

CODE OF PRACTICE FOR THE SAFE OPERATION OF CONTROL LINE MODEL AIRCRAFT

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Foreword

Members of the NZMAA Control Line Special Interest Group have prepared this Code of Practice and it is submitted in good faith to promote the safe operation of control line 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 control line 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 control line model shall 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 shall be understood by the operator that common sense and caution are factors that cannot be built into model aircraft but shall 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:-

'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

Control line models share many of the safety issues of powered model aircraft but these are generally limited to the flying circle area. All operators of control line models should make themselves familiar with the general safety issues, as detailed in Chapter 4 (Safety) of the NZMAA Members Handbook.

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

- a. Danger of structural failure during the high stresses of aerobatic manoeuvres or flying at high speed.
- b. Danger of injury caused by the breakage of the control lines or the release of the control handle.
- c. Danger of injury from rotating propellers.
- d. An increased risk to the helpers/pitmen in competitions of team race and combat due to the close proximity of flying models.
- e. A risk of injury if spectators walk into the flying circle.
- f. Dangers associated with filling tanks with fuel and mixing fuels.

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 control line models, however designed and constructed, shall be subject to testing before operation in flight to ensure that all components will sustain the expected stresses arising from the model's operation.
- 1.2 Where a design has been published or a kit been manufactured commercially, no inferior materials or techniques should be substituted for those specified. Modifications to increase strength are permitted, but unless you have a rudimentary engineering knowledge be careful that such changes do not simply cause failure-prone zones or other problems elsewhere. Should the pilot have any concerns about the expected strength of repairs they should contact the C/L SIG 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 a similar type to establish service reliability. New models should be examined carefully for manufacturing defects that could lead to structural failure, and if defects are found, then have these assessed by the manufacturer or his agent to determine serviceability or repair/replacement.

2. Control Systems/Pre-Flight Checks

- 2.1 The pilot of the model shall ensure the integrity of the control system before flying, including lines, control handles, push rods and control horns. Control should be checked for movement, correct orientation and freedom from excessive wear before a model is flown.
- 2.2 Control linkages should be of a suitable stiffness for the expected flight loads, taking into account the type of model i.e. aerobatics, speed, combat or team race.
- 2.3 Pilots should run the control lines through their hands to check for kinks, frays or broken strands before each flying session and after any incident where the lines become tangled, walked through or otherwise interfered with.

- 2.4 For all competition classes, lines shall be made of steel or stainless steel. Other types of line such as Terylene, Polyester, Kevlar or monofilament Nylon (fishing line) are not permitted.
- 2.5 All lines should be load tested at the start of the days flying to a minimum of ten times the model weight or the appropriate load test for the model class in the flying rules for a minimum of three seconds. This is to be done on the assembled model, lines and handle. A load scale is the recommended way of performing the load test and shall be mandatory for all competition classes. For sport or practice flying, a suitable load should be applied to the complete control system with or without a load scale. Ensure that the controls are free moving whilst under load and remain free when the load is released. The load test should be repeated after any incident where the lines have been tangled, walked through, or otherwise interfered with.

Note:

Lines should be replaced when there are serious kinks or corrosion present. Lines should be wound up on suitable reels to ensure freedom from kinks and long life.

- 2.6 For control line speed and combat, handles shall be fitted with a safety wrist strap which should also be load tested and shall be used by the pilot during flight.
- 2.7 Before starting a motor, the propeller should be checked for any cracks or any other damage and that it is properly tightened to the motor.

3. Flying Site

- 3.1 Model flying sites must be registered with the NZMAA, for the Association's Public Liability Insurance Cover to be valid. The owner must have given their permission for model flying to take place on their property.
- 3.2 The flying circle for control line models shall be safely clear of any power lines by a recommended minimum distance of twenty metres. If transmission power lines are present this distance should be increased to a minimum distance of 50 metres. If combat models are being flown it is recommended that the minimum distance is increased further due to the possibility of a model being cut off the lines.
- 3.3 Grass flying sites for control line models that ROG, should be mown suitably short in the take off and landing area to prevent a nose over on take off. The centre area should be mown to be free of long grass stalks etc, which may catch the control lines and hence turn the model in towards the pilot.
- 3.4 The take off and landing area, whether of grass or a hard surface, should be free of any objects (heaps of grass cuttings, stones, etc.) which may damage the propeller or divert the model from its normal take-off path.
- 3.5 The centre of the flying circle should be clearly marked and the pilot should remain close to the centre while the model is flying.
- 3.6 The flying circle should be roped off or be supervised by other fliers to prevent spectators walking into the path of a flying model.
- 3.7 The radius of the flying circle should be suitable for the line length being used plus two metres minimum. It is recommended that spectators are kept a further clear distance of three metres from this radius, and preferably upwind.
- 3.8 Where multiple flying circles are used it is recommended that there is a distance of ten metres between the circles, with a minimum of three metres.
- 3.9 The pits should be roped off to minimise the risk of damage to control lines by unaware spectators.
- 3.10 It is recommended that, where practical, motor silencers be used at all times, particularly when flying in public places and/or near residential housing.
- 3.11 Hearing protection is recommended for spectators and competitors who are in close proximity to running motors. Considered to be essential for FAI F2D Combat fliers, pitmen and helpers and for operating pulse jet motors.
- 3.12 Where possible, lay the lines in the pits in line with the circle centres to avoid walking over lines.

4. Launch Equipment

- 4.1 Control line stoozes or self release devices. These are normally used with control line Aerobatic models when being flown without a person to launch the model. The pilot shall ensure the stooze is securely anchored to the ground to resist the forces of the motor/propeller thrust.

- 4.2 The stooge shall restrain the model securely allowing for vibration as well as the force of the motor/propeller thrust. It is recommended that the release pin, if used, is spring loaded to prevent an accidental release.
- 4.3 The stooge release line, if used, should be laid on the ground behind and clear of the flying lines. The pilot should walk out to the handle in the front of the flying lines (opposite side to the stooge release line) so as not to catch or trip on the stooge release line hence activating an accidental release.

5. Starting

- 5.1 All modellers need to make themselves aware of the dangers of the ingredients used in fuels, with appropriate care taken when mixing fuels or filling tanks.
- 5.2 Ensure that the model is securely held by stooge, helper or yourself, prior to starting the motor.
- 5.3 Care should be taken when flicking over the motor without the glow plug lead being connected, especially with a fully primed or flooded motor, as the motor may start spontaneously due to compression ignition (diesel effect).
- 5.4 Care should be taken to have hands clear of the propeller when connecting the glow plug lead as there is the possibility of the motor starting spontaneously.
- 5.5 If, while turning the motor over by hand or with an electric starter, there is a larger than normal ignition kick associated with a loud 'crack' or 'bang', then check the propeller for cracked or broken blades and check that the spinner/propeller is still tight to the motor.
- 5.6 All modellers need to be aware of the dangers associated with rotating propellers both to themselves and to other people nearby. Keep hands well clear of rotating propellers.
- 5.7 When adjusting motor controls, e.g. needle valve, compression lever or tank vents, with the motor running, this should be done from behind the propeller and not by reaching over the rotating propeller.
- 5.8 Keep spectators, helpers and yourself away from the line of a rotating propeller in case of a blade failure.
- 5.9 Be aware, when starting, of the risk of a fire/explosion from the backfire of a glow plug or pulse jet motor.

6. Launching/Take Off

- 6.1 The pilot should check that the flying circle is clear of other people before release for take off.
- 6.2 Whenever possible prior to launching, spectators need to be advised to stay out of the flying circle while a model is airborne.
- 6.3 Launching preparations just prior to release, should include a control check to ensure that the pilot has picked up the control handle in the right sense.
- 6.4 If using a launching stooge, the pilot should pick up the control handle and check for correct sense before picking up the stooge release line.

7. Flying

- 7.1 Where class rules require the use of crash helmets, it is mandatory for these to be used in competition, (e.g. Team Race and Combat). The crash helmet shall be equipped with a safety/chin strap and this shall be used. It is also highly recommended that when practice flying these classes, crash helmets are used.
- 7.2 Do not fly control line models when there is lightning or thunderstorms in the area as there is the risk of electrocution or accidental release of the handle caused by electric shock.

8. Landing

- 8.1 The pilot should ensure that they do not move too far from the circle centre when they are trying to maintain speed and altitude while landing.
- 8.2 Helpers should be aware of hot silencers, tuned pipe exhausts or jet tailpipes when carrying a just landed model back to the pits.

9. Maintenance

- 9.1 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.
- 9.2 After a heavy landing, the model should be checked for damage including full movement of controls to indicate broken or damaged controls, loose hinges etc. On take apart models, it may be necessary to disassemble the model for a proper inspection.

10. Operator Qualifications

- 10.1 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.
- 10.2 Operators of control line models must comply with the requirements of the current issue of the NZMAA Members Handbook.

11. Emergencies

- 11.1 A basic first-aid kit should always be available at the flying site. This applies especially to power model flying sites, where the overwhelming number of injuries are lacerations, bad cuts and even amputations from propellers. The first aid kit should be optimised for dealing with this type of injury. i.e. alcohol/disinfectant, sterile pads, bandages and safety pins.
- 11.2 It is recommended that a mobile phone is also available on the flying field in case of emergencies.

Competition Specific points of note

Organiser responsibility

With many pilots having been in the sport for a long time, complacency through familiarity is a risk. Organisers, in particular the contest directors, must give a full safety briefing, and ensure that any visitors to the field are aware of possible risks and reasonable precaution's that should be taken to ensure their safety.

Organisers must ensure that all competitors hold current NZMAA membership for insurance purposes.

A safety briefing would need to include:

- * Launch safety procedures; including stop, look, and listen particularly for those who are close to the flying circle.
- * Flying circles being used.
- * Pit areas.
- * Safety zones.
- * No fly zones.
- * Spectator safety.
- * Location of the first aid kit.
- * Flier and spectator movement around the site and parking.
- * If required, the use of crash helmets and hearing protection.

Personal responsibility

It is the pilot's responsibility to make sure that;

- * Their models are sound, and suitable for the conditions.

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.

Annex A

Suggested Field Layout (not to scale)

