Members Handbook

NEW ZEALAND MODEL AERONAUTICAL ASSOCIATION (INCORPORATED)

PREFACE

This Handbook contains most of the information you need on the NZMAA and its activities. Please read it thoroughly and familiarise yourself with its contents. In this way you can gain the maximum benefit from your Association and help establish a responsible image of model flying with your fellow fliers and the general public.

Established in 1935, the Association and has been providing accumulating benefits to its members ever since. The NZMAA is active in liaising with Government Bodies, Local Authorities, Civil Aviation Authority of New Zealand (CAA), Radio Frequency Service, and other organisations, in order to safeguard your interests. It also promotes and controls, with the assistance of clubs and sub-committees, many facets of model flying such as National Competitions, Fly-Ins and Rallies. The NZMAA Secretary together with a secretariat assist a Council of Management in the administration of the Association. Most of your enquiries can be answered through the Secretary or from the NZMAA official responsible for the discipline concerned. They are always pleased to hear from members and help where they can. On a local level your Area Councillor can be contacted directly. Their addresses and other topical information can be found in the Association's magazine The Flier's World that is published five times each year.

The Association is very conscious of the need to ensure that its members practice safety at all times. There are a number of safety guidelines in this Handbook ranging from pre-flight inspection through to flying procedures. There are also details of an R/C pilot proficiency programme that gives all R/C flyers the opportunity to be certified safe to fly unsupervised.

Good luck and safe flying.

Alister McKenzie

President NZMAA
November 1997

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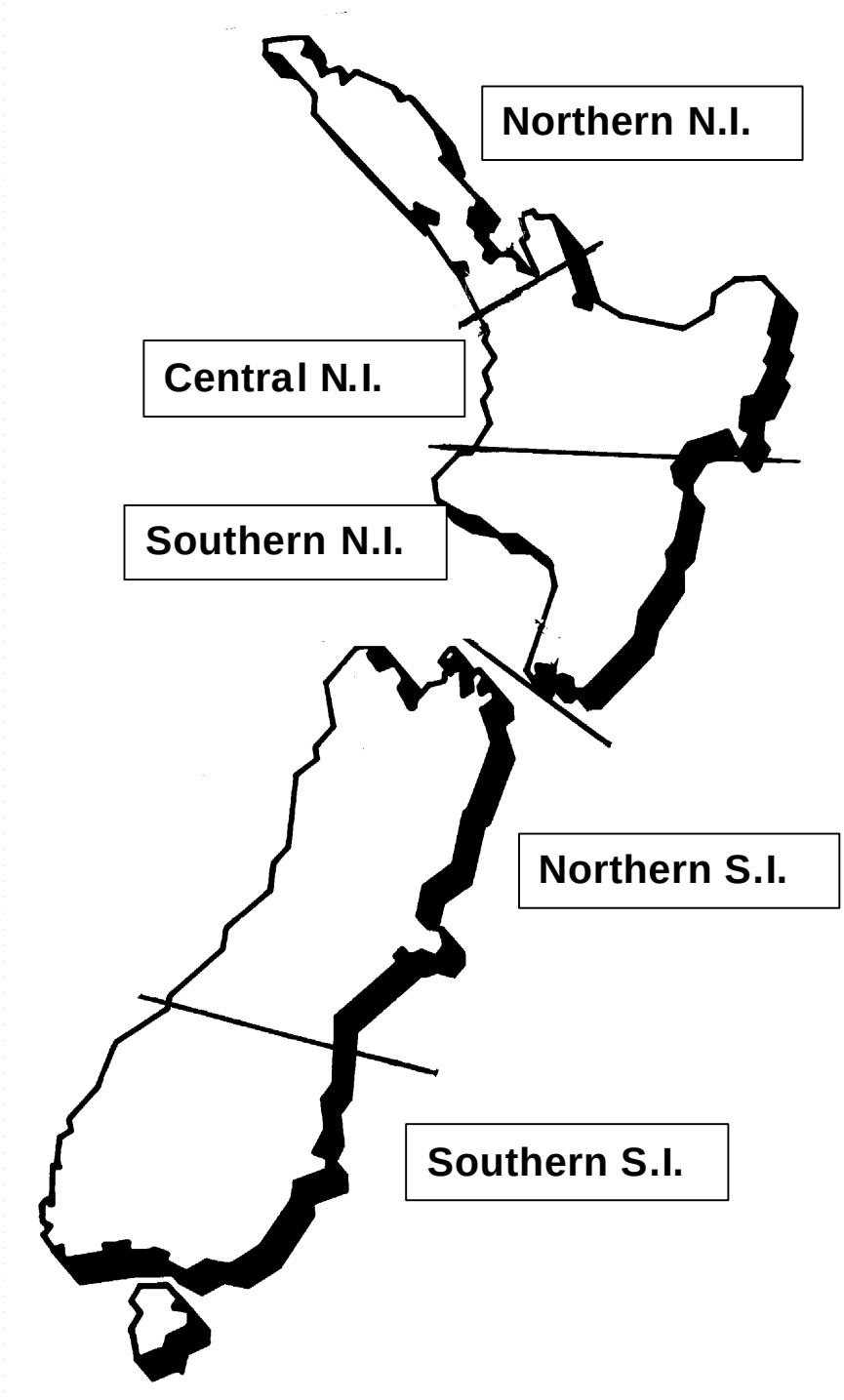
Area Representative Regions



Chapter 1

GENERAL INFORMATION

What The Association Is and What it Does for you as a Member

The NZMAA's Origins

A national body was formed to co-ordinate NZ aeromodelling in 1932, and in 1947 it was named the NZ Model Aeronautical Association. Incorporation followed in 1948. The first National championships were held in Wanganui over Christmas/New Year of 1948/49.

It's Your Association

Membership to the NZMAA is by belonging to a member club. To gain full benefit from your NZMAA membership it is important that you support, and work through, your club. As a full member, you can use your vote through your club delegate to influence decisions made at General Meetings of the Association on policy, finance and the election of the Association's Council. Your club committee can prove a powerful influence for the benefit of model flying, locally and nationally. The country is divided into five Areas and your club will fall into one of these (refer to map on the facing page for your area). In each Area, your NZMAA Area Councillor will be keen to hear your viewpoint, and assist you should you have any concerns.

The contact name and telephone number of all Officers can be found in the front of each issue of the Association's Magazine 'The Flier's World'.

The Association is affiliated with the Royal New Zealand Aero Club and is a member of the Aviation Federation. By these liaisons, we can raise aeromodelling concerns and issues with other operators in the aviation industry.

As a member you can help strengthen model aviation in NZ as a whole by encouraging fellow fliers to join the Association.

What Does the NZMAA Do?

It:

- Negotiates with the Civil Aviation Authority of New Zealand on all aspects of Model Aviation. These negotiations are usually to protect the rights of model aircraft fliers.
- Negotiates for radio frequencies. In the 1970's the NZMAA obtained the frequencies currently used for remote control.
- Negotiates on behalf of clubs for acquisition or retention of flying sites. There have been many instances where a reluctant local Authority has suddenly changed attitude when the National Organisation becomes involved.
- Assists groups with guidance and information in 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.
- Publishes a regular magazine (The Flier's World) sent to all members, giving up to date news reports on events, developments around the country and coming activities.
- Is affiliated to the Federation Aeronautique International through associated membership of the Royal New Zealand Aero Club which gives us an International voice and allows selected members to represent NZ to complete in international events.
- Promotes regular regional meetings, rallies and decentralised contests through the year and National Championships in the Christmas/New Year period.
- Assists clubs in coordinating their activities and provides a national forum for discussion and solution of common problems.
- Provides third party insurance cover of $2,000,000 for all members.

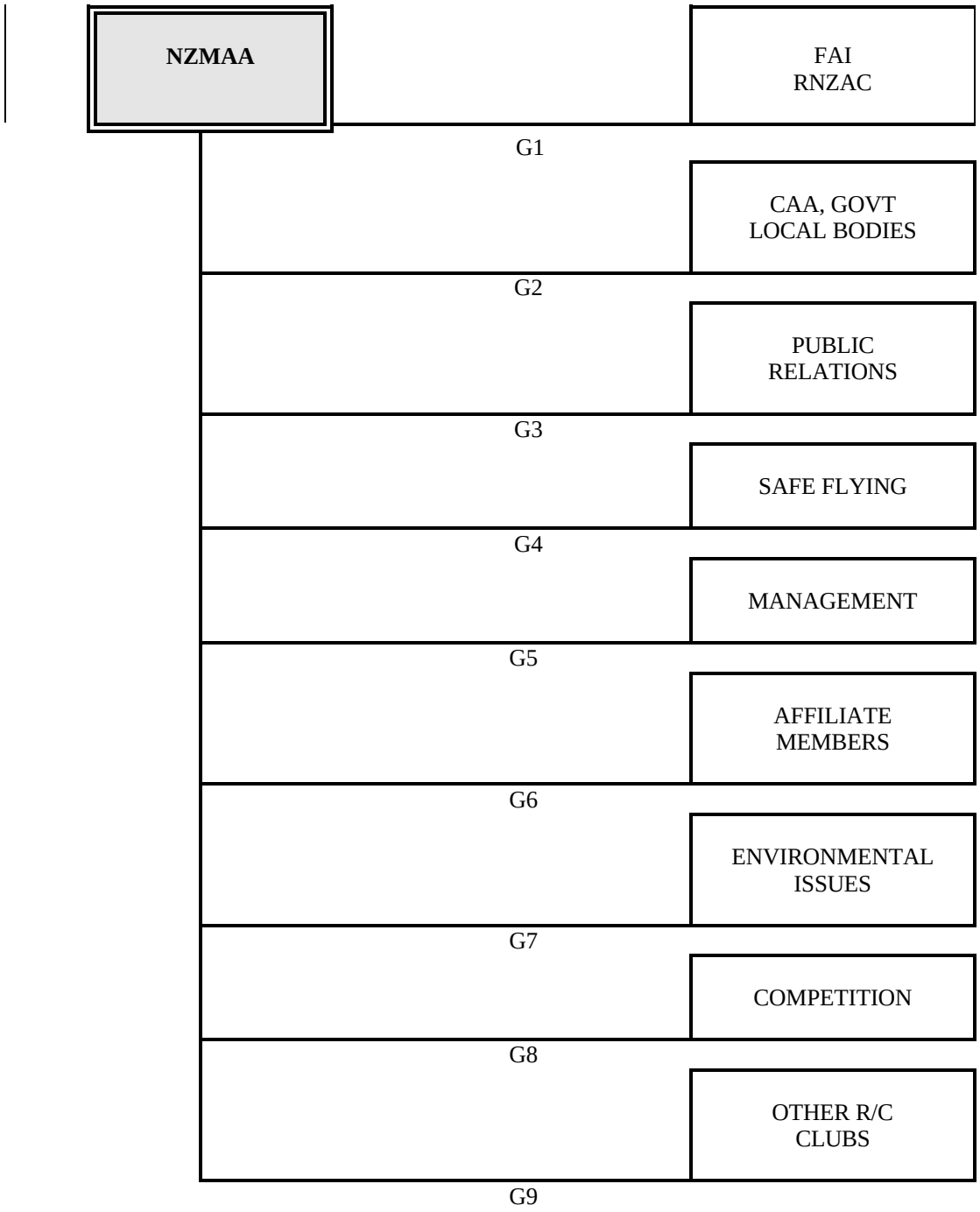
How the NZMAA is Organised

The NZMAA is governed by a nationally elected Council of Management with a President, Vice President, Secretary, Treasurer, Competition Manager, and five Area Councillor who liaise with clubs in their area and represent their views at Council meetings. In addition there are eleven Special Interest Groups who make and control contest rules, select International teams, and organise rallies and competitions for their various categories of model flying.

The Association's Goals

***MISSION**: To encourage, foster and coordinate the sport of aeromodelling in New Zealand*

Strategic Model:



GOALS

G1**.** Foster a close association with the RNZAC (and hence FAI) and other overseas Model Aviation Bodies and coordinate a close relationship with clubs of like association.

G2. Maintain good liaison with Government Departments and Local Authorities to ensure that the Sport is recognised and facilitated. Monitor Rules and Regulations to ensure that the sport is not disadvantaged or over regulated by Laws and Rules.

G3. Pursue an active public relations policy by actively promoting the Association and the Sport of Model Aviation within the Association's resources.

G4. Set guidelines for the safe operation of model aircraft to be followed by all clubs and members in their normal flying activities.

G5. Manage the affairs of the association in a versatile and efficient manner to the satisfaction of members.

G6. Meet the needs of the membership.

G7. Address the environmental issues concerning noise, pollution, and the safe flying of model aircraft near residential areas and the public.

G8. Promote and encourage competition at International, National and Regional level.

G9. Foster relationships with National Bodies of other similar interest groups.

NZMAA Back-Up

Whatever your model flying interest you will find the NZMAA willing to act on your behalf. The CAA rules for operating models in NZ airspace were finalised after representations from the Association. If your model flying takes place in the local park or on a farm, the NZMAA may have already helped with negotiations between the local Council or with property owners ensuring that all types of model aircraft have the best and safest possible facilities. If you fly R/C aircraft, the Association has already been of help to you, possibly even before you knew it existed, e.g. the NZMAA obtained the current frequencies and is at present working actively to retain and expand them.

Responsible Flying

Your enjoyment of model flying depends on developing a highly conscious 'safety first' attitude both towards your equipment and the flying site you use. Members must at all time fly within the rules and height restrictions set by the CAA and under Local Body noise control regulations. In this Handbook we have listed Safety Guidelines for you to follow. The best publicity model flying can receive is through our members compliance with these rules and guidelines, and in displaying a responsible attitude.

National and International Standing

The NZMAA is affiliated to the Royal New Zealand Aero Club (RNZAC), who recognise it as being responsible for all aspects of international class (FAI) competition model flying in New Zealand. This is an identical situation to, for example, the New Zealand Parachute Association or the New Zealand Gliding Association. Through the RNZAC, the NZMAA is thus the accredited representative organisation for the sport in the NZ by the Federation Aeronautique Internationale, (FAI), which is the world-wide governing body for all forms of sporting aviation, including model flying.

The FAI has numerous international committees relating to its various interests, such as gliding aerobatics, ballooning, space, and model flying. The CIAM is the FAI Models Commission responsible for our sport. The NZMAA makes its contribution to the work of the CIAM through a representative resident in UK. The benefits of our FAI and RNZAC memberships are two-way. We can learn much from the problems of model fliers in other countries, as well as giving them the benefit of our own experience.

It has been through this FAI affiliation that New Zealand has been represented with credit at many World and International Championships over the past 60 years and set significant World Records. NZ fliers are held in very high regard in a number of disciplines and the Association encourages participation at these top levels. Teams to fly in World and International Championships are selected by our Special Interest Groups who also organise International events here in NZ.

Flying Site Negotiations

The NZMAA has assisted many clubs in negotiations over flying sites with local government authorities and has the expertise and many years of experience to offer. The Secretary, with the assistance of members experienced in such dealings, provides the assistance and advice to the clubs. The Secretary is able to supply a booklet on the subject. Experience shows that the National bodies can, by early involvement, be instrumental in obtaining and retaining the use of flying fields while other independent action, in some instances, succeeded only in the withdrawal of flying facilities for everyone. The moral is clear - use the experience available through the NZMAA.

What your Subscription is spent on

The NZMAA's main expenditure is the magazine "The Flier's World" which is published five times a year and sent to all members. This accounts for 40% of the annual expenditure. The remaining expenditure is divided approximately equally between accounting, membership and secretarial fees (20%) general expenses, insurance and administration (20%), and the Annual General Meeting and Council Meetings (20%). Competition expenses are not charged against subscriptions, income for competitions being derived mainly from National Championship entry fees.

Chapter 2

INSURANCE

As a member, you are covered for third-party Insurance.

Cover

From the time members pay the NZMAA affiliation fee to the club secretary, they are fully covered by the Association's third party insurance policy. It covers the entire normal and lawful model flying pursuits of Association members and presently provides third party cover up to $2,000,000 per claim. Like all insurance policies, an excess does apply and provided you were complying with all the relevant regulations, rules and conditions at the time of the accident, the Association will contribute towards the cost of the excess. At present the Association pays 50% of the excess. As the excess is liable to change, you will need to contact the Secretary to obtain the current cost.

It is necessary that you fly your model on a site ***approved by your club*** for you to be covered. If you wish to fly on a private site advise your Club Secretary or, in the case of Lone Members, the Secretary of the Association. Claims must be lodged by your club Secretary through the NZMAA Secretary. In general, the policy covers members whose flying activities cause accidental damage to third-party property.

In the event of an accident:

1. DO NOT accept liability.
2. Obtain the following details:
   - Name, address and telephone number of the person whose property has been damaged
   - If they are insured, the name of their insurance company.
3. Make a note of the following:
   - Description of the property damaged.
   - Date, time and location of the incident.
   - Description of the amount of damage caused.
   - Name and address of any witnesses.
   - Draw a sketch and write down the details of how the accident occurred.

The name of our current Insurer is available from the NZMAA Secretary

To make a claim:

- Contact your club Secretary who will assist you in making the claim and pass all the information on to the NZMAA Secretary.
- The NZMAA will contact the Association's Broker who will process the claim with our Insurance Company.
- The NZMAA Secretary will contact you as to the acceptance/rejection of the claim and advise the amount of your contribution to the excess.

Chapter

3

CONTEST and RALLY FLYING

An overview

The Contest Scene

The NZMAA on your behalf 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 The Flier's World and in the Calendar of events published each December. Newcomers are always welcome and are encouraged to participate. For many, 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. It will also give you the opportunity to see some of the country's best models and fliers 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.

Rallies

As well as formal competition the NZMAA fosters the many rallies that are organised by clubs and other groups around the country every year. These events may have a minor competitive aspect, often a novelty event, but are primarily to allow modellers to get together to discuss each others models and have an enjoyable days flying. Often a rally will place emphasis on a particular type of model (large models, war birds etc) to add to the days enjoyment. Your NZMAA membership entitles you to fly at any Club rallies but note that you must comply with the host club flying rules at their event.

National Decentralised Contest

You do not need to travel outside your own area to participate in nation-wide contests. The NZMAA holds several National Decentralised Contests (NDC). Each year the NZMAA Recording Officer in conjunction with the Special Interest Groups produces an NDC Contest Calendar that is published in The Flier's World. Results are also published in the Flier's World and the NDC Champion Club and NDC Champion Open and Junior Modeller awards are made are the Nationals.

Nationals

The first National Championships were in 1948 and have been held every year since over the Christmas/New Year period. There are over 60 events in all flying disciplines with some special events for Junior (under 18) fliers. Both highly competitive and fun-fly events are held. Nationals are a great opportunity to take the whole family on a modelling holiday and to have a close look at other flying disciplines. The individual events at the championships are run by the Special Interest Groups and are funded by entry fees. A rally day is also held at the Nationals to cater for Sport fliers and is used to promote model aviation flying to the public.

Records

National and World records are recognised for all types of Model Flying. NZ records are published biennially in the "Fliers World" but details of any records are always available from the NZMAA Secretary. Any member may attempt a NZ or World record. There are records for contest classes as well as "absolute" records such as R/C Speed, R/C Duration etc.

Special Interest Groups

Contest organisation is the responsibility of the Special Interest Groups (SIGs) of the NZMAA, and the rules for the various types of flying are available from the NZMAA Secretary and the SIGs. The groups also select teams to represent New Zealand at Trans Tasman and World Championship events that are held regularly in most disciplines. SIGs forward International rule change proposals, voting instructions and nominations for various FAI Committees via NZMAA Council to the FAI.

There are SIGs for:

Free Flight, Control Line, Vintage, Large Model & Sport, Pattern, F/F and C/L Scale, R/C Scale, R/C Scale Aerobatics, Soaring, Pylon , and Helicopter

Special Interest Group details are listed in the front of each 'Flier's World'

Chapter

4

SAFETY

A Summary of Flying Safety Regulations and Guidelines

Principles

Safety is an important issue for Aeromodellers, and it is *no accident* that a large portion of this handbook is about safety. Statistics and low insurance rates show that model flying is not a dangerous sport but, as with other sporting activities, hazards can arise if common sense rules are not adopted and applied.

This complete chapter is designed to make you aware of SAFETY. 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. You must have a commitment to the safest reasonable operation of model aircraft at all times.

New Zealand has rapidly grown into a very intolerant society, and there are sectors in the community that do not like to see others having fun and relaxation and may conceivably pose a safety threat or noise intrusion into the complainant's environment. Safe operation is therefore vital to avoid the imposition of unreasonable rules and regulations from groups and authorities that see modellers as a threat.

The NZMAA 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.

This and the 'General' section have a number of important safety principles that will assist all modellers to operate safely. Specific sections follow on: Free Flight, Control Line, Radio Control, R/C Gliders, Electroflight, Large Models and Turbojets.

General

a) All members must at all times actively seek to identify aeromodelling hazards and reduce or eliminate them.

b) No modeller is to wilfully or negligently cause or permit a model aircraft to endanger any person or property.

c) No modeller is to do or say anything that would make another modeller perform any unsafe act.

d) All model aircraft ***must*** be flown in accordance with CAA Rules Part 101. If you cause an accident whilst in breach of CAA Rules, you may be deemed to be criminally negligent. In particular, no person is to fly an R/C model within 4 km of a licensed airfield without either being qualified as proficient under the NZMAA wings badge program, or being under the direct supervsion of a badge holder or NZMAA approved Instructor. Further details of the CAR 101 are contained in Annex A (Note that CAA rules do not apply to models below 100 g, and any pilotless aircraft over 25 kg is not a model, but is considered to be a full-size aircraft).

e) Any model weighing between 15 and 25kg requires an NZMAA Permit to Fly and must meet the extra requirements of the 'Large Models' section of this Chapter.

NOTE: An NZMAA "Permit to Fly" is required for models with an AUW between 15 and 25kg and for turbojet powered aircraft with a static thrust of over 10kg.

f) No modeller is to operate a model while being legally intoxicated with drugs, alcohol, or any other substance.

g) No modeller is to operate a model: higher than the maximum permitted height for that site (Generally this will be 400 feet, but check with your local rules), further away than safe control can be maintained, in cloud, or outside the legal hours of daylight. CAR 101 specifies further meteorological limitations.

h) 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. The minimum requirements are detailed in the NZMAA Club Manual.

i) Local club regulations and rules must be followed at all times.

Free Flight

In addition to the 'General' section, 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 down wind 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 dethermaliser is used a snuffer tube must be used and extreme care should be exercised when lighting the fuse.

e) Flying surface alignment, dethermaliser operation and any automatic systems must be checked for correct operation before release.

Control Line

In addition to the 'General' section, the following requirements apply to the operation of all C/L model aircraft.

a) Steel lines, preferably stranded and of sufficient strength for the C/L model being operated, must be used.

b) Before every flying session 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. 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 is there is an immediate risk of collision between the model and a person.

Radio Control Models

In addition to the 'General' section, the following requirements apply to the operation of all R/C model aircraft.

a) Only the frequencies specified in the NZMAA R/C Frequency System (Annex B) may be used, and transmitters must comply with RFS27 or RFS29 specifications. A system of frequency control similar to that in Annex B must be used.

b) R/C sites must be at least 8km from each other to avoid interference

c) Batteries. Many R/C equipment "defects" are caused by faulty batteries, connecting wires or switches. Battery failure will almost 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:

   i) must ensure all batteries are fully charged before flying;

   ii) should use a monitor to check battery condition and/or a battery backup;

   iii) should use batteries less than 5 years old;

   iv) should cycle batteries at regular intervals, not exceeding 12 months; and

   v) should take care to detect the early stages of "black wire" corrosion.

d) No R/C model is to be flown without a ground range test before the first flight of a new or repaired model, or after the RC equipment has been repaired or modified.

e) Each club is to produce a map for its members that shows:

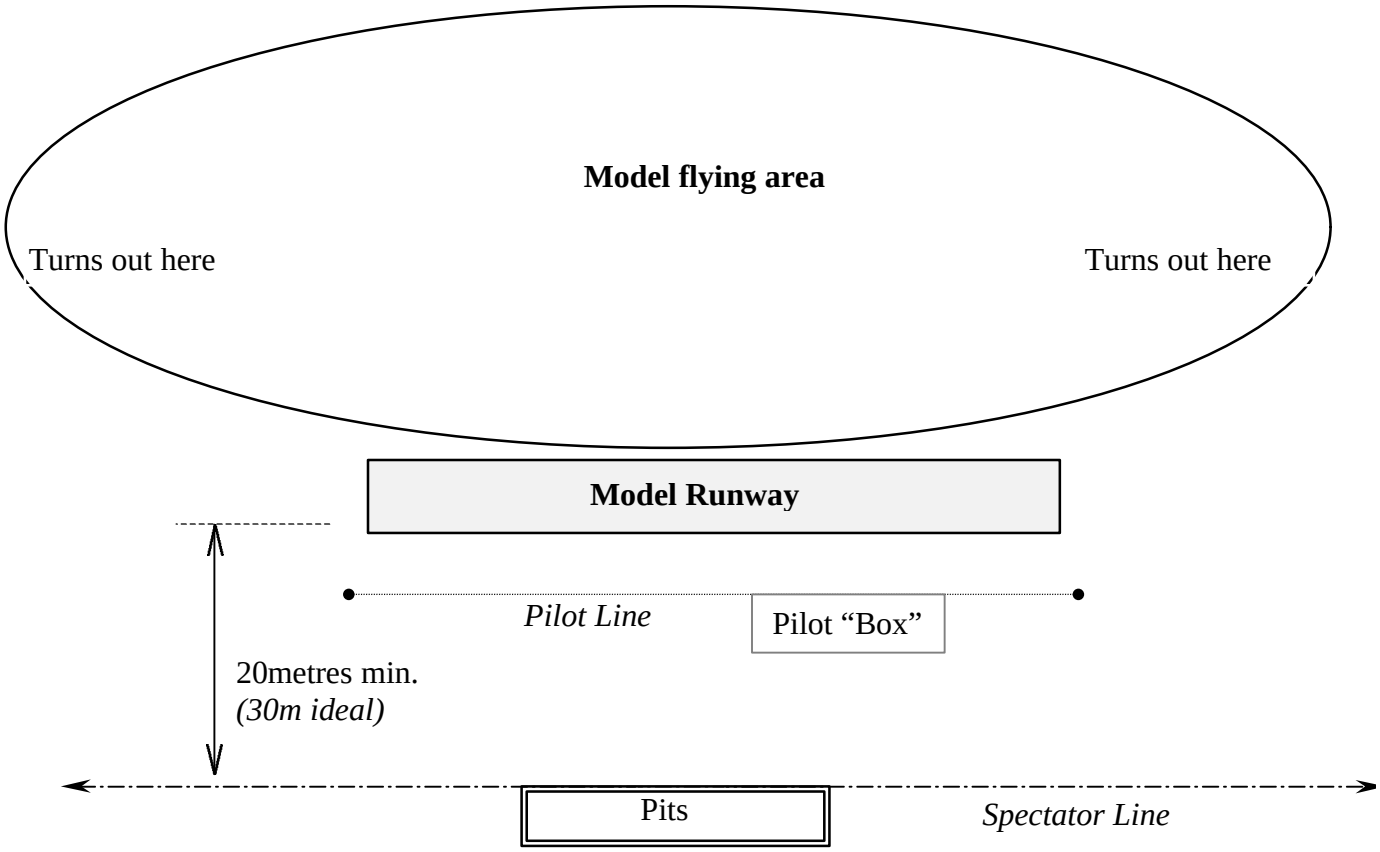
   i) The Flying Area reserved for R/C flying. The area should ideally be at least 300 meters by 100 meters and be clear of all buildings, people and car parks

   ii) No-Flying Areas for R/C models. These include the Pits area, spectator areas, houses, buildings, approach roads, overhead wires and cables and any other areas the land owner or manager has specified.

   iii) The Pits Area: An area where models are stored between flights and where maintenance and start-up procedures are normally carried out. The pits area should be behind a line at least 20m (an absolute minimum), and preferably 30m from, and parallel to, the side of the runway being used for R/C. Where the 20 meters separation cannot be met, a barrier at least 1metre high should be placed next to and in front of the pits to prevent a model on or near the ground entering the pits from the flying area.

iv) Spectator Line(s): A line, or lines, established at least 20m from, and parallel to, the side of the runway being used for R/C models. The line(s) should extend at least 150m past either end of the runway. When Large Models are being operated, at least 30m distance should be provided and preferably more to increase the safety margin.

v) Pilot Line(s): A line(s) established between the runway in use and the spectator line, behind which R/C models must not be flown. This line shall bound an area where pilots are to stand in a relatively closely spaced group while operating their models.



R/C Gliders

In addition to the 'General' and the 'Radio Control' sections, the following requirements apply to the operation of R/C gliders.

a) Launching. Designated areas for launching should be allocated for winch lines, hi-start positions and hand tow. Space between winch lines should be three metres. Hi-start anchors and, particularly, turn-round pulleys and must be very securely staked. Remember that the strain on a turn-around is *twice* the line tension. Hi-starts should be given maximum space and restricted to no more than three per contest, to prevent tangles. Launching preparations must include a control check for full and free movement and in the right sense. A final check of the flight path and airspace for other users should be made before release of the model. Flying models have right of way over launching models.

b) Flight. A clearway of 5 metres width should be provided behind the launch line to allow a passageway for fliers moving to the landing areas. Flight over cars and preparation areas should be treated with *extreme* caution with at least 10 metres of height being available. Local restrictions on flying over hangars, houses, etc. must be well defined, advised to all participants, and complied with.

c) Landing. Pilots must stand in an upwind position well clear of the landing spot and not to impede the landing of another model. Landing spots should be approximately 30 metres clear of the winch lines and launching area, having due regard for fences, trees and other obstructions and allowing an unimpeded approach without airbrake devices being deployed.

d) Slope Soaring. Slope Soarers must not be flown in the same airspace as manned aircraft. Particular care should be taken when sharing a slope site with non-NZMAA fliers, who may be unaware of the importance of Frequency Control.

Electroflight

The following additional requirements apply to the operation of Electroflight models:

a) Use a foolproof system for fast charging batteries. Overcharging at high currents will ruin the battery cells and may cause them to explode. Use a charger with a timer or a temperature or voltage controlled cut-off.

b) Check the motor operation does not interfere with the R/C equipment in the model. Range checks with the motor off and with it on will highlight any problems.

Helicopters

It is emphasised that model helicopter flying needs a higher degree safety awareness than perhaps any other model type. The following additional requirements apply to R/C model helicopters:

a) A helicopter must never under any circumstances be flown or run up:

   i) with metal rotor blades;

   ii) with sharp leading edges on main or tail blades;

   iii) with unproven radio equipment;

   iv) within 10 meters of spectators;

   v) in any fashion that might endanger spectators;

   vi) in the presence of spectators or at a competition, until properly tested and proved airworthy;

   vii) until thorough maintenance checks are carried out as set out in b) and c) below; or

   viii) with a receiver battery pack which is not of welded or soldered construction.

b) Checks before daily flying session:

   i) check all ball links for wear;

   ii) check all main and tail rotor blades for damage, check root at blade pivot hole and check tip weight installation;

   iii) check for signs of loose or missing nuts and bolts;

   iv) check main drive system for integrity;

   v) check servos secure and for correct operation;

   vi) check fuel tank and piping secure;

   vii) check receiver aerial in good condition with no chafing or damage;

   viii) check radio range; and

   ix) ensure batteries have been fully charged. (Helicopters place heavy demands on servos, so an on-board battery monitor is recommended.)

c) Checks before each flight:

i) If the helicopter on the previous flight suffered damage or a heavy landing, recheck all of b) above;

ii) check all controls before starting for correct operation, especially for binding links, or slowing of servos;

iii) check receiver aerial cannot become entangled with any moving or rotating part;

iv) at operating RPM, just before lift-off, check for correct operation of controls;

v) check for abnormal vibration, and eliminate before flight;

vi) check main rotor blades for correct tracking in hover.

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 trust is provided from a propeller driven from the turbine. This section does not cover rockets or pulse jets where a compressor and turbine is 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. Consequently, the following specific procedures and checks are required, in addition to those already covered, to ensure the safe operation of aircraft powered by these engines.

a) Turbojet models with static thrust over 10kg require an NZMAA 'Permit to Fly'.

b) Ensure that the turbine exhaust is always pointed into clear space of at least 5m. (Exhaust gas temperatures are typically in the range of 700-800 deg C, but this drops substantially 1 to 1.5 meters behind the engine.)

c) The turbojet engine is to be started with the model on an elevated platform (Starting Station), providing at least 700mm clearance from the ground, in order to avoid unconfined combustion, should it occur, igniting combustible material on the ground surface.

d) A fire extinguisher must be available at the Starting Station at all times.

e) Prior to fuelling, fuel systems must be checked for signs of damage or leaking, and any damage or leaking eliminated.

f) The fuel tanks must be isolated from the engine while filling takes place to prevent an accumulation of unburned fuel in the engine.

g) The fuel system must be checked for leaks again after filling and any leaks eliminated prior to starting,

h) The engine designer or manufacture's instructions for refuelling and operation of the engine must be used as a minimum. The operator of the engine must be able to validate the procedures used by reference to specific documentation.

…and, for LPG (propane) fuelled engines only:

i) Because of the nature of LPG, models fuelled with it should be refuelled and started at a starting station located at least 10m from the pits, spectators, vehicles, and buildings. Only pressure vessels supplied, or approved, by the engine manufacture specifically for the fuel used may be utilised.

j) The fuel supply must have a positive shut-off, operable from the transmitter, and independent of the throttle.

PRE-FLIGHT AND SAFETY CHECKS

Large R/C model aircraft must be built and operated to higher standards than small R/C models. The following checks must be made in addition to those already covered in the 'General' and the 'Radio Control' sections:

Daily Checks:

a) There are no visible external signs of damage, warps or loose covering.

b) The engine can be stopped from transmitter.

c) All wing attachments are secure.

d) All aileron hinges in the wing are secure.

e) All control links in the wing are secure and keepers fitted to all clevises.

f) All wing controls have free movement.

g) All elevator hinges are secure.

h) All elevator control links are secure and keepers fitted to all clevises.

i) The elevator controls have free movement.

j) The rudder hinges are secure.

k) All rudder control links are secure and keepers fitted to all clevises. The rudder controls have free movement.

l) All bracing wires, if fitted, are secure.

m) The canopy, or windscreen, is secure.

n) All wheels, and the landing gear, are secure.

o) Radio control batteries are fully charged and their capacity or voltage under a load has been checked.

p) All radio control equipment is mounted securely and the connections (plugs and sockets) have keepers to ensure they cannot become disconnected.

q) The fail-safe system, if fitted, operates correctly. The recommended minimum fail safe operation is for the throttle to be closed to a low throttle setting if the radio control link fails.

r) The battery backup system (if fitted) is operational.

s) The radio control system checked for ground range.

t) The radio control system checked with the motor running.

u) Just before take-off check again that all controls operate in the correct direction.

Between Flight Checks:

a) If the aircraft has suffered damage, or a heavy landing, all checks listed above must be repeated.

b) Check all controls before starting the engine, especially for binding control links or slowing of servos.

c) Re-check all controls for correct operation at high engine speed.

d) Check that battery capacity or voltage under load is greater than the minimum for safe radio control operation before takeoff. The use of a "Go", "No Go" tester is considered to be a sufficient test method.

Chapter

5

MODEL SPECIFICATIONS

Limitations and Definitions that apply to all Models

General

CAA Rules 101 (Annex A) give some definitions and limitations on model aircraft. In addition to those, the following rules apply to all models, whether contest or sport:

Maximum flying weight with fuel	15kg
Maximum wing area	500 sq.dm.
Maximum wing loading	250 g/sq.dm. (82oz/sq.ft.)
Maximum swept volume of piston motor(s)	250 cc
Maximum Static Thrust for Turbojets	10kg

Exceptions:

Large Models(weighing more than 15kg but less than 25kg), Turbojets with more than 10kg thrust, or models with piston motors over 250cc may fly only if they have an NZMAA "Permit to Fly". Permits can be obtained from the Large Model and Sport Technical Committee after the model has been cleared by an NZMAA Inspector.

Note: Models in excess of 25kg all-up-weight are classified as pilotless aircraft and require the authority of CAA. Details may be obtained from the Large Model and Sport Tech Committee.

Definitions

The following definitions are in addition to those in CAR101(Annex A):

1) **Control Line** Flight during which the model aircraft is aerodynamically manoeuvred 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. No other means of controlling the model or the motor may be employed during the take-off and flight, except that exercised by the pilot through the line or lines.

2) **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.

3) **Free-Flight**. Flight during which there is no physical connection between the model and the competitor or the competitor's helper.

4) **Gliders** Model aircraft which are not provided with a propulsive device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed except for changes in camber or incidence during flight.

5) **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). Fixed horizontal supporting surfaces up to 4 percent of the swept area of the lifting rotor(s) are permitted. A fixed or controllable horizontal stabiliser of up to 2% of the swept area of the lifting rotor(s) is permitted. Ground effect machines (hovercraft), convertiplanes or aircraft that hover by means of propeller slipstream(s) deflected downward are not considered to be helicopters.

6) **Scale** A scale model is a replica (miniature copy) of a heavier-than-air man carrying aircraft.

7) **Surface Area/Wing Area** Except when specified as 'wing alone' the “surface area” and “wing area” is the same thing and includes the total surface of the wings (mainplanes) and the horizontal or oblique stabilisers (tailplanes). The areas taken for calculation are the orthogonal projections to a horizontal plane in a position of horizontal flight. When wings or stabilising surfaces are built into the body of the model, the surface taken into account includes that area contained within the normal contours of the flight surfaces extended so as to meet the plane of symmetry of the model. For Vintage Models, special calculations apply - see the vintage rules

8) **Weight** The weight taken to determine minimum loading and minimum weight is that of the complete model less fuel. The weight taken to determine maximum loading and maximum weight is that of the complete model in flying order with fuel at the moment of departure.

Annex

A

Civil Aviation Rules Part 101

These Rules apply to all Model flying in New Zealand

Introduction:

The following is extracted from the CAR 101 Subparts A and E. More detailed excerpts are in the NZMAA Club Manual. The CAA Director has certified the NZMAA as an *"approved model aircraft association"* in the terms of these rules.

Subpart A – General

101. 3 Definitions

Aerodrome means any aerodrome that is promulgated in the current Visual Flight Guide of the NZAIP:

Controlled Aerodrome means an aerodrome at which air traffic control service is provided to aerodrome traffic:

Control line model aircraft means any model aircraft primarily controlled in flight by a single or multiple wire system operated by the person flying the aircraft and restricted to circular flight about a central point:

Free flight model aircraft means a model aircraft with a maximum wing loading of 62 g/dm² (20oz/ft²), with a flight path that, once launched, is uncontrollable:

Model aircraft means a pilotless aircraft with a gross mass of between 100g to 25kg and includes-

1) Control line model aircraft:

2) Free flight model aircraft:

3) Radio controlled model aircraft:

Radio controlled model aircraft means a model aircraft that is primarily controlled by radio signals from a remote transmitter being operated by a person:

Shielded operation means within 100m of a structure and below the top of the structure.

101. 9 Low flying areas

A person shall not operate a…model aircraft… within a designated low flying area prescribed under Part 73.

101. 11 Controlled airspace

A person shall not operate a…model aircraft…in controlled airspace without prior authorization from the ATC unit responsible for that airspace.

101.13 Hazardous operations

A person shall not operate a…model aircraft…in a manner that creates a hazard to aircraft or to persons or property.

101.15 Dropping of articles

A person operating a…model aircraft…shall not allow any object to be dropped in flight if such action creates a hazard to other persons or property.

Subpart E – Model Aircraft

101.201 Applicability

This Subpart prescribes rules governing the operation of model aircraft.

101.203 Control line model aircraft

No person shall operate a control line model aircraft with a single or multiple wire system longer than 30 m.

101.205 Aerodromes

(a) With the exception of a control line model aircraft, no person shall operate a model aircraft on or within 4 km of-

(1) an uncontrolled aerodrome, unless-

(i) it is undertaken in accordance with an agreement with the aerodrome operator, **and**

(ii) in the case of a free flight model aircraft, it is launched downwind of an active runway, **and**

(iii) in the case of a radio controlled model aircraft, it is operated at a height not exceeding 400 feet AGL, and each pilot has an observer in attendance while the model aircraft is active in the air; **and**

(2) a controlled aerodrome, unless it is operated in accordance with an authorisation from ATC; and

(3) any aerodrome, unless-

(i) the person is the holder of, or is under the direct supervision of the holder of, a pilot qualification issued by a model aircraft association approved by the Director; **or**

(ii) the person is under the direct supervision of a person appointed to give instruction in the operation of radio controlled model aircraft by a model aircraft association approved by the Director.

(b) A person shall not operate a model aircraft-

(1) on or over any active aircraft movement area of an aerodrome; **or**

(2) on or over any active runway strip area.

101.207 Airspace

Each person operating a radio controlled model aircraft more than 4 km from an aerodrome boundary and above 400 feet AGL shall ensure the operation remains clear of Class C, D, or E airspace and shall-

(1) operate in a danger area designated for that purpose under Part 73; **or**

(2) provide the following information to the New Zealand NOTAM office, at least 24 hours before the operation:

(i) their name, address, and telephone number:

(ii) the location of the proposed operation:

(iii) the date and time and duration of the proposed operation:

(iv) the type and number of aircraft:

(v) the maximum height AGL proposed for aircraft operation.

101.209 Meteorological limitations

Except for control line model aircraft, a person shall not operate a model aircraft-

(1) in any area where the ground visibility is less than 3 km; or

(2) in any area where the cloud base is at a level where a model aircraft is unable to be operated-

(i) in sight of the operator; and

(ii) beneath the cloud base at all times.

101.211 Night operations

With the exception of control line model aircraft, a person shall not operate a model aircraft at night unless the operation is-

(1) indoors; or

(2) a shielded operation.

101.213 Right of way

Each person operating a model aircraft shall ensure it gives way to, and remains clear of, all manned aircraft on the ground and in flight.

101.215 Radio controlled model aircraft

A person shall not operate a radio controlled model aircraft with a gross mass of between 15 kg and 25 kg unless the aircraft is constructed and operated under the authority of a model aircraft association approved by the Director

Annex

B

FREQUENCY CONTROL SYSTEM

System Components

The NZMAA radio frequency control system consists of four major components:

(a) Frequency Control Board. (Channel Control Board). The radio frequencies are to be clearly designated by Channel Number and frequency on the Channel Control Board. Adjacent to each Channel Number is provision for the storage of either a Channel Peg or a Personal Peg.

(b) Channel Pegs. Channel Pegs shall have 20 by 50 mm labels with the Channel Number indicated by black lettering on a yellow background.

(c) Personal Pegs. Personal Pegs shall have 20 by 50 mm labels with the operator's name printed in red on a white background.

Personal Pegs should normally be kept on a pilot's R/C transmitter or flight box.

(d) Transmitter Flags. Transmitter Flags should be at least 65 by 95 mm and display the channel number in black 40mm minimum height lettering on a yellow background. The frequency may be printed in smaller numerals on the bottom of the flag. Regulation flags are available from the NZMAA Secretary.

All transmitters in use should display the appropriate channel flag, preferably attached to the aerial.

System Operation

(a) An operator removes the appropriate Channel Peg from the Frequency Control Board and replaces it with his Personal Peg before using that frequency. (This shows that a given frequency is in use and also who is operating on it.) The Channel Peg is attached to the operator's transmitter.

(b) After a flight is completed, the Personal Peg is removed from the Frequency Control Board and replaced by the Channel Peg. Operators are responsible for ensuring that this exchange is made promptly.

Channels

Channel Number	Frequency
1	26.995
2	27.045
3	27.095
4	27.145
5	27.195
6	27.245
10	29.725
12	29.745
14	29.765
16	29.785
18	29.805
20	29.825
22	29.845
24	29.865
26	29.885
26	29.905
30	29.925
32	29.945
34	29.965
36	29.985
38	35.450
39	35.550
40	35.650
41	35.750
42	35.850
43	35.950
44	36.050
45	36.150
46	36.250
47	36.350
48	36.450
49	36.550
81	40.510
82	40.530
83	40.550
84	40.570
85	40.590
86	40.610
87	40.630
88	40.650
89	40.710
90	40.730
91	40.750
92	40.770
93	40.790
94	40.810
95	40.830
96	40.850
712	72.030
714	72.070
716	72.110
718	72.150
720	72.190
722	72.230
724	72.270
726	72.310
728	72.350
730	72.390
732	72.430
734	72.470
736	72.510
738	72.550
740	72.590
742	72.630
744	72.670
746	72.710
748	72.750
750	72.790
752	72.830
754	72.870
756	72.910
758	72.950
760	72.990
762	73.030
764	73.070
766	73.110

Annex

C

R/C Proficiency Programme

The "Wings" Programme for basic R/C Flight qualification

1. Aim

1.1. To provide certification of a basic proficiency level for Radio Control model pilots enabling them to operate unsupervised. Pilots achieving the required level are entitled to wear the NZMAA 'Wings' badge.
1.2. To meet the requirements of Civil Aviation Rule 101 for flying within 4km of aerodromes.

2. Method

2.1. The NZMAA encourages all clubs to adopt this proficiency scheme and encourage all Radio Control pilots to obtain their "Wings".
2.2. Many club flying sites, rallies and contests are on or near aerodromes and this qualification is essential to fly at those sites. The badge provides ready proof of the minimum qualification.
2.3. Within 4km of an aerodrome trainee pilots must operate under direct supervision of a badge holder or an approved Instructor, and should not be considered safe to fly on their own until they have reached the wings standard. This procedure is also recommended for use away from aerodromes.
2.4. The badge doubles as a smart looking identification tag.

3. Examiners and Instructors

3.1. Examiners are to be proficient flyers, appointed by the club and would normally be an NZMAA approved instructor. Clubs must forward lists of approved instructors to the Secretary NZMAA for recording on the Association database. A booklet on Instructor requirements is available from the Secretary on request.

4. Qualification

4.1. There are six types of qualification:

S	Training/Vintage/Sport/Gliders	Low wing loading models
A	Pattern (Aerobatic) type. F3B gliders. Fan and Turbojet. Scale models with high wing loading.	Includes sport models of similar Wing loading.
F	Pylon. Speed.	
M	MANZ (Over 2m wingspan monoplanes & over 1.5m wingspan biplanes)	
L	Large models and pilotless vehicles as defined by CAA	Each pilot must qualify on each aircraft.
H	Helicopter	

5. Certification

5.1. The Wings badge and a laminated credit card sized Certificate of Proficiency, listing the type(s) of qualification, will be issued by the NZMAA. Applications must be made through Club Secretaries on the official form, signed by the examiner. There is a charge for the badge but the certificate or any alterations to the certificate will be free of charge.

5.2. The badge may have the club name at the top, the NZMAA wings in between, with the letters R/C in the centre, and the name of the pilot at the bottom. If specifically requested, the club name may remain blank.

5.3. All persons who qualified for their badge before October 1st 1997 may obtain an 'S' (or, if qualified on Helicopters, an 'H') rating certificate directly from the Secretary NZMAA on receipt of a stamped addressed envelope. For other ratings, application must be made through the Club Secretary on the official form.

5.4. The NZMAA will maintain a register of all certificate holders.

6. Testing Procedure

6.1. There are four parts to each wings test:

a) Pre-flight inspection of model.
b) Oral Test.
c) Pre-flight procedures test.
d) Flight Test.

6.2. Each part is marked on a pass/fail basis and total mastery is required to qualify.

6.3. Retesting is permitted. The examiner may decide if a retest can be carried out on the same day or if there needs to be some retraining or consolidation before the retest.

7. Pre Flight inspection of model

Check that:

a) All radio equipment is secured in the model and protected against engine vibration.
b) Pushrods, ball links clevises and other fittings are secure.
c) All controls are effective, check especially for binding links or slowing of servos.
d) Engine is mounted securely and propeller has no cracks or damage.
e) Wings are firmly mounted and any bracing wires secure.
f) There are no loose or missing nuts and bolts.
g) Receiver battery pack is suitable (single replaceable cells are allowable but definitely not recommended).
h) All hinged flying surfaces secure.
i) CG is in right position.
j) Critical structure is of adequate strength with no cracks or significant warps.
k) The radio and switch free of fuel and oil.

And for *Helicopters only* check that:

l) The gyro is correct and secure.
m) Wiring is clear of mechanics.
n) The receiver aerial is in good condition with no chafing or damage and aerial cannot become entangled with any moving or rotating part.
o) All main and tail rotor blades are not damaged, checking root at blade pivot hole and the tip weight installation.

8. Oral Test

The candidate must display a good knowledge of:

a) Local flying and field rules, for example flying times.
b) Local no-flying zones.
c) Emergency landing areas.
d) Maximum altitude.
e) Local maximum noise levels.
f) The frequency control system in use.
g) The importance of charged batteries.

9. Pre-flight Procedures check

The following checks must be made:

a) Correct frequency peg attached to transmitter.
b) Radio switches on, battery OK.
c) Basic Radio Range check (Tx aerial collapsed)
d) Check controls for full and free travel, and in the right sense.

And for Helicopters only:

e) Start engine, one hand holding rotor head.
f) Run engine up at least 10m from pits. Check blade tracking and vibration.

10. Flight Test

Following is a brief description of each manoeuvre required. Details of each test are in section 11.

10.1. Fixed Wing Powered Aircraft

a) Take off
b) Level flight
c) Procedure turn
d) Horizontal figure of eight
e) Left hand circuit landing approach
f) Overshoot
g) Right hand circuit landing approach
h) Landing, power on
i) Takeoff (within 15 minutes of landing)
j) Left hand circuit
k) Landing, power off

Note: In the case where flying strip or wind velocity prohibits actually landing off both a left and a right hand circuit approach, an overshoot may replace one of the landings.

10.2. Gliders

a) Launch (bungee, winch or hand tow)
b) Straight flight for 30 seconds, stall then recover to level flight
c) Procedure turn
d) Horizontal figure of eight
e) Right hand circuit landing approach
f) Landing within 10 metres of a spot
g) Relaunch (within 15 minutes of landing)
h) Demonstrate a series of four 180° U-turns over a 150metre course then land safely… **or** for 'A'-type (F3B) qualification:
i) Complete 2 rounds of F3B achieving one landing score of 35 or better, 6 Laps, and a speed run of 45 seconds or faster

10.3. Helicopters

a) 10 Second Hover
b) Hovering M
c) Tail in Circle
d) Take off, circuit and landing

11. R/C Proficiency Test Manoeuvres

It is important the pilot under test show complete control of the model throughout the test and that if at any time safe flying is compromised, the test is terminated.

11.1. RC Power

The pilot should safely start the model and deliver it to the take off point.

a) Take off

The model should stand still on the ground, with the engine running. The takeoff should be straight and into wind and conclude with a 90° turn

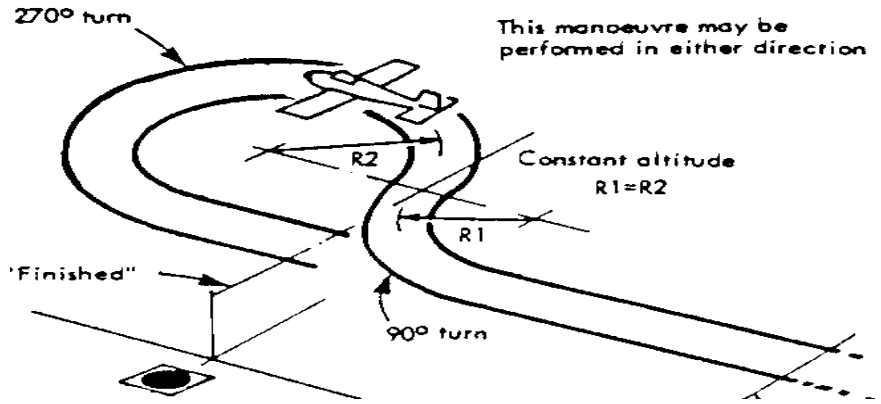
away from the pits. Some swing is acceptable as long as it is clear that the pilot has control over the model.

b) Level flight

The model should make a straight and level flight upwind of 100 metres or 10 seconds which ever is of least duration. The model should pass over the landing area or as directed.

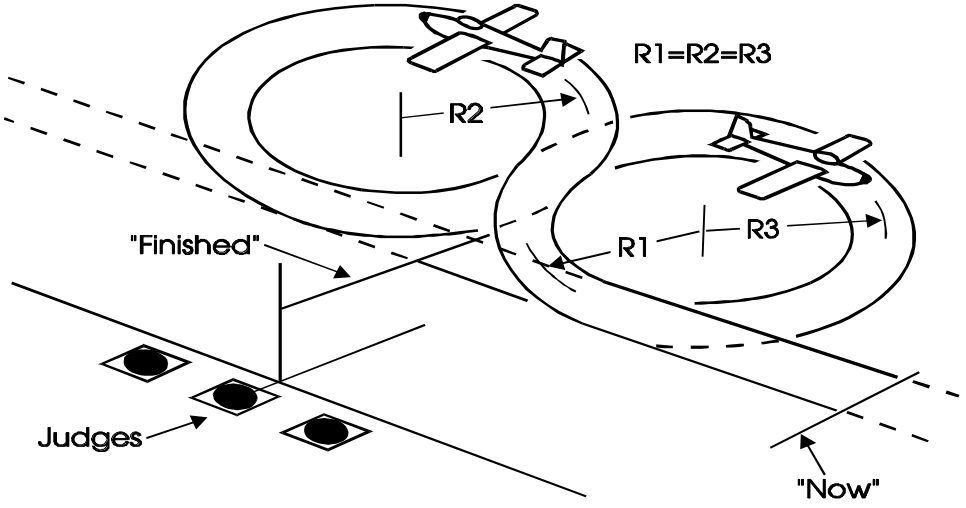
c) Procedure turn

Commencing from straight and level flight the model is turned 90° away from the pits, and then through 270° in the opposite direction resuming straight and level flight on the opposite heading to that of the entry. The manoeuvre must be commenced in order to place the point where the model changes from the 90° turn to the 270° turn on a line which passes through the centre of the landing area or as directed, at right angles to the direction of entry.



d) Horizontal figure of eight

Commencing from straight and level flight the model must turn 90° away from the pits, followed by a 360° turn in the opposite direction, followed by a 270° turn in the first direction completing the manoeuvre on the original approach line. The intersection (mid point) of the manoeuvre shall be on a line that is at right angles to the direction of entry and passes through the centre of the landing area.



e) Left hand circuit landing approach The rectangular approach is commenced with the model flying from left to right above the landing area followed by a 90° left turn, a crosswind leg, a second 90° left turn, a downwind leg, a third 90° left turn, final cross wind leg, a final 90° left turn, then a final descent towards a final touch down point. The model should commence descent no earlier than the downwind leg.

f) Over-shoot
The model approaches as for a normal landing, and over the landing area at a height of approximately 3 metres, power is applied and the model climbs straight ahead.

g) Right hand circuit landing approach
Same as the left-hand approach except that all turns are 90° to the right.

h) Landing, power on
The model approaches with power reduced to idle then rounds out smoothly, adopting the three point attitude applicable to the specific type and touches down with a minimum of bouncing and roll to a stop.

i) Takeoff (within 15 minutes of landing)
As **a)** above

j) Left hand circuit; and

k) Landing, power off
Power is cut to a low idle or complete stop when the model is overhead the landing area. A landing follows a rectangular approach with steady descent on each leg. Power should not be applied during the approach or landing.

11.2. RC Glider

a) Launch
Using bungee, hand tow or winch, the pilot must control the climb of the model without excessive weaving or stalling on the line then release smoothly into gliding flight.

b) Straight Flight & Stall
The model is flown straight and level in a prescribed direction for 30 seconds then stalled and recovered smoothly on the same heading as the straight flight.

c) Procedure Turn Same as in **11.1. c).**

d) Horizontal Eight Same as **11.1. d)**

e) Right Hand Approach; and

f) Landing
The rectangular approach is commenced with the model into wind above the landing area followed by a 90° right turn, a crosswind leg, a second 90° right turn, a downwind leg, a third 90° right turn, final cross wind leg, a final 90° right turn, then a final descent towards a final touch down point. The model must come to rest upright, complete and within 10 metres of a pre-determined spot.

g) Relaunch
Using the same launching method as before, the model must be airborne within 15 minutes of the landing.

h) Four 180° U-turns
Flying between two markers placed approximately 150 metres apart, the flyer must make four consecutive 180° U-turns over the markers, in either direction, with straight legs between the turns, then land safely. ***OR:***

i) F3B tasks (for 'A' Type qualification only)
Using the 1997 F3B course and flying rules, the pilot must fly two complete rounds, and in those rounds achieve one landing score of 35 or better, a speed run of 45 seconds or better and a distance run of 6 laps or better.

11.3. Helicopter

The flight test should be completed on a standard F3C competition square which is a 10 metre square with a flag at each corner and two central flags. The two central flags may be omitted for this flight test.

In the following sections, hovering the model at eye level means that the model's landing skids must be at the same altitude as the competitor's eyes.

For the first three hovering manoeuvres, the pilot must stand within a radius of 0.6 metres of one of the centre flags. The pilot must then stand in any position outside the square to complete the Take Off and Landing manoeuvre. The pilot may move between these two manoeuvres but not during them.

a) 10 Second hover
Model takes off from central helipad, climbs to eye level and hovers for 10 seconds. Model then descends to a landing on the central helipad.

b) Figure M
Model takes off vertically from central pad and stops at eye level. While maintaining a heading parallel to the examiner's line and a constant altitude, the model moves along a diagonal line to the left or right near corner flag and stops. The model then moves forward to the second corner, stops, then moves sideways to the third corner and stops. The model then moves backwards to the fourth corner, stops again, then proceeds to move along a diagonal line back to the central helipad where it stops again. The model then descends to land on the central helipad.

c) Tail In Circle
The model ascends vertically to eye level and stops. The model then flies in a circular path to the left or right while maintaining a constant altitude and distance from the pilot finishing back over the central helipad. The tail must always point towards the pilot. The model then descends to land on the central helipad. (Pilot then moves to a nominated pilot position outside the square)

d) Take off, circuit and landing
The model lifts off from the central helipad, rises, and accelerates to forward flight. The model then flies a circuit around two of the corner flags, descends, and decelerates to land on the central helipad. The model may fly around the pilot.

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