Pilots must comply with the following requirements before visiting the flying site:

I. A Pilot should ensure that they are fit to fly. Do not fly or perform any ground duties when under the influence of alcohol, drugs, illness, injuries or other conditions which would render the pilot unfit.

II. Have evidence of an appropriate level of competency to fly the specific model, such as an SAA membership card / relevant insurance document.

III. Be familiar with the manufacturer's instructions, if applicable, for the equipment being operating.

Before flying, it is essential that the remote pilot must:

I. Make sure there are no relevant airspace restrictions in place where it is intended to fly.

II. Ensure that the operating environment is compatible with the limitations and conditions set out within this Safety Code.

III. Ensure that the aircraft and its equipment are in a condition to safely complete the intended flight.

IV. Ensure that any relevant information about the operation has been made available to the appropriate air traffic service (ATS) unit, other airspace users and relevant stakeholders, when required.

During the flight, the remote pilot must:

I. Comply with the limitations and conditions of model flying set out within this Safety Code.

II. Avoid any risk of collision with any manned aircraft and discontinue model flying where it may endanger other aircraft, people, animals, environment or property.

III. Comply with any applicable airspace restrictions.

IV. Not fly close to, or inside areas where an emergency response effort is ongoing.

Note:-

Where the 'remote pilot' and the 'operator' are the same person, then the responsibilities of both the 'remote pilot' and the 'operator 'will apply.

9 REMOTE PILOT COMPETENCE

Any SAA member (not under tuition) wishing to fly as a remote pilot under the conditions of the Association and in accordance with the SAA Article 16 Authorisation, must show a suitable degree of pilot competence, by achieving a level of SAA safety certification and by passing the CAA online DMARES test. (Drone & Model Aircraft Registration & Education Service).

10 SEPARATION DISTANCES

For model aircraft, **other than 'free flight' models**, that weigh above 250g and not more than 7.5Kg MTOM the following separation distances shall apply:

a) Not less than 30m (approx.100ft) horizontal distance from gatherings of people (see note*).

b) Not less than 30m distance (approx.100ft) from any uninvolved person. This may be reduced to 15m for take-off and landing if required for practical purposes, providing that an appropriate risk assessment has been carried out and locally applied mitigations will protect any uninvolved persons.

For model aircraft with a MTOM greater than 7.5Kg, and less than 25Kg shall **not** be flown:

a) Within a horizontal distance of 50m (approx.165ft) of assemblies of people (see note*). This may be reduced to 30m for take-off and landing if required for practical purposes, providing that an appropriate risk assessment has been carried out and locally applied mitigations will protect any uninvolved persons.

b) Within 30m (approx.100ft) of any uninvolved person.

Note Gatherings or assemblies of persons - where, due to the density of people present, they are unable to move away quickly.*

11 SAA ACHIEVEMENT SCHEME

The purpose of the SAA Achievement Scheme (hereafter called 'the scheme') is to provide members with a recognised and standardised system of graded levels of piloting competence. Intended to provide clubs with a measure of the abilities of their members and also to serve as proficiency goals for those members. The manoeuvres at each stage are chosen to assess the ability of a pilot to control a model with confidence and safety rather than as a demonstration of aerobatic perfection. See SAA achievement Scheme Manual for details

a. **The Bronze Standard Award** provides a means for recording the attainment of solo piloting ability by the novice flyer to permit unsupervised flying to take place.

b. **The Bronze Plus Award** offers a stepping-stone to Silver, whilst not conferring the ability to fly at Public Displays.

c. **The Silver Standard Award** provides a measure of piloting safety competence sufficient for the pilot to be considered suitable for performing at public displays or demonstrations.

d. **The Gold Standard Award** is provided for pilots wishing to demonstrate a very high level of control and safety in operation.

The aim of the SAA Council is to encourage all SAA members to achieve SAA Safety certification to a minimum of Bronze Standard.

The scheme also provides a means for the recruitment of SAA Examiners and for their piloting skills to be evaluated prior to them being appointed so that the scheme can be delivered with consistency to members at club level.

The Safety Committee Chairman will appoint an 'Examination coordinator' for each flying discipline as required, and they will be invited to become members of the Safety Committee.

The scheme may also provide a standard of competence for establishing entry to National competitions and club events where a particular safety requirement exists.

Members intending to undertake any scheme achievement award must first have obtained their CAA flyer ID and provide proof of this to the examiner.

12 OCCURRENCE REPORTING

The purpose of the Occurrence Reporting system is not to apportion blame, but to learn from occurrences and to facilitate improvements in aviation safety and prevent recurrence.

Reporting is a legal requirement as detailed in CAP 722, Section 2, Para 2.9 which contains information identifying what is required. This should be read in conjunction with this Safety Code.

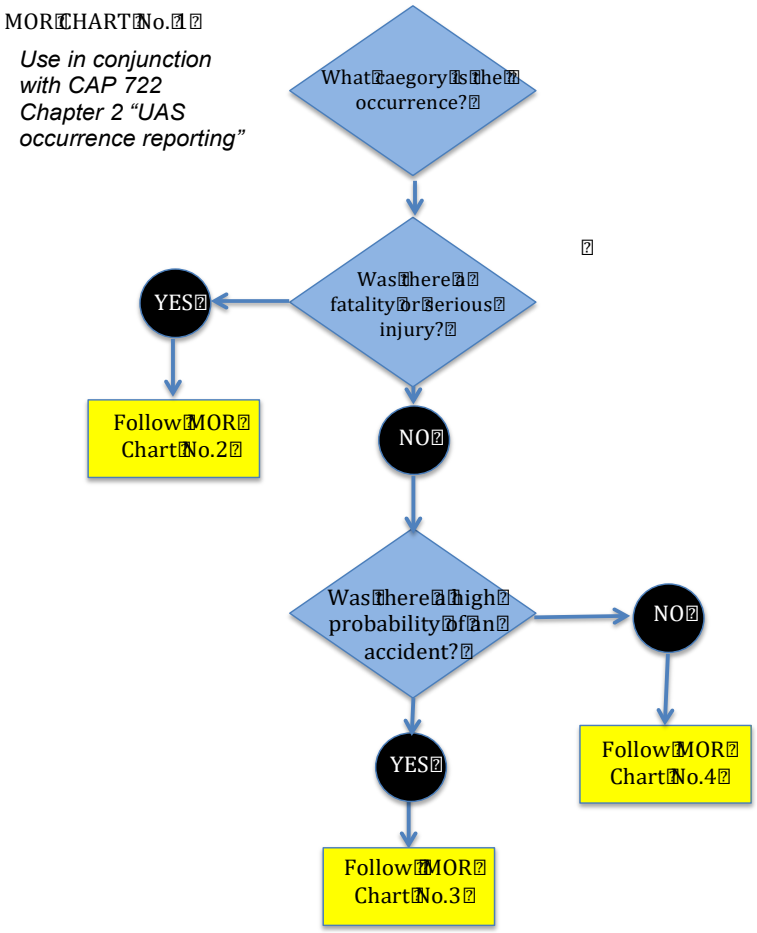
To ensure pilots have the most up-to-date information it is advised to check the UAS Unit latest updates webpage.

An occurrence (either, Accident, Serious Incident or Other Occurrence) is considered to be any safety related event which endangers or which if not corrected or addressed **could** endanger, a manned aircraft and its occupants or any other person or property.

Pilots must consider if a UAS occurrence (either actually experienced or simply observed) is reportable and guidance on this matter is available from the SAA Safety committee. Although an incident may be considered 'benign' in one circumstance the same incident may have more serious repercussions in a different setting or location or if in close proximity to people or property.

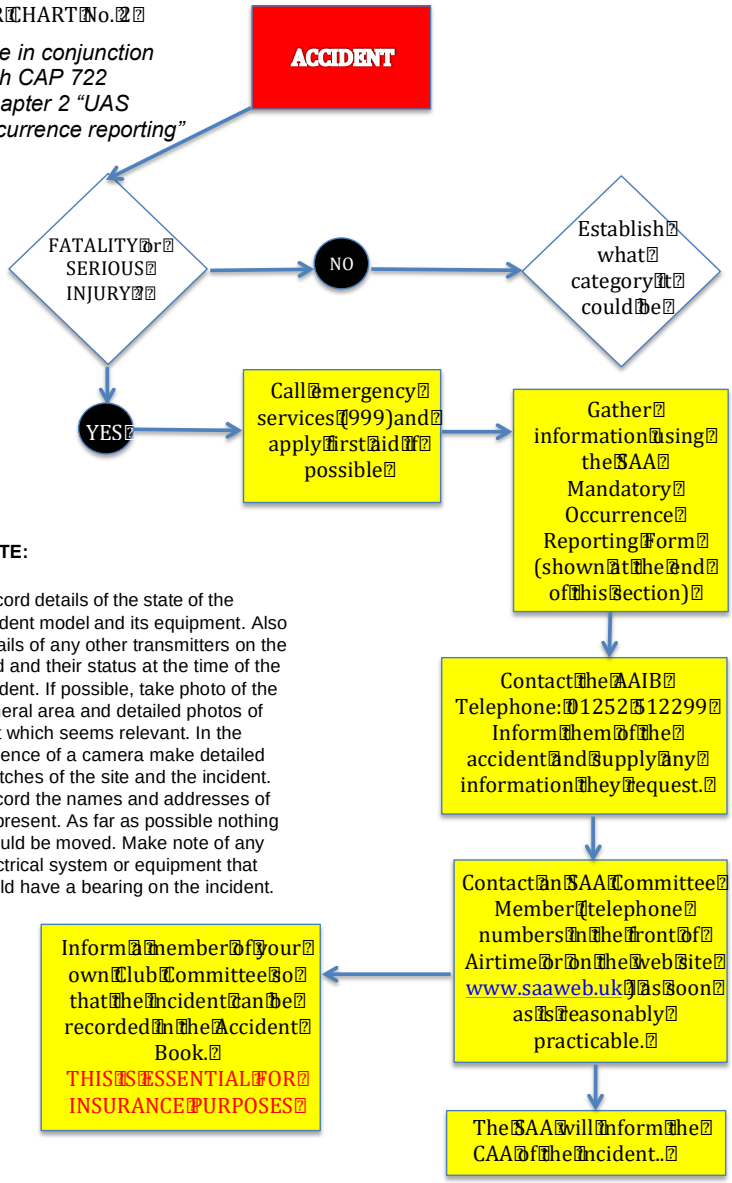
Any incident where the safety of the aircraft, operator, other airspace users or members of the public is compromised or reduced to a level whereby potential for harm or damage is likely to occur (or has only been prevented through luck) should be considered a reportable incident.

Use the flow charts on the following pages to help to identify the reporting procedures:



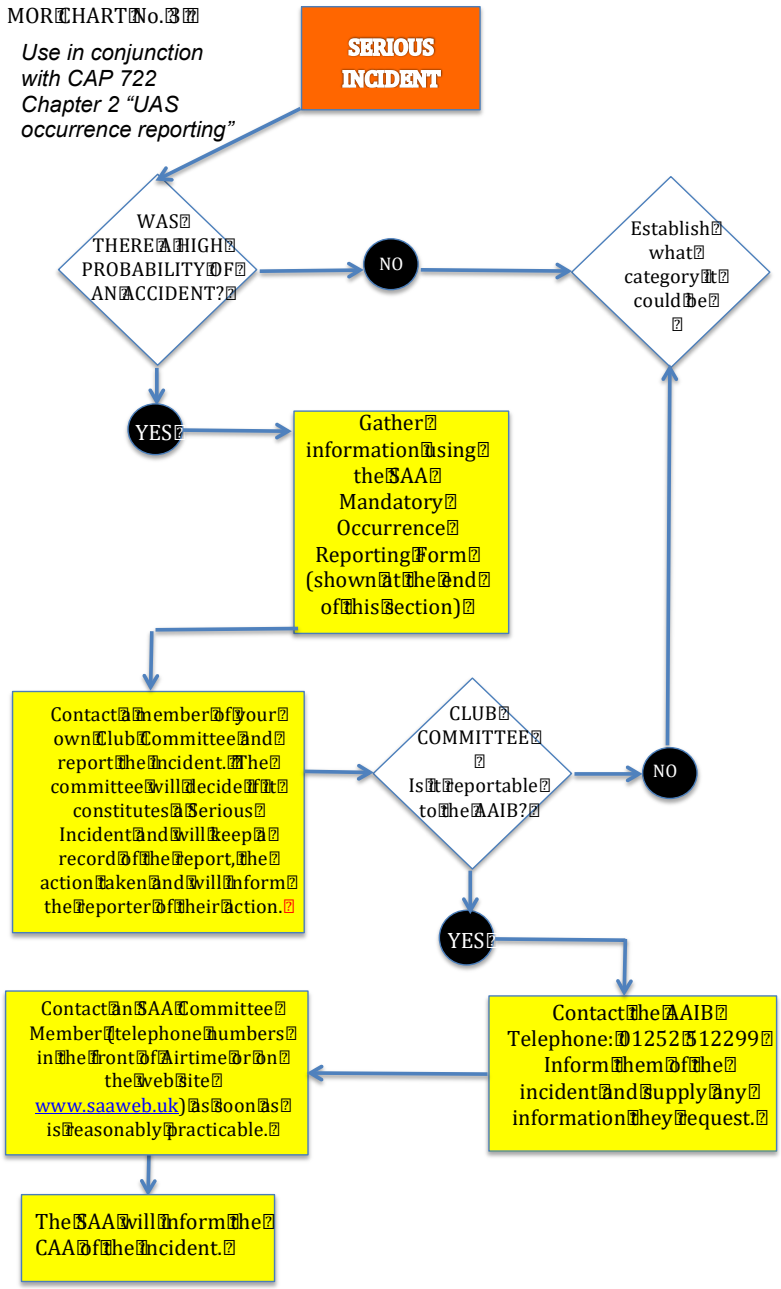
MORI CHART No. 2

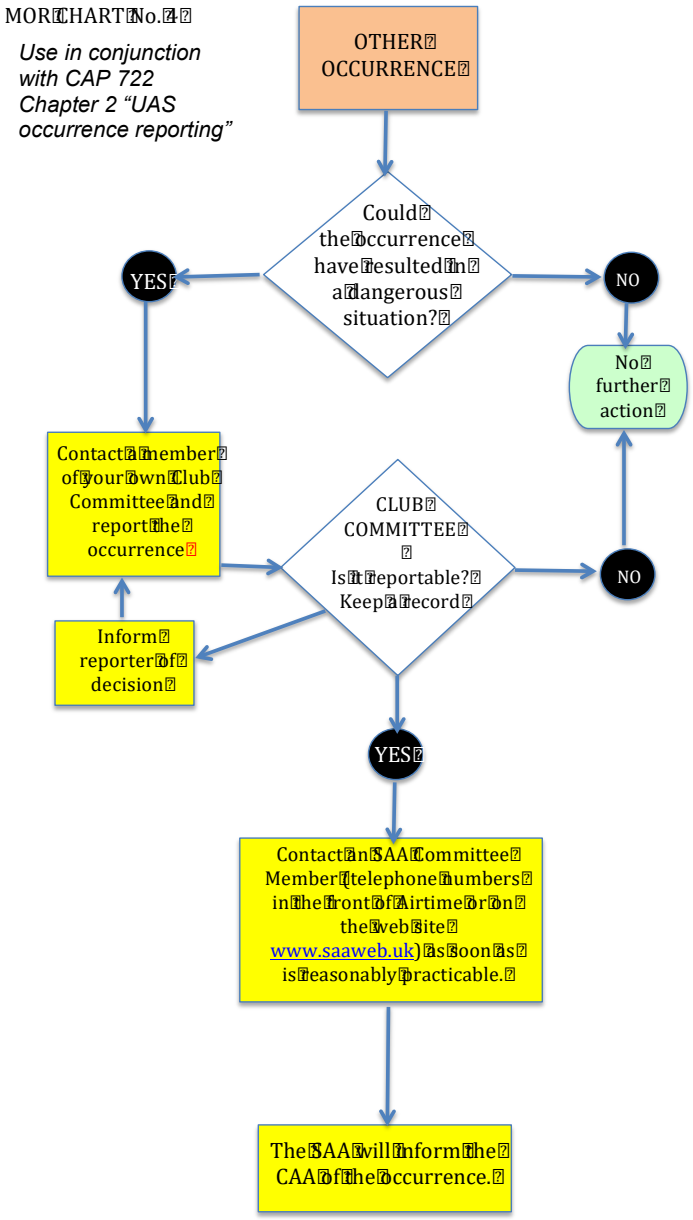
Use in conjunction with CAP 722 Chapter 2 "UAS occurrence reporting"



NOTE:

Record details of the state of the incident model and its equipment. Also details of any other transmitters on the field and their status at the time of the incident. If possible, take photo of the general area and detailed photos of that which seems relevant. In the absence of a camera make detailed sketches of the site and the incident. Record the names and addresses of all present. As far as possible nothing should be moved. Make note of any electrical system or equipment that could have a bearing on the incident.


MORE CHART No. 3
Use in conjunction with CAP 722 Chapter 2 "UAS occurrence reporting"
SERIOUS INCIDENT
WAS THERE A HIGH PROBABILITY OF AN ACCIDENT?
NO
Establish what category it could be
YES
Gather information using the SAA Mandatory Occurrence Reporting Form (shown at the end of this section)
Contact a member of your own Club Committee and report the incident. The committee will decide if it constitutes a Serious Incident and will keep a record of the report, the action taken and will inform the reporter of their action.
CLUB COMMITTEE Is it reportable to the AAIB?
NO
YES
Contact an SAA Committee Member (telephone numbers in the front of Airtime or on the website www.saaweb.uk) as soon as is reasonably practicable.
Contact the AAIB Telephone: 01252 512299 Inform them of the incident and supply any information they request.
The SAA will inform the CAA of the incident.



13 SAA MANDATORY OCCURRENCE REPORTING FORM

Please see SAA Occurrence Report Form.docx
Or
SAA Occurrence Report Form.pdf

These forms can also be found on the web site for download

14 INSURANCE

All current members of the SAA enjoy insurance cover for legitimate (the policy will not cover reckless or irresponsible flying) and non-commercial model flying. The full details of the Insurance cover can be found on the SAA Insurance Policy section of the SAA website, a copy of which may also be downloaded and in conjunction with a valid membership card may be also used as evidence of insurance cover

15 DROPPING OF ARTICLES

Generally, the dropping of articles from unmanned R/C aircraft is not permitted. However, permission may be granted in specific circumstances if supported by a written Risk Assessment detailing the extent of the items to be dropped, the proposed landing areas and any limitations based on the weather conditions. Overall, though, the remote pilot must not cause or permit any article to be dropped from an unmanned aircraft so as to endanger persons, property, or animals.

16 SAA MEMBERS COMPLIANCE

Should an SAA member be reported to a club or directly to the SAA Council for failing to comply with Article 16 regulations or any of the CAP notifications governing model flying, the SAA will investigate the situation to consider an appropriate course of action.

It is likely that any potential breach of regulations or legislation will be investigated by a Director of the SAA, in conjunction with the SAA Council and members of the Safety committee, should the matter be safety related.

Where possible the situation should be dealt with, in the first instance through informal discussion and the member provided with clear and precise details of the nature of the breach they are being accused of.

They should also be given details of who had raised the concern and requested that their actions be formally investigated.

Prior to any disciplinary procedures being considered the member should be given the opportunity to provide their version of the specific events and any mitigating evidence in support of their actions.

Once the initial investigation has indicated that there is a valid cause for concern and a case to answer, a decision on the appropriate steps to be taken must be made based on the nature and severity of the incident being reviewed.

If it is considered that the breach of compliance occurred as a result of the individual member's lack of knowledge or understanding of the regulations, then this would warrant the compulsory requirement to undertake further training and /or undergo further education in relation to the specific nature of the breach.

Following a fully comprehensive investigation by the SAA, if a member is found to have been deliberately flaunting the Article 16 or CAP regulations, then a more severe approach should be taken, and a formal written warning issued with the requirement to immediately comply with the relevant regulations.

In the unlikely event that, after having received a written warning detailing the breach and the remedial actions required, the member subsequently continues with the unacceptable behavior, then the ultimate course of action would be expulsion from SAA membership.

If the member's behavior and actions are considered that they might also pose a risk to other persons, either involved or uninvolved, or to property, then the SAA would recognise the need to alert those other persons of the situation. This would include the requirement to share the members' relevant details with other model flying associations to alert them of the potential risks of accepting that person as a member and to also indicate the nature of the breach and their subsequent expulsion from SAA membership.

During the notification process, clearly detailing the breach and the actions required, the member should also be made aware of their right to appeal against any decision imposed.

Should the member wish to submit an appeal against the decision, or provide additional mitigating evidence, this would require to be heard by an independent group of suitably qualified and experienced persons (comprising of SAA Guardians and Fellow members of the SAA) and their deliberations should be forwarded to the full board of SAA Directors with recommendations of the appropriate action to be taken.

After scrutiny of all information available and having received the recommendations of both the initial investigation, and possibly a second independent review group, the decision of the board of Directors of the SAA will be final, no further appeal will be permitted, and the outcome reached will conclude the matter.

17 OPERATOR RESPONSIBILITIES

The registered operator of a model aircraft must comply with the following requirements:

a) Ensure that the remote pilot has achieved the required level of competence as set out in the 'Remote Pilot Competence' section of this manual.

b) Ensure that the model aircraft is sufficiently maintained, and that any repairs carried out have been completed to a standard that renders the model in a safe condition for the intended flight.

c) Ensure that any necessary additional permissions or authorisations have been obtained for any specific flight.

d) Ensure that the remote pilot is aware of any relevant airspace limitations.

Note: If the 'operator' and the 'remote pilot' are the same person then the responsibilities of both roles are applicable.

18 CONTROL LINE FLIGHT

'Control line' models are directly operated by the pilot using flexible lines which are physically attached to the model, and these are used to manipulate the aircrafts flight control surfaces. As the model aircraft is physically restrained, these model types are therefore exempted from the requirements of CAP722 including Operator Registration and Remote Pilot Competency provided that the following conditions are met:

a) The length of the lines does not exceed 25m
b) The MTOM is less than 1Kg
c) The aircraft is not capable of vertical take-off / landing or hovering.

Although under Article 16 Authorisation, Control line pilots are exempted from any competency requirements, they will still require to register with the CAA as an Operator if their model aircraft has an MTOM which is greater than 1Kg.

Provided below is a selection of recommendations when flying Control line models:

a) Always use lines of sufficient strength for the type of model.

   (See APPENDIX B – Control line recommendations)

   Note :-Stranded wire should be used at all times.

b) Before each flying session the model and lines must be pull checked to 10 times the model weight for sports models or to the specified limits shown in APPENDIX B for competition and, proved to take the strain satisfactory.

c) Do not fly if the circle is obstructed in any way and, in particular, if spectators, young children or pets are unsupervised in the vicinity.

d) Wrist straps to restrain the “Control Handle” must be used at all times.

e) Never release the control line handle while the model is in motion. For FAI combat, engines must be securely anchored to the bell crank.

f) Hard hats must be worn by combat pilots and their pitmen and by team race pitmen.

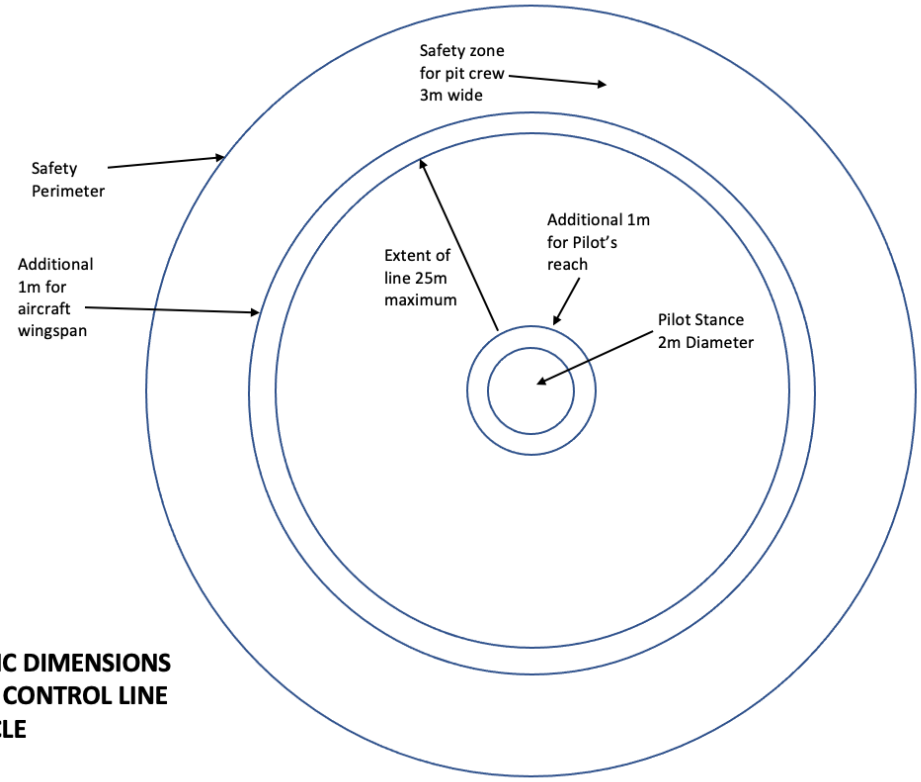
g) Always mark a centre spot or inner circle for the intended flight ensuring adjacent circles are safe distances apart.

h) Always stay on the centre spot or inner circle when flying.

i) If someone strays into the flight circle while a flight is in progress, then the pilot must take evasive action and fly high to avoid them. The pilot must summon assistance to get the flight circle cleared. It is advisable to always ditch the model safely rather than risk hitting someone.

j) Never fly near overhead electrical power lines as electricity can arc across to the model and through the control lines.

When more than one aircraft is being flown in the same flight circle, should any model complete the flight, all pilots must remain in the circle centre until all the flights are completed. At no time should ‘downed’ models be recovered from outside the circle until all flying has been completed. An exception can be allowed during combat flying, and team race if flown under pre-agreed strict competition rule.



BASIC DIMENSIONS FOR CONTROL LINE CIRCLE

19 FREE FLIGHT

Free flight is the segment of model aviation involving model aircraft with no active external control (such as radio) after launch. Free flight models are designed to be inherently stable in flight and if, for example, they are disturbed by a gust of wind or a thermal, they will automatically return to stable flight.

There are four main categories of free flight model:-

1. Gliders, either hand launched or towed.
2. Rubber powered.
3. Power, either CO2, glow or diesel internal combustion or electric motor.
4. Indoor flight

20 FREEFLIGHT MODEL FLYING REQUIREMENTS

Models should not be launched from an area which could result in the model being blown off course and possibly over-fly houses, major roads, railways, gardens, public & industrial buildings, power lines, public play areas, and other structures.

Spectators and other participants / car parking / public facilities etc should always be upwind and a safe distance from the launch point.

Check the wind direction has not changed before launch and alert other flyers before undertaking an initial flight with an untested model.

When a fuse type dethermalizer (D/T) is employed, it must be fitted with and, be able to be contained within a 'snuffer tube'.

Ensure that the dethermalizer and timer equipment are working correctly before launch.

Where the potential for 'Beyond Visual Line of Sight '(BVLOS) exists, a flight termination device (D/T) should be fitted. (CAA Model Aircraft Strategic Regulation Review 4.2.2 Recommendation 5, Free Flight Termination Device).

To avoid creating a trip hazard, ensure towlines are carefully stored immediately after use and not left lying unreeled

20.1 Free flight Equipment:

A flight termination device can be used to manage the potential flight duration of the aircraft.
The simplest method is an ignited fuse which burns / smoulders for a time (usually one minute) and then activates a flap / airbrake / boom or elevator. This then causes the aircraft to descend to earth. If this kind of dethermaliser is used, then an aluminium 'snuffer' tube should be part of the design in order to extinguish the fuse.
Radio controlled dethermalisers are also available which allow the remote pilot to control this function electronically (and thus the aircraft's flight duration). This gives the remote pilot more control over when (and therefore where) the aircraft comes to earth. A radio dethermaliser also allows the remote pilot to bring the aircraft down if it is caught in a thermal air pocket and is heading out of sight (as the aircraft must always remain within visual line of sight).

20.2 Checking for Damage:

Always conduct a pre-flight check of both models and equipment for signs of damage before flying a model. Although free flight aircraft are usually very lightweight and so carry little inertia, if the model descent is not controlled then it can be expected that damage may be sustained on landing. Pilots should check that all of the control surfaces are properly aligned and also that the dethermaliser mechanism works satisfactorily.

20.3 Selection of location:

Competition free flight model flyers usually operate on large open areas such as military airfields or military exercise areas. These provide ideal locations as the predetermined space allows the remote pilot to judge the area in which the aircraft

is likely to fly (the 'flight volume') and to be confident that no uninvolved persons will be within that area. It is also essential to check that no flight restriction zone (or other airspace restriction) will be infringed without permission.

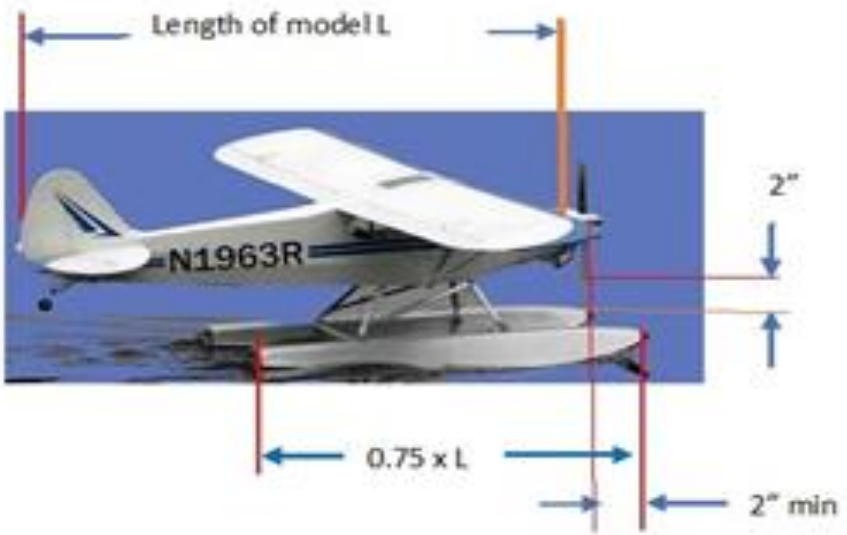
Free flight models are destined to always land downwind of their launch point and this is an important consideration when choosing a launch area. The model should always be launched downwind of any people, vessels, vehicles or structures – the model will therefore fly away from the potential hazard and this will help to ensure that the pilot complies with the stipulations of the Article 16 operational authorisation.

20.4 Checking the Flying area:

Free-flight pilots must ensure that the selected launch area, and the 'flight volume' are kept clear of uninvolved people throughout the flight and be satisfied that the model will remain within the intended area and within the line of sight.

21 WATER PLANES

Water planes tend to be normal fixed wing model modified by adding floats, or fixed wing model especially designed for flying from the water, which have a waterproof hull and small floats or sponsons on the wing tips. Both high wing and low wing models are suitable for flying from water.
Planes which have floats added require the float to be positioned correctly regarding the step position to the Centre of Gravity (C of G) of the model, float size, and length. This must be sufficient to displace the model's weight of water while being positioned correctly on the model. See diagram below for guidance only as some trial and error may be required to find the set up best for the specific model: -



The guidance for adding floats is that the length of the floats should be 75% of the overall model length.
The float step should be approximately 1 inch behind the Centre of Gravity.
The front of the floats should be typically 2 to 3 inches in front of the propeller blades.
Clearance from the tip of the propeller to the top level of the floats should be around 2 inches.

The incidence of the wing should be positive to the water when the model is floating to create lift on take-off (*perhaps around 3 degrees)*

Aircraft with floats added will find the inclusion of a water rudder, situated on the rear of the float, will assist the low-speed steering of the model. The water rudder can be controlled either by a linkage or Bowden cable from the air rudder or the use of a separate servo, suitably mounted, to provide a simple push-rod connection to the water rudder.

Models designed especially for water flying tend to have the rudder integrated to perform the dual function of air and water rudder.

Floats and hulls found on water-panes produce more drag than wheels, hence, it is normal to need more power to take off from water and fly as a consequence of this additional surface area of the floats / hull. This is particularly true during take-off as the floats need to break the surface tension of the water to transition up, then step off the float before breaking free from the water.

Radio equipment should be adequately protected from the ingress of water. Protection of the receiver, servos, Electronic Speed Controller (ESC) electric motor etc. can be done by immersion or spraying in water repellent liquids such as “Corrosion X”. Other techniques such as putting sensitive items in balloons is also possible, but it is very difficult to stop water ingress and treatment with the water repellent chemicals is considered to work better.

Flying off water should not be attempted unless a suitable recovery method is available. Any recovery boat should be inspected and considered ‘safe’ before use and the occupants should be equipped with life jackets. Other methods of recovery are also possible such as, poles with hooks, which can be used to recover models close to the shoreline, or radio-controlled boats with a hook pickup system which can be guided to hook a model and tow it back to the shoreline. None of the alternative methods are as effective as having a manned rescue boat which must be suitable for the area of water selected to fly from.

22 FIRST PERSON VIEW MODEL AIRCRAFT

22.1 Introduction

FPV (First Person View) is a developing technology and those intending to use these advanced systems should ensure compliance with Cap 722.

(FPV) is a method where a “Remote Pilot” (RP) is able to control a flying model by viewing an image provided from a camera mounted on the model. The camera wirelessly transmits a “Video Link” to goggles or a monitor screen which can be used by the (RP) to see a view from the model's perspective and allows control of where the model is flying.

The (RP) only has access to the image on the goggles / monitor device, and the “Field of View” (FOV) of the video image will be restricted to that provided by the camera on board the model and the video viewer. The limited FOV received from the flying model means that the (RP) lacks “Spatial Awareness” of the airspace surrounding the flying model and hence may not see people, aircraft and other objects etc. encroaching the flying space. It is therefore recommended that a support person is available to assist with this safety aspect.

Because the flying of the model is dependent on the integrity of the “Video Link” it is important that the (RP) ensures the reliability of the equipment being used. It is also essential that the Remote Pilot ensures, before any flight, that the channels used for the Video Link do not conflict with other users or that other users Video Links do not interfere or conflict with their own equipment.

Note: - While 2.4GHz (as used in “Radio Control Transmitters”) uses frequency hopping and spectrum spread techniques and gives robust interference rejection, the “Video Link” equipment “DOES NOT”, and simply depends on channel separation. It is therefore important that the (RP) checks that no interference is caused to others or the (RP’s) own equipment by proper selection of “Video Link” channel separation. This will apply to all those participating in FPV, especially, if attending a multi pilot event.

FPV can be used to fly various model types, such as: -
Fixed wing aircraft
Quads
Others -- Multiple Rotors, etc.

22.2 Flying FPV

Subject to Authorisation, there are two options allowed for FPV flying. Depending on the model type, size, how many participants, and what type of flying is intended

to be carried out. One of these options will be applicable and generate the conditions which must be observed when flying FPV.

22.3 Flying solo or in a small group (FPV Authorisation Option B)

If flying solo or with a small group, “each flyer” must have their own “competent observer/spotter”, whose job it is to ensure the model is kept within visible range and to ensure that flying space remains clear of people or aircraft etc. The observer/spotter must give the (RP) guidance to allow continuation of safe flying within the option (B) and safe flying distance rules or call for termination of the flight if they cannot be met.

Note: - Safe distances are defined within the Option Rules area of the Authorisation document.

If flying a “Fixed Wing Aircraft” under this option, the following conditions are allowed: -

- The maximum height permitted is 1000ft (~307m) above the ground.
- The maximum mass of the model is 3.5kg

If flying a multirotor / quad aircraft, then the max height allowed is lower and the following restrictions apply:

- The maximum height permitted is 400ft (~123m) above ground.
- The maximum mass of the multirotor is 3.5kg

22.4 Flying In a FPV Race (Authorisation Option A)

This option is most suited to FPV racing and requires a “Sterile Area”.

a) A “Sterile Area” is considered as an area which has been cordoned off to prevent anyone entering the area. The height of flight is strictly controlled to 50m (160ft) which is a safe low risk height. Models of higher mass of up to 25Kg may be permitted to fly, however, most FPV racing is done with low mass models.

b) Individual observers /spotters are no longer required, and the responsibility is transferred to the “Race Director” and a team of competent “Race Marshals”. Their function is to monitor the flying and ensure uninvolved persons do not enter and no models cross the sterile area boundary.

c) The **Sterile Area** should be set out with a flying area and a further separation area to the cordoned off boundary. Typically, the flying area width and the additional separation area width should be similar so that in the event of a model crash or failure it remains within the sterile area. This means than neither the flying area nor the separation area can be small and probably each need large equal widths for the flying area and the separation area. Hence the recommended cordoned off boundary would typically be at twice to three times the flying area width.

22.5 The Race Director and Marshals

a) The function of the “Race Director” (RD) is to be overall in charge and hence should be positioned near the (RPs) so that they can be instructed. This is especially required in case the (RD) needs to instruct the pilots to immediately land models or terminate the race due to some danger such as someone entering the secure cordoned area.

b) Before the race the (RD) should brief the (RPs) and the “Race Marshals”. Typically, the (RD) should ensure all (RP) understand the command for termination of the race or the immediate land command in the case of emergency. The (RD) should make sure the (RPs) are familiar with the course and the safety separation area and ensure there are no frequency clashes between pilots by defining channel separation for the “Video Links” in use for each race.

c) The (RD) should brief the “Race Marshals / Observers” on their responsibilities to fully police any traversing of the cordoned boundary by models or people and report problems immediately. Radio communications equipment may be deployed so that information can be relayed to the race director without delay. The FPV models should be checked prior to the race to ensure they are airworthy; ground stations operate correctly, and failsafe's’ are set and suitable for the race conditions.

23 OPERATION OF MODEL AIRCRAFT BY NON-UK PERSONS.

A non-UK resident may operate a model aircraft in accordance with our authorisation provided they meet all of the following conditions:

a) They must be able to provide proof of appropriate and adequate insurance and comply with the rules and practices of the association and the host club.

b) They must meet the pilot competence requirements as set out in this manual.

c) They must comply with the registration requirements for Operator and Flyer Identification criteria.

24 VISITING PILOTS

It is recommended that visiting pilots invited to a club flying site by a member should be accompanied by that member, who by default accepts responsibility for ensuring the visitor is aware of the SAA Safety Code, abides by it, and also holds valid / current insurance cover.

Visiting pilots who arrive uninvited at a club field should be allowed to fly only at the club's managements discretion and may be permitted to fly after showing proof of valid /current insurance cover. It is recommended that a member of the local club be assigned to the visitor to act as though that member had invited the visitor and should also undertake the role of host accordingly.

A notice should be posted at any private club flying site to the effect that visitors may not fly unless accompanied by a club member.

Visitors should always be asked to produce a valid document confirming current and valid insurance cover, their flyer ID and proof of their safety achievement standard before being permitted to fly. All models being used by the visitor must also be marked with their operator ID number.

24.1 TRIAL FLIGHTS FOR NON-MEMBERS.

Under the current SAA Insurance arrangements, trial flights may be given to new people wishing to enter the hobby; they may have up to three flying sessions before being requested to join a club and the Association.

The details of the trainee and instructor must be recorded to maintain a safety record available to be reviewed if required.

The instructor’s model must have his registration attached as normal, the person taking the trial lessons does not need to comply with the competence requirements for the purposes of these flights as the instructor will be responsible for the flight.

25 GENERAL SAFETY INFORMATION

25.1 Transmitter Management

The Current 2.4Ghz Transmitter systems and Legacy Transmitter systems

25.1.1 Current 2.4Ghz Systems

2.4Ghz systems and transmitters have now become the normal in model flying.

The advantage is in robust interference rejection, (although not totally immune), has made flying safer.

At normal club flying sites there is no longer the danger of someone switching their transmitter on and causing interference with a flying model.

Frequency control has all but been done away with and this modern transmission system has taken over model flying.

Few modellers remain with 35MHz but there is still the possibility that a odd model will still use what is now become a legacy system.

However, Failsafe when fitted, must be set, and most all 2.4Ghz receivers have a failsafe function. All models over 7.5Kg in weight MUST have a failsafe in place.

The use of 2.4Ghz is almost mandatory at model displays. Where the control of the transmitter may be just by announcements to keep active devices to a minimum. Larger shows may insist of some form of transmitter control but on the club scene this is a thing of the past.

Most 2.4Ghz transmitter systems are now computer processor controlled and have a feature to ensure the model selected only works with the correct model, but some still allow all models to link to one ID of the radio hence it is still required that pilots carefully check all model functions and control surfaces before flying.

25.1.2 Legacy Products

The vast majority of transmitters in use today use the 2.4GHz frequency, although there are other legacy frequencies also in use, these are 27Mhz, 35MHz and 459Mhz. The 35MHz range is reserved for aircraft only, 27MHz & 459MHz are designated for general model control, and are not advised for model flying use. It is essential that a frequency control system is in place and rigidly adhered to at every flying site where these non-aircraft legacy systems are operated, their use, is not recommended.

The manually operated safety control system normally used for 27MHZ, 35Mhz and 459MHz takes the form of one single peg located on a master peg board, the peg being coloured or numbered to represent each possible frequency, and each pilot also carries a similar peg with their personal identification.

Before a transmitter is switched on, the peg from the board is clipped to the transmitter aerial and replaced on the board by the pilot's identification peg.
It is particularly emphasised that, to avoid confusion when a numbering system is being used, the two numbers 68 and 89 are clearly identified (usually by being underlined, as indicated).

Whilst 35Mhz and 2.4Ghz are both in use, it is recommended that a control system also applies to 2.4Ghz for large model events by using an identity system. It is recommended that for models Displays that only 2.4Ghz is used, and the number of active transmitters is kept to a minimum.

The following applies to all legacy non 2.4Ghz transmitters, which are currently rarely used, but is included in this manual for comprehensiveness:-

a. *When using the 27MHz,35MHz or 459MHz frequencies, transmitters must always display the peg showing the frequency being used, in a clearly visible position. The pilot must be familiar with the frequency identification system and ensure the frequency marked on the transmitter crystal is indeed the frequency stated on the peg.*

b. *Transmitters must never be switched on in the vicinity of a flying field before ascertaining the frequency control system in place and the frequencies in use by other pilots.*

c. *If a frequency control, system is in use then it is recommended that on arrival, all transmitters should be located at a central spot designated as the transmitter pound at which the frequency control system is established.*

d. *Transmitters must not be switched on unless the user is possession of the single frequency peg and operating in compliance with the sites frequency control system. It is recommended, that when using the 27MHz, 35MHz and 459MHz frequencies, numerically adjacent frequency pegs should not be in use at the same time.*

   NOTE: - If 35MHz equipment must be used then the SAA strongly recommends the use of dual conversion receivers.

e. *When using the 27MHz, 35MHz and 459MHz frequencies, transmitter aerials should be kept retracted at all times except when at the pilot stance, to prevent possible damage to the aerial by contact with propellers or pilots, and to prevent injury to other pilots. After landing the model, the aerial must not be retracted, or the transmitter switched off until the receiver within the model has been `switched off.*

f. *Transmitters should be returned to the control pound as soon as the flight is completed, and the frequency peg relocated on the control board. It is essential to check the transmitter is switched off before removing the frequency peg.*

g. *Pilots using computerised transmitters must ensure that when in PCM mode, the fail-safe device is programmed to set I/C engines or gas turbine throttle to 'idle' and to 'stop' for electric motors.*

25.2 Club and Group Flying

The group of flyers should establish the following criteria at each session and pilots should collectively adhere to them:

a) Take-off and landing direction,

b) flight circuit pattern,

c) pilot stance position,

d) transmitter pound area if ‘shared’ frequency is in use,

e) Safe location for engine run-up area.

All of these aspects must be chosen with safety rather than convenience in mind. In particular, the active runway should never need to be crossed either to reach the model pits from the car park or the pilot stance from the model pits area.

All persons in attendance shall be jointly responsible for their own and everyone else’s safety. In the case of those clubs that operate within airspace also used by other aviation interests, e.g., military aircraft, light aircraft, full-size gliders, micro-lights or hang gliders, the presence of a nominated Safety Officer is mandatory to alert those in attendance to any possible conflict in the use of the airspace.

Any deviation from the safety rules should be treated very seriously and the matter should be referred to the club committee to consider appropriate action. If the severity of the matter is not acknowledged by the person concerned, the club committee may invoke such actions as further training or being banned from the club flying activities.

If the individual concerned persists in breaching the recognised safety regulations, it may lead to the removal of any SAA safety award certification which they have previously attained and therefore a requirement to be re-examined to regain the certification.

25.3 Piloting Discipline

Radio systems should be switched on before starting the engine or electric motor. However, if a 'shared’ frequency is being used the transmitter should **not be switched on** until the appropriated frequency ‘peg’ has been obtained to ensure no other pilot is using the same channel. The transmitter should always be switched on before the receiver within the model and should remain on until the receiver has been switched off.

No, I/C engine or electric motor should be started in the pits. All engine tuning and operating at full power should only be carried out at a start-up bench or an area out

with the pits but behind the pilot's stance. It is essential that all other people remain behind the model and the rotating propeller.

All flight and control surfaces must be checked and be able to operate correctly, in the correct direction, and freely before every take-off and under full power if applicable. If there is any doubt about their safe condition the flight must be aborted.

Batteries should be checked for sufficient charge before each flight and the operating condition must be known, if any doubt exists, they should not be used. If batteries are found to be suspect at a pre-flight check, they should be replaced, or the flight should be aborted.

The integrity of the model airframe must be checked regularly, and also all pneumatic systems fitted must be inspected for leaks – if any doubts exist then the undercarriage should not be retracted. A model may still be flown with the undercarriage in a fixed extended position.

If fitted, undercarriage doors must be checked for security, and the retract system operated to make sure there is no binding when closing or opening. A failure may result in an inability to lower the undercarriage on landing.

If the model has a wheel brake system fitted ensure this is operating correctly and apply the brakes prior to start-up.

All hand launches of powered aircraft should be undertaken from or adjacent (and parallel) to the runway in use. Hand launch models must never be launched from the pits or the pilot stance area.

Unless a managed and controlled take off procedure is in force, all pilots must use the same take-off area at a flying session.

On every occasion, when preparing to fly any new model for the first time, or after a radio change / repair, or after a heavy landing, always carry out a transmitter / receiver range check in accordance with the safety instructions provided within the manufacturer's user manual.

25.4 Novices

'Novice' is a term used to describe those pilots who have not yet passed the SAA Bronze Safety Certificate in the discipline being flown.

Novices should be discouraged from flying solo and are advised to seek guidance from a club instructor until attaining the SAA Bronze safety award. They should endeavour to attain this level in a timely manner, albeit there is no set timeframe for gaining this award. Club instructors should be selected by the club officials and should hold a minimum of an SAA Bronze qualification and have gained a recognised level of relevant experience.

Clubs must ensure, on an ongoing basis, that all new members are made fully aware of the SAA Safety Guidelines and the restrictions imposed on their flying activities until an SAA Bronze safety award has been achieved.

Clubs are required to set up suitable arrangements for instructors supervising novice flyers and to make provision for recognised and relevant instruction to be available, using the Achievement Scheme Manual, and by giving all possible encouragement to undertake the SAA Achievement awards.

Clubs should be encouraged to consider arranging specific training sessions for novice pilots out with normal club flying periods to avoid distractions to novices from other social flyers.

25.4.1 Juniors and Vulnerable Adults

Junior members are members of the SAA who are under the age of 18 on the 1st of January of the current year. They are subject to all of the conditions set down in the SAA Safety Code and also have a number of membership rights afforded to them in accordance with the SAA Constitution. However, it is recognised that, by definition, junior members can be very young and inexperienced and because of this fact, it is considered that there is a duty to Clubs and the Association to ensure these members are given as much help and advice as possible. They must also be subject to a level of adult supervision, to ensure they come to no harm themselves and do no harm to others whilst pursuing their enjoyment of this hobby.

To this end the following recommendations are proposed:

a) When there is no ‘responsible adult’ present to accompany juniors or vulnerable adults, Clubs must ensure they have members who are in receipt of a Disclosure Scotland (disclosure certificate) to ensure these persons are supported in accordance with legal requirements.

b) It should be noted that clubs are not “Childcare facilities” and it is recommended that junior members should be accompanied by a parent or guardian at all times.

c) Clubs must apply an enhanced “Duty of Care” when supporting junior members.

d) Clubs must be aware of the additional possible safety issues which may present themselves as a consequence of having junior members attend an active flying site. The young, by definition, are inexperienced in safety procedures and have a natural curiosity which leads them to experiment and explore and a potential accident may ensue.

e) Junior members should be given the benefit of continuous training and advice by experienced adult members in all aspects of:

   i. The building and trimming of models, including the dangers inherent in the use of cutting tools and the toxic nature of some adhesives.

   ii. Instruction in the safe handling of all power units used in modelling. Besides the more obvious dangers of internal combustion engines, electric motors, and electric winches, the hazards of rubber and "JETEX" motors must also be considered.

   iii. The correct application of recognised 'custom and practices' in respect of the safe use of transmitters, frequency control and flying site etiquette, which will all contribute to the safe flying of their models

f) Junior members must always be supervised by an experienced adult whilst operating their models, even after passing any safety examinations, their young age requires additional safety measures to be applied. This supervision should be at a level consistent with individual's experience and proven attitude to the responsibility of safety. Young members who are over 16 but have not achieved adult membership, should be allowed to fly unsupervised providing they have attained at least an SAA Bronze award and that they show suitable maturity, this being dependent on their local club rules. Junior members should be over 14 years old before instructing others and may only do so if they are considered to have developed an appropriate level of maturity. (CAP 722 section 4.2.1.1 & 4.2.1.2 and ANO article 265D, paragraph 2a)

g) Junior members are also required to enlist the aid of a qualified adult (SAA Bronze award or above) when starting an I/C or other engine. The adult will hold the model securely and monitor the junior member whilst they undertake a safe engine starting procedure. They must also observe the correct use of the transmitter controls and be confident that the flight control surfaces, and aircraft mechanical movements have been checked by the junior member.

h) It is recommended that no junior member may fly alone or unsupervised by an adult at any flying site. This applies equally to fixed wing power flying sites, flat field sites, areas used for thermal flying, or a hill used as a slope soaring site.

i) Junior members must not be left in sole charge of a transmitter control or display control function at any flying site or event. However, they should be encouraged to assist an adult member in these functions in order that they can gain a greater understanding of the safety issues involved.

25.5 Solo Flying

The S.A.A. discourages flying model aircraft of any type without the support of an assistant for obvious safety reasons and to help with the launching and operation of the model.

If a member decides to fly solo, the SAA advises that the following guidelines are implemented:

a) Do not indulge in launching practices which are unsafe when conducted without the help of an assistant. In particular, it can be very dangerous to hand-launch single-handed an untrimmed radio-controlled power model.

b) Before each launch, thoroughly check for correct control surface movement and freedom, ensure all wing and tailplane retaining bands/fixings are secure and ensure no safety hazards are evident in the take-off path.

c) Avoid situations that could cause self-inflicted injury. If no help is at hand to assist, e.g., to act as transport to hospital the consequences could be severe.

d) If flying alone always let someone know the location and expected time of return.

25.6 Power Unit Handling

NOTE: All operators of spark ignition, petrol fuelled, or gas turbine engines should have a fire extinguisher of the correct type (CO2 or similar) present.

25.7 Internal Combustion - (I/C) Engines

The vast majority of flying field accidents are I/C engine related. Most modellers are able to show some damage to their hands caused by coming into contact with rotating model aircraft propellers. Hospital records show that over the years, there have been a steady flow of aeromodellers attendances with 'propeller-related' incidents, and in some cases resulting in the loss of a finger.

As many of these accidents are as a result of pilots attempting to start I/C engines or carrying out adjustments to running engines whilst positioned in front of the propeller, the single most effective self-protection measure is to move behind the wing as soon as possible after starting the engine.
With this in mind, the recommended sequence of starting operations is as follows: -

a) Use a purpose designed model start-up stand /bench where available.

b) If at all possible, enlist the help of another person to restrain the model.

c) Check there is **no-one in front of, or parallel to** the rotation of the propeller.

d) Check that the starter equipment and glow clip **leads are well clear** of the

propeller rotation.

e) Check that any **loose clothing** cannot be drawn into the propeller.

f) In the case of R/C models, make certain the **transmitter and receiver are switched** on (35Mhz rules permitting) and **the throttle is set to idle.**

g) Attach the glow clip, checking that it is a tight fit and it **does not fall off** as the engine starts, it **CANNOT** be allowed to fall into the rotating propeller.

h) Use an electric starter where possible, but if required to use a hand-starting technique, ensure a rubber covered 'chicken-stick', or rubber finger stall is employed. A sharp-edged propeller will easily cut skin when trying to turn using a bare finger.

i) If attempting to 'clear' the engine by 'flicking' the propeller with a finger or fingers, hold the model securely and with one hand 'flick' the propeller over slowly, ensuring the **glow plug is disconnected**, this is a recognised practice to check for a flooded condition that can cause the propeller to 'kick back' immediately on start up. When using a starter and especially on smaller engines this procedure can save internal damage to a badly flooded engine. Also beware of the trailing edge of the propeller blades as these can be extremely sharp and are likely to damage unprotected fingers.

j) When attempting to hand-start an I/C engine, **avoid placing the whole finger through the arc of the propeller blades**. It is advisable to use only the smallest portion of the finger needed to push on the sloping front face of the blade, so that in the event of a 'kick-back' the blade will push the finger aside.

k) When the engine starts, make sure the starter equipment has been cleared to one side and the pilot must reposition behind the wing before removing the glow clip connection to avoid leaning over a spinning propeller and causing a possible accident.

l) No engine should be run in the pits. Where possible, use the **dedicated starting bench /area** provided.

m) **Carefully carry** the active model to the engine run-up area to check full-throttle operation **ensuring the route is clear** of other modellers and obstacles.

n) **Do not hold the model nose-up with the propeller at head height** and open the throttle, as this action raises the active propeller to then be in line with everyone nearby thereby increasing the accident potential. This procedure is meaningless as all that is required is to adjust the carburettor needle to be set to a slightly rich air/fuel mixture to compensate for in-flight unloading of the propeller. After the flight, it is essential **to stop the engine before** switching off the transmitter and receiver.

25.8 GAS Turbines (JETS)

Additional to the advice on I/C Engines it is strongly recommended that when using a turbine engine, a manually operated fuel shut-off device is fitted in the fuel supply line of the turbine, as well as a switch assigned to isolate the engine from the transmitter.

It is absolutely essential that the operator and remote pilot have read and understood the manufacturer's operating instructions for turbine engines and does not deviate from them.

Appoint (and brief if necessary) a nominated fireman. The fireman must be familiar with the operation of the extinguisher (Co2 gas type) and be ready to it use if needed.

When operating the fire extinguisher, do not point the nozzle at the opening of the jet pipe as this will blow the flame back into the model, and probably cause its total loss. The extinguisher should be used downward of the intake, or, if the engine cover is off, down the bypass / jet pipe. Always make sure any fire has been completely extinguished before leaving the model.

The jet exhaust must always be pointed away from other models and people, and where possible should be directed over a hard surface away from grass. Care must be taken to start the engine with the intake into wind to avoid a hot start. Keep people away from the surface of the rotating compressor and turbine, and make sure no loose items are close to the intake. This especially applies to items of clothing, neck straps, and also ensure fingers are kept clear. It is strongly recommended that an air intake guard is fitted to the engine. Keep people back from directly behind the jet pipe as the high exhaust temperatures could cause burns; this is also the area in which spilt fuel (such as from an aborted start) will ignite.

Following a failure to start, the modeller must ensure that the engine and jet pipe are clear of unburned fuel (in some cases it may be necessary to point the front of the engine downward to drain it).

It is advisable to monitor each start and the respective idling temperatures. If this changes markedly from previous starts when no large change in the outside air temperature have been noted, the problem should be further investigated as high temperatures can be an early indication of an engine bearing failure.

It is recommended to always use ear protectors, as even short exposure to jet noise can damage hearing.

With a helper holding the model run the engine at high revs to check the operating temperature, and check for any evidence of vibration.

As a safety measure, observe the UAT (Ultimate Air Trap or Bubble Trap) when operating the engine at high power. If the fuel level is reducing, or there are bubbles

present, this may indicate a leak that must be repaired before flight otherwise a ‘flameout’ situation could occur.

As with all flights a transmitter range check should always be carried out before commencing a flying session.

Prior to every flight inspect the model and carry out the normal surface control and servo checks for full and correct operation of all controls.

The radio signal failsafe must be confirmed as functional (e.g., on Jet cats, with the GSU (Ground Support Unit) plugged in, switch off the transmitter and note that ‘F’ is displayed on the GSU)

In the event of a loss of signal, the failsafe must be set so that, after a maximum of three seconds, the engine will return to idle or shut down completely.

25.9 Electric motors.

It should be emphasised that electric motors have the capacity to be far more dangerous than their I/C counterparts. When an object is placed into the rotating propeller arc of an I/C engine it will be damaged and the engine will in all probability stop. When the same object is placed into the rotating propeller arc of an electric motor the object will receive the same amount of damage, but the motor will continue to rotate the propeller until, either the fuse burns out, the motor burns out, or the battery is depleted.

With this in mind, the following procedures are recommended.

a) Before each flight, any folding propellers and their spinner hubs should be inspected for damage and that they are free to operate correctly.

b) The transmitter should be checked to ensure the throttle stick or motor switch is in the OFF position BEFORE switching ON.

c) It is of major importance that the transmitter is switched ON BEFORE the receiver to avoid the possibility of the motor activating unintentionally.

d) Once the battery has been connected to the motor circuit the aircraft is LIVE and should only be handled from behind the arc of the propeller.

e) No one should be in front of, or in line with, the propeller arc when the transmitter and receiver are switched on.

f) All switches and speed controllers should be checked for correct operation and position before each flight – this action should be performed in the start / run up area.

g) Upon completion of the flight, the motor power circuit should be disabled at the earliest possible opportunity.

h) Charged battery packs should never be carried in a pocket due to the danger of them 'shorting out' on any metal objects with which they may come into accidental contact.

i) LiPo's (Lithium Polymer batteries) should always be treated with respect and **not** charged inside any vehicle, preferably they should be charged on a dedicated fireproof bench, or area, using a proprietary 'balance' charger as recommended by the manufacturer.

j) LiPo batteries MUST be inspected for signs of damage and 'puffing up' before continued use as even minor damage to the cell 'skin' may result in a spontaneous fire.

25.10 Rubber Power

While not inherently dangerous, rubber powered models are capable of inflicting severe injuries. This could be by being struck by the revolving propeller or because of the 'snap' energy released due to a rubber band breakage during stretch-winding.

In addition, a wire hook in the chuck of a hand-drill being used as a winder can pull out of the drill chuck, with the result that the holder of the model is likely to be struck by the separating nose assembly of the model.

26 FLYING SITE CONDUCT

The following recommendations are considered good practice when attending a flying site:

a) When choosing a set up point in the model pits, pilots should note the wind direction and positions of other models to ensure the slipstream from a running motor cannot blow smoke, dust etc. over other people and models.

b) It is imperative for obvious reasons that a rotating propeller must not be allowed to point towards any persons.

c) If flying with either a 27Mhz / 35Mhz or 459Mhz transmitter set up, ascertain the frequencies in use, in order to agree the allocation of frequency peg control and make sure other pilots are aware of any additional users of the frequency.

d) All pilots should maintain an open contact with other flyers working with models when in the pits and when flying so everyone enjoys a safe flying experience.

e) It is essential that everyone stays clear of the runway while other pilots are landing or taking off.

f) In the case of beginners, it is not recommended to allow the aircraft to fly a long distance downwind and this should be avoided, as this is the most probable part of the flight where mistakes may occur. It is important to keep the flight pattern within easy visibility.

g) For the first flight of a new model, it is good practice and flying site etiquette to allow the pilot sole use of the flying strip. It is also a safety issue in the event of an unexpected mechanical or engine failure.

h) If using a 27Mhz / 35Mhz or 459Mhz transmitter frequency, it is common courtesy to have an alternative set of crystals available to avoid any particular frequency becoming overcrowded and pilots unable to fly whilst the frequency is in constant use.

i) Ensure all support equipment such as starters, batteries and power panels are fully operational and spare glow plugs and propellers are in the flight box before setting out for the flying site.

j) Before attending the flying site ensure all equipment and models have been checked and are fit for their intended use.

k) Clubs should also ensure members are aware of local conditions applicable to their flying site which may affect safe flying. Also, appropriate signage must be visible to all flyers and visitors to the flying site.

26.1 Spectator Discipline

For the purpose of this Safety Code, a spectator is defined as a person who is attending a flying session other than as a pilot or as a pilot's nominated helper. It is the responsibility of the pilot to ensure that his nominated helper is fully aware of the SAA Safety Code.

It is desirable that a clearly identified area of a flying site be allocated and set aside for positioning spectators. See 'SEPARATION DISTANCES' and 'FLYING SITE LAYOUT' sections of this manual. If necessary, a physical barrier should be established.

Spectators should be made aware of the hazards associated with model flying and of any local conditions relating to spectators' restrictions. This may best be achieved by having a suitable notice at the entrance to the flying site and / or at the point where spectators are designated to congregate.

Every attempt should be made to keep spectators at a safe distance away from the model pits and flying area.

Unless specifically arranged with the pilot, spectators should not be permitted to converse with the pilot while a flight is in progress. This may easily lead to a distraction and ultimately an accident.

If the presence of spectators poses a compromise to safety, all flying must cease until the situation is rectified.

27 Glider R/C General

Flying must be conducted at a suitable site having first obtained permission from the landowner for the use of the site.

Flying is not permitted within an Aerodrome Traffic Zone (nominally 5 kilometres from the airfield boundary) unless with the prior permission of the Air Traffic Control Unit or the Operator of the Aerodrome or Airfield.

A glider may not be flown if the total weight inclusive of ballast exceeds the current large model weight limit, unless the pilot has an Exemption Certificate from the CAA.

Ballast must never be mounted externally or in a way which would allow it to become detached in flight.

The radius of the nose section of a glider should measure no less than 7.5mm.

27.1 Thermal Soaring

When launching a thermal soaring glider, ensure the area in front of the launch point is free from other flyers, spectators, car parking or obstructions, and that if using a towline, there is no obstruction of the towline.

Do not launch unless it is clear that it is safe to do so. Beware of other in-flight models approaching the launch trajectory area. Do not launch unless the air space is clear. Launching single-handed in a strong wind is not recommended and the help of an assistant in these conditions should always be sought.

When considering landing, a pre-arranged landing area should always be designated before a flying session and all pilots should stand to the upwind end or side of this area whilst landing takes place. Pilots should stand close to each other in a designated area (pilot stance) whilst flying and should avoid low level flight over other modellers and their transmitters to prevent radio capture and safety risks.

Designated areas for launch and landing should be chosen so they do not cause overflying of one or the other during launch or landing.

Bungee lines must be fitted with parachute drogues at the end of the line and attachment rings or fittings and must not carry any unnecessary weight.

Should the pilot decide to increase the speed or power of a hand tow by the use of a pulley, it is strongly recommended the following actions be observed:

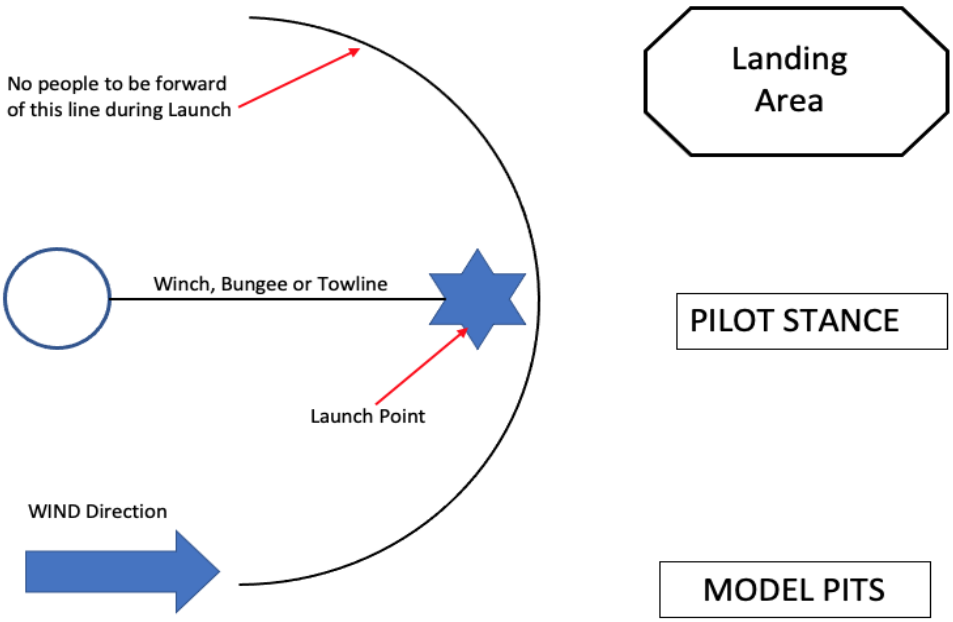
a) The static end of the towline should be firmly attached to the ground by means of a ground spike of minimum dimensions 15mm diameter and 450mm long, of which 350mm must be driven into the ground. This restraint must be checked at regular intervals during a flying session to ensure it is still secure.

b) **Failure to secure the stake properly has proven fatal in the past.** It is further recommended that only one person should operate the towline through the pulley device.

c) Alternatively, two persons may perform the pulley tow, however one person must be nominated to hold the end of the line securely, in the place of a ground spike, whilst the second person will provide the motive force to the towline through the pulley device.

d) Under no circumstances should the person securing the end of the line, (acting in place of a static spike) release that line until the tow has been fully completed.

RECOMMENDED THERMAL SOARING SITE LAYOUT



27.2 Flying protocol

All relevant parts of POWER UNIT HANDLING apply and in addition particular care should be taken when both power and glider flying are conducted concurrently on the same field but using different flight lines.

Ensure that:

a) Power flyers are made aware of the designated launch and landing areas in use by the glider pilots.

b) Glider flight patterns are agreed in advance such that mutual overflying of the launch and landing areas are avoided.

27.3 Power Winch Guidance

27.3.1 General:

Power winches are an efficient method of launching gliders, but they have the capacity to be **very dangerous** if incorrectly operated. The energy generated by even a modestly powered winch could **severely injure** anyone coming into contact with the winch line or drum.

Great care should be taken when planning a flying site for the use of a power winch, especially if flying in the company of power models. The following actions are recommended:

a) The winch should be regularly serviced so it is in good mechanical and electrical condition and all moving parts should be well lubricated.

b) A mechanical switch which completely isolates the motor from the power supply should be fitted to the winch.

c) It is recommended that the towline should be of nylon monofilament, in good condition and without any unnecessary knots or joins. There should be no weak links within the line.

d) If a constant tension device is being used, it should be regularly serviced, and its operation fully tested at the start of each flying session.

e) The connectors from the winch to the battery should provide a good solid contact with the battery terminals so there is no chance of arcing or loss of power during operation.

27.3.2 Equipment Positioning:

a) The winch should be sited in such a position as to leave sufficient area downwind and to one side of the launch site for the positioning of the landing area, model pits, and any spectator viewing areas.

b) The winch should be firmly fixed to the ground with numerous pegs to ensure it will not move. The drum axle should be at right angles to the wind direction and all moving parts clear of long grass or other obstructions.

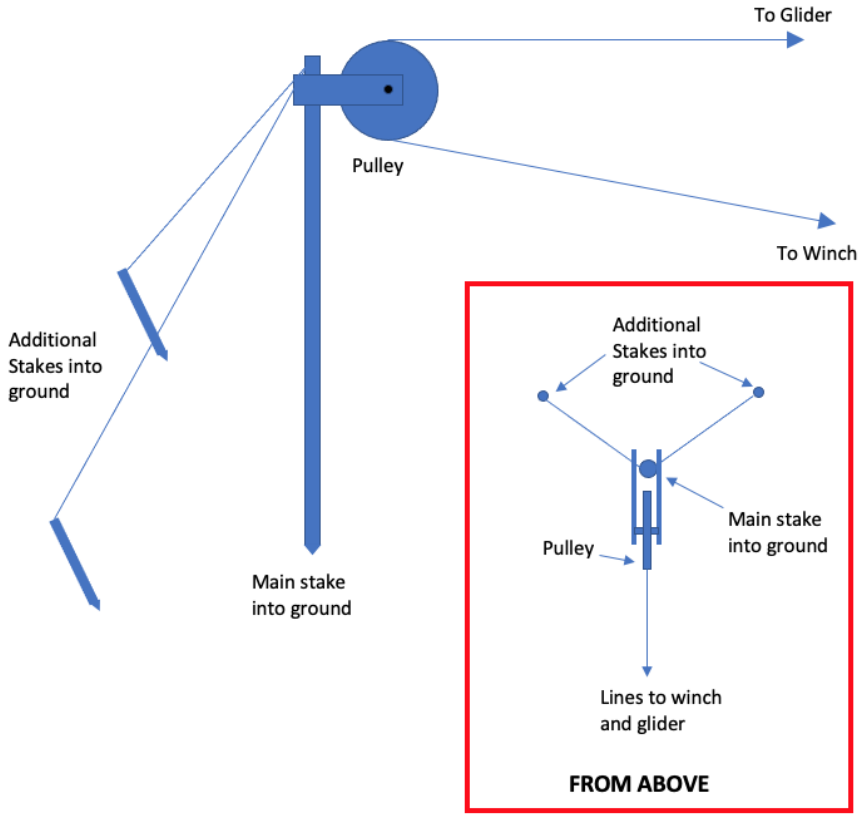
c) The winch tow line should be laid out directly into wind.

d) A suitable parachute and a strong tow ring should be fitted to the line. No additional weights should be fitted to the flying end of the tow line.

e) The turnaround mechanism should be sited in such a position that power lines or telephone cables and wires do not fall within the arc of the tow.

f) The turnaround equipment, depending on the type in use, should be very firmly anchored to the ground by a ground spike and / or substantial pegs and be subjected to a 'pull test' far greater than the load it is expected to have to withstand in normal use. The turnaround must be checked at regular intervals during a flying session to ensure it is still secure.

GLIDER WINCH TURNAROUND ARRANGEMENT



27.3.3 Winch Operation:

Having first ensured the power supply is switched off, the constant tension device should be adjusted to suit the model to be launched.

a) The tow line must be checked for correct routing over the turnaround pulley and the constant tension device if fitted.

b) The winch foot switches, and constant tension device mechanism should be fully tested for correct operation before use.

c) There should be no one standing level with, or upwind of the winch whilst it is in operation.

d) The person who is launching the glider should always first check the air space above them and to the rear to ensure there are no other aircraft flying in the planned flight circuit.

e) It is recommended that a helper operates the winch and launches the aircraft, especially if flying in windy conditions.

f) The power source to the winch should be switched off as soon as practical after the aircraft has left the line to avoid the winch being accidentally activated.

28 SLOPE SOARING

It is advisable not to use sites where flying may cause concern during the lambing or shooting seasons, when unnecessary disturbance could occur. Also, caution must be used where recovery of the glider could be dangerous to the retriever or damaging to crops. This may occur in the event of 'loss of lift', mid-air collisions or loss of pilot control. It is recommended when using remote sites to carry a map, compass and wear adequate clothing.

28.1 Launching

Do not launch unless certain it is safe to do so and in particular attention should be given to the following aspects:

a) Ensure the area in front of the launch point is free from other flyers, spectators, etc.

b) Watch out for in-flight models immediately to the front of the slope and do not launch unless air space is clear.

c) Always announce in a loud voice that a launch is about to take place before doing so.

d) Launching single handed in a strong wind should be avoided - enlist the help of an assistant in these conditions.

28.2 Flying pattern

This should generally be conducted parallel to the slope with flight turns being made away from the slope into wind. Do not fly directly towards the pilot stance area or overfly other pilots or spectators.

28.3 Landing

Select an approach pattern to the pre agreed landing area which does not put other pilots or spectators at risk. Should an aircraft be in danger of overshooting the landing area, other pilots and spectators should be warned in a loud voice that an overshoot is being carried out. If it is considered there is any possibility a safe landing cannot be made - do not launch.

28.4 Other Users

Pilots must remain vigilant and be aware of other users when visiting the flying site. It is also imperative to be aware of those in the vicinity and the affect model flying may have on their activity. It is always best to avoid coming into conflict with users of hang gliders or full-size gliders if they are within the same airspace. It is recommended to arrange in advance with them a safe separation distance, so no other user is put at risk.

Pilots of models intended for slope combat (EPP or similar construction) should only enter into “full contact” combat bouts with the agreement of the other flyers and flying site users.

If necessary, separate flying “slots”, where no other types of aircraft are in the air, should be allocated for the flying of slope combat type models.

All combat flying between slope combat style models must be curtailed if members of the public encroach closer than 30m to the edge of the slope.

29 ELECTRIC POWER RC

Electric powered model aircraft, although similar in many respects to internal combustion powered models, have a number of characteristics which require special attention if they are to be operated in a safe manner as electric power has the potential to be even more dangerous than its internal combustion counterpart.

The following recommendations have been adopted to assist members in the safe operation of electric power.

29.1 Airframe:

As the airframe is likely to be similar to a traditional I/C. powered aircraft, the same checks should be carried out before attempting to fly.

There are however a few differences, which must be taken into account including:

a) The model design should be able to accommodate the high temperatures which can be achieved by electric motors, controllers and batteries therefore cooling vents should be incorporated to provide a sufficient flow of air.

b) As the weight of the battery is concentrated in one location, the construction of this section of the model must be of sufficient strength to support the battery in normal operation when flying.

29.2 Electric Motors and wiring:

It is essential that the electric motor is securely fitted in the model airframe.

The electric motor should be adequately 'suppressed' to avoid causing electrical noise interference to the receiver.

Where possible, it is recommended that a suitable electronic fuse should be fitted between the speed-controller / flight switch and the motor. By convention this would be in the positive lead of the power circuit. Under no circumstances should the fuse be fitted in the battery lead when using a BEC (Battery Eliminator Circuit) system.

It is recommended that an arming switch should also be fitted to the motor power circuit, unless the controller already incorporates an electronic arming device.

The wiring and electrical plugs should be of suitably rating to avoid overheating in high power draw situations.

All electrical cable joints should be securely soldered or 'made' using a high-quality crimping system.

All electrical connectors must be inspected frequently for any distortion, which could lead to intermittent equipment operation and / or overheating.

29.3 Receiver and Motor controls:

It is recommended that if using BEC receivers, systems, switches, or devices these should only be used where they have been tested and proven prior to flying and are installed to manufacturer's specifications.

Motor speed controllers and switches should be correctly adjusted to allow the motor

to be stopped directly from the transmitter.

All combinations of controller and switch should be set to allow the receiver to be switched ON without the motor unintentionally activating.

All combinations of controller and switch should be calibrated to allow the motor to be switched OFF in the eventuality of the transmitter signal being lost or the receiver battery failing.

29.4 Battery Charging, Discharging and Storage:

Battery cells should always be charged, discharged and stored in accordance with the manufacturer's instructions.

It is imperative that when charging batteries, extreme care should be taken **not to reverse the cell polarity** by incorrectly connecting the charging leads.

A good quality, 'balance' battery charger as recommended by the battery manufacturer should be used for all fast charging, especially when used in conjunction with a temperature cut-off control.

If a timer type charger is being used it must be constantly monitored.

BEWARE: Electric powered models must be treated as if the motor is running as soon as the system has been made live. If the batteries are to be connected in the pits, then the model must be treated as if starting an internal combustion engine model – i.e., be pointed in a safe direction with people clear of the propeller rotation, before the batteries are connected.

Extra care needs to be taken when using **LIPO batteries as any misuse resulting in a puncture to the battery covering can cause them to catch fire**. It is recommended that the batteries are removed from the aircraft for charging and are stored in a fireproof container. The use of a 'balance charger' is also highly recommended to ensure the cells are not overcharged. If a LIPO cell is seen to be 'puffed up' it should be disposed of in accordance with the manufacturers' recommendations.

29.5 Electric aircraft Operation:

Whenever a pilot is about to fly a new model for the first time, or after a radio change / repair, a range check should always be undertaken. The action of going 'out of range' during a range check may cause the motor to start, and therefore precautions must be taken to ensure the model is restrained.

This can best be done by an assistant who positions themselves behind the wing and with the propeller pointing away from themselves and any other persons.

The range should be checked in various applications - with the motor shut off as well as running at various throttle settings. This should identify any radio faults caused by electrical interference from the motor or controller and also from vibration.

These checks must prove satisfactory in accordance with the makers' instructions, or in the absence of these, at a distance of 30 paces with the transmitter aerial retracted or in the case of 2.4Ghz, with the transmitter set to “low power” or ‘’range check’’ mode before attempting to fly.

The range check should be undertaken preferably some distance from the pits in order to avoid annoyance to other pilots from the effects of the slipstream. If using a 35Mhz system, possession of the frequency peg is mandatory to avoid conflict with other flyers using the same frequency channel.

30 HELICOPTERS

On each occasion, prior to flying, a thorough check of the condition of linkages and ball links should be made. **Do not fly** if the condition of any part of the flight linkages are suspect. A delayed flight is preferable to a short flight ending in disaster.

Also, before each flight, the condition of the rotor blades and the blade root connections should be checked as these will seriously affect the stability and flight characteristics of the helicopter and may also result in the loss of the model.

Rotor blades should never be fitted with externally added weights as these could be extremely dangerous if detached through extreme centrifugal force. Any balancing weight should be an integral part of the blade structure.

As with all models' engines must only be run at an idle setting when in the start-up area.

31 DEFINITIONS

Assemblies of people: A large gathering where persons are unable to move away due to the density of the people present.

Automated model aircraft: A model aircraft with autonomous or automatic flight capability. This does not include systems that are fitted for flight stabilisation purposes or flight termination purposes, such as free flight termination devises.

Built up area: An area of land substantially used for industrial, recreational, commercial or residential purposes.

Control line model aircraft: means an unmanned fixed-wing aircraft with MTOM of less than 7.5kg that remains securely tethered to a person, the ground or an

object at all times, while being controlled via a physical line link such as a flexible wire or cable of no longer than 25metres.

First Person View (FPV): In FPV operations the remote pilot flies the aircraft using images provided by camera(s) on board the aircraft. The camera(s) mounted on the model give the pilot a perspective of being seated within the aircraft. When flying an FPV model the remote pilot cannot physically view the flight path as he/she will be wearing FPV goggles fitted with a small monitor screen or be looking directly into a static monitor. The FPV pilot will require an assistant to monitor the flight path to avoid a collision with other aircraft, persons, vehicles, vessels, or structures.

Free flight model aircraft; A free flight model aircraft cannot be remotely piloted and does not have software or systems for autonomous control of the flight path. A flight termination device may be fitted. The aircraft trim is adjusted prior to flight. The aircraft is trimmed (and fueled if applicable) with the intent that it will follow a substantially circular path relative to the air and ultimately glide to a low velocity landing. A free flight unmanned aircraft will drift relative to the user depending upon the speed and direction of the wind. The person in charge of the free flight unmanned aircraft is deemed to be the remote pilot for the purposes of the Article 16 authorisation.

Maximum Take Off Mass (MTOM): this means the mass of the unmanned aircraft when it is ready for flight with all required equipment and batteries installed and with all installed fuel tanks completely full.

Model aircraft: any unmanned aircraft being flown purely for the recreational sport of model aircraft flying. This includes shop bought RTF (Ready to Fly) or home built aircraft, which are flown ‘manually’ using traditional control inputs rather than with any automation, other than for flight stabilisation purposes.

Multi rotor aircraft: (commonly referred to as drones) As per **Model aircraft** and includes multi rotor models that are being flown with ‘direct’ control inputs rather than with any automation other than for flight stabilisation purposes.

Large Model Aircraft: A model aircraft with a MTOM of 25kg or greater, and less than 150kg.

Physically constrained model aircraft; a model aircraft that is.

- Flying within a closed building or other physical construction forming a safely enclosed area.
- A control line aircraft.

UAS IR; Commission Implementing regulation (EU) 2019/947 relating to the rules and procedures for the operation of unmanned aircraft as ‘retained’ in UK domestic law.

Uninvolved persons; Persons who are not participating in the UAS operation or who are not aware of the instructions and safety precautions given by the UAS operator.

For further information regarding additional definitions and abbreviations see CAP 722D

32 APPENDIX A

32.1 Introduction

The Health & Safety Executive has a 5-step workplace risk assessment which would appear to be industry standard and is easily adaptable to the model flying environment either for use by clubs or country members.

32.2 Why Risk Assess?

Accidents and ill health can ruin lives.

A risk assessment is nothing more than a careful examination of what, during model flying activities, could cause harm to people, so that a club can weigh up whether it has taken enough precautions or should do more to prevent harm. The aim is to make sure that no one gets hurt or becomes ill.

The important things to ask yourself are:

- what are the hazards?
- are they significant?
- are hazards covered by satisfactory precautions so that the risk is small?

Clubs need to check this when assessing risks. For example, we know that being struck by a model can kill, but the risk of it happening in a well-run club environment is remote, provided everyone knows and abides by the safety rules.

32.3 What is a hazard and what is a risk?

A hazard means anything that can cause harm (e.g., chemicals, propellers, electricity, etc.).
A risk is the chance, high or low, that somebody will be harmed by the hazard.

32.4 How to assess risks.

Some years ago, the HSE produced guidance for employers to help with the process. This guidance is equally valid for model clubs. Known as the 5 *Steps to*

Risk Assessment, as it is an invaluable tool for grasping the essentials of risk assessment. It comprises the following:

Step 1: Look for the hazard.

Step 2: Decide who might be harmed and how.

Step 3: Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done.

Step 4: Record your findings.

Step 5: Review your assessment and revise it if necessary.

To help understand the concepts try to put yourself in the position of a club member carrying out a risk assessment.

Step 1: Look for the hazard	
When you are doing a risk assessment, walk around the club site. Look at what could reasonably be expected to cause harm, ignoring the trivial and concentrating on significant hazards that could result in serious harm or affect several people. Some typical examples are slippery, uneven surfaces, spillages, scrap or waste materials lying around, flammable materials, damaged models, etc,	Check with other club members as they may have noticed things that are not apparent. Manufacturers' instructions or datasheets will also identify hazards and can put the risks in perspective. Another aid can be accident records, if several club members have been injured carrying out the same task, it's time to urgently review the process.
Step 2: Decide who might be harmed and how.	
Don't forget categories such as: junior members, and inexperienced trainees, etc., who may all be at particular risk visitors, contractors, etc. who may not be regular visitors to the club	members of the public (uninvolved persons) you share your flying site with, if there is a chance they could be hurt by your activities.

Step 3: Evaluate the risks	
Evaluate the risks and decide whether existing precautions are adequate or more should be done. Consider how likely it is that each hazard could cause harm. This will determine whether	In taking action, ask yourself these questions. • Can I get rid of the hazard altogether? • If not, how can I control the risks so that harm is unlikely? In controlling risks apply the principles below, where possible in the following order:

or not more needs to be done to reduce the risk. Even after all precautions have been taken, some risk usually remains. Decide for each hazard whether this remaining risk is high, medium or low. First, ask yourself whether you have done all the things that the law says you have to do. Your real aim is to make all risks small by adding precautions as necessary. If something needs to be done, draw up an 'action plan' and give priority to any remaining risks which are high and/or those which could affect most people.	• Try a less risky option. • Prevent access to the hazard (e.g. by guarding and using barriers and notices). • Provide welfare facilities (e.g. eye washing facilities for removal of contamination; first aid). Improving health and safety need not cost a lot. For instance, placing a mirror on a dangerous blind corner on the access road to help prevent vehicle accidents, or putting some non-slip material on slippery steps, are inexpensive precautions considering the risks. Failure to take simple precautions can cost you a lot more if an accident happens. identify the hazards you reasonably expect and assess the risks from them.

Step 4: Record your findings	
It is sensible and useful to keep a written record of what you have done. This means writing down the significant hazards and conclusions. You must also tell other club members about your findings. Risk assessments must be suitable and sufficient	You need to be able to show the following: • A proper check was made. • You asked who might be affected. • You dealt with all the obvious significant hazards, taking into account the number of people who could be involved. • The precautions are reasonable, and the remaining risk is low. Keep the written record for future reference or use; it can help you if an inspector asks what precautions you have taken, or if you have become involved in any action for civil liability. It can also remind you to keep an eye on particular hazards and precautions and it helps to show that you have done what the law requires.
Step 5: Review the assessment	
Review your assessment and revise it if necessary. Sooner or later you will bring in new equipment or procedures that could lead to new hazards. If there is any significant change, add to	But if new equipment (use of gas turbines at a site where electric motors only, have previously been used) introduces significant hazards of its own, you will want to consider them in their own

the risk assessment to take account of the new hazard. Don't amend your assessment for each trivial change.	right and do whatever you need to keep the risks down. In any case, it is good practice to review your assessment from time to time to make sure that the precautions are still working effectively.

32.5 Why is it necessary to Control Risks

it is important to take steps to minimise any dangers to the health and safety of persons using or visiting the site where the activity is taking place.

It is necessary then to identify and assess the risks to persons and to decide on how these risks can be kept to an absolute minimum so that the risk of injury is reduced.

A risk assessment is important in protecting persons participating in the sport as well as complying with the law. It helps the risk assessor to focus on the risks that really matter and have the potential to cause real harm.

The law does not expect that all risks are eliminated but does require that people are protected as far as is reasonably practicable.

When the model flying site is in operation the club members and visitors must be kept from injury as far as is reasonably practicable. The safety of club members and visitors not actively involved in flying must be considered as well as that of the persons involved in flying at the time and the risk control measures put in place must take account of all these person

32.6 Risk Assessment

Assessment no: 001/22 Assessed by:J BLOGS Date of Risk Assessment: 01/01/2022

Location: ANY CLUB FIELD Activity: FWP FLYING

Hazard	Risk	Who is at risk	Severity	Likelihood	Risk	Control measures	Severity	Likelihood	Risk	Action by whom	Action Completed By
A **hazard** is anything that may cause harm such as chemicals, electricity, working from ladders an open drawer etc	The **risk** is the chance, high or low, that somebody could be harmed by these and other hazards	This could be an individual or a group of people	**Scale 1 – 5 Risk (1 – Low; 5 High)**			The introduction of systems/ processes that will reduce the severity and/or likelihood	**Scale 1 – 5 (1 – Low; 5 High)**				
Overhead Electricity or Telecommunication cables	Injury to people or damage to property caused by collision with cables	Pilots, the general public and other users of the area	5	4	20	Ensure that the designated flying area does not encroach the proximity of and overhead cables or supporting structures.	5	2	10	Club safety committee	
Buildings or other structures	Injury to persons or damage to property caused by collision with aircraft	Uninvolved persons using the buildings	4	3	12	Ensure that the designated flying area does not encroach within 50m of and buildings	3	2	6	Club safety committee	
General public/uninvolved persons	Injury to unaware people wandering into the area being struck by aircraft.	Uninvolved persons	5	3	15	Warning signs to be posted to make people aware of possible R/C flying activities. Area to be fenced off if possible. Visual checks to be	5	2	10	Club safety committee. All Pilots	

						carried out prior to take-offs and landings by all pilots. If airborne, do not land until it is safe to do so.					
Radio transmission failure	Injury and damage to property caused by out-of-control aircraft	Pilots uninvolved persons or animals/livestock in the vicinity	5	3	15	Carry out functional check of system before each flight and carry out range check following and heavy landing or crash.	5	2	10	All pilots	
Nearby roads and footpaths	Injury to users or damage to vehicular traffic.	Users of roads and footpaths	5	4	20	Designated flying areas should be set to avoid flying over roads and footpaths where possible. Warning signs to be posted advising users of R/C flying activities	5	2	10	Club safety officer	
Novices or guests unfamiliar with the flying sit	Injury to persons or damage to aircraft or vehicles	Novices, guests, other pilots and uninvolved persons	5	3	10	Novices and guests to be briefed on procedures and designated flying area. A club member to take responsibility for	4	2	8	Designated club member	
Livestock, pets	Injury	Any livestock or pets roaming within the designated flying area.	5	3	15	Do not fly when livestock are within the flying field. Warning signs to be posted that pets should be always restrained and under control. Do not fly if there are unrestrained pets within the flying site. If already airborne, ask owner to restrain pet immediately, stay airborne until situation is resolved or land out in a safe area if dead stick.	5	1	5	All	
Review Date:01/01/2023											

32.7 Guidance on Ratings

Identify the likelihood and severity of the Hazards and multiply them together to determine the risk rating for each area. (2 x 5 = a rating of 10, this falls into the category where caution is required). A rating above 15 would require changes to the operation, systems, or materials to bring the risk rating down to an acceptable level.

Ratings			
Likelihood	**Score**	**Severity**	**Score**
Very Unlikely	1	No Injury	1
Unlikely	2	First Aid	2
Likely	3	Require Hospital Attendance	3
Very Likely	4	Major Injury	4
Certain	5	Fatality	5

Matrix for overall risk rating Likelihood x Severity = Risk Rating						
	Severity					
Likelihood		1	2	3	4	5
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

32.8 Risk Rating

Ok	**Caution**	**No**

33 APPENDIX-B

33.1 Control Line/Round the Pole

33.1.1 Scope

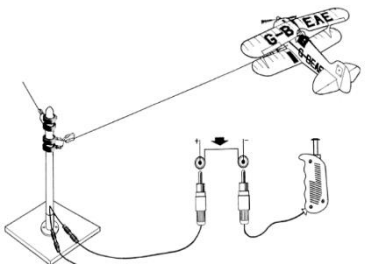
This appendix gives some additional guidance on operating control line/ round the pole models and gives some technical details.

33.2 Competitions

There are many national competitions for control line models such as various team races, aerobatics, combat, speed and vintage etc. but these are beyond the scope of this document but the definition of these events can be found within the BMFA Publication “Contest rules section 4 Control Line”

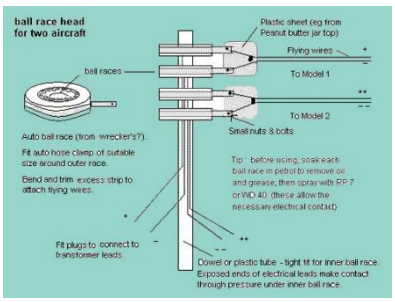
33.3 Round the pole

Round the pole typically uses small models which may be electrically powered with a fixed pole with bearings and electrical slip rings which allow power to be fed to the motor which powers the model fed from a controller. In the most sophisticated systems, there may be several sets (normally two) sets of slipring bearings so that two models can fly together, and models may even include radio control. Other systems are available the simplest probably using models with rubber band power



as supplied by the RTP Hut

Typical system with pole and models



and typical pole design

33.4 Control Line Connections

(a) Loop connections on ends of control lines shall be constructed safely and essentially as described in the image below

(b) Loops shall be bent cold around a suitable circular former (wood dowel, metal rod or similar) whilst the wire is under tension so as to produce a bend of constant minimum radius as shown. The wire must not be heated at any time during the bending process.

(c) the loop shall be bound with tinned copper wire, minimum diameter 0.2 mm or similar, and wound in an open spiral to ensure complete penetration when soldered to the control line wires.

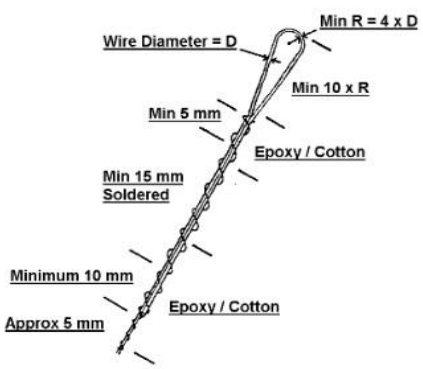
(d) Only 'soft' solder shall be used, applied with a suitable flux and using a soldering iron at sufficient temperature to tin the wires properly with good flow of the solder to provide good adhesion. Excessive heating must be avoided and soldering with a flame must NOT be used as this will not provide a strong joint and will weaken wire. Do not use hard solder or silver solder. If the flux used is an acid type, it must be neutralised after soldering. Typically, this is done with an alkaline solution (baking powder or similar) and washed off once compete.

(e) Each side of the soldered area, the binding shall be reinforced by a coating of epoxy adhesive, over-binding with cotton thread or similar.

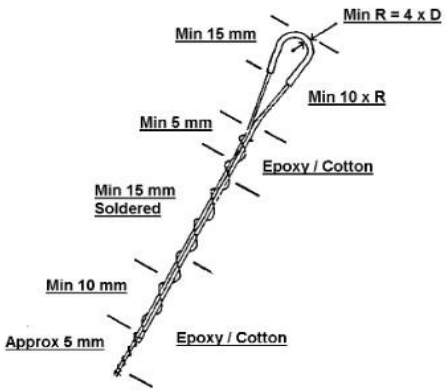
(f) Un-sleeved loops shall be attached to models and/or control handles via pins, shafts or 'buttons' with shank diameter sized to fit the loop

(g) Pins, shafts or 'buttons' (as in (f) above) where attached to any component which will impart any rotary motion to the pin etc. by reason of normal operation of the models controls (e.g. bell-cranks, rigid parts of control handles etc.) shall be attached via a concentric axle allowing the pins etc. to rotate freely when the control system is operated under tension equal to the appropriate pull test.

(h) Sleeved loops shall be protected from deformation by sleeving the wire before bending with brass, copper or aluminium tube or similar of a bore not more than 0.1 mm greater than the control line wire.

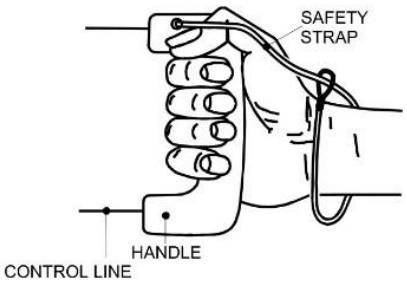


UNSLEEVED LOOP CONNECTIONS



SLEEVED LOOP CONNECTIONS

33.5 Control Handle



HAND AND SAFETY STRAP FIGURE

Handles for use with the single point pylon top shall incorporate a 'hook' or other device
which, when engaged with the pin on the pylon top, can sustain the entire load
generated by the model in flight.

33.6 Safety Strap

In order to ensure that a model is prevented from flying away if inadvertently released by the pilot during a flight, a safety strap shall be connected to the Pilots wrist to the control handle. This will be a requirement of Competition but is advised to be used in normal every day flying as a good safety measure.

i) The safety strap must be of the "noose" type, see drawing below.

ii) There is no restriction as to where the strap is connected to the handle, however it is recommended that it is NOT attached at the bottom of the handle grip.

iii) Safety straps may be examined by the Contest Director when used in competitions to ensure that the intent of this rule is met.

33.7 Load Tests

(a) A load test shall be applied to the assembled control handle, lines and model equal to the load typically to 10 times the mass of the model. The BMFA's competitions rules give tables of the pull tests for each competition class See BMFA Publication "Contest rules section 4 Control Line" available on the BMFA web site

(b) In each case the pull shall be applied slowly, increasing to maximum load and releasing at a similar rate.

(c) The pull test must be applied to the handle grip, not to the point of attachment of the lines and, when the handle is to be used on a single point pylon top the load test must also be applied to the 'hook' or 'ring'.

(d) The safety strap/handle assembly must be pulled to the same load specified

i) This test may be done separately from the line load test.

ii) The safety strap does not have to be on the wrist when this test is made.

Note: For the wrist strap, it is recommended that minimum of 80lb (36Kg) capacity cord for models up to approximately 2kg and a minimum of 160lb (73Kg) for models of great mass.

Parachute cord is suitable for safety straps and is available online from Amazon

33.7.1 Control line thickness recommendations

Depending on the mass and speed of the model then the lines use must take different strains and the table below give a rough guide of the line thickness required but Members should check and pick the correct size that is required for their particular application.

The strains required are based on 10g which is intended to give a times 2 margin of safety so even if one line breaks the model should not become free.

Typical control line wires can be found from PAW and SIG and typically 3 strand Wires in the 0.3 to 0.38 are available from PAW while 7 strand wires in the sizes in the table are available from SIG.

Table shows a “Rough” indication of wire thickness required

Typical Engine size	Model Mass	Thickness Based on 2 wire control	Max test strain bases on two wire control x10
1.5cc	<1kg	0.2mm (0.008”)	10kg
3.5cc	up to 1.5kg	0.3mm (0.012”)	15kg
5cc	up to 2.5kg	0.38mm (0.015”)	25kg
10cc	up to 4kg	0.45mm (0.018”)	40kg
10cc	up to 5.5kg	0.53mm (0.021”)	50kg
>10cc	up to 7.5kg	0.68mm (0.027”)	75kg

Note Competition classes tend to define wire size, and these can be seen in the BMFA publication “Contest rules section 4 Control Line” which should be referred to if members are entering the competition classes