APPENDIX L

BYE LAWS GOVERNING ISSUE OF A AND B ACHIEVEMENT CERTIFICATES

Amended Apr 17, June 18, Sept 18, June 19, Apr 22, July 23, July 24, June 25 and June 26

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. As the IAA have accepted the MACI A + B scheme as a suitable training program it is now a requirement that a MACI A certificate is required to fly an SUA (Small unmanned Aircraft) of > 4 Kgs and up to 25 Kgs to comply with S.I. 563 of 2015 and SI 24 of 2023

Three R/C categories are covered:

(A) Fixed Wing Aircraft
(H) Helicopters
(G) Gliders.

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 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, fly a Turbine powered model in the appropriate category or an SUA (Small unmanned Aircraft) > 25 Kg. A member must pass the relevant “A” certificate before completing the “B” Certificate.

MACI does 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 annually by a Scheme Co-ordinator who shall select a subcommittee to oversee its activities and report back to the MACI Council. The subcommittee shall ensure that an adequate number of Examiners will be available during the year, arrange training and hold Examiners Courses as required. Any disputes or queries about the Achievement scheme shall be decided by the scheme subcommittee. The Examiners courses will be a forum for agreed changes to this appendix and subsequent ratification at the next available MACI council meeting. **Any Qualifications achieved through this scheme are only considered valid so long as a member holds current membership.**

EXAMINERS

A club may only nominate a person as an Examiner if he/she is a MACI member in good standing and the holder of a B Certificate for at least 3 months on the day of attendance at the Examiners course.

Examiners shall be appointed by the scheme committee upon the written nomination of their listed MACI club and only then after attending a course or seminar as prescribed by the scheme subcommittee. Digital copies of permission will be stored on the members “Just Go” profile

The status of an Examiner is valid until 31st March of the 3rd year following the date of the course attended including the year of course attendance. It is intended that an Examiners course shall be run at least once a year. The digital membership card shall show the expiry by MACI calendar year end (Mar 31st) of the examiner. A current list of examiners may be requested from "abcoordinator@maci.ie"

Two recognised MACI examiners shall give examination in either level and in all disciplines.
Two examiners are required as appropriate and the lead examiner must be from the relevant category being tested. An Examiner can only be qualified in the category in which the examiner holds a current B certificate. E.g. B cert Fixed wing qualifies as a Fixed Wing Examiner. Examiners with multiple category B certs qualify for all categories held. Examiners can be from any club for an "A" test but only one from the candidates own primary club for a "B" test.

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SITE OF AN EXAMINATION

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

For Fixed Wing/Gliders; the use of gyros, autopilot or other electronic stabilising systems are not allowed for this examination. If any such system is fitted to the model it must be disabled during the test.

For Helicopters; the use of Rescue Mode or Self stabilising systems are not allowed for this examination. If any such system is fitted to the model it must be disabled during the test.

The B certificate examination may not be taken by a candidate at their primary club including any additional registered club sites. This also applies to any club that the candidate has been registered to in the previous membership year. In the case of a Glider B Cert, it may be flown at any suitable site. Actual details will be taken from the "Just Go" system.

For Fixed Wing/Gliders; the use of gyros, autopilot or other electronic stabilising systems are not allowed for this examination. If any such system is fitted to the model it must be disabled during the test.

For Helicopters; the use of Rescue Mode or Self stabilising systems are not allowed for this examination. If any such system is fitted to the model it must be disabled during the test.

Candidates must bring the latest copies of the test procedure from website for use on the day.

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 model's capability it is incumbent on each pilot to present with an appropriate model aircraft for the test being undertaken. Powered models must be capable of Rise off Ground on their own undercarriage or a dolly.

A Cert exam requires an SUA not exceeding a weight limit of 4 Kgs, documentary evidence in the form of model specifications may be required prior to test.

B Cert exam requires an SUA not exceeding a weight limit of 25 Kgs or the use of any model powered by a turbine engine

(1) GROUND CHECK OF MODEL:

By examination	**By enquiry**
Proof of MACI membership	
MACI Registration number displayed on model	
IAA registration sticker displayed if model > 250g	
	A Cert held before B Cert Exam
Radio installation (check servo directions)	Propeller – balanced?
Engine installation check	Batteries adequately charged?
Tank / Fuel system checks	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	Is this a permitted venue for you?

(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 and restrained for Aircraft and off for Nitro 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 / helper may be asked to be in attendance to take over flying control where an examiner on the appropriate Radio Mode is unavailable, however they cannot communicate or assist the Pilot until requested during the flight test. Only the pilot can be present during the model preparation and questions period.

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. Any use of a motor during a Glider A or B cert test (except to gain height to commence the test) is an automatic FAIL.

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 or Fail, completed and signed by both examiners. The Examiners will return their Checklist immediately to the A + B Coordinator 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 records 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. Digital copies of the exam sheet will be stored on the members “Just Go” profile

EXPIRY OF ACHIEVEMENT CERTIFICATES

An “A certificate” shall be valid for life.
However, should the holder cease to be a paid-up Maci member for a period of three consecutive years or more that member shall be required to complete a local briefing and a basic proficiency flight check comprising of any 3 manoeuvres from the A cert with any two current Maci examiners prior to re commencing solo flight.

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 MACI Membership periods (years)

MACI

List of questions from which the candidate will be examined

Answers will be found in the MACI Code of Safe Practice

(A) Applies to fixed wing aircraft
(H) Applies to helicopters
(A/H/G) Applies to all Aircraft, Helicopters and Gliders

1. What needs to be checked when inspecting a propeller? (A/G)
2. Are there any problems to be aware of when fitting a spinner? (A/G)
3. How is vibration combated with reference to the engine and silencer? (A/H/G)
4. For how long should a battery be charged before flight? (A/H/G)
5. When is there a need for a range check? (A/H/G)
6. Explain the procedure involved in carrying out a range check. (A/H/G)
7. If the C.G. is wrong how best can it be moved? (A/H/G)
8. What does one look for in properly set control surfaces? (A/H/G)
9. Explain the function of rudder/elevator/aileron (A/H/G)
10. What does one look for in a secure linkage? (A/H/G)
11. Explain the function of the throttle trim. (A/H/G)
12. What are the rules governing the pits area. (A/H/G)
13. When should a transmitter not be switched on? (A/H/G)
14. What procedures must be followed before switching on a transmitter? (A/H/G)
15. Explain the pre-start up checks on a model. (A/H/G)
16. What safety features must be followed during an engine start up? (A/H/G)
17. Where should a model be started? (A/H/G)
18. In which direction does a model take off and land? (A/G)
19. List the checks necessary before a model is released. (A/H/G)
20. In an emergency what is the cardinal rule. (A/H/G)
21. What is meant by the normal flight condition? (H/G)
22. What is the allowable weight before registering a “large” model to MACI (A/H/G)
23. Should you check your blade tracking in the pits area? (H)
24. What is particularly important with regard to aerial installation? (A/H/G)
25. What occurs when the gyro direction is reversed? (H)
26. Which is the principal function to set up on a receiver failsafe system (A/H/G)
27. What is the typical recharge time for a LiPo battery pack? (A/H/G)
28. What is the maximum allowed power output of the transmitter? (A/H/G)
29. What are the particular dangers associated with a heavy battery pack in a model? (A/H/G)
30. What is the most likely outcome if incorrectly charging a Lithium battery? (A/H/G)
31. What is the maximum height allowed for SUA flight? (A/H/G)
32. What material may be used for jettisonable Ballast? (G)
33. Which direction must the glider turn when joining other gliders in a thermal? (G)
34. What is the cardinal rule to avoid collisions with other gliders in a crowded environment? (G)
35. When aero-towed, how do you confirm the release of your glider from the tow plane? (G)
36. Explain the advantages to have your airbrake function on a proportional channel? (G)
37. Explain when ballast can be used for a glider? (G)
38. If you want to ballast your glider, where the ballast should be positioned? (G)
39. Where should the attachment hook be positioned for winch launch? (G)
40. What is the maximum lateral distance that an aeroplane with a wingspan >1.7 M may fly from the pilot position?
41. What is the maximum lateral distance that a helicopter with a rotor diameter of 1.0 M may fly from the pilot position?
42. What is the radio term “LBT” used in all EU compliant radio equipment?

Pass Rate is:

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

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

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. Manoeuvres are centred on Pilot position. Turnarounds are not assessed as part of the manoeuvres.

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call "Start" at the beginning of the Manoeuvre and "Complete" at the end of the Manoeuvre. Without a call then examiners will make their own assessment.

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. Continue flying upwind and turnaround.

2. **Fly the opposite hand rectangular circuit**, at a similar height beginning and ending over the take-off area. Continue flying downwind and make a turnaround

3. Fly upwind to perform a "**Horizontal Flat figure of eight**" followed by a free downwind pass. Aircraft flies away from pilot prior to the centreline and crosses the centreline at **45** degs (plan view) continuing on to perform the first circle in the same direction of entry, crosses over the centre again at **45** degs and continues to complete the second circle finishing on the entry line and travelling upwind.

4. **Procedure turn** (upwind) and finishing downwind. Continue flying downwind and make a turnaround. Aircraft flies away from pilot at 90 degs starting just prior to the centreline. This is followed a 270 deg turn back to the original entry line but now travelling in the opposite direction.

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

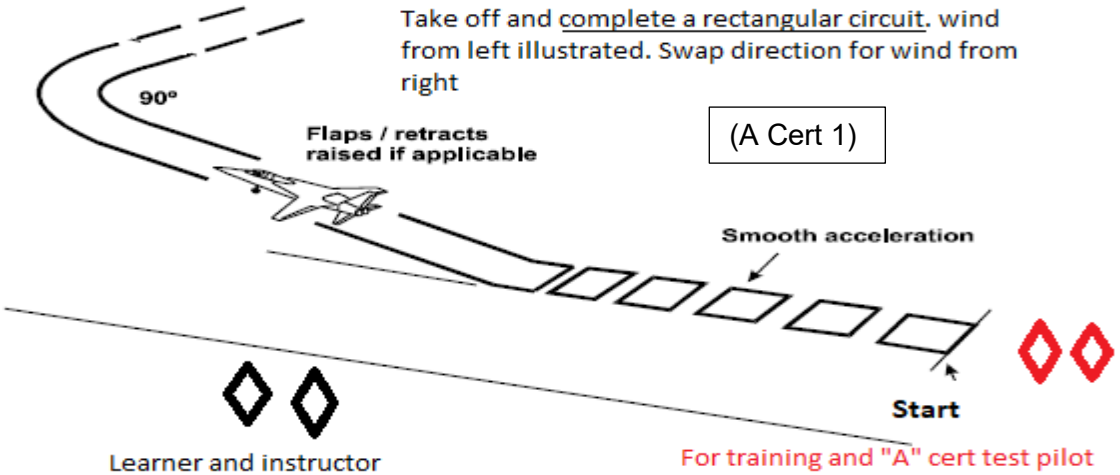
6. **Intentional Stall and recovery** (upwind). Aircraft remains in a level attitude.

7. Enter directly into a rectangular landing approach into wind and **overshoot** with simulated landing at low speed.

8. Continue upwind and complete a **full rectangular landing approach** for actual landing.

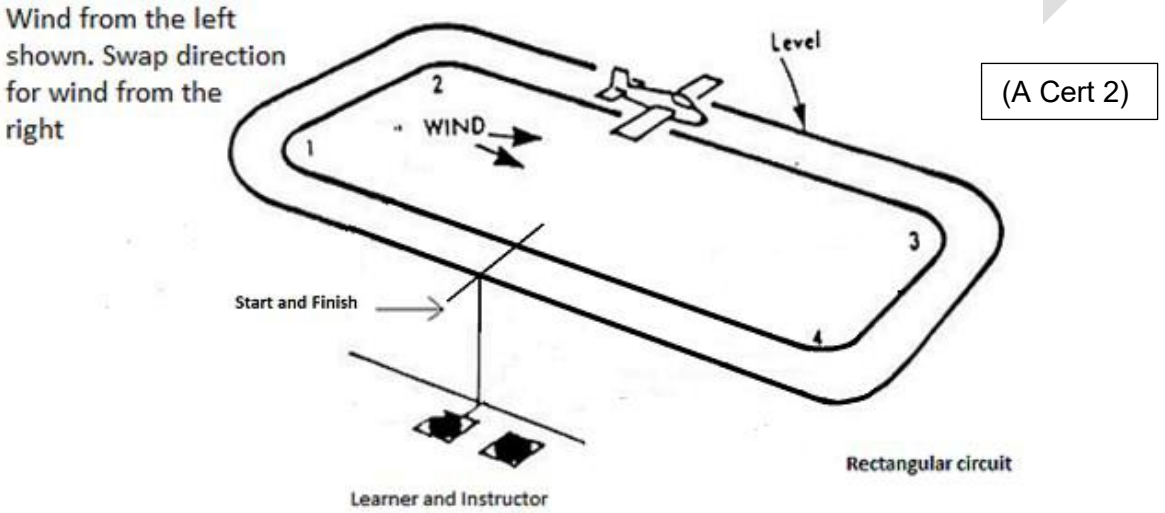
9. **Landing** within designated landing area.
   This area will be defined in advance by the examiners and will usually be a clearly defined runway. Running off after landing will not be penalised.

MAC



Take off and complete a rectangular circuit. wind from left illustrated. Swap direction for wind from right

(A Cert 1)



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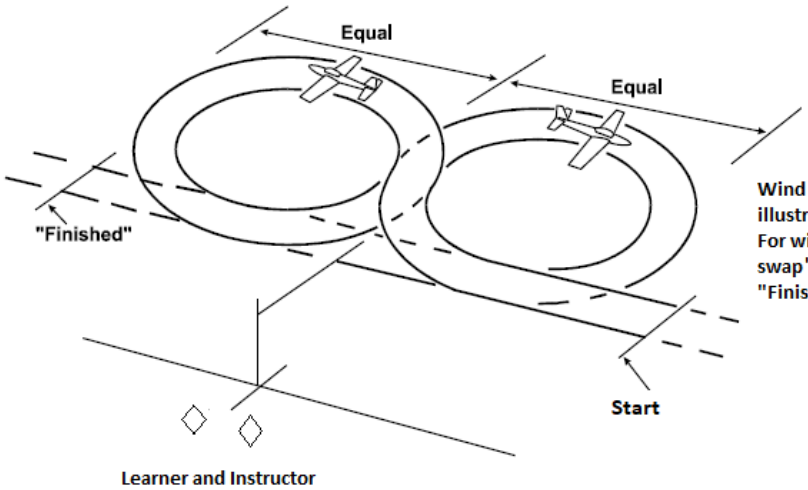

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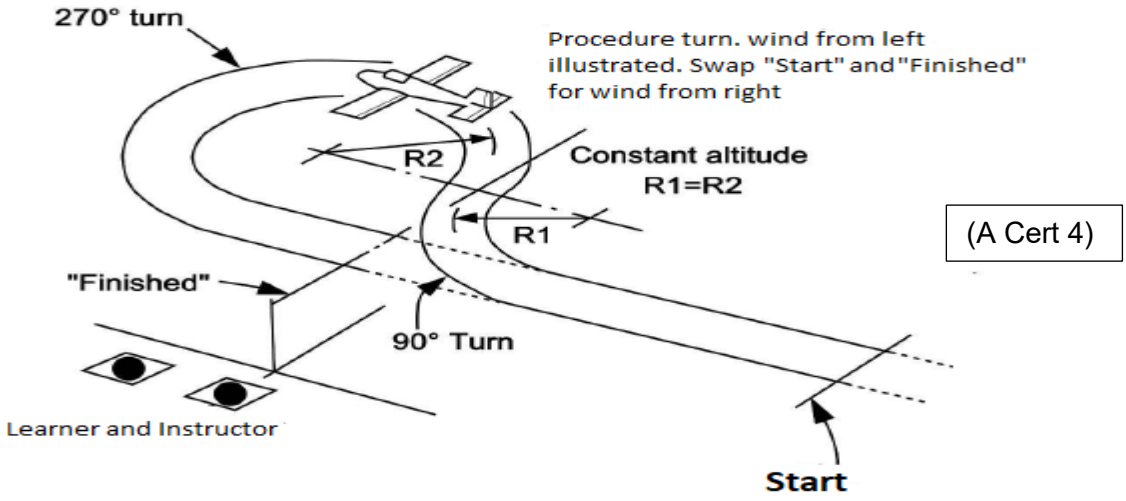

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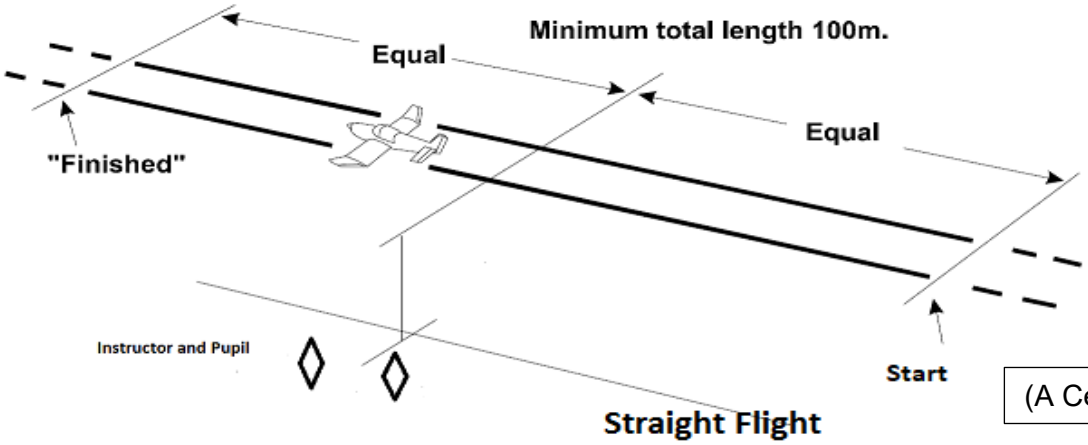
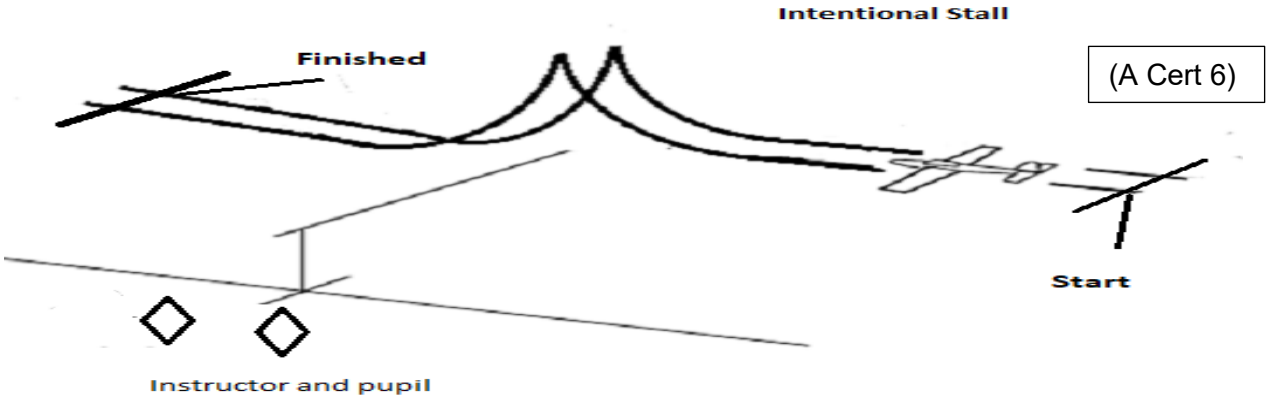


(A Cert 5)

Wind from the left shown.
Swap direction for wind from the right.

From Level flight the model climbs vertically, and power is reduced. Model stops and stalls forward with wings level. Power is increased and model recovers straight and level flight in the same direction



(A Cert 6)

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

Pilots must stand in the designated pilot position at runway edge for take-off and remain there for the duration of the test. The model may be carried to the take-off position by an assistant if required. Manoeuvres are centred on Pilot position. Turnarounds are not assessed as part of the manoeuvres.

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call "Start" at the beginning of the Manoeuvre and "Complete" at the end of the Manoeuvre. Without a call then examiners will make their own assessment. Manoeuvres are flown one after the other except where a "Free Pass" is indicated

1. **Take off into wind and climb to approx. 50 metres**, then complete a rectangular circuit away from the pits and ending over the Take-off Area. Continue flying upwind and turnaround. (90 degs corner turns required)

2. Fly the **opposite hand rectangular circuit downwind**, at a similar height beginning and ending over the take-off area. Continue flying downwind and make a turnaround.

3. Fly upwind to perform a "**Horizontal Flat figure of eight**" followed by a free downwind pass.
   Aircraft flies away from pilot prior to the centreline and crosses the centreline at **45 degrees** (plan view) continuing on to perform the first circle in the same direction of entry, crosses over the centre again at **45 degs** and continues to complete the second circle finishing on the entry line and travelling upwind.

4. Following the free downwind pass perform **one inside loop** (upwind). Continue upwind and climb to a turnaround in preparation for No.5

5. **One outside loop** (downwind) from height. Continue downwind and onto a holding height turnaround in preparation for No.6

6. **One split S** (upwind) and centred on pilot position. Model performs a half roll at height followed by a half loop, followed by level flight on the baseline, continuing on to a downwind turnaround.

7. Flying upwind, complete a **Stall turn** with nose away from pits approx. 50 metres past the centreline. Continue downwind to a turnaround

8. Complete **two consecutive rolls into wind** (noting rotation Left or Right), centred and continue to a turnaround.

9. Complete **two consecutive rolls downwind**. (Opposite rotation to above), centred and continue to a climbing Turnaround to gain height.

10. Continue to centreline and complete **a spin with three complete turns** and recover upwind.

11. Enter directly ~~in~~to a rectangular landing approach into wind and **overshoot** with simulated landing at low speed.

12. Continue upwind and complete a **rectangular landing approach and land** into designated landing area. This area will be defined in advance by the examiners and will usually be a clearly defined runway. Running off after landing will not be penalised.

SCHEDULE OF MANOEUVRES FOR THE A CERT "HELICOPTER" EXAM

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.

During all manoeuvres the height should be kept constant using the reference of skids no lower than eye level. Manoeuvres are centred on Pilot position.

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call "Start" at the beginning of the Manoeuvre and "Complete" at the end of the Manoeuvre. Without a call then examiners will make their own assessment.

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 point finishing with a 5 Secs hover. **(Do not land)**

3. Hover the helicopter slowly to the opposite side approx. 5 metres and stop. Hover for 10 seconds and return to start point finishing with a 5 Secs hover. **(Do not land)**

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

5. Take off, Hover "tail in" 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 overall length, symmetrical about the pad, it is not required to be two precise circles. The manoeuvre finishes by stopping over centre pad, rotating 45 degrees to the tail in position and hovering for 10 seconds before landing

   As the Helicopter passes over the centre pad in the Figure 8 it must be clearly "sideways on" to the Pilot. The nose is always pointing in the forward direction of flight.

Manoeuvres 1, 2, 3 and 4 must all be completed before landing. Where an attempt is called on an individual manoeuvre, the pilot will start again from the take-off pad with a 10 second hover then proceed through remaining manoeuvres until completion of No.4. The candidate should remain at the one nominated Pilot position. The examiner will define the "Pad" and flight area in advance. Where possible the 10-metre square and centre should be clearly marked.

MAGI

SCHEDULE OF MANOEUVRES FOR THE B CERT "HELICOPTER" EXAM

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.
All manoeuvres must be carried out in front of the Pilot in a similar manner to the Fixed Wing Schedules. Manoeuvres are centred on Pilot position with no regard to wind direction.

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call "Start" at the beginning of the Manoeuvre and "Complete" at the end of the Manoeuvre. Without a call then examiners will make their own assessment.

Prior to take off, the candidate must demonstrate that the "Throttle Hold" (Auto) function clearly drops rotor RPM, slight dragging of engine drive to the rotor blades is acceptable.

1. Perform one standard "side on" hovering triangle over an approx. 10 metre square. Take-off and landing are part of the manoeuvre. (Landing with power only)

2. Perform one standard schedule "side on" hovering rectangle over an approx. 10-metre square. Take-off and landing are part of the manoeuvre. (Landing with power only)

3. Take off from "landing pad" directly into forward flight and climb to an altitude of approx. 20 metres. Continue flying forward and perform a full circuit (180 deg turns) of at least 100 metres length away from the Pits area. (complete an optional turnaround Manoeuvre)

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

5. Continue on current flight path and perform one Stall Turn (180 degs) with nose away from the pits at least 20 metres height approx. 50 metres after passing centreline.

6. Continue on current flight path, descend and return to the hovering area turning 90 degrees to perform a 10 second "Nose in Hover" within the 10 metres hovering square.

7. Resume flying on the flight line in either direction to perform a "Double Stall turn" (180 deg turns). The horizontal segment of this should be centred and may be up to 100m in length. Note that the Stall turns (180 degs) must be performed in opposite directions i.e. each 180-degree rotation is **away** from the pits.

8. Finish flight by performing an upwind controlled slow descent at 45° to the vertical from a starting height of more than 20 metres and land within the 10-metre square. Model should continuously descend "side on" from left or right direction parallel to the flight line, smoothly touchdown and remain upright on the skids when completed. Model may be in full autorotation or a low idle speed with only a minimum of negative pitch required.

MAC

SCHEDULE OF MANOEUVRES FOR THE A CERT “GLIDER” EXAM

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call “Start” at the beginning of the Manoeuvre and “Complete” at the end of the Manoeuvre. Without a call then examiners will make their own assessment.

1. Launch the model and gain height. (Powered models may use the motor to gain height then the motor is shut off and not used again during the test.)
2. Fly for 10 seconds straight and level across wind.
3. Fly for 10 seconds straight and level across wind in the opposite direction to (2)
4. Perform one 360-degree left hand turn, away from slope
5. Perform one 360-degree right hand turn, away from slope
6. Perform two consecutive 360 degree 'thermal' turns, either left or right,
7. Fly into wind and perform a straight stall and recovery.
8. Fly a rectangular circuit in front of the slope in the opposite direction to that chosen for the landing
9. Fly a rectangular landing circuit opposite to that flown in (8) and land within 20 metres of a pre-designated spot. Model may fly behind pilot during landing at examiners discretion.

SCHEDULE OF MANOEUVRES FOR THE B CERT “GLIDER” EXAM

If a Candidate so wishes one of the Examiners will call the Schedule of Manoeuvres, if the Candidate accepts this, they have to call “Start” at the beginning of the Manoeuvre and “Complete” at the end of the Manoeuvre. Without a call then examiners will make their own assessment.

1. Launch the model, gain height and complete one horizontal circuit (either left or right hand) in front of the pilot. (Powered models may use the motor to gain height then the motor is shut off and not used again during the test.)
2. Fly a horizontal figure eight with the crossover point in front of the pilot.
3. Fly two consecutive loops across wind.
4. Fly crosswind left to right and complete a stall turn away from the slope.
5. Fly crosswind right to left and complete a stall turn away from the slope.
6. Complete 10 seconds straight and level inverted flight across wind.
7. Perform one axial roll across wind, either from the left or right.
8. Perform one axial roll across wind in the opposite direction to (7), rotating in the opposite direction to (7).
9. Perform a three-turn spin with exit in the same direction as the entry.
10. Fly a left-hand rectangular landing approach and overshoot.
11. Fly a right-hand rectangular landing approach and overshoot.
12. Fly a rectangular landing approach either left or right hand and land within 15 metres of a predetermined spot. (Model may fly behind pilot during landing at examiners discretion)

MACI

MACI Achievement Scheme Test Result

Candidate's Name		Candidate's MACI No	IRL -
A or B Examination		Fixed Wing/Heli/Glider	
Date of Test		Flying Site Location	
Examiner 1 Name		Examiner 1 Expiry 03/	IRL -
Examiner 2 Name		Examiner 2 Expiry 03/	IRL -
Candidate's Signature			

Section 1 - Ground Checks
Tick each Box as examined (F =Failure, A =Attempt and P= Pass)

By examination		**By inquiry**	
MACI and IAA No. displayed on model		Check local procedures first	
Current MACI membership card available		Is the Propeller balanced?	
		Are the batteries adequately charged? Is the model weight < 4kg for the A Cert?	
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		Has A Cert been achieved before taking a B Cert	
Airframe, Control surfaces/ Push rods / linkages and hinging OK			
Is a Large Model cert > 7kg required and if so, provide evidence to Examiners		Does this site conform to an acceptable exam location as per requirements for a valid site within "Justgo" details.	

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 Pre-flight Safety Checks	
Has candidate observed the Code of Safe Practice in Engine starting	
Has model passed a **failsafe motor range check** with motor running for aircraft, (Engine off for Nitro Heli, Motor running but all blades off for Electric Heli)	

Section 4 - Flight Tests
Tick each Box as examined (F =Failure, A =Attempt and P= Pass)

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		Manoeuvre No. 12	

Result and Certification (Must Return to AB Co-ordinator within 10 days)

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

========== **Remove and retain for Candidate receipt** ==========

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	

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 may be freely used by clubs as a document to advise members on the practical aspects of operating radio control models. 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 Aircraft, Helicopter, Glider and Multirotor types, with either internal combustion (IC) or electric powered. Specific references as appropriate to helicopters are preceded by **(H)** and printed in Green and Electric models by (E) and printed in blue.

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Section 1: Before setting out for the field

The following checks must be completed.

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.

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. (E) The power pack (or drive battery) needs particular attention as it is typically a heavy component which requires suitable restraint by straps. It also contains a large amount of electrical energy and therefore care should be taken with all connections. These should be checked regularly for looseness and to ensure all protective sleeves securely insulate them.

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 servo loads increase combined with a greater distance between transmitter and receiver, loss of control may be experienced due to range problems. Hence the importance of range checks. The types of cells used in modern r/c equipment vary from NiMh packs to Lithium cell with voltage regulators and have discharge characteristics where they show good charge initially and then go flat quickly towards the end of the cycle without warning. A full charge in accordance with the manufacturer's recommendations is required before a flying session. As a general guideline most receiver LiPo batteries will be charged at 1C so taking approx. one hour to fully charge and NiMh batteries vary from 5 to 10 hours depending on charges and cell type. 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 use of an on-board battery checker or handheld meter used regularly is very useful in preventing problems.

The receiver aerial also needs to be properly installed regardless of model type. For 35MHz it is important to uncoil the aerial and exit the model to allow the maximum length outside. It is recommended that it be tied back to the tail fin with a simple restraining band. For 2.4GHz, the practice varies between manufacturers but the principle of putting the Rx aerials at 90 degrees apart is fundamental to the success of the system and should be observed at all times.

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 aircraft should be range checked on the ground with the engine running and model restrained. For 35MHz system the transmitter aerial should be down to reduce power and on 2.4GHz system a special program or button on the transmitter should be used to reduce the power output in a similar way. The signal response is then checked by walking away for a distance of approx. 50 paces and seeing a normal response to all commands. As the range increases even further the model should go into failsafe model for 35MHz PCM receivers and all 2.4GHz systems. However, in regular non-PCM systems the servos will typically jitter and lose control. The failsafe operation which should be demonstrated, if technically available, is to witness the propulsion system shutting down with the other channels being optional for this test. It is not considered appropriate to carry out an engine or electric motor running range check on a helicopter without the removal of main and tail blades; however, a range check with an I/C engine off and throttle stick open may be carried out. To demonstrate failsafe satisfactorily to the examiners, it may be necessary to switch off the transmitter, if the reduced range check does not achieve the desired result.

All radio equipment must be well isolated from vibration by foam insulating pads or similar. The battery pack in particular needs restraint as its weight may move the pack and disconnect from the switch. The aerial must be affixed in such a way so as to prevent chafing on any part of the frame or entanglement with moving parts. Some 2.4GHz receivers require a particular mounting system and the specific manufacturers' data sheet should be followed in all cases. All 2.4 receiver Aerials should be fitted at 90 degrees to each other for diversity.

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 during flight. 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 checked at the main shaft centreline.

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.

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 are 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", throttle opening and pitch direction.

Does the engine stop when the stick and trim are fully back or the "kill" switch is used? 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".

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.

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 gears, ball joints, and that the gyro is securely mounted.

Pilots should ensure that their radio equipment conforms to the latest version of Document ODTR 02/71R17 11/2024 Permitted Short-Range Devices in Ireland. This in general terms describes the Max. Power output as 100 mW ERP for any radio type and the requirement to use equipment only with a "CE" approval stamp. 5.8 Ghz Video equipment is usually limited to 25 mW ERP.
No licence is required for approved Transmitters on the bands of 35 MHz, 2.4 and 5.8 GHz.
900 MHz is often used as a backup frequency but members should note that none of the bands with the exception of 35 MHz is a protected aircraft band, all others are in use at all times by domestic and Industrial users, hence the requirement for all equipment to use a system known as "Listen before Talk" or "LBT". This ensures that a radio will listen to the airwaves and wait for a clear frequency before transmitting.

Models should carry their MACI number and IAA Registration number (QR Code is acceptable) as per current MACI guidelines.
If the model exceeds 7kg weight a MACI large model registration permit is required. If the model exceeds 25kg, to a maximum of 40 Kg additionally a separate individual written approval from the Irish Aviation Authority is required. Flying cannot take place without the IAA Permission being filed on "Just Go" system

Section 2: On arrival at the flying site.

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.

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.

Do not switch on your transmitter until the local procedures are understood and complied with.

On 35MHz systems, 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 both models, with potentially disastrous consequences. Check locally which control system is in operation (usually called a pegboard) and comply with these rules at all times. With 2.4 GHz systems frequency control is not an issue as each Radio is operating with a unique digital code rather than a frequency. However, you should still observe the need to check procedures as some clubs may have a unique peg for 2.4 GHz use and registration may also be required.

As an added precaution on 35MHz systems, call out your channel number loudly or speak to the other pilots present to confirm their frequencies before switching on so as to eliminate other pilots to a possible clash.

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. Check for secure mounting of the canopy, **(H)** boom clamps, and main and tail rotor blades.

If circumstances dictate that range checks are required upon arrival, then look for the assistance of a helper and inform others of your intention.

When using Electric Models, it may be necessary to recharge the drive batteries at the field, if this occurs the following guidelines should be observed;

1. Never charge battery packs in a model or left in a motor vehicle.
2. Ensure a well-ventilated area and never charge battery packs unattended.
3. Check carefully that the charge rate and cell count are appropriate to the pack.
4. The use of a fireproof bag or case is recommended for home use. At a flying site it may not be necessary if it is in an open environment and if the pack is separated from any combustible items.
5. Lithium batteries, in particular, have a tendency to swell up and even explode if charged incorrectly

Section 3: Starting the model

For fixed wing models have someone trustworthy to hold the model securely or use a suitable restraint mechanism.

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

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

(E) The final electric connection to be made is normally the drive battery and should only be completed when satisfied that the model is operating correctly and the throttle is off. The drive battery should be disconnected in all cases before turning off the transmitter.

If flick starting the engine, use finger protection or a strong glove.

When the engine has started performing all adjustments from behind the model.

(H) Adjustments should only be made with the clutch disengaged and while holding the rotor head firmly.

Ensure that the model is restrained at all times 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. Model should be started and all adjustments made only in the pits area.

(H) Ensure that the rotor head is restrained by hand at all times while the engine is running in the pits area

Section 4: Flying the model

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.

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

The only material allowed for jettisonable Ballast on a glider is water (G)

When joining other gliders in a thermal you must join in the same rotation as the other gliders already inside (G)

To avoid collisions with other gliders in a crowded environment, gliders in sight must not visually cross each other (G)

To confirm the release of your glider from the tow plane, flick release several times and watch for the marker separation (G)

Gliders should ideally use an airbrake function on a proportional channel to control glide path (G)

To increase wing loading for high wind, create more velocity and speed retention ballast may be used (G)

When using ballast in your glider, it should always be positioned at the C of G (G)

When launching by winch launch, the hook be positioned 2 to 3 cm in front of C of G (G)

Last thing before take-off; check all controls for correct movement and direction.

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

"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. (A/H)

"Landing" must be called clearly to alert others in the area. (A/H/G) Also applies to helicopters flying in the same airspace as fixed wing models.

The IAA in SI 563 of 2015 and SI 24 of 2023 has stated that the maximum height allowed is 400 ft. for all models. This is calculated as Above Ground Level (AGL), i.e. from Pilot position. As this can often be difficult to achieve in practice the following guidelines apply to all members:

- Individual members should endeavour to estimate to the best of their ability this height before commencing any flight.
- MACI appreciate that without a marker in the sky this is a difficult task and open to personal interpretation when considering environmental conditions, ground terrain and an individual's perception.
- If you are unsure of your height consult with other local club members for guidance.
- It is understood by MACI that models may occasionally have to fly above the estimated 400 ft. while transitioning through manoeuvres or completing turnaround parts of their flight.
- In accordance with MACI competition regulations a pilot may take a re-flight if manned aircraft are transiting close to the site during a competition flight.

- Given that any time spent above the estimated height will only be a small percentage of an overall flight and members adhere to all parts of this guidance material then members are acting in the best interests of MACI.
- Members must always observe all other rules of the air and specific arrangements agreed with the IAA.
- No SUA (Small unmanned Aircraft) may fly within 2 Kms of a manned aircraft and that manned flight has right of way at all times.

- IAA agreed Lateral Visual line of sight (VLOS) regulations and restrictions for your specific site taking into consideration the type of models flown on the day.

  - All Multirotor Drones 300M (VLOS) Max.
  - Helicopters of Rotor diameter < 1.1 M 300M (VLOS) Max.
  - Helicopters of Rotor diameter > 1.1 M 500M (VLOS) Max.
  - Aeroplanes of Wingspan < 1.7 M 500M (VLOS) Max.
  - Aeroplanes of Wingspan > 1.7 M 800M (EVLOS) Max.

- If members are attending an organised event or competition on a MACI site in any category, then the CD is responsible for the practical application of these guidelines.
- For any other flying activity on a MACI registered site the individual member is responsible for the practical application of all these guidelines.

In an emergency the model is the lowest priority.

The cardinal rule is – "Ditch, if necessary, to avoid people".

Further details are available from the AB Officer

mailto:abcoordinator@maci.ie

MACI