

SAMAA PROFICIENCY TESTS FOR FIXED WING POWERED MODELS

SECTION 1

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INTRODUCTION

In the interest of the hobby and sport, it is essential that first,

~~///~~ an adequate standard be achieved before a Beginner be allowed to fly on his own without a qualified instructor in attendance, and secondly,

~~///~~ that further challenges be set to ensure and entice the model Pilot to improve his flying skills.

With these two main objectives in mind, SAMAA have produced, over the years, a number of Proficiency Tests.

The first set of proficiency tests being the "Propeller" series, which due to a number of irregularities was discontinued and was replaced in 1984 by the present "Merit" system, which is represented by the four qualifications of Bronze, Silver, Gold and Instructors.

The "Bronze Merit" was regarded by SAMAA as the minimum requirement for a Radio Control Pilot to fly a model on his own. But recently following criticism from many SAMAA Members and Clubs, it has been decided that a more forgiving (in terms of flying requirements) and more comprehensive (in terms of general safety knowledge) test be formulated.

This test will be known as the "Solo".

This "Solo" test will ensure a model Pilot's ability to fly and control a model safely when other members are present, it will also ensure that the model Pilot has a good working knowledge of his Club's General and Safety Rules and has a working knowledge of Basic Aerodynamics (i.e. why an aeroplane flies!)

Other changes to the present SAMAA proficiency regulations relate to:

~~///~~ level of qualification for a member to "Instruct" or teach a Beginner,

~~///~~ the level of competence for a model Pilot to be allowed to fly at an airshow held at his own club with public present.

Also added to this Booklet is a "Teaching sequence" for Pupil Pilots. This is a milestone recorded and progress by which should make it much easier for a Club Instructor to monitor the progress of a beginner or pupil.

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SECTION 2

DEFINITIONS

For clarity, let's define some of the terms used in this Booklet, these are:

- ✂ *Pupil Pilot* - a Pupil Pilot is a member who is learning to fly a R/C model aeroplane. He will have SAMAA membership but has not as yet obtained his "Solo" status. HE SHALL ALWAYS BE ACCOMPANIED BY AN EXPERIENCED SAMAA REGISTERED AND QUALIFIED CLUB INSTRUCTOR.
- ✂ *Pilot* - a member who is in charge of an aeroplane, and who can fly a model aeroplane and has achieved the minimum qualifications of a "Solo". When he switches on his radio transmitter he becomes a Pilot.
- ✂ *SAMAA* - is the South African Model Aircraft Association which is the Coordinating and Controlling Body for Aeromodelling in South Africa. All SAMAA Rules and Regulations are to be incorporated in and enforced at SAMAA registered clubs.
- ✂ *Member* - means a fully paid up member of SAMAA who is in good standing with the association.
- ✂ *Pilot Box/Pilot Area* - means designated area from which Pilots fly their aeroplanes.
- ✂ *Frequency Peg Board* - shall mean the frequency control system used by the club to ensure control over all the frequencies which can be used at the field.
- ✂ *Pit Area* - shall mean the area between the club house and the Pilot boxes on the runway nearest to the club house.
- ✂ *Run Up Area* - shall be an area off to the side of the taxiways where engines can be checked without interfering with aircraft in the pit area or the Pilots flying.

- ✂ *Transmitter Control Area* - shall be the area at the back of the pit area where all Transmitters are impounded when not in use.
- ✂ *Transmitter* - shall be a purpose made, commercially manufactured unit which shall have been designated and manufactured to work within the tolerances of the frequency band without interfering with the adjacent frequency bands.
- ✂ *Buddy Box* - is a system whereby the Instructor has a "master" Transmitter and can assume control of the airplane as required.
- ✂ *Aircraft or Aeroplane* - shall mean a fixed wing model aircraft powered by an Internal Combustion, CO₂, Jetex or Electric motor.
- ✂ *Frequency Peg/Marker* - will be the marker used to identify the radio frequencies in use at the field. This could be either the "PEG ON" or "PEG OFF" system of control.
- ✂ *Rules and Regulations* - these shall mean the SAMAA Rules and Regulations, the Club Rules and Regulations Special Rules and Regulations (which have been specifically modified to accommodate any particular club requirements).
- ✂ *Club Instructor* - A person, who in the Club's views, is qualified to assist a beginner to learn to fly. A member who has obtained a proficiency level which makes him competent to instruct beginners. A member who has obtained a SAMAA silver merit.

Any two club instructors can test a pupil pilot and award a "solo" status.

The Club Instructor position is critical to the development of the flying expertise of members in the club and the achievement of this merit will enable these qualified members to contribute.

A list of approved Instructors will be posted on the Club Notice Board and will be updated.

✂ SAMAA Instructor

- A Pilot who has satisfactorily obtained his SAMAA Instructor Merit, and who has demonstrated to the SAMAA Instructor Judges that he has a good understanding of the Safety Rules, and comparative scoring system. He will be allowed to judge when accompanied by a second qualified SAMAA Instructor and award SAMAA merits for Solo, Bronze, Silver and Gold.

✂ SAMAA Instructor Judge

- After a Pilot has satisfactorily performed and been awarded his SAMAA Instructors merit, he could be appointed to a SAMAA Instructor Judge status at SAMAA's discretion provided he fulfills the following criteria:
 - (a) He shall be a fully paid up member of SAMAA and be in good standing with regards to payments.
 - (b) He shall have a minimum of 7 (Seven) years' exposure to model flying.
 - (c) He shall have judged at competitions and at national level.
 - (d) He shall have judged adequate Instructor's Merit tests to ensure that he has a good understanding of the SAMAA requirements.
 - (e) He shall be mature.
 - (f) He shall be respected in the flying fraternity.
 - (g) He shall be approved and appointed by the SAMAA Committee

It must be stated that it is SAMAA's decision as to how many Judges they wish to appoint in an area or province, and potential Instructor Judges will only be appointed as and when required.

✂ Display Pilot

- Is a pilot who regularly flies at Air Displays.

SECTION 3**TEACHING A PUPIL PILOT TO FLY**

This section has been introduced to set down some guidelines to Club Instructors.

It is intended to outline the things that a pilot should know, and its objective is to assist and remind the Instructor of things that he takes for granted and assumes others know.

The duties of the Club Instructor are four fold:

1. Check out the Pupil Pilots aeroplane before the first flight, or after any repairs.
2. Instruct the Pupil Pilot on SAMAA, the Club's Constitution, the Club's Flying Procedures and the Clubs' Safety Rules and Safety Code.
3. Instruct briefly on a number of general subjects as outlined under "General Instruction".
4. Teach the Pupil Pilot to fly.

3.1 CHECKOUT THE PUPIL/BEGINNER'S AEROPLANE

Each and every aeroplane should be checked out structurally, and for the method and correctness of the radio, motor and equipment installation. For this purpose it is suggested that the preflight checklist in Section 5 be used.

3.2 FIELD ETIQUETTE AND SAFETY RULES

This is the Instructors' second duty:

At this stage most clubs have not prepared classes to cover this aspect of the hobby and therefore it is up to the Instructor to run through the Constitution book covering:

- (a) – Club Rules and Flying Procedures;
- (b) – Safety Rules, Safety Code and Procedures; and
- (c) – Bye-Laws and Special Regulations.
- (d) – SAMAA Rules.

THIS IS A MUST.

3.3. GENERAL INSTRUCTION

The Instructors' third duty covers a fairly large scope and the Instructor must do his best to cover the subjects listed below.

To date, no course has been prepared, so it is up to the Instructor to do his best to give the Pupil a grounding in the following:

3.3.1 Theory of Flight

- (i) basics.
- (ii) speed/lift. (Bernoulli principles).
- (iii) stalling.
- (iv) centre of gravity (forward-safe, rearward-disastrous).
- (v) the 3 axis (yaw, pitch, roll).
- (vi) control surface function and load.
- (vii) adverse yaw.
- (viii) air density and temperature.
- (ix) mass and wing loading.

3.3.2 Radio Functions

- (i) very basic theory.
- (ii) actions and functions of Tx.
- (iii) actions and functions of Rx.
- (iv) checks, range, batteries, etc.
- (v) third order intermodulation problems (60MHz).
- (vi) maintenance and charging.
- (viii) PCM receiver "failsafe" settings.

3.3.3 Frequency Control

- (i) describe both systems used in South Africa, i.e. "PEG ON" and "PEG OFF" in detail, emphasising discipline and consequences of failure to observe the rules.
- (ii) RED system, peg on radio, radio on.
- (iii) BLUE system, peg on Frequency Board, radio on.
- (iv) Transmitter impound system.

3.3.4 Pre-Flight Checks

- (i) radio/start up/mixture at high – low rpm/mixture when aircraft nose up, reliable idle, etc.
- (ii) engine power limits.
- (iii) control checks.
- (iv) taxi and runway discipline.
- (v) runway entrance, hold for landing aeroplane, permission from other Pilots flying.
- (vi) line up and delays.
- (vii) club local flying and safety rules.

3.3.5 Flying

- (i) power for height, elevator for speed.
- (ii) acquisition of stick "feel" – practise.
- (iii) simple turns and correction during manoeuvres.
- (iv) normal turns and manoeuvres.
- (v) disorientation - stick time.
- (vi) dangers of flying through the sun.
- (vii) basic aerobatics and correction.
- (viii) changing altitude.
- (ix) accurate positioning of aeroplane in the sky.
- (x) approach and landing pattern.
- (xi) landing.
- (xii) take-off procedures (use of rudder at lower speeds).
- (xiii) touch and go's.
- (xiv) identification of pupil's weakness, revision and practise to improve.
- (xv) first solo flight.
- (xvi) Solo Proficiency Test.
- (xvii) one month check-up and correction of any problem.

3.4. TAKE-OFF AND FLYING

Now comes the hard work for the Instructor – teaching the Beginner or Pupil to fly.

NO PUPIL PILOT MAY FLY HIS AIRCRAFT UNATTENDED.

Once the Pupil has listened to all the above theory, has forgotten more than half and misunderstood a quarter, he is now ready to fly, but again only after:

3.4.1 Pre Flight Checks

1. Re-check control movements before you taxi.
2. Taxi
 - (i) explain up elevator for a tail dragger
 - (ii) straight taxiing
 - (iii) torque effect.
3. Nose wheel effective.
4. Speed (i.e. enough power for take off).
5. Refuel if necessary.
6. Explain "aerial theory" of orientation (don't point aerial at aeroplane).

7. Explain “stick towards the wing that’s down” theory of orientation when aeroplane is coming towards the Pilot.
8. Explain stick movements, and use of trims and rates if necessary.
9. Explain position of hands and fingers on the transmitter.
10. Give commands to pupil and check his response to positioning aeroplane.

3.4.2 Flight Checks

1. Take-off.
 - (i) more speed than usual.
 - (ii) keep climb out flattish until safe height attained.
2. Check and adjust trims on transmitter.
3. Land immediately if trims are way-out or aeroplane behaves abnormally.
4. After test flight, land and adjust trim on aeroplane to re-centre trims on transmitter.
5. Re-check trims in flight, re-adjust if necessary.

3.4.3 TEACH THE PUPIL PILOT TO FLY

Flying – Sequence of Teaching

Here each Instructor has his own individual idea as how best to teach a Pupil, but the basics throughout the world show that the normal is:

- ~~///~~ Take-off by the Instructor, either using pupils or Buddy Box, climb to a reasonable height, throttle back and trim out for straight and level flight.
- ~~///~~ Hand over transmitter to Pupil who will do hours and hours of left and right turns, squares, figure eight’s, etc.
- ~~///~~ Landing by Instructor.
- ~~///~~ The Pupil learning to taxi, as this teaches him to use rudder and throttle.

- ~~///~~ The Pupil flying further hours of circuits, at gradually decreasing height above ground.
- ~~///~~ The Pupil’s first landing.
- ~~///~~ Further flying circuits, practising approaches and flight over runways.
- ~~///~~ First takeoffs.
- ~~///~~ Practising takeoffs, landings, flying the solo test pattern, approaches and landings.
- ~~///~~ Performing and passing the “solo” test.
- ~~///~~ Periodic check-ups.

The Instructor’s job is well done and he is a mental wreck, but guess what...there will still be dozens of new members over the years who will still want to learn to fly!

We believe that some of the points which must become part of the Instructor’s vocabulary ad nauseam are:

- ~~///~~ Is your peg on the board?
- ~~///~~ Have you charged your batteries?
- ~~///~~ Have you checked out your aeroplane?
- ~~///~~ Have you fuelled up?
- ~~///~~ Have you switched on?
- ~~///~~ Mind/be careful of the spinning propeller.
- ~~///~~ Pull out your aerial.
- ~~///~~ Keep away from the pits.
- ~~///~~ Get more height.
- ~~///~~ Tell the other members your intentions.
- ~~///~~ Have you switched off?
- ~~///~~ Is your transmitter back in the Tx impound?

SECTION 4

BEGINNERS/PUPIL PILOT MILESTONE LOG

4.1 PUPILS/BEGINNERS MILESTONES

This section now sets out the proposed learning – “achievement milestones” for teaching Pupils and to help achieve uniformity we have produced a Progress Log, we suggest that these milestones become a club standard in that any Instructor can see at a glance the status and progress of the Pupil, and carry on instruction from that point.

A suggestion to clubs is that a cardboard print of the Progress Log be issued to the Pupil, and this card is then presented to the Instructor before a Pupil flies. This card is then finally signed off by the Instructor and the Club Safety Officer.

A copy of the Progress Log/Milestones Achieved follows:

PROGRESS LOG

Pupils Status – Milestones

Member's Name: Type of Aeroplane:
 Club Name:
 SAMAA Number:

MILESTONES ACHIEVED

Item	Flying	Ground	Signature and Date
1	Explain Frequency Control System, Control Functions, Movement of Sticks, Flying Criteria to pupil	Demonstrate Frequency Peg System. Explain Basic Safety Rules, and Flying Rules	
2	Aeroplane checked out, trims ok, flies ok	Airworthiness checklist ok	
3	Pupil can ground taxi, do left and right hand circles and figure eight's at altitude	Club Safety, field and Flying Rules known by pupil	
4	Pupil can do left and right hand circles and figure eight's at low altitude, as well as trim our aircraft and do landing approaches	Safety Procedures know and practiced by pupil	
5	Pupil can do landings including dead stick landings	Safety and flying rules and procedures known	
6	Pupil can do takeoffs	Basic aerodynamics known	
7	Pupil passes solo test and is qualified to fly solo at any SAMAA registered club	Has satisfied Instructor on knowledge of Safety, Club Rules and Basic Aerodynamics	

Instructor's Signature: _____ Date: _____

Safety Officer Signature: _____ Date: _____

SECTION 5

PRE-FLIGHT CHECKLIST

This checklist is a general checklist and should be used in part or in whole by all Pilots to check out their aeroplanes before the first flight of the day.

This preflight checklist is to be used in whole by all Pilots who are doing their proficiency tests.

5.1 This checklist should be used to check out a Beginner or Pupil's aeroplane before it's first flight. To assist the Pilot, this section has been set out in a logical sequence so that each check or set of checks follows the previous one. The Pupil must practice and become familiar with this checklist.

5.2 Airworthiness

Here is the first of the Instructors duties.

It is a prerequisite that any new, untried or repaired aeroplane be properly checked before its first flight. The check-lists which follow are brief but reasonably comprehensive and, if in the views of the Instructor, the aeroplane is not airworthy or is unsuitable for a Pupil, now is the time to say so. It is pointless for a Pupil to try to fly an aeroplane which is not airworthy or too advanced for him which he will crash and which will convince him that this hobby is not for him.

If the plane fits the above category, it should be grounded until such time as the alterations, modifications or replacement is done to the satisfaction of the Instructor. A list of the defects, if not fixable at the field, should be given to the Pupil by the Instructor. A copy of this same list must be given to the Safety Officer with the Pupils name, the type of aeroplane, and his reasons for not allowing the plane to be flown clearly documented thereon.

Checks to be done by the Instructor must include the following:

- ~~✍~~ Explain to the Pupil, during the check out of the aeroplane, his observations and his reasons for any adjustments that are made.
- ~~✍~~ If this check is being done at the field – RESERVE THE TRANSMITTER FREQUENCY BEFORE STARTING THE CHECK. Confirm that the frequency is an approved SAMAA frequency.

5.3 CHECK LIST:

Structure

1. Check wing for warps.

2. Check ailerons.
 - (i) method of attachment (hinges pinned, etc.)
 - (ii) check aileron/wing gap and temporarily seal with tape if excessive.
 - (iii) movement (correct direction and adequate or excessive movement).
3. Check the centre section of the wing for strength, and the wing overall for stiffness.
4. Check that the tail plane is on straight and square.
5. Check that the fin is on straight and square.
6. Check the method of attaching tail surfaces to fuselage.
7. Check the rudder and elevator hinges (pinned), and the control surface gaps.
8. Check rudder and elevator movements.
 - (i) correct direction and amount of movement, (adequate or excessive).
 - (ii) kwiklinks (control rod locks) correctly fitted to both ends of push rods.
 - (iii) check to see if elevator and rudder are firmly fixed.
9. Check method of mounting engine.
 - (i) type of mount.
 - (ii) correct type and number of screws.
 - (iii) servo linkage, movement correct.
 - (iv) no metal to metal linkages to cause noise.
10. Check fuel tank.
 - (i) is it at the correct level?
 - (ii) position, can it move or rotate?
 - (iii) correct plumbing to tank, are the pressure and clunk systems okay?
 - (iv) filter(s) fitted.
11. Check nose wheel (if fitted).
 - (i) drag.
 - (ii) correct direction of movement.
 - (iii) amount of movement.
 - (iv) linkages okay, no metal to metal links.
 - (v) tracks straight when servo is at centre.
12. Check main wheels.
 - (i) drag.
 - (ii) method of attachment to fuselage, and wheels to axles.
 - (iii) tracking straight.

- (iv) position of wheels relative to CG.

5.4 **Radio Installation**

1. Check servo tray and/or aileron servo attachment.
 - (i) trays screwed down correctly.
 - (ii) servos mounted correctly on grommets.
 - (iii) screws in servo output arms.
 - (iv) kwiklinks on push rods fitted and adjusted correctly.
 - (v) no binding of output arms or push rods over full servo throw, including trims.
2. Check battery
 - (i) position and, method of mounting. Can it move and alter C of G, etc.?
 - (ii) check battery voltage under load.
 - (iii) set up "fail safe" settings if applicable.
3. Check receiver position and protection.
4. Check exit position of aerial.
 - (i) restraint inside fuselage, not under tension.
 - (ii) away from servos and output arms.
 - (iii) method of attachments to fin and/or tail plane.
 - (iv) not doubled back on itself.
 - (v) not inside fuselage alongside metal control rods?
 - (vi) protected at exit point of fuselage.
5. Linkage on servos.
 - (i) no metal to metal contact.
 - (ii) nyrod outers glued down at both ends and supported in the middle of a long run.
 - (iii) end of control rods properly restrained.
6. Foam rubber packaging (not plastic foam) where necessary.
7. Servo leads okay and plugged in properly.
8. Check linkage to elevator, rudder, ailerons, throttle and nose wheel.
 - (i) method of attachment.
 - (ii) throttle travel correct or override provided.
 - (iii) nose wheel shock absorber (on leg and linkage).
 - (iv) clearance of aileron linkages when wing attached to fuselage.
 - (v) kwiklinks.

9. Check movement of servos.
 - (i) servos move smoothly with no grinding noises, jerkiness or buzzing.
 - (ii) no binding during full throws and trims.
 - (iii) all moving in the correct directions relative to stick movements on ailerons, elevator, rudder, throttle and nose wheel.
 - (iv) set up rates if thought necessary.
 - (v) Check failsafe settings on servos if PCM receiver used. (Motor to stop – balance of servos to hold.)

5.5 Assembly

1. Check if covering of total aeroplane okay.
2. Check wing incidence.
3. Check tail plane incidence.
4. Check thrust line of motor.
 - (i) viewed from side for down thrust.
 - (ii) check to top of fin for right thrust.
5. Check all control surfaces are aligned with flying surfaces, i.e. elevator, rudder and aileron.
6. Check position of Centre of Gravity.
7. Method of attaching wing to fuselage.
8. Wing square on fuselage.
 - (i) viewed from front.
 - (ii) viewed from back.
 - (iii) viewed from top.
 - (iv) check aerial or servo leads not trapped.

5.6 Engine Checks

1. Propeller.
 - (i) correct size for engine.
 - (ii) correct type for engine (not pure nylon).
 - (iii) prop nut tight (no pliers please).
2. Glow Plug.
 - (i) correct type.
 - (ii) firmly tightened, but not over tight.

3. Carburettor.
 - (i) mounted firmly.
 - (ii) idle adjusted correctly.
4. Fuel.
 - (i) tank full of correct type fuel.
 - (ii) filter recommended in fuel line.
5. Silencer.
 - (i) check that the silencer is an approved, unmodified unit.
 - (ii) check that the silencer is properly attached to the motor.

[WARN ABOUT THE DANGERS OF A SPINNING PROPELLER]

6. Start engine.
 - (i) check high speed setting, set intermediate setting.
 - (ii) check for fuel foaming.
 - (iii) check idle and adjust so that motor stops on pulling throttle trim back.
 - (iv) recheck over full rev range and sort out problems.
 - (v) motor runs with aeroplane nose held vertically up.
 - (vi) check that the noise level is within SAMAA and Club limits when engine is at full revs.

5.7 Range Checks

1. Output meter on the transmitter reading correctly and in the "green" at plus 9.6V.
2. Check receiver battery voltage under load.
3. Check operating range with transmitter aerial collapsed.

NOTE Explain adjustments to the Pupil and let him observe, learn and participate with the necessary checks and adjustments and range check.

SECTION 6

6.1 REQUIREMENTS FOR "SOLO" TEST

From the attached "Solo Proficiency Test Score Sheet" it can be seen that the flying manoeuvres required are basic. This is intentional, the reason for this test is to demonstrate to the two SAMAA or Club Instructors that you, the Beginner or Pupil, have enough knowledge of the club procedures and experience to fly, without an Instructor present, when there are other members flying and that you will not create a liability or danger to those present, including spectators and their possessions at the flying field.

This qualification also fulfills the minimum requirement of the SAMAA Insurance for flying alone.

The first two items, Oral (general and safety) and Pre-flight, will require some homework from you.

These solo tests will be arranged and conducted in a formal manner, with the correctly qualified persons present at the tests, and the duly signed test papers will be approved by the Club Safety Committee before being placed on file and a copy forwarded to SAMAA.

As this test has only recently been introduced, SAMAA have brought in a "Grandfather Clause" whereby members who have been flying regularly for years, and who in the views of SAMAA and the Club Safety Committee, are adequately experienced, will automatically be awarded this qualification.

Right, let's get on with a description of the requirements for the manoeuvres.

Takeoff into the Wind

The runway used will be the one nearest into the wind and the Pupil will be required to do a takeoff which consists of the following:

- ✍ Apply power smoothly
- ✍ Keep reasonably straight down the runway on takeoff
- ✍ Keep straight, climbing slowly, (not hanging on propeller) for at least 5 seconds
- ✍ Do a gentle turn away from the pits

Left and Right Hand Circuits

Here the Pupil must demonstrate his ability to do circuits while maintaining a reasonable level.

- ✍ After takeoff, climb to a reasonable height
- ✍ Announce your intention, i.e. left or right circuit, when the airplane is in front of you
- ✍ Proceed to do the turn
- ✍ When the turn is complete, repeat the manoeuvre in the opposite direction

Showing a lack of control or uncertainty in your control will result in a retest of this manoeuvre.

Horizontal Eight

This is a manoeuvre with a smooth transit in between the two turns.

- ✍ When the plane is in front of you start either a left or right hand turn
- ✍ Continue the turn, trying to close back to the starting point
- ✍ Cross the start-up point and proceed with the other hand turn crossing back near or over the start point.

Dead Stick Landing

At some point in the test, the Judges will tell you to cut your plane's motor. This command will always be in such a position that you will be able to land on the runway.

- ✍ On receiving the command of cut, you must throttle your motor back to idle/stop
- ✍ You must judge your circuits and approach so as to be able to land into the wind near the runway in use

Landing on or near the runway is required. Landing on the pit side of the runway or in an uncontrolled manner means a test failure.

Ok, so we have written a lot about a simple test, but we at the SAMAA want you to pass, to be able to fly on your own, so as to allow you to practice and become more proficient.

6.2. SOLO PROFICIENCY TEST SHEET

Attached is a "Solo" Test sheet divided into:

(a) Flying

This test is scored on pass or fails, not points. The judge's may, if doubt exists, require you to repeat any of the manoeuvres listed. The test will consist of two rounds of the same manoeuvres.

The Judges will tell you whether you passed or failed. Their decision is final. A test may be redone a second time on the same day provided that there is time and the judges believe you are capable of passing the test.

(b) Oral and Preflight Check

This part of the Solo test is actually the more difficult part, as it requires you know and understand something about the frequency control, Club Rules and the workings of a model aeroplane.

The test is in the form of random questions which will be asked, and answered to the satisfaction of the judges. A list of the types of questions are set out on pages 20 and 21.

The preflight check will be based on the SAMAA Instructors check list (per section 5 of this booklet). As stated elsewhere, a lack of knowledge on the frequency control system and the basic Club Rules will ensure that you fail the test.

**PROFICIENCY TEST SHEET
SOLO LEVEL**

Description of Manoeuvre	First Flight		Second Flight	
	Judge 1	Judge 2	Judge 1	Judge 2
Oral Test – eight questions regarding flying / safety				
Pre-flight Check & Frequency Control – to club rules				
Take-off into Wind – controlled				
Left Hand Circuit – end of circuit parallel to runway				
Right Hand Circuit – end of circuit parallel to runway				
Two consecutive Horizontal Eights – cross-over at center				
Simulated “Deadstick” Landing – engine on at idle speed				
<i>PLEASE PRINT THE FOLLOWING DATA:</i>				
DATE OF TEST _____				
JUDGE 1: _____ SIGNED _____ DATE _____				
JUDGE 2: _____ SIGNED _____ DATE _____				
MEMBER _____ SAMAA No. _____ FREQUENCY _____				
MEMBERS CLUB _____				
PASS/FAIL				

Judges Comments: _____

Safety Committee Recommendation: _____

Badge Issued _____ Date _____

TYPICAL QUESTIONS TO BE ASKED FOR SOLO/BRONZE BADGES

Answers to all these questions will have been covered by your Instructor during your “learning to fly period” or should be common knowledge.

1. Which areas are you not allowed to fly over and why?
2. What do you do if you want to fly and there is a peg on your radio frequency?
3. How do you set about checking your motor if it does not want to start?
4. How long does your receiver battery last in a day and how do you know it is ok for another flight?
5. What is your procedure when you arrive at the club?
6. Why is it dangerous to lean over the motor to adjust the needle valve when the motor is at full throttle?
7. Why do the Club Safety Rules state that you should not taxi your aeroplane in the pit area?
8. Why is it essential that you secure the frequency spot and place your peg on it before switching on your transmitter?
9. What would you do if on take-off, just after becoming airborne, your aeroplane turned towards the pit/spectator area?
10. If there are Pilots standing, say three (3) meters from and halfway down the runway and you needed the full runway for take-off, what would you do?
11. If you are going to land and see someone on the runway trying to retrieve an aeroplane, what would you do?
12. If you were lined up ready for take-off and during your final check you notice a servo glitching, what would you do?
What would you do if you saw -
13. - That the tail plane was loose -
14. - That the aeroplane is vibrating badly -
15. - That the wing is skew -
16. - That the undercarriage is skew or loose -
17. - That some covering is loose -
What would you do if you heard -
18. - Someone yelling “DEADSTICK” -
19. - Someone yelling “LANDING” – What would you do?
20. If you are the most senior person at the field and the duty officer is not present, what would you do?
21. If you see a child running in the pit area, what would you do?
22. If you see a child with a transmitter, what would you do?
23. If you are the duty officer for the day, what would you do: -
i) If someone is ignoring the safety rules?
ii) If after a verbal warning they still persist in ignoring the rules?
24. What are your duties of a safety officer of the day?
25. What do you do if you want to fly and your frequency spot is not on the board?
26. What would you do if after waiting patiently for your frequency spot, the peg is not removed?
27. What would you do if someone has placed a peg on the board but he is no longer at the field?
28. What would you do if you want to fly but left your frequency peg at home?

29. What would you do if your motor stalls on the threshold/runway prior to take-off and other Pilots are waiting to take -off?
30. What would you do if you are about to fly and when you switch on your transmitter the meter shows red or under 9 volts?
31. How do you know the state and condition of your flight and transmitter battery packs?
32. What would you do if you notice that you forgot to switch off your transmitter an hour or so ago?
33. What would you do if it starts to rain whilst you are flying?
34. What would you do if there is lightning whilst you are flying?
35. What would you do if you notice a full-size aeroplane or helicopter is flying lower than you are?
36. What would you do if you notice a glider, old-timer aeroplane or beginner flying aimlessly?
37. What would you do if you are flying and the cell phone on you rings?
38. What would you do if you feel ill or faint while you are flying?
39. What would you do if you lose sight of your aeroplane in the sky?
40. What would you do if you are in a thermal going up and want to get down?
41. What would you do if the throttle on your aeroplane sticks at full throttle whilst flying?
42. Why does an aeroplane pull to the left on take-off?
43. Why do most models have down thrust?
44. Why do most models have right thrust?
45. What precautions should be taken when landing down wind?

SECTION 7

7.1 THE BRONZE, SILVER, GOLD AND INSTRUCTORS PROFICIENCY TESTS

- 7.1.1 Requirement for SAMAA Bronze, Silver, Gold and Instructor's Merit are as follows:

The SAMAA Proficiency Tests

The Proficiency tests for Bronze, Silver and Gold will be conducted by Club members who have achieved the SAMAA Instructors Merit. No proficiency test may be conducted by an Instructor who has instructed the Pilot under test.

Instructors' Proficiency Tests will be judged by two Instructors, one of whom will be a SAMAA Instructor Judge.

No Pilot may take an Instructors proficiency test without having first passed the Gold proficiency test.

The proficiency tests will be for the following merits: -

The Solo Level (qualification only)
 The Bronze Level
 The Silver Level
 The Gold Level
 The Instructors Proficiency Level

Sample score sheets are attached. The score sheets are designed to score both rounds of whichever test the Pilot has taken, and are scored by both Judges. These tests will be arranged and conducted in a formal manner, with the appropriately approved persons present at the tests. The test papers will be submitted to the Club Safety Committee for recommendations and will be ratified by the main committee before being sent to SAMAA.

7.1.2 Scoring

The scoring system for the proficiency tests will be on the same basis as for pattern flying, i.e., scores per manoeuvre will be out of 10. It is pointed out that the purpose of these tests is to determine the Proficiency of the Pilot rather than the accuracy of flying the manoeuvres. It is also emphasised that the landing approach pattern is probably the most important aspect of the proficiency tests and therefore competent approaches from both base legs are essential to the attainment of proficiency merit.

The scoring standard used has been set by the SAMAA Instructor Judges and although more relaxed than that used for FAI Competitions, is still stringent at Instructors' Merit level.

The preflight check is a pass or fail and the final score is unaffected by this item. The divisor used is the number of manoeuvres undertaken and scored, obviously a fail in the preflight check is a test fail.

The final score is the average of the four sub-totals. (2 Judges x 2 flights) for a pass on a merit to be achieved, the average score must equal or exceed the passing percentage required and no manoeuvre may score less than the minimum required for that merit.

Do be careful, a minimum score for a manoeuvre for say a Silver Merit, i.e. a 4, requires one eight, or two sevens to offset this minimum and achieve the ultimate pass percentage!

7.1.3 Test Failure

In any of the proficiency tests a score less than the minimum specified for the test is a failure for the whole test and the test must be repeated in total. So a fail in one manoeuvre in the first round means that there is no point in flying the second round of that test as you have failed.

7.1.4 Repeat Test

Two attempts at the same proficiency badge will be allowed on the same day provided time permits.

7.1.5 Time before a Retest

If a Pilot has failed both attempts at a proficiency level, he will have to wait and practice for one month before a retest will be allowed. The complete test will be redone, and no cognizance will be taken of previous attempts.

7.1.6 Level of Entry

A Pilot may do his first test at any level up to Gold, a pass at any level of proficiency automatically qualifies the Pilot for the levels below.

7.1.7 Proficiency Badges

The initial badge granted to any proficiency level will be paid for by the individual Pilot. The cost is R10-00 per badge. If the qualifying Pilot wishes to purchase the badges of the levels below that which he has qualified he may do so but again at a cost of R10-00. This figure of R10-00 is the current price and could be increased by the SAMAA Committee at any time dependant on replacement costs, etc.

7.1.8 Time Out

Should a Pilot, for some valid reason, such as to refuel or as a result of a deadstick, require to land, he shall be entitled to, and shall in no way be penalised provided he requests time out and then proceeds to land in a controlled manner on the runway in use.

After the problem has been rectified, he will resume his test at the point it was interrupted.

7.1.10 Time Between Attempts

A Pilot will be given, if he so requests, or if circumstances rule, be given a break between attempts. The length of this break will be at the discretion of the Judges.

7.1.11 Pilot's Briefing

A Pilot's briefing will be held at the beginning of the test session. The Judges will host this session. All Pilots doing tests will be properly briefed as to what is required of them. And at this time the candidates must clear any queries they have on the tests to be performed or the manoeuvres required.

7.1.12 Debriefing

If time permits, a debriefing will be held by the Judges and the results of the Proficiency tests made available.

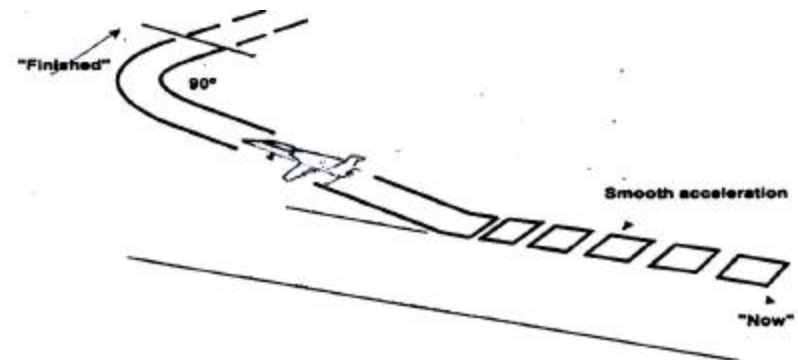
7.2 Proficiency Test Manoeuvres

7.2.1 Preflight Check

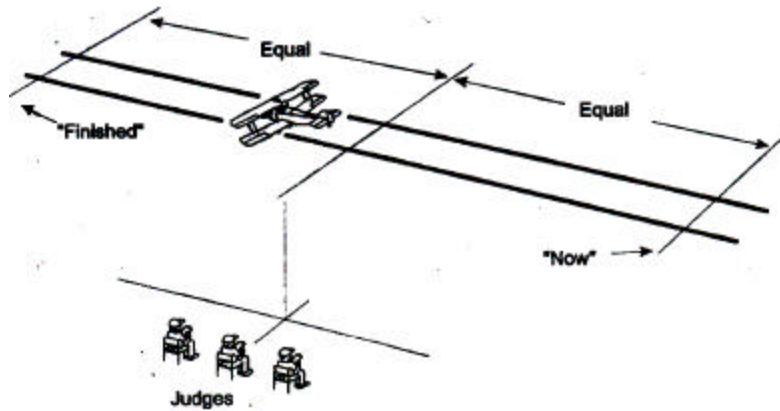
This will be done on the aeroplane before any flight testing takes place and is to be a complete safety and airworthiness check. It must be demonstrated to the Instructor(s) judging the test. The requirements for a preflight check is given in Section 5.

7.2.2 Takeoff into the wind

The takeoff will be judged on model control, particularly use of rudder, use of throttle, length of run and angle of ascent. Where a tail dragger is used for the test, a reasonable amount of swing on initial acceleration should be tolerated. The takeoff should start from a standstill and is complete when the model has performed a 90° turn away from the Pilot.

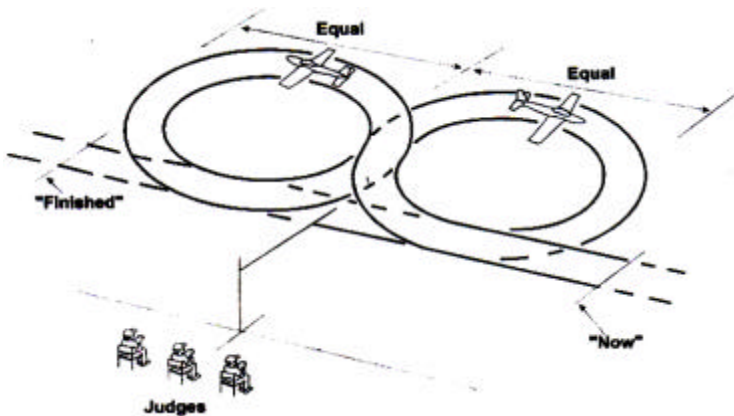


- 7.2.3 Straight and level flight into wind for five seconds at an altitude of between 50 and 100 feet (17 and 34 metres).



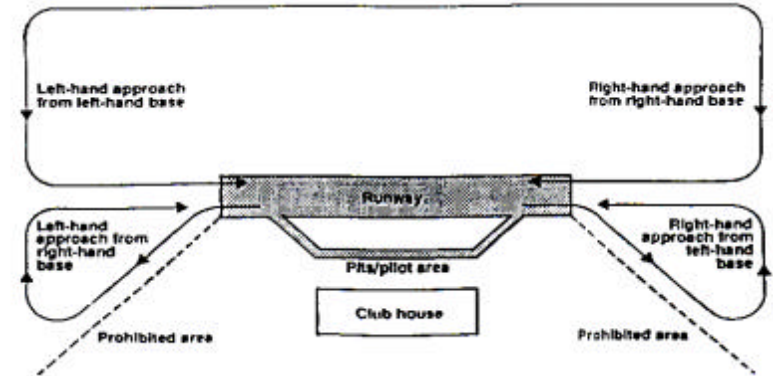
- 7.2.4 Two "figures of eight"

One into wind, the other downwind whose longitudinal axis shall be parallel to the runway of takeoff. Altitude will be maintained within reasonable limits and consistency of the figure of eight will be judged, taking into account any wind strength. Altitude should be between 50 and 150 feet (17 and 34 metres). The model approaches in straight and level flight, performs a quarter circle turn away from the Pilot, followed by a 360° turn in the opposite direction. This is then followed by a 270° turn in the original direction. The manoeuvre is complete after the model has passed the Pilot in straight and level flight in the direction of the original entry into the manoeuvre.



- 7.2.5 Approaches from both sides and both bases

The Pilot will demonstrate to the satisfaction of the judges that he can make a satisfactory **approach** to within 10 feet (3 metres) of the runway centre from either direction and from both left and right base legs, on **both** attempts for the test. The sketch below will clarify how the approaches should be made to prevent the Pilot flying above or behind the club house. The criteria for a pass in this test is whether the Pilot could land the aeroplane safely from any direction of approach.



LANDING APPROACH LAYOUT

- 7.2.6 The Landing

The landing would be straight on the relative runway, and touchdowns within the first one third of the runway length. A small bounce, particularly with a tail dragger will be tolerated.

- 7.2.7 One Inside Loop

From straight flight, parallel to the runway of takeoff, the model pulls up into a circular loop and resumes straight and level flight on the same heading as the entry. The throttle may be reduced at the top of the loop as appropriate to the type of aeroplane and opened when normal flight is resumed.

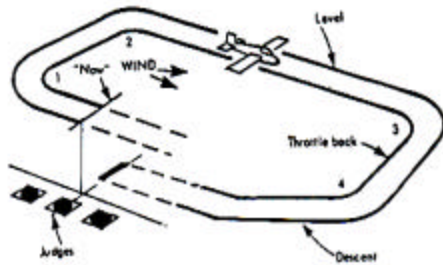
- 7.2.8 Slow Pass Into Wind

Straight and level at about 4 metres above ground, throttle back to a safe low speed and do a low pass into wind parallel to runway in use.

- 7.2.9 One Roll

Starts from straight and level, flown into wind parallel to runway of take-off, aeroplane to roll axially (unless otherwise stated) to left or right until the roll is completed with the wings level and the model is on the same heading and at the same altitude as at the entry.

- 7.2.10 Spiral Decent
This is not a flat spin, the motor must always be below the tail. Suggested method for performing a spiral descent is: Obtain sufficient height, from level flight, throttle back motor, apply some up elevator, apply rudder and if required, some aileron, allow some 2 – 3 turns. Recover to level flight.
- 7.2.11 Consecutive Rolls
Starts from straight and level, flown into wind parallel to runway of takeoff plane to roll axially (unless otherwise stated) to left or right until rolls are completed. The recovery should be at the same heading and altitude as entry. Slight changes in altitude depending on aircraft type will be acceptable.
- 7.2.12 Emergency Landing
For this manoeuvre the Pilot will be told to cut throttle and land. An idling motor will be acceptable, and the Pilot will land into the wind on the runway of takeoff. The use of the throttle or landing off the runway scores zero.
- 7.2.13 Outside Loop
Obtain sufficient height flying downwind parallel to the runway of takeoff from straight and level, shut throttle, give down elevator to dive down into a circular loop. Open throttle at about the 4 o'clock position pushing back up to entry altitude to complete the loop.
- 7.2.14 Cross Wind Landing
As per normal landing, but rudder and/or aileron should be applied to keep the aeroplane flying on a track down the runway before touching down.
- 7.2.15 Landing Pattern
The landing pattern should be of the rectangular approach type and should demonstrate the ability to control rate of descent and throttle setting. The final approach and touchdown must be smooth and demonstrate a consistent rate of descent and speed. All landings shall be on the runway. Where no runway exists, landings will be within 3 metres of the assumed centre line of the runway. Acceptance will be at the discretion of the Judges and their decision shall be final.



- 7.2.16 Recovery from unusual altitudes The judge(s) will, while the Instructor is under test, with his hands off the Tx, place the aircraft in an unusual flight altitude on two separate occasions during the flight and the Instructor under test will demonstrate his ability to recover from the unusual altitude, the first reaction being to close the throttle. (This may be dependant on the circumstances at the time).
- 7.2.17 Fast low pass downwind Straight and level at about 4 metres above the ground and parallel to the runway in use.
- 7.3 The Bronze Proficiency Test
This test is the most basic of the tests but still requires that you score a minimum of 3 points for a manoeuvre and an average of 50% for a pass.
- 7.4 The Silver Proficiency Test
This test is a minimum achievement for all flyers as it entitles you to:
?? Become a Club Instructor and teach others to fly
?? Fly at a local club airshow.
- It is not a hard merit to achieve but does require that you be a reasonably competent and experienced Pilot.
- This merit is very close to the entry level requirement for competition flying.
- 7.5 The Gold Proficiency Test
With this merit you are well on the way to becoming a good flyer, and you certainly should be considering, if not flying in competitions.
- 7.6 The Instructor Proficiency Test
This is the ultimate SAMAA test, which certainly qualifies you as an excellent flyer.
- The Instructor Proficiency Test will encompass the Gold Merit Test Schedule as well as the following additional manoeuvres:-
- ?? One of the rounds will be flown with a Cross Wind Take off and Landing.
 - ?? Two outside loops instead of inside loops will be performed.
 - ?? Two inverted figures of eight, one into the wind the other downwind, the longitudinal axis of which shall be parallel to the runway of take off. Altitude will be maintained within reasonable limits and consistency of the figure eight will be judged, taking into account any

wind strength. The model approaches in straight and level flight, rolls inverted, performs a quarter circle turn away from the Pilot, followed by a 360° turn in the opposite direction. This is then followed by a 270° turn in the first direction. The manoeuvre is complete after the model has passed the pilot and rolled upright, back into straight and level flight, on its original heading.

As stated earlier this test is notably more severe than the other tests and a Pilot must be capable and experienced to achieve this merit.

It should be noted that many “good” Pilots will fail this test if they do not practice the manoeuvres prior to the test.

SECTION 8

8.0 SAMAA TEST SHEETS

Included are test sheets for:

- (a) SAMAA Solo (Section 6.2)
- (b) SAMAA Bronze
- (c) SAMAA Silver
- (d) SAMAA Gold
- (e) SAMAA Instructors

8.1 Display Pilot Proficiency Testing

A Display Pilots’ Rating is also attainable. This is only awarded to Instructor rated Pilots who **regularly** fly at public displays. To maintain a **DISPLAY** Rating the Pilot must re-fly his Instructor Rating test **annually** in front of two SAMAA appointed Instructor Judges.

- ~~✍~~ No Pilot holding a rating under the **GOLD** proficiency level should be allowed to fly at any SAMAA sanctioned public display.
- ~~✍~~ Any Pilot who wishes to fly at public displays **regularly** must hold a minimum of an **INSTRUCTOR** rating.
- ~~✍~~ Pilots who fly at displays at their own club shall hold a minimum rating of a current **SILVER** rating.

Please ensure that SAMAA permission is obtained for any Display or Flying Event at a non-SAMAA registered site to validate the Insurance cover.

Contact your local area delegate of SAMAA for help in this or any other respect concerning proficiency.



**PROFICIENCY TEST SCORE SHEET
BRONZE LEVEL**

Description of Manoeuvre	First Flight		Second Flight	
	Judge 1	Judge 2	Judge 1	Judge 2
Preflight Check				
Take Off into Wind				
Straight and Level flight for 5 seconds				
Two Horizontal Figure Eights				
One Inside Loop				
Slow Low Pass into Wind				
Left Hand Landing approach from Right Hand Base				
Right Hand Landing approach from Left Hand Base				
Left Hand Landing approach from Left Hand Base				
Right Hand Landing approach from Right Hand Base				
Landing into Wind				
Minimum Score per Manoeuvre	3	3	3	3
SCORE SUB TOTALS				
TOTAL SCORE FOR EACH FLIGHT				
OVERALL FLIGHT PERCENTAGE				
AVERAGE % OF BOTH FLIGHTS				
PASSING PERCENTAGE IS	50%			
N.B. If less than the minimum score is achieved for any manoeuvre, the flight attempt will be deemed a failure				
ORAL TEST			PASS / FAIL	
PLEASE PRINT THE FOLLOWING DATA:				
PILOT'S NAME _____		CLUB NAME _____		
PILOT'S ADDRESS _____		TEL No. (W) _____		
_____		TEL No. (H) _____		
_____		CELL No. _____		
PILOT'S SIGNATURE _____		SAMAA No. _____		
JUDGES NAMES 1 _____		SIGNATURE _____		
2 _____		SIGNATURE _____		

Judges Comments: _____

Safety Committee Recommendation: _____

Main Committee Approval: _____

Note: If the member has not done the “solo” test, he will be required to answer the questions as per “solo” oral section 5 before being awarded his “Bronze” or a higher merit



The South African Model Aircraft Association

**PROFICIENCY TEST SCORE SHEET
SILVER LEVEL**

Description of Manoeuvre	First Flight		Second Flight	
	Judge 1	Judge 2	Judge 1	Judge 2
Preflight Check				
Take Off into Wind				
Straight and Level flight for 5 seconds				
Two Horizontal Figure Eights				
Two Inside Loops				
One Roll				
Slow Low Pass into Wind				
Left Hand Landing approach from Right Hand Base				
Right Hand Landing approach from Left Hand Base				
Left Hand Landing approach from Left Hand Base				
Right Hand Landing approach from Right Hand Base				
Landing into Wind				
Minimum Score per Manoeuvre	4	4	4	4
SCORE SUB TOTALS				
TOTAL SCORE FOR EACH FLIGHT				
OVERALL FLIGHT PERCENTAGE				
AVERAGE % OF BOTH FLIGHTS				
PASSING PERCENTAGE IS	60%			
N.B. If less than the minimum score is achieved for any manoeuvre, the flight attempt will be deemed a failure				
<i>PLEASE PRINT THE FOLLOWING DATA:</i>				
PILOT'S NAME _____	CLUB NAME _____			
PILOT'S ADDRESS _____	TEL No. (W) _____			
	TEL No. (H) _____			
	CELL No. _____			
PILOT'S SIGNATURE _____	SAMAA NO. : _____			
JUDGES NAMES 1 _____	SIGNATURE _____			
2 _____	SIGNATURE _____			

Judges Comments: _____

Safety Committee Recommendation: _____

Main Committee Approval: _____



The South African Model Aircraft Association

**PROFICIENCY TEST SCORE SHEET
GOLD LEVEL**

Description of Manoeuvre	First Flight		Second Flight	
	Judge 1	Judge 2	Judge 1	Judge 2
Preflight Check				
Take Off into Wind				
Straight and Level flight for 5 seconds				
Two Horizontal Figure Eights				
Two Inside Loops				
Spiral Descent				
Two or More Consecutive Rolls				
One Inverted Figure Eight				
Slow Low Pass into Wind				
Fast Low Pass Downwind				
Emergency Landing (called anytime during flight)				
Left Hand Landing approach from Right Hand Base				
Right Hand Landing approach from Left Hand Base				
Left Hand Landing approach from Left Hand Base				
Right Hand Landing approach from Right Hand Base				
Landing into Wind				
Minimum Score per Manoeuvre	4	4	4	4
SCORE SUB TOTALS				
TOTAL SCORE FOR EACH FLIGHT				
OVERALL FLIGHT PERCENTAGE				
AVERAGE % OF BOTH FLIGHTS				
PASSING PERCENTAGE IS	60%			
N.B. If less than the minimum score is achieved for any manoeuvre, the flight attempt will be deemed a failure				
<i>PLEASE PRINT THE FOLLOWING DATA:</i>				
PILOT'S NAME _____	CLUB NAME _____			
PILOT'S ADDRESS _____	TEL No. (W) _____			
	TEL No. (H) _____			
	CELL No. _____			
PILOT'S SIGNATURE _____	SAMAA No. : _____			
JUDGES NAMES 1 _____	SIGNATURE _____			
2 _____	SIGNATURE _____			

Judges Comments: _____

Safety Committee Recommendation: _____

Main Committee Approval: _____

