APPENDIX L

BYE LAWS GOVERNING ISSUE OF A AND B ACHIEVEMENT CERTIFICATES

Adopted in principle at AGM on 3/12/94 and in full on 25/03/95. Amended on 6/5/98, 24/01/01, 22/01/02, 20/03/02, 23/03/03, 28/08/04 and 26/11/05 and 15/03/2008

The main aim of the A and B Achievement Schemes is to encourage model flyers to reach a minimum standard of flying ability and safety and to promote a desire for personal betterment in achieving as high a standard as possible in their flying.

For the present only two R/C power categories are covered:
(A) Fixed Wing Aircraft
(H) Helicopters
but it is hoped that shortly in the future Silent Flight will be catered for also.

M.A.C.I. will not charge any fees for any A or B certificate examination.

There shall be 2 achievement levels for R/C powered model flying –

1. The A Certificate level
2. The B Certificate level.

The A certificate shall generally be an acknowledgement of a person's capability to control an R/C model in a safe manner in normal circumstances without the assistance of a supervising instructor.

The B certificate shall generally be an acknowledgement of a person's capability to control an R/C model in such a manner that he/she is able to fly at a public display.

MACI do not guarantee any capability or the performance of any individual as a result of the issue of an achievement certificate. The certificate only states that the candidate achieved the required standard during the test.

The scheme will be administered by a MACI sub committee consisting of the relevant discipline secretaries at that time and one appointed member of the Executive Council. The sub committee shall elect from its members a Chairperson who shall oversee its activities and report back to the MACI Council. The committee shall ensure an adequate number of Examiners will be available during the year and will also arrange Examiners Courses as required. Any disputes or queries about the Achievement scheme shall be decided by the sub committee.

EXAMINERS

Two recognised MACI examiners shall give examination in either level and in all disciplines.
Helicopter or Aircraft examiners are required as appropriate and at least one must be from the relevant category being tested. Examiners can be from any club including the candidates own club.

Examiners shall be appointed by MACI upon the written nomination of their primary listed MACI club and only then after attending a course or seminar as prescribed by the Council. The status of an Examiner is valid for three membership years including the year of course attendance. The membership card shall show the status of examiner.

A club may only nominate a person as an Examiner if he is a MACI member in good standing and the holder of a B Certificate on the day of attendance at the Examiners course or if a holder of an A cert on the day of attendance at the Examiners course then they must pass a "B" cert exam within 90 days of attending an Examiner's course.

SITE OF AN EXAMINATION

The A certificate examination may be taken by a candidate at his/her own MACI registered Club site.

The B certificate examination may not be taken by a candidate at any club to which the candidate is affiliated or any of the sites that the club have registered.

EXAMINATION FORMAT

The examination shall consist of 4 sections.
Satisfactory completion of Section 1 is compulsory before proceeding to the remaining sections.
All components of the Test must be completed in the one session.

As the tests are for pilot competency and not of a models capability it is incumbent on each pilot to present himself/herself with an appropriate model aircraft for the test being undertaken. This model must be capable of Rise of Ground on its own undercarriage or a dolly.

(1) GROUND CHECK OF MODEL:

By examination	**By enquiry**
Proof of MACI membership	
MACI Registration number displayed on model	
Conform with Local Frequency Control	
Transmitter Frequency as stated	
Radio installation (check servo directions)	Propeller – balanced?
Engine installation check	Batteries adequately charged?
Tank / Fuel system check	Centre of Gravity check?
Propeller /Rotors - no nicks/damage	Have you read the Documentation?
Airframe - control surfaces/hinging	Large Model Permit if required
Pushrods / Linkages check	
Range Check with engine running	

(2) The candidate shall be asked the appropriate number of questions from the "Code of Safe Practice". A pass rate of 8 from 10 in the A Cert. and 12 from 15 in the B Cert. to "Pass"

(3) Observation of candidate during pre-flight safety check, model preparation, engine start and range check with Engine on for Aircraft and off for Helicopters)

(4) Flying the A or B Certificate flight schedule.

There is no time limit on an examination or any flight. Only the Examiners may accompany the Pilot to the Flight line. Provision should be made where possible to take control of a model if unsafe conditions arise.

An Instructor may be in attendance but cannot communicate with the Pilot.

The Examiners will determine the flight line and pilot position allowing for wind direction and local conditions.

The Examiners may terminate the test any time and at their discretion.

The Examiners shall not look for exceptional quality or perfection in manoeuvres, but rather for the display of safe and adequate control of the model at all times. The Examiners shall take into consideration the entire flight including flying between manoeuvres. All manoeuvres must be carried out in front of the pilot.

At no time during the flying test should the aircraft be flown behind the pilot or examiners, this will constitute an automatic FAIL.

With the prior permission of the Examiners an intermediate landing may be allowed for a person flying an electric model for the purpose of refitting a fully charged flight battery.

Termination of a flight due to engine or other mechanical failure will be deemed an attempt. Because of the significance of the B test, a higher standard of control shall be looked for.

RESULT/SCORING

The result shall be either a “Pass” or a “Fail”.

A candidate must pass each item in a section to pass that section and a candidate must pass all 4 sections in order to pass the examination.

For the A test in the flying section of each category, a candidate may make two attempts at each manoeuvre, excluding landing, and two attempts at the entire flight schedule.

For the B test, in the flying section of each category, a candidate may make only one attempt at each manoeuvre and only one attempt at the entire flight.

Upon completion of the test, a candidate who has passed shall be given a Receipt giving Confirmation of a Pass, completed and signed by both examiners. The Examiners will return their Checklist immediately to the Membership Secretary of MACI for processing and filing. The candidate shall keep the receipt in case of an enquiry. Upon receipt by MACI, the register of achievement tests shall be updated accordingly and the member's membership card amended to show the new achievement level when next issued.
In the event of a failure, a candidate may not repeat an A or B Cert. examination for at least two weeks.

EXPIRY OF ACHIEVEMENT CERTIFICATES

An “A certificate” shall be valid for life.

A “B certificate” shall cease to be valid should the holder cease to be a paid up MACI member for a period of 3 consecutive years.

The MACI Code of Safe Practice

The following is designed to provide a minimum set of guidelines for members to ensure their own safety, the safety of other members and of the public. It should be noted that it forms the basis of the questions used by examiners in the A/B "Certificate" scheme.

The code applies to both Fixed wing and Helicopter types. Specific references to helicopters are preceded by (H).

Section 1: Before setting out for the field

The following checks must be completed.

1. Is the propeller the correct size for the model? Too small a prop can result in the engine over revving, while too large a prop places excessive loads on the engine. It should be free from nicks and other damage, and properly balanced. Otherwise a prop may be shed when rotating at high speed. An unbalanced prop can lead to excessive vibration in the airframe, giving rise to many problems from radio failure to bits falling off the airframe. When a spinner is fitted it should not exert pressure on the blades on the propeller. It may be necessary to cut away the spinner where it wraps around the blades to prevent contact.

(H) Check that all rotor blades are in good condition, with no obvious damage. Check mounting bolts and blade clamping area for security. Blades should be balanced.

2. Are the engine and silencer securely mounted? Even in the best constructed model there is some vibration present. The vibration has the effect of loosening the screws, allowing bits to fall off. Locking washers or locking compound should be used on all critical screws and nuts.

3. Are the receiver and transmitter batteries fully charged? A discharged battery will result in total loss of control, and loss of the model. Partially discharged batteries may appear to function correctly while operating the model on the ground, but when the model takes off and the distance between transmitter and receiver increases loss of control may be experienced due to range problems. Hence the importance of range checks. The types of cells used in most r/c equipment (usually Ni-Cads) have discharge characteristics where they will operate normally when discharging and then without warning go flat. A full charge in accordance with the manufacturer's recommendations is required before a flying session. One must be particularly wary of old batteries, or equipment laid up for a number of years. It is a false economy not to replace all such batteries. The aerial also needs to be properly installed, not looped around itself, and exiting the model to allow the maximum length outside. It is recommended that it be tied to the tail fin securely. Range checks should take place before flying any new model or when any equipment is first used after an accident, or when any equipment is changed in a model. The model should be range checked on the ground with the engine running and the transmitter aerial down, and the signal then checked by walking away for a distance of approx 25 paces. It is not considered appropriate to carry out an engine running range check with a helicopter without the use of special equipment; however a range check with the engine off should still be carried out.

(H) All radio equipment must be well isolated from vibration by foam insulating pads or similar. The Aerial must be affixed in such a way so as to prevent chafing on any part of the frame or entanglement with the rotors.

4. Has the centre of gravity been checked and adjusted where necessary? The balance point of a model has a major effect on the stability of a model. If it is too far back the model may be so unstable as to be uncontrollable. A forward CG will normally result in a more stable model. The desired balance point should be indicated on the plan or instructions, which came with the model. If it is not as indicated it must be adjusted, preferably by moving existing equipment, for instance the receiver battery pack forward or aft, or, if this is not possible, by adding weight to the nose or tail.

(H) The model should hang level or nose forward when lifted by its flybar.

5. Are all the control surfaces and hinges secure? Do they move in the correct directions? Looking at a model on the ground it is difficult to imagine the stresses and forces on the airframe and surfaces in flight. Try putting your hand out the window of a car travelling at sixty miles per hour, and feel the force of air striking your hand to appreciate the effect on a model. For this reason it is imperative that all control surfaces are well secured. Hinges should be well glued and pinned where necessary.

6. Are the control movements correct? The elevator controls pitch, the aileron controls roll, and the rudder controls yaw on an aeroplane. It is vital to check that all the surfaces move in the correct direction and that the amount by which the surface moves is appropriate for the particular surface and model. An experienced modeller should always check this aspect of the model set-up.

(H) Particular attention should be given to "gyro direction".

7. Does the engine stop when the stick and trim are fully back? Apart from the fact that it is normally necessary to be able to stop the engine after landing, it can also be useful at other times. For instance during a test flight if the model is virtually uncontrollable, stopping the engine can slow things down enough to make flying manageable, and allow the model to be landed "dead stick".

8. Are all the linkages secure? Plastic clevises split easily and can detach from the control horn or servo arm. The clevises should be screwed on to the threaded end sufficiently far to ensure adequate grip. When cables or snakes are used the outer casing must be securely supported at both ends and in the middle if the run is long.

(H) Check all links for stiffness or looseness, replace links on an ongoing basis as necessary.

9. The following mechanical checks should be made; loose or missing nuts or bolts, fuel tank and piping secure.

(H) Check for excess backlash in the gear chain, and that the gyro is securely mounted.

10. Has the model got its MACI Registration number attached?
    If the model exceeds 7kg weight a large model registration form is required.

Section 2: On arrival at the field.

1. Check flight line /pits/parking arrangements and park your vehicle accordingly. The flight line must not overfly the pits or the parking area. The pits area must be chosen taking into account the direction of the wind.

2. Are the weather conditions suitable for the model, and for the experience level of the pilot? Wind condition and visibility must be taken into account.

3. Do not switch on the transmitter. Pilots should ensure that their radio equipment conforms to the latest version of Document ODTR 00/62 ***Permitted Short-Range Devices in Ireland***

4. But only one model at a time may use any given channel. Switching on a second transmitter on the same channel will result in interference to the first model, with potentially disastrous consequences. Check locally which control system is in operation (usually called a pegboard) and comply with these rules at all times.

5. As an added precaution call out your channel number loudly a few seconds before switching on so as to alert other pilots to a possible clash.

6. Ensure that the wings are properly secured to the fuselage. If rubber bands are used ensure that they are of sufficient quality and quantity. A minimum of six is recommended.

(H) Check for secure mounting of the canopy and boom clamps.

Section 3: Starting the engine (I.C.)

1. Have someone trustworthy to hold the model securely or use a suitable restrainer.

2. Ensure that all leads, tools, clothes etc. are well clear of the prop and the throttle stick is at "low" when starting.
(H) Before any attempt is made to start, it must be ensured that the transmitter's flight condition is "normal" and the throttle stick is at "low". The model should be held by the rotor with one hand while starting with the other.

3. Ensure that nobody is standing in line with the prop disc. Any bystanders should stand behind the model to avoid danger.

4. If flick starting the engine, use finger protection.
(H) This does not apply.

5. When the engine has started perform all adjustments from behind the model.
(H) Adjustments should only be made with the clutch disengaged and while holding the rotor head firmly.

6. Ensure that the model is restrained at all time when the engine is running. Run the engine at full throttle and hold the nose of the model up to ensure that the engine will not lean out and stop.
(H) Ensure that the rotor head is restrained at all times while the engine is running in the pits area.

7. Models should be started and adjustments made only in the pits area.

Section 4: Flying the model

1. The model must not be flown behind the pilot line, over cars, people, property, or any other area which would constitute a hazard in the event of loss of control, or an engine cut.

2. "Dead stick" must be called out in the event of an engine failure to alert other fliers to give priority and to keep the runway clear.

3. "Landing" must be called clearly to alert others in the area.
(H) Applies to helicopters flying in the same airspace as fixed wing models.

4. All take offs and landings must take place into wind.
(H) This does not apply to helicopters.

5. Pilots should stand together when flying, with their backs to the pits area.
(H) Applies to helicopters flying in the same airspace as fixed wing models.

6. Last thing before takeoff; check all controls for correct movement and direction.

In an emergency the model is the lowest priority. Ditch if necessary, to avoid people, is the cardinal rule.

List of questions from which the candidate will be examined

(A) Applies to fixed wing aircraft
(H) Applies to helicopters
(A/H) Applies to both

1. What needs to be checked when inspecting a propeller? (A)
2. Are there any problems to be aware of when fitting a spinner? (A)
3. How is vibration combated with reference to the engine and silencer? (A/H)
4. For how long should a battery be charged before flight? (A/H)
5. When is there a need for a range check? (A/H)
6. Explain the procedure involved in carrying out a range check. (A/H)
7. If the C.G. is wrong how best can it be moved? (A/H)
8. What does one look for in properly set control surfaces? (A/H)
9. Explain the function of rudder/elevator/aileron. (A)
10. What does one look for in a secure linkage? (A/H)
11. Explain the function of the throttle trim. (A/H)
12. What are the rules governing the pits area. (A/H)
13. When should a transmitter not be switched on? (A/H)
14. What procedures must be followed before switching on a transmitter? (A/H)
15. Explain the pre-start up checks on a model. (A/H)
16. What safety features must be followed during an engine start up? (A/H)
17. Where should a model be started? (A/H)
18. In which direction does a model take off and land? (A)
19. List the checks necessary before a model is released. (A/H)
20. In an emergency what is the cardinal rule. (A/H)
21. What is meant by the normal flight condition? (H)
22. What is the weight restriction for unregistered models? (A/H)
23. Can you check your blade tracking in the pits area? (H)
24. What is particularly important with regard to aerial installation? (A/H)
25. What occurs when the gyro direction is reversed? (H)

Pass Rate is:

A Certificate: minimum of 8 out of 10 correct.
B Certificate: minimum of 12 out of 15 correct.

Note: Answers to the above will be found in the MACI Code of Safe practice

SCHEDULE OF MANOEUVRES FOR THE A CERT "FIXED WING" EXAM

1. Take off and climb to approx 50 metres, then complete a rectangular circuit away from the pits and ending over the Take off Area.

2. Fly the opposite hand rectangular circuit, at a similar height beginning and ending over the take off area.

3. Procedure turn (upwind) and finishing downwind.

4. Straight and level flight (upwind) followed by a downwind free pass.

5. Intentional Stall and recovery (upwind).

6. Overshoot by turning away from the pits and completing the balance of a rectangular approach with simulated landing at low speed.

7. Continue upwind and complete rectangular landing approach for landing.

8. Landing within designated landing area.

Pilots may stand behind the model on Take Off for the A Cert but must return immediately to the designated pilot position after take off and remain there for duration of test. The Pilot may be assisted to the agreed position.

SCHEDULE OF MANOEUVRES FOR THE B CERT "FIXED WING" EXAM

1. Take off and climb to approx 50 metres, then complete a rectangular circuit away from the pits and ending over the Take off Area.

2. Fly the opposite hand rectangular circuit, at a similar height beginning and ending over the take off area.

3. Fly a horizontal flat figure of eight course followed by a free downwind pass.

4. One inside loop (upwind).

5. One outside loop (downwind).

6. One split S (upwind) followed by a downwind free pass.

7. Stall turn away from pits (upwind) approx 50 metres from centreline.

8. Complete two consecutive rolls (downwind).

9. Gain height and spin three complete turns and recover upwind.

10. Enter into a rectangular landing approach into wind and overshoot with simulated landing at low speed.

11. Continue upwind and complete a rectangular landing approach and land into designated landing area.

Pilots must remain in position in the designated pilot position for the take off and the duration of the test.

The model can be carried to the take off position by an assistant if required.

SCHEDULE OF MANOEUVRES FOR THE A CERT "HELICOPTER" EXAM

1. Take off and hover "Tail in" over the centre pad Take off point for 20 Seconds.

2. Hover the helicopter slowly either left or right approx. 5 metres and stop. Hover for 10 seconds and return to start.

3. Hover the helicopter slowly to the opposite side approx. 5 metres and stop. Hover for 10 seconds and return to start.

4. Hover the helicopter slowly forwards approx. 5 metres and stop. Hover for 10 seconds and return to start. Hover for 10 secs and land on the centre Take off pad.

   During the above manoeuvres the skids should be kept at eye level.

5. Take off, Hover as above for 10 seconds, turn 45 degrees either left or right and fly forward at a slow hovering pace to perform a large open "Figure 8" in front of the Pilot. This should be at least 20 metres in length. Height control should be demonstrated by maintaining skids at approx. eye level. As the Helicopter passes over the centre pad it must be clearly "sideways on" to the Pilot. The exercise finishes by stopping over centre pad, rotating 45 degrees to the tail in position and hovering for 10 seconds before landing.

Manoeuvres 1, 2, 3 and 4 must all be completed before landing. Where and attempt is called on a manoeuvre, the pilot will start that one again from the take off pad with a 10 seconds hover. The candidate should remain at the one nominated Pilot position. The examiner will define the "Pad" and flight area in advance. Where possible the 10metre square and centre should be clearly marked.

SCHEDULE OF MANOEUVRES FOR THE B CERT "HELICOPTER" EXAM

1. Perform one standard hovering triangle over an approx. 10 metre square. Take off and landing are part of the manoeuvre.

2. Perform one standard schedule hovering rectangle over an approx. 10-metre square. Take off and landing are part of the manoeuvre.

3. Take off from "landing pad" into forward flight and climb to an altitude of approx 50 metres. Continue flying forward and perform a full circuit of at least 100 metres length away from the Pits area.

4. Return once again along the previous flight line and perform a full opposite hand circuit of at least 100 metres in length.

5. Continue flight and perform one Stall Turn at least 20 metres height approx 50 metres after passing centreline.

6. Descend and return to the hovering area to perform a 10 second "Nose in Hover" within the 10 metres hovering square.

7. Resume flying on the flight line to perform a "Double Stall turn". The horizontal part of this should be centred and may be up to 100m in length. Note that the Stall turns must be performed in opposite directions i.e. each rotation is away from the pilot line.

8. Finish flight by performing an autorotation (throttle hold) approach at 45^{o} to the vertical and land within the 10-metre square. Model should descend directly and smoothly to touchdown.

All manoeuvres must be carried out in front of the Pilot in a similar manner to the Fixed Wing schedules.
The Pilot should remain in one position approx 10 metres from edge of box at all times.
Where possible the 10 metre square and centre should be clearly marked.
The airspace to carry out the flying manoeuvres will be defined in advance by the Examiners.

MACI Achievement Scheme Test Result

Candidate's Name		Candidate's MACI No	IRL -
A or B Examination		Fixed Wing or Heli	
Date of Test		Flying Site Location	
Examiner 1 Name		Examiner 1 MACI No	IRL -
Examiner 2 Name		Examiner 2 MACI No	IRL -
Candidate's Signature			

Section 1 - Ground Checks

Tick each Box as examined and passed ("X" indicates Failure)

By examination		**By inquiry**	
MACI no displayed on model		Have you checked local procedures	
MACI membership card available		Is the Propeller balanced?	
Transmitter Frequency as stated		Are the batteries adequately charged?	
Radio installation - direction check OK			
Engine installation OK		Is the Centre of Gravity correct?	
Tank/fuel system OK		Have you read the documentation?	
Propeller /Rotors - no nicks/damage		Is a Large Model cert required and if so is a current one available	
Airframe, Control surfaces and hinging OK			
Push rods / linkages OK			

Section 2 - Questions

A Certificate - 10 Questions asked (8 Pass)	Passed =
B Certificate - 15 Questions asked (12 Pass)	Passed =

Section 3 – Observation

Has candidate observed the Code of Safe Practice in Preflight Safety Checks?	
Has candidate observed the Code of Safe Practice in Engine starting?	
Has model passed an engine range check with engine running?	

Section 4 - Flight Tests

Tick each Box as examined and passed ("X" indicates Failure, "A" =Attempt)

Manoeuvre No. 1		Manoeuvre No. 7	
Manoeuvre No. 2		Manoeuvre No. 8	
Manoeuvre No. 3		Manoeuvre No. 9	
Manoeuvre No. 4		Manoeuvre No. 10	
Manoeuvre No. 5		Manoeuvre No. 11	
Manoeuvre No. 6			
B Test - Pilot stayed in the same position for entire flight (incl take off)			

Result and Certification

Result of test (Pass/Fail)		Date	
Signed	(Examiner 1)	(Examiner 2)	

Acknowledgement of Test (to be handed to candidate after test)

Candidate's Name		Candidate's MACI No	IRL -
A or B Examination		Fixed Wing or Heli	
Date of Test		Flying Site Location	
Examiner 1 Name		Examiner 1 MACI No	IRL -
Examiner 2 Name		Examiner 2 MACI No	IRL -
Candidate's Signature		Pass/Fail	

Please retain for your records in case of query, until a new MACI card has been received with your achievement level recorded.