MFNZ MEMBERS MANUAL

A guide for members

Amendment Status

Version	Change Detail	Date	Approved
0	First Issue	May 2018	
1	Revision to flying site design and flight line manning	Oct 2019	
2	Reformatting / Wings / Insurance updated / Night moved to CAR102 Operations Manual.	August 2022	C Jackson
3	Links updated, recurrency changed to 5 years, clarification of “under instruction”. Clarification of Gliders. Addition of LMC to 1.1	February 2023	C Jackson
3.1	Clarification on engine starting locations. Addition of Flight Advisor to links	March 2023	C Jackson
3.2	Updated flying field graphic, addition of barriers	April 2023	C Jackson

Contents

Model Flying New Zealand

The NZ Model Aeronautical Association (NZMAA) was formed in 1932. Its purpose was to ensure that the sport of aeromodelling is run in an efficient manner and that participants are able to enjoy their pastime knowing that there is an organisation working on their behalf.

In 2008 the Association was rebranded to Model Flying New Zealand (MFNZ) to give a more meaningful public image.

MFNZ is an association made up of approximately 2200 members of some 80 or so clubs spread throughout New Zealand. The Association is governed by a Council, elected by Members at the Annual General Meeting. The Council maintains links with key central government organisations such as the Radio Spectrum Management Service, the Civil Aviation Authority and the Ministry of Transport to ensure model flying remains compliant with rules and laws set by these organisations.

We contract the services of a secretariat to manage our relationships with individual members and clubs, maintain an up-to-date web site, and to do all the routine administration for the association.

The sport of aeromodelling also provides an avenue for serious competition, and we have twelve Special Interest Groups (SIGs) or technical committees covering the full range of specialist model flying undertaken in New Zealand. Each has its own subset of enthusiasts and communicates via bulletins and newsletters. Their rules, operations and codes of practice can be found on their dedicated pages on the MFNZ website.

MFNZ produces its own magazine to communicate with members, the "Model Flying World". When a member affiliates with MFNZ they automatically receive this 4 times a year online. It is also available by mail on request. Everything important done by the Association is reported in the magazine. We also have a web site (www.modelflyingnz.org) where members can keep up to date with matters of interest. The magazine is also available on the MFNZ website.

Of necessity, the Association produces quite a bit of formal documentation – which can be downloaded from the website or requested from our secretary. This documentation is, to a large degree focused on safety issues associated with operating models, and on the rules for competition flying. We cannot stress enough the importance of taking personal responsibility for safety.

Possibly the most important thing that the Association offers both members and their clubs is a comprehensive insurance policy. In the event that disaster does strike, provided you have been flying in accordance with MFNZ rules, then the policy covers you for damage to 3rd party property.

Advice and guidance from MFNZ is there to be had, either in the documentation on the website, or by contacting the Council.

Enjoy your aeromodelling and remember Safe Flying is No Accident.

1 The Association

1.1 Governance and Management

The Association (NZMAA, trading as Model Flying New Zealand) is an Incorporated Society under the Incorporated Societies Act. The Constitution is available on the MFNZ website.

MFNZ is governed by a nationally elected Council of Management with a President, Secretary, Treasurer, Competition Manager and Area Representatives. The Area Representatives liaise with members and clubs in their area and represent their views at Council meetings. In addition, there are twelve Special Interest Groups (SIGs) who create and control contest rules, select international teams, and organise rallies and competitions for their respective categories of model flying.

Additionally, the Large Model Controller is responsible for and administers the Large Model Program, which operates under CAR101.202 and CAR102.

1.2 National and International Standing

MFNZ engages with the Civil Aviation Authority of New Zealand on all aspects of Model Aviation. This usually involves ensuring the rights of model aircraft fliers are protected.

In the 1960's we had a very limited number of radio channels available for remote control and in the 1970's MFNZ obtained the frequencies currently used for R/C and has successfully negotiated several amendments since then with Radio Spectrum Management.

MFNZ assists clubs in negotiations for acquisition or retention of flying sites. There have been many instances that the involvement of the national organisation has benefited clubs negotiating with their local authorities.

The Association is affiliated with the Royal New Zealand Aero Club, and the FAI (the international aviation body, via Flying NZ (RNZAC)) and is a member of the New Zealand Aviation Federation. Through these relationships, MFNZ can raise aeromodelling concerns and issues with other operators in the aviation industry. Membership of FAI gives us an international voice and allows selected members to represent NZ at international events.

1.3 Roles and Responsibilities

The various roles and responsibilities of the elected officers (Council) are outlined in the Constitution.

Membership of MFNZ is conferred by belonging to an affiliated club. To gain full benefit of MFNZ membership it is important that members support, and work through, their clubs. As a senior member, you can use your vote to influence decisions made at General Meetings of the Association on policy, finance and the election of the Association's Council. Club committees can prove a powerful influence for the benefit of model flying. The country is divided into areas and your address will fall into one of these. In each area, your MFNZ Area Representative will be keen to hear your viewpoint, and assist, should you have any concerns.

MFNZ assists groups with guidance and information on the formation and the incorporation of clubs. In the interest of their members, all clubs should be incorporated, particularly in these days of increasing claims for damages.

MFNZ promotes regular regional meetings, rallies and decentralised contests through the year and National Championships in the New Year period.

MFNZ provides third party insurance cover of $10,000,000 for all members in New Zealand and while overseas, and for bona-fide overseas visitors. Details of the insurance are available in Section 4

2 Definitions

The following definitions are used in addition to the definitions in Civil Aviation Rule 101.3

- **Control Line** - Flight during which the model aircraft is aerodynamically maneuvered by control surfaces in attitude and altitude by the pilot on the ground by means of one or more inextensible wires or cables directly connected to the model.
- **Free-Flight** – Model aircraft with a flight path that, once launched, is uncontrollable
- **Glider** - Model aircraft which are not provided with a propulsive device, with the exception in some cases for gaining altitude, and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed except for changes in camber or incidence during flight.
- **Helicopter** - A helicopter is a heavier-than-air model that derives all of its lift and horizontal propulsion from a power-driven rotor system(s) rotating about a nominally vertical axis (or axes).
- **Multirotor** - A multirotor is a heavier-than-air model that derives all of its lift and horizontal propulsion from multiple power-driven rotor system(s) rotating about a nominally vertical axis (or axes).
- **Radio Control** - Flight during which the pilot on the ground using radio control aerodynamically manoeuvres the model aircraft by control surface(s) in attitude, direction and altitude.
- **Scale** - A scale model is a replica (miniature copy) of a full-sized aircraft.
- **Large Models** - Models meeting anyone of the criteria below are considered large models. Weights are inclusive of fuel and demountable equipment.
  - **Category 1**: Models 15kg – 25kg
    Authority is delegated to Model Flying New Zealand as an approved organization in accordance withCAR101.202 to allow the operation of aircraft between 15kg and 25kg.It is a breach of the Civil Aviation Rules if such models are flown without approval. Aircraft in this weight range must have a permit, issued through the Large Model Program.
  - **Category 2A/B**: Models 25kg – 150kg
    CAA authorizes MFNZ to manage the certification process of unmanned aircraft in the range 25kg – 150kg, to be flown for recreational use only. MFNZ issues Permits to Fly at public sites in this weight range relating to aircraft/pilot combinations.
    - Category 2A – 25-76kg
    - Category 2B – 76-150kg
  - **Category 3**: Models less than 15kg but exceeding the following power outputs are also certified under the Large Model Program.
    - Internal combustion powered aircraft greater than 86cc capacity
    - Turbine powered aircraft with greater than 140N thrust
    - Turboprop powered aircraft with greater than 5kW output
    - Electric powered aircraft with greater than a sustained 5kW input power

  Large Models in any of Categories 1, 2, and 3 may be flown only if the aircraft has been certificated under the Large Model Certification Process.

  The process for achieving certification in these categories is described in the Large Model code of practice and the MFNZ CAR102 operator's manual which can be found on the website.

3 Regulations and Compliance

Model aircraft operated by MFNZ members operate under the Civil Aviation Authority of New Zealand Rule Parts101 and 102. MFNZ's rules and Codes of Practice have been developed and are reviewed regularly to ensure compliance with the CAA rules as well as best practice.

3.1 Airspace

The New Zealand Government has rules on airspace use by model aircraft. For a good overview of these and their application, the following resources should be used

- The current CAR101 rule available at www.aviation.govt.nz/assets/rules/consolidations/Part_101_Consolidation.pdf
- The associated Advisory Circular (CAA interpretation of how you should apply the rule) at www.aviation.govt.nz/assets/rules/advisory-circulars/ac101-1.pdf
- Aeronautical Information Publications (Aerodrome contact details) at www.aip.net.nz/document-category/Aerodrome-Charts
- Airshare is used to gain approval with the use of Controlled Airspace www.airshare.co.nz
- Flight Advisor is very useful resource for low level flight advise, including VNCs and NOTAMs www.flightadvisornz.io

Visual Navigation Charts (VNCs) are available for reference from Model Flying New Zealand Area Representatives and also available from providers such as Aeropath.

https://shop.aeropath.aero/

Particular attention is directed to the requirements when flying in controlled airspace and in proximity to airfields and airports, as well as special use airspace such as Danger Areas and Low Flying Zones, and the privileges and limitations of them. Members are required to comply with all Civil Aviation Rules, if a member is unsure how to operate in certain airspace, they should contact the Model Flying New Zealand council for clarification.

3.1.1 Aerodromes

Operations within 4km of an aerodrome are inherently at a higher risk of interfering with manned aviation, members must hold MFNZ Wings and detailed procedures for operations with 4km of an aerodrome are documented in the Model Flying New Zealand CAR102 Operations Manual section 8.8.

Operations within 4km of an aerodrome and above 400ft require further risk mitigations to be taken and are to be carried out in accordance with Model Flying New Zealand CAR102 Operations Manual section 8.9 which documents the Standard Operating Procedures for both CAR101 and 102 operations.

3.2 Regulations Specific to Model Aircraft

CAR Part 101 applies if you are operating a model aircraft less than 25kg and you fly during the day and below 120m (400ft) while complying with the other airspace rules, it's a prescriptive rule set of do's and do nots.

Aircraft can be flown under this rule if they are in the 15-25 kg range provided, they are approved by an organisation under CAR101.202 (MFNZ is such an approved organisation). MFNZ manages this through its Large Model Code of Practice.

CAR Part 102 applies if you are operating a model aircraft outside one or more of the restrictions of Part 101, e.g., at night, above 120m (400ft) or an aircraft weighing more than 25kg, etc. MFNZ has delegated authority as a Certified Unmanned Aircraft Operator under Part 102 to manage these operations.

Members that are operating under the privileges provided by the MFNZ CAR 102 Certificate are required to operate in accordance with the MFNZ CAR 102 Operation Manual. This is not optional, it is a legal requirement, failing to do so jeopardizes the activities of all other members.

Model Flying New Zealand CAR102 Operations Manual

3.3 Delegated Authority

MFNZ is an approved organisation under CAR101.202 of Civil Aviation Rules which gives members certain privileges to operate model aircraft, with the MFNZ President being the Primary Person responsible for ensuring the organisations compliance. MFNZ is also a Certificated Unmanned Aircraft Operator under CAR Part 102 for the purposes of safely managing the operation of member's models beyond the restrictions of CAR101. The MFNZ CAR102 exposition details the way these operations are safely managed including the Large Model Code of Practice which is a key element. These documents are available on the MFNZ website and must be complied with.

3.4 Radio Frequencies

The MFNZ website details the frequencies currently approved for use by Aeromodellers in New Zealand.

www.modelflyingnz.org/frequencies.html

Under the Radio communications Regulations (General User Radio License for Aeronautical Model Control Short Range Devices) Notice 2003, we are able to operate within the frequency and power restrictions of the regulations.

www.rsm.govt.nz

www.rsm.govt.nz/licensing/frequencies-for-anyone/aeronautical-model-control-gurl/

www.rsm.govt.nz/licensing/frequencies-for-anyone/short-range-devices-gurl/

2.4 GHz radio equipment is permitted in NZ. The band 2.4 to 2.4835 GHz is a shared one with many other users, thus spread-spectrum systems are essential. The power emitted shall not exceed 1 Watt EIRP, however, higher gain antennas may be used, provided the peak power does not exceed 4 Watts EIRP.

915MHz is also relatively common and legally able to be used in accordance with Radio Spectrum Managements documentation.

For older non agile radio systems most clubs (and all MFNZ sponsored events) may require you to use the pegboard and take a frequency peg. The purpose of this is to ensure that good frequency control habits remain in place. Some clubs and/or event/contest directors may impose additional restrictions, and these must be complied with.

4 Competition

MFNZ, through the Special Interest Groups, organises and fosters contests at venues all over New Zealand, covering all aspects of the sport, from indoor flying to R/C scale. Details of forthcoming competitions and events are published in Model Flying World, and on the MFNZ website. Newcomers are always welcome and are encouraged to participate. For some, model flying is a truly competitive sport, but even if you do not have a competitive streak, you will find that competition is an excellent way to improve your flying skills.

Taking part in competition events can add a great deal of enjoyment to model flying. As well as the social aspect, it will also give you the opportunity to see some of the country's best models and pilots in action. Selection trials are held regularly to pick teams to represent NZ at various World and Trans-Tasman Championships for many popular classes of model flying.

Through the National Decentralised Competition (NDC) local clubs have the opportunity to hold events while effectively competing in a national event.

4.1 Rallies

In addition to the contest schedule there is an active RC rally scene, particularly for groups such as Large Models and Warbirds as well as more general flying hosted by various clubs, often associated with memorials for members who have passed on. These offer the opportunity to catch up with fellow modellers from around the country and view their handiwork as well as flying in a relaxed atmosphere. These events are usually advertised in the Model Flying World as well as on the relevant Special Interest Group or Club website.

5 Insurance

5.1 Cover

From the time a member pays the MFNZ affiliation fee they are fully covered by the Association's third-party insurance policy.

This policy covers the entire normal and lawful model flying pursuits of the Associations members. Like all insurance policies, an excess does apply.

A full summary of the insurance and its current details is available on the Model Flying New Zealand website

Model Flying New Zealand Insurance Policy

5.1.1 Salient Details of the Cover

It is the responsibility of MFNZ affiliated clubs to ensure that its members undertake flying activities within the rules and safety requirements of the Association and the Civil Aviation Authority. The Insurance Cover does not extend to members who fly outside these requirements.

5.1.2 Excess and Coverage

Provided you were complying with all the relevant regulations, rules, and conditions at the time of the accident, the Association may contribute towards the cost of the excess, at the discretion of the Model Flying New Zealand council.

At the time of writing, the liability insurance cover provides indemnity for:

- Property damage caused by an occurrence in connection with the undertakings and activities of MFNZ.
- All classes of model aircraft activity sanctioned by the MFNZ.
- Claims arising anywhere in New Zealand and when a member is participating in an overseas event.
- Member to member liability in respect of vehicle or other property damage.
- Members are indemnified for legal defence costs arising when acting as an official in a MFNZ activity.

The liability insurance cover does not provide indemnity for:

- Damage to model aircraft or UAVs, either first or third party.

Please check the MFNZ website for the most up to date details of coverage.

5.1.3 Other Members

In addition to ordinary financial members engaged in flying models, cover may extend to include:

a) Legal liability of MFNZ caused by bona fide visiting overseas model flyers who are members of an equivalent national association in their home country (if they are not otherwise covered by their home association's insurance). Overseas visitors MUST be registered through a New Zealand Club or SIG as temporary members of MFNZ.
MFNZ provides, at no charge, one calendar month membership, which may be extended on application by the Club or SIGs.
Temporary membership forms are held by Clubs and SIGS or from the MFNZ Secretary
secretary@modelflyingnz.org

Overseas visitors flying models in the large model category must be operated in accordance with the Large Model Program as applicable.

b) Prospective (new) club members who have yet to pay their club and MFNZ fees. This cover extends for a maximum of three months from the first date that such a person first operates a model aircraft with the club); and

c) Persons who may be assisting at club activities (such as spouses and other appointed volunteers).

5.2 In the Event of an Incident

DO NOT accept liability.

Obtain the following details of the person whose property has been damaged

- Name
- Address
- Telephone number
- The name of their insurance company (if applicable)

Document the following:

- Date and time of the incident.
- Description of the property damaged.
- Description of the amount of damage caused.
- Name and address of any witnesses; and
- If possible, take a photo or, draw a sketch and write down the details of how the accident occurred.

Note –

If the incident has caused either serious injury to an individual, or death, then the incident must be reported immediately by calling 0508 ACCIDENT (0508 222 433) monitored 24 hours. This must be followed by reporting the accident to the President. Please refer to the MFNZ CAR 102 Operation Manual for details.

5.2.1 To Make a Claim

The MFNZ Secretary will assist you in making the claim.

secretary@modelflyingnz.org

MFNZ will contact the association's broker who will process the claim with our insurance company and the MFNZ Secretary will contact you as to the acceptance/rejection of the claim and advise the amount of your contribution to the excess.

6 Wings Qualification

6.1 Overview

The Model Flying New Zealand Wings program is detailed on the Model Flying New Zealand website

Model Flying New Zealand Wings Program

It's a proficiency qualification based on the members abilities and knowledge of

- Fundamental Civil Aviation Rules
- Operation of the specific model aircraft discipline

All members are encouraged to hold Wings for the discipline they are flying. Some club sites require members to hold Wings.

Some variations in the MFNZ CAR102 Operations Manual requires specific Wings endorsements.

All members operating within 4km of an aerodrome are legally required to hold Wings to comply with CAR101 or be under the direct supervision of a member who does hold the qualification.

6.2 Civil Aviation Rules

Model Flying New Zealand is an Approved Person or Organisation as defined under CAR101.202 (1 through 6) allowing the instruction of personnel to fly remotely piloted aircraft, and the issuing of pilot qualifications for flying remotely piloted aircraft

MFNZ Wings is a qualification meeting the requirements defined under CAR101.202(a)(3)(i)(A) allowing the holder to operate within 4km of an aerodrome (along with other requirements, such as observers and permission from controlling/administering authorities)

6.3 Recurrency Requirements

As best practice Model Flying New Zealand Wings Program requires recurrency at a 5-year period for all members.

This ensures members are up to date with any rule changes and continue to have competency in the disciplines they fly. This also promotes the safety of the Public, other members, and airspace users.

The recurrency requirements will be phased in from 2025.

6.4 Operating Under Instruction

Any member who does not hold a current Wings qualification, such as a prospective member, may temporarily operate under the direct instruction of a Wings qualified member and in doing so will meet CAR101 requirements and be covered by Model Flying New Zealand's insurance policy.

Safety

7 Safety Management

This section is designed to make you aware of model flying safety requirements and provide a set of generic rules as a basis to safe operation. It is not intended to be a comprehensive list of rules. There are two reasons for this. Firstly, it is impossible to produce a fully comprehensive set of rules that cover all eventualities. Secondly, rules are not always appropriate for all conditions, and once a rule is ignored for a sound local reason, others tend to be ignored as well. We must have a commitment to the safest practicable operation of model aircraft at all times.

We share our environment with a wide variety of people, some of whom may be upset or disturbed by our activities. Noise, privacy, and safety issues can be a concern to members of the general public, particularly to those who are unfamiliar with the sport of Aeromodelling. Safe operation is therefore vital to avoid the imposition of unreasonable rules and regulations from groups and authorities that see modellers as a threat or nuisance.

MFNZ cannot be aware of all local conditions and variations, so it is important that clubs also have local guidelines for safe operations on their own sites. These local rules should be specific to the site and could also include non-safety but other very important sections, typically those relating to noise limits, hours of operation, no-flying zones and directions on where car and foot access is not permitted, for example.

This section covers a number of important safety principles that will assist all modellers and members to operate safely. Some of these are part of the privileges exercised under Model Flying New Zealand's CAR102 certificate.

7.1 Basic Safety Rules

a) All members must at all times actively seek to identify hazards and reduce or eliminate them.
b) No member is to wilfully or negligently cause or permit a model aircraft to endanger any person or property.
c) No member is to do or say anything that would encourage another member to perform any unsafe act.
d) All model aircraft must be flown in accordance with CAR Part 101 or CAR Part 102 as applicable. If you cause an incident whilst in breach of CAR or in breach of the Civil Aviation Act, you may be deemed to be criminally negligent. In particular, no person is to fly an R/C model within 4 km of an aerodrome without either being qualified as proficient under the MFNZ wings program and having an observer or being under the direct supervision of a Wings qualification holder or MFNZ approved Instructor. Flying within 4km of an aerodrome can only be done with the agreement of the aerodrome operator.
e) Large R/C Models must meet the extra requirements of the Large Models Code of Practice and comply with CAR102
f) No member is to operate a model while being intoxicated by drugs, alcohol, or any other substance
g) No member is to operate a model: higher than the maximum permitted height for that site (Generally this will be 400 feet AGL, but check with your local rules), further away than safe control can be maintained and within visual range, in cloud, or outside the legal hours of daylight unless operated explicitly in accordance with a variance documented in CAR102 Operations Manual.
h) Models must be flown within Line of Sight (LOS) of the pilot in accordance with CAR 101, or Beyond Visual Line of Sight (BVLOS) in accordance with the Model Flying New Zealand CAR102 Operators Manual
i) At rallies, demonstrations, advertised events, or any other flying event where large numbers of public spectators might reasonably be expected to attend, extra safety controls will be put into place and are to be observed by all participants. Local club regulations and rules must be followed at all times.

j) At events the event organizer is to ensure that spectators are contained in a clearly defined area and that the distance of the spectator area is no less than 30 metres from the flying area. Organisers are encouraged to seek MFNZ Council Guidance if needed for event planning.

7.2 Observer Duties

7.2.1 Purpose and Scope

Every pilot of a radio-controlled model aircraft operating within 4km of an aerodrome is required by the Civil Aviation Rules to have their own competent observer in direct communication with them in the while their model is in the air.

This is not a requirement invented by the MFNZ nor the local Club Committees – it is a requirement under the Civil Aviation Rules.

Further details on the role of Observers are detailed in the MFNZ 102 Operations Manual.

7.2.2 Primary Functions of an Observer

Ensuring the safety of the public, air traffic and other members are the paramount role of the Observer. This is achieved by keeping the pilot fully informed of:

- Other aircraft movements, both full size and other models, so that proper aircraft separation is always maintained.
- The Observer should advise the model Pilot of the location, track and height of a manned aircraft entering the flight area and help with recommending a flight path to ensure separation is maintained.
- Other pilot's calls and flight intentions (take-off, landing, dead stick, low pass, etc.); and any other hazards that may appear during the flight (pedestrians on the strip, dogs, etc.).

Note - Being an Observer is not a social engagement. While the duties are neither difficult nor onerous, full attention is required for secondary functions

Additional input from an Observer could be to:

- Assist with safe engine start up and aircraft handling in the pit area and to the flight line; and
- Ensuring that all other Pilots and Observers are aware of the Pilot's flight plans (take- off, landing, dead stick, etc.).

8 Discipline Specific Safety Guidance and Rules

8.1 Free Flight (F/F)

The following requirements apply to the operation of all F/F model aircraft, be they sport, competition or Vintage:

a) F/F models must not be launched when manned aircraft are overhead.
b) F/F models must not be launched from an area where they could overfly buildings, major roads, aerodromes, active runways, power lines, railways, or similar places, on their expected flight paths.
c) F/F models, in particular all types of powered models, must be launched well away from, and downwind of, any spectators and vehicles. Tow launched models must be kept at least one towline length away from spectators, vehicles, and buildings.
d) When a fuse type dethermalizer is used a snuffer tube must be used and extreme care should be exercised when lighting the fuse.
e) Flying surface alignment, dethermalizer operation and any automatic systems must be checked for correct operation before release.

8.2 Control Line (C/L)

The following requirements apply to the operation of all C/L model aircraft.

a) Steel lines of sufficient strength preferably stranded and for the C/L model being operated, must be used.
b) Before every flying session starts a C/L model and its lines must be subjected to a pull test of at least 10 times the model's weight and control lines and linkages shall be checked after a pull test (competition models must be pull tested as detailed in the C/L Rule book). If any damage is obvious the model MUST NOT BE FLOWN before the damage has been repaired and another pull test satisfactorily completed.
c) The control handle must never be released while a model is flying. When high line pulls are expected, or the type of flying might cause accidental release of the handle, a safety strap connecting the control handle to the operator's wrist should be used.
d) The centre of the flight circle must be clearly marked, and pilots must remain at the centre of the flight circle when flying. Adjacent flight circles must be located so they have an adequate clearance between them. Spectators should be encouraged to stand up-wind of the circle and must not be in, or adjacent to, the circle when a control line model is hand-launched or released for take-off.
e) A C/L model must be ditched if there is an immediate risk of collision between the model and a person.

8.3 Radio Control Models (R/C)

The following requirements apply to the operation of all R/C model aircraft.

a) Only the frequencies specified on the MFNZ website may be used, or those complying with Radio Spectrum Managements guidance, and transmitters must comply with RFS27 or RFS29 specifications or other applicable standards.
b) A system of frequency control must be used for other than 2.4GHz or other spread spectrum systems.

Many R/C equipment "defects" are caused by faulty batteries, connecting wires or switches. Battery failure will certainly cause an R/C model to crash, and "Fail Safe" devices will not work if the battery fails. Therefore, modellers must take particular care of batteries, connecting wires and switches in their radio control equipment and:

a) Must ensure all batteries are fully charged before flying.
b) Use a monitor to check battery condition and/or a battery backup.

c) Use batteries less than 5 years old.
d) Cycle batteries at regular intervals, not exceeding 12 months; and
e) Take care to detect the early stages of “black wire” corrosion.

No R/C model is to be flown without a thorough pre-flight check as per the wings scheme requirements and a ground range test before the first flight of the day or the first flight of a new or repaired model, or after the RC equipment has been repaired or modified.

There have been some quite serious, and potentially fatal, accidents caused by starting large models. Positive and effective restraint is required for starting any larger models and is recommended for anything with a 40 size or larger engine. Such restraints can take many forms depending on the model type and construction, and will generally be guided by local club practices, but can include:

- A dedicated helper
- A rope or strap around or on the tail.
- Wheel chocks.
- Metal rods {covered with foam); and
- A safety starting table.

8.3.1 Flying Fields

The flying fields for all R/C flying, except Pylon and Soaring which are documented in their relevant SIGs Codes of Practice, will apply the following:

Examples from around the world have shown that even light weight park fliers have the potential to injure fellow fliers, or members of the public. Similarly, most modellers are aware of the damage that can be sustained when parts of the body pass through a propeller arc. To that end, every flying site registered with MFNZ must have been subjected to a risk assessment as per the process outlined in the Model Flying New Zealand Flying Site Risk Assessment Procedures

The diagram below depicts an example of a typical model flying site. While it is acknowledged that the layout of every flying site in the country will vary to some degree, the marked areas must all be present if risks are to be either eliminated or substituted.

8.3.1.1 Aircraft Operating Area

The area reserved for flying must be of sufficient size to enable safe control of the model types flown at the site. The operating area must be clear of pedestrians, cycles, vehicles, and buildings. If a person or vehicle enters the area, flying must cease until the area is clear. For airborne models the aircraft must be kept at a safe distance until the area is clear.

8.3.1.2 Runway

Set up or retrieval of models must not proceed until other fliers have given their OK. Operators should remain clear of the runway with pilots remaining in the pilot box as models are taxied into position for take-off or after landing.

8.3.1.3 Barriers

The use of barriers, temporary or permanent, is encouraged for all flying fields and for all types of model aircraft. Barriers can provide a suitable shelter for the Pilot and Observer in the event of a model departing the runway, and also provide members with a visual reminder of the hazards.

Barriers should be used for all large models, or where the type of model being flown introduces extra risk (such as high speed), in situations where there is not suitable distance between the runway and pilot box.

8.3.1.4 Pilot Box

This is an area close to the edge of the runway where pilots can stand in a relatively closely spaced group while operating their models. Ideally the area should be protected from the runway by a low wire mesh fence and no closer than 5 meters from the runway centre line.

When a pilot is ready to take off, the pilot should call “Taking off”. The model should be placed on the runway and the pilot stand in the pilot box. When ready to land, the pilot should call “Landing” and get an acknowledgement from other pilots. After the flight has been completed the model should be removed from the runway and a call made, “Runway clear”.

8.3.1.5 Starting Areas

Ideally, areas should be reserved for starting and running up/tuning model engines. Positive and effective restraint must be used when starting any model. Such restraint can take many forms depending on the model type and construction and can include:

- A dedicated helper
- A rope or strap around the tail
- Metal rods covered with foam, and
- A starting table

Any time a model is started, the area directly in front of the model should be clear of other people.

Engine starting may occur in the Pits Area, provided it can be done safely in the space available.

8.3.1.6 The Pits Area

This is an area where models are prepared for flight and stored/maintained between flights. This area should be safely clear of the runway and pilot’s box.

8.3.1.7 Spectator Area

At any time aircraft are operating, Spectators must be kept clear of all the operational areas listed above. Ideally, the operational areas and the Spectator area will be separated by a physical fence. If this cannot be achieved, then the club must appoint a safety officer to ensure that members of the public do not enter the operational areas.

8.4 First Person View (FPV)

Introduction

First Person View (FPV) flying is a branch of the model aircraft hobby whereby the pilot controls the model using a video image transmitted from an on-board camera to a screen or goggles at ground level rather than directly observing the aircraft. FPV equipment can be fitted to any flying model including power glider, helicopter and multi rotor.

Regulatory Requirements

CAA regulations require that FPV flying takes place within the following constraints:

a) The model must remain within the height restrictions for the flying site.
b) The model must remain within the direct line of sight (LOS) of the pilot/observer.
c) The pilot using the FPV equipment must be accompanied by an observer who can maintain a lookout for other aircraft and assist the pilot with identification and orientation of the model in the event of any system failure

MFNZ Recommendations for successful FPV Flying

Safe Airframes Where appropriate, pilots should use lightweight, low-speed models which will minimise impact forces if things go wrong. Faster, heavier aircraft should only be used when the FPV pilot is expert and is flying in a suitable and safe location (i.e., far away from people and property).

Safe Location Pilots should make a considered judgement when choosing their FPV flying field and only fly from a safe location away from populated areas and busy roads. It is important to consider whether, in the event of something going wrong during a flight, the location is safe.

Suitable Conditions Pilots should only fly when weather conditions are suitable for their aircraft and their level of ability. Nil wind is usually ideal (except for slope soaring) and anything below approximately 10kph is suitable for beginners with most aircraft. Pilots should leave more challenging conditions until they have considerable FPV flight experience. Beginners should choose a bright day with a clear horizon so that they have a good attitude reference.

Quality Equipment As with all R/C flying it is important to use good quality components. In addition to a good quality radio transmitter, receiver, servos, etc. a good quality camera should be used that has adequate resolution to easily see the plane's attitude, location, and proximity to other objects. Pilots should also ensure that a high-quality video downlink and viewing system (e.g., video goggles) are used. Pilots should select high quality tried and tested components available from the dedicated FPV sources. The video link and the control link must use different frequencies. If using 2.4Ghz for the video link, interference may occur with other users of 2.4Ghz equipment at the flying site. This may result in loss of the video link for the FPV aircraft and loss of control for other pilots. When designing an FPV system it is best to choose R/C and video frequencies that are significantly separated. For example, 35MHz R/C control and 2.4GHz video, or 2.4GHz R/C control and 5.8GHz video. Return to home/ Return to land systems, if fitted should not be used to assist with flight beyond the visual range of the pilot/observer.

Pre-Flight Checks

Pilots should:

a) Check R/C Tx/Rx range – as specified in the transmitter manual.

b) Repeat the R/C Tx/Rx range check with the video Tx switched on.

Check the video system range. On new set-ups this is best done by flying a Line of Sight (LOS) circuit whilst recording the FPV feed and then checking the quality before attempting to fly FPV. Alternatively, this can be checked by someone else flying a LOS circuit with the newly configured aircraft whilst the pilot monitors the live video.

Note - Ground range tests of video will usually show 1/4 to 1/3 of air to ground range.

Training

First Person View flying means that the pilot controls the aircraft by reference to the horizon just as with full-sized aviation. It is recommended that novice FPV pilots practice on a radio control simulator with FPV mode and become proficient before attempting FPV flight for real. Before attempting a first flight it is a good idea for a novice FPV pilot to wear the goggles and view the video feed as a "passenger" whilst another pilot flies the aircraft. This will give the new pilot a feel for FPV flying and allow him to become familiar with the flying field and locality before taking control. Until the pilot is proficient at flying FPV, it is advisable that flights are carried out with an experienced person in charge who will carry out the take offs and landings by traditional line of sight flying.

Positional Awareness

FPV flying is different to line-of-sight flying. The pilot sees a completely different perspective, and during the first flights, it is easy to lose track of where the aircraft is relative to the flying field - especially when directly above it. Pilots should get to know the flying field and locality from the air by flying as a "passenger" and also by using tools such as OS maps, or Google Maps/ Google Earth to become familiar with the terrain, trees, buildings, roads, landmarks, etc. Equipment such as On Screen Displays (OSD) () which can overlay GPS data on to the pilot's screen and provide an arrow and distance back to the field ensure that positional awareness is never lost. Flights should be planned to ensure that obstacles such as woods or terrain cannot come between the plane and the pilot thus disrupting control or vision. The observer should be able to see the entire area of operation and be able to spot full-size aircraft that may be entering the model flying area. The observer should establish an effective communication routine to inform the pilot of full-size activity and how to maintain separation between models and aircraft.

8.5 Helicopters

It is emphasised that model helicopter flying requires a high degree of safety awareness. The following additional requirements apply to R/C model helicopters:

A Helicopter must never under any circumstances be flown or run up:

a) With sharp leading edges on main or tail blades.
b) Within 10 meters of spectators.
c) In any fashion that might endanger spectators.
d) In the presence of spectators or at a competition, until properly tested and proven airworthy.
e) Until thorough maintenance checks are carried out as set out below; or
f) With a receiver battery pack which is not of welded or soldered construction.

Checks before Daily Flying Session:

a) Check all ball links for wear.
b) Check all main and tail rotor blades for damage, check root at blade pivot hole and check tip weight installation.
c) Check for signs of loose or missing nuts and bolts.

d) Check main drive system for integrity.
e) Check servos are secure and operating correctly.
f) Check fuel tank and piping is secure.
g) Check receiver aerial in good condition with no chafing or damage.
h) Check radio range; and
i) Ensure batteries have been fully charged. (Helicopters place heavy demands on servos, so an on- board battery monitor is recommended.

Checks before each flight:

a) If the helicopter on the previous flight suffered damage or a heavy landing, recheck all of the above.
b) Check all controls before starting for correct operation, especially for binding links, or slowing servos.
c) Check all controls for correct operation
d) At operating RPM, just before lift-off, check for correct operation of controls; and
e) Check for abnormal vibration and eliminate before flight.
f) Check main rotor blades for correct tracking in hover.

8.6 Turbojets

A turbojet engine is an engine where air drawn in at the inlet is compressed, heated by the burning of a fuel, the resulting hot gases are delivered to a turbine that drives the compressor. The hot gases leave the engine to provide thrust or the thrust is provided from a propeller driven from the turbine.

This section does not cover rockets or pulse jets where a compressor and turbine are not part of the design. Turbojet engines have many unique inherent features, namely, continuous combustion, high temperatures, high energy release rates, and the potential for unconfined combustion, especially during the starting phase.

Gas turbine operation requires that operators must be aware of the flying characteristics which arise from the application of gas turbine power. Paying particular attention to:

- The delay in response to opening the throttle.
- The high speeds which can result from the available thrust not decreasing with increasing air speed.
- The residual thrust at engine idle speed which can make for difficulties in slowing the aircraft down for landing.

Reference must be made to the MFNZ Turbine Code of Practice.

- New Zealand Jet Modellers Association (NZJMA) website www.nzjma.com
- Model Flying New Zealand website www.modelflyingnz.org
- Google Drive Link

Appendices

Appendix 1 – Basic Inspection Checklist

Name		Date	
Model Description			

CHECKLIST	Accept	Reject	Recheck
GENERAL APPEARANCE – overall appearance (Check for damage, warps, loose covering etc.)			
PROPELLER – secure (check for cracks, damage)			
ENGINE – Securely attached (including muffler)			
ENGINE KILL – to prevent accidental starting (Ask if able to kill with radio)			
LEFT WING – Attachment secure			
LEFT WING – Aileron hinges secure			
(WING – Control link keeper)?			
LEFT WING Control pushrod stiffness			
ELEVATOR – Hinges secure			
ELEVATOR – Control link keeper			
ELEVATOR – Control pushrod stiffness			
RUDDER – Hinges secure			
RUDDER – Control link keeper			
RUDDER – Control pushrod stiffness			
TAIL SURFACE – Brace wires secure			
TAIL SURFACE – Brace wires keepers			
RIGHT WING – Attachment secure			
RIGHT WING – Aileron hinges secure			
RIGHT WING – Control link keeper			
RIGHT WING – Control pushrod stiffness			

HATCHES OR COVERS – Secure			
WHEELS AND LANDING GEAR – Secure			
BATTERIES FULLY CHARGED – Ask			
WEIGHT & BALANCE – Any changes since approved?			
Radio Checks			
Transmitter Battery			
Range Check and confirm Failsafe operation.			
Control directions			
Crystal-based frequency and peg correct			
Synthesized module Setting checked against frequency peg			
Frequency selectors sealed with sticker			

AUTHORIZATION:

I certify that the above-described aircraft has been inspected

INSPECTED BY

Appendix 2 – Referenced MFNZ Documents Hyperlinks

Constitution	Google Drive Link
Bylaws	Google Drive Link
MFNZ CAR102 Operations Manual	Google Drive Link
CAR102 Certificate and Ops Spec	Google Drive Link
Competition Rules	www.modelflyingnz.org/competitionrules.html
Wings Program	Google Drive Link
Insurance	Google Drive Link
Large Model Program	www.modelflyingnz.org/largemodel.html

Appendix 3 – External Websites Links

Civil Aviation Authority	www.aviation.govt.nz
Civil Aviation Rule 101	www.aviation.govt.nz/assets/rules/consolidations/Part_101_Consolidation.pdf
Advisory Circular 101-1	www.aviation.govt.nz/rules/advisory-circulars/show/AC101-1
Civil Aviation Rule 102	www.aviation.govt.nz/assets/rules/consolidations/Part_102_Consolidation.pdf
Advisory Circular 102-1	www.aviation.govt.nz/rules/advisory-circulars/show/AC102-1
Aeronautical Information Publication	www.aip.net.nz
Internet Flight Information System (NOTAM)	www.ifis.airways.co.nz
Airshare Map	https://pilot.airshare-utm.io/maps
Visual Navigation Charts	https://shop.aeropath.aero/collections/all-visual-navigation-charts
Radio Spectrum Management	www.rsm.govt.nz
Jet Modelers Association	www.nzjma.com
Turbine Code of Practice	Google Drive Link