

CODE OF PRACTICE FOR THE SAFE OPERATION OF RADIO CONTROL SOARING MODEL AIRCRAFT

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Foreword

Members of the NZMAA Soaring Special Interest Group have prepared this Code of Practice and it is submitted in good faith to promote the safe operation of soaring model aircraft. The content of the Code is drawn from the collective knowledge of those individuals who have amassed significant experience in the building and operating of radio controlled soaring model aircraft.

Whilst every effort has been made to avoid errors and omissions, the authors cannot be held responsible for any and every eventuality arising from the application of this Code. The safe operation of any soaring model must remain the sole responsibility of the operator. The warnings, cautions and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors that cannot be built into model aircraft but must be supplied by the operator.

Definitions

Persons complying with the requirements of the Code must be aware that throughout the Code there are certain words which have specific meanings, defined as follows:-

must or shall - indicates an absolute obligation to comply. (There are no circumstances under which the requirement could be relaxed).

should - indicates an obligation to comply so far as is practicable but allows a relaxation of the requirement under exceptional circumstances. (There has to be a very good reason why the requirement is not complied with).

may - indicates a preferred course of action, based on collective experience. (Non-compliance is not expected to result in an unsafe situation)

Introduction

Radio controlled soaring models share many of the safety issues of powered model aircraft. Those people choosing a soaring model as an entry to the sport of radio controlled models should first make themselves familiar with these general safety issues, as detailed in Chapter 4 of the NZMAA Members Handbook.

Specific safety issues relating to soaring model aircraft in particular are as follows:

- a. Danger of structural failure during high stress tows
- b. Likelihood due to the generally streamlined design of the model of a high increase in speed before impact if the model becomes uncontrolled for any reason
- c. Danger of injury caused by the breakage of or caused by the towline itself.
- d. An increased risk due to the nature of competition landings and relaunches of being hit by a landing model
- e. A risk of injury caused by the winch or turnaround used to launch the model.

To prevent or minimise risk from all of these possibilities there are various approaches.

- i. Ensure that operators and pilots have a level of skill, knowledge and experience to enable them to avoid dangerous situations.
- ii. Ensure that failures and incidents happen as infrequently as possible by paying attention to reliability, model design, operational procedures and maintenance.
- iii. Provide fail-safe areas and mechanisms whenever practicable to ensure that most failures follow a "low risk" path.
- iv. Pay attention to where and when we fly to ensure the safety of people, property and the environment.

THE CODE OF PRACTICE**1. Design**

- 1.1 All soaring models, however designed and constructed, must be subject to testing before operation in flight to ensure that all components will sustain the expected stresses arising from the models operation.
- 1.2 Where a design has been published or a kit being manufactured commercially, no inferior materials should be substituted for those specified. Modifications to increase strength are permitted. Should the pilot have any concerns about the expected strength of repairs they should contact the STC for advice.
- 1.3 Pilots must ensure a new model is designed for the flights and launching method to be used. Advice may be sought from other operators of similar type to establish service reliability. New models should be examined carefully for manufacturing defects that could lead to structural failure, and if defects found, then have these assessed by the manufacturer or his agent to determine serviceability or repair/replacement.

2. Control systems

- 2.1 The pilot of the model is to ensure the integrity of control linkages before use.
- 2.2 Control linkages should be as short as practical and of a suitable stiffness for the expected flight loads, taking into account the type of model i.e. F3B, thermal, slope.
- 2.3 It is recommended that pilots use a voltmeter/load tester to ensure the on-board battery is suitably charged for the expected duration of the flight.
- 2.4 Faulty or incorrectly charged batteries cause more crashes than all other radio equipment failures. Transmitter and receiver batteries must be maintained in good condition and be correctly charged before use. It is recommended that rechargeable batteries be used.
Note: Some modellers consider it is prudent to replace battery packs after three or four years of use, even if they appear to be functioning correctly. This is supported by reliability theory and much experience.
- 2.5 Pilots are to check before flying each day that controls are moving freely in the correct direction.
- 2.6 Battery leads should be examined regularly to detect early stages of 'black wire' corrosion and should be replaced if any doubt exists as to the leads suitability.

3. Frequency Control

- 3.1 Every pilot intending to fly should provide him or herself with a standard NZMAA peg for use on the pegboard. The pilot's name should be clearly marked on the peg and may also include the frequency number.
- 3.2 When flying operations, or ground testing of radio equipment is in progress, the pegboard should be used, and must be used if more than three pilots are present and intending to fly. In informal gatherings such as on a slope site, pilots should check with other visible pilots and perhaps use pen/paper if numbers warrant it to keep track of frequency use if no peg board is available.
- 3.3 Each pilot must place his/her peg in the appropriate slot in the pegboard and remove the pegboards peg before switching on, and must ensure that his/her equipment is switched off before removing his peg.
- 3.4 Only the pilot him/herself, or a person he/she authorises, is permitted to remove a peg from the pegboard, except that a pilot's peg may be removed if, after a thorough investigation, those present agree that he/she is no longer at the field or in its vicinity.
- 3.5 All radio control equipment used at soaring events or clubs shall be operated in accordance with the NZMAA rules and on NZMAA approved frequencies. In addition it is recommended that radio systems be range checked:
 - a. Immediately after purchase.
 - b. When changing to a previously untested frequency.
 - c. Whenever there is doubt that they are functioning correctly.
 - d. After the radio equipment has been repaired or modified.
 - e. Before the first flight of each flying day.

Note:

Some modellers consider it prudent to replace receiver crystals after a crash even if the equipment appears to be functioning correctly.

- 3.6 For large events/gatherings the organisers should give thought to use of a controlled radio impound system.

4. Flying site

- 4.1 The pilot will not fly above 400ft from the ground within 4km of an aerodrome or above the altitude limit for the particular site, or at such a height or distance as renders the models attitude and speed difficult to detect, given due regard to weather conditions of the day.
- 4.2 The flying site for flat field flying should be laid out similar to that shown in Annex A, taking into account local rules and variations. Parking areas should where possible be located near natural shelter such as a tree line or power lines to discourage low flying over the area.

5. Launch Equipment

- 5.1. The pilot is to ensure winch drum diameter-enlarging devices if used are secure and will not fly off the drum.
- 5.2 Whilst retrieving launch lines during flying operations, the pilot/helper is to keep a look out for launching models and launch lines so that avoiding action can be taken if necessary
- 5.3 All winches, turn around pulleys, and the stakes used to secure bungee or hand tow lines, must be securely fastened to the earth during use.
- 5.4 Stakes used for the winch are to be a minimum size of 400mm x 10mm dia. for use on turnarounds and 300mm x 8mm dia. on the winch. At least 2 stakes are to be used on both turnaround & winch. More or longer stakes may be necessary if ground conditions are particularly soft. Bungees should also be secured using 400mm x 10mm dia. stakes with a minimum of 2 being used. Stakes meeting these rules are generally available from most camping stores.
- 5.5 Great care should be taken to ensure that no part of the body or clothing can become entangled in the rotating parts of a winch, or with the winch line itself, during launching or retrieval of winch lines.
- 5.6 The winch must be fitted with a physical method of quickly disconnecting the battery in the event of solenoid lock. i.e. quick release clamps or switch

6. Launching

- 6.1 Designated areas for launching should be allocated for winch lines, bungee positions and hand tow.
- 6.2 Space between winch lines for sport flying should be a minimum of three metres.
- 6.3 Launching preparations should include a control check for full and free movement and in the right sense.
- 6.4 Flying models have right of way over launching models.
- 6.5 Immediately before launch the pilot of a soaring model aircraft must check to ensure that there are no people or objects in, or dangerously near to, the intended path of the aircraft or towlines and that the model is switched on.

7. Flying

- 7.1 Pilots must maintain visual contact with their aircraft at all times.
- 7.2 Model aircraft must keep well clear of all man carrying aircraft.
- 7.3 Landings should be carefully planned, and be carried out at least 30 metres from the pits giving due regard to local obstacles such as trees, powerlines and fences.
- 7.4 For sport flying, pilots should stand upwind of the intended landing spot at least 15 metres
- 7.5 The pilot should use aerodynamic braking to lose excess height rather than high speed passes low over the field. The only high speed passes over the flying field permitted are those necessary in competition or for competition practice i.e. F3B speed runs
- 7.6 Models should not be flown over parked cars, spectators or pit areas below 10 metres in height. Landing approaches should take this into consideration. Local restrictions on flying over hangars, houses, etc. must be well defined, advised to all pilots, and complied with by all pilots. Pilots are to plan landing approaches to avoid flying over pit or parking areas.

- 7.7 When mixed operations, for example gliders and powered aircraft, or winch and aero-tow launching, are undertaken, the participants must agree on where each group shall be based, and the direction for launching and landing, so that each can operate without endangering the other.
- 7.8 Ideally, each club should produce a map to show its members safe flying areas, no-go areas and suggested pit locations.

8. Maintenance

- 8.1 As well as before flight checks, model owners should periodically inspect their models for fine cracks, delamination and other signs of extreme stress and rectify before flying again.
- 8.2 After a heavy landing, the model should be checked for damage including full movement of controls to indicate broken servo gears or loose hinges and cracked wing joiners etc. It may be necessary to disassemble a model for a full inspection

9. Operator Qualifications

- 9.1 No person shall undertake a flight, or other associated activity, for which he is not properly prepared and competent. If in doubt, seek help from someone with appropriate experience.
- 9.2 Operators of non-powered soaring models should have attained a recognised standard of flying proficiency (Wings Badge) before attempting to fly an aircraft unsupervised. Persons supervising flying activities must also be qualified to this standard.
- 9.3 Operators in NZ must comply with the requirements of the Civil Aviation Authority publication CAR 101 and the current issue of the NZMAA Members Handbook.

10. Slope Flying

- 10.1 As most slope flying sites are not controlled by clubs, the following are a guide to safe operation.
- 10.2 Slope soarers must not flown in the same airspace as manned aircraft (including Para gliders and Hang gliders)
- 10.3 All turns should be made away from the slope in a figure 8 pattern.
- 10.4 Frequency control on slopes can be difficult due to a relatively large number of non-NZMAA pilots. Care should be taken before turning on to check with all visible pilots as to what frequencies are in use. If in doubt, turn on the receiver only and watch for one minute to see if there is any movement that may indicate someone using your frequency before turning on your transmitter.
- 10.5 When flying on public slopes, be especially aware of spectators and do not engage in activities that may cause a model to hit or crash near the area where they are located.

Competition Specific points of note

Organiser responsibility

There is an issue with complacency within the flying fraternity, most of the pilots have been in the sport for a long time and take for granted that everyone is aware of possible risks or assume that all will be well, just like it was last time.

Organisers are to ensure that all competitors hold current NZMAA membership for insurance purposes and that they preferably hold a proficiency badge for the type of model being flown.

This is where it falls to the organisers, in particular the contest directors, to give a full safety briefing, and to make sure that any visitors to the field are aware of possible risks and precaution's that should be taken.

A safety briefing would need to include:

- * Launch safety procedures; including stop, look, and listen particularly for those who are down the winches retrieving towlines during a launch.
- * Safety zones.
- * No fly zones.
- * Correct use of the peg board and radio equipment.
- * Spectator safety.
- * The role of helpers/timers working as the eyes and ears for pilots whilst they are flying.
- * Equipment standards and suitability.

Personal responsibility

SOARING CODE OF PRACTICE

It is the pilots responsibility to make sure that;

- * Their models are sound, and suitable for the conditions.
- * Radio gear is in working order, eg no black wire disease etc
- * To make sure batteries are fully charged.
- * That, where used, clam shells are properly attached.
- * Winch gear is in sound condition and appropriately set-up and anchored.

It is the responsibility of all on the field to be aware of what's going on and to keep eyes and ears open at all times.

Suggested Field Layout (not to scale)

