



Phoenix Model Aviators Inc

Fixed Wing Powered - Flight Training for Bronze, Silver & Gold Wings

As from 1st July, 2015, the Model Aeronautical Association of Australia - MAAA, has extended the '*Flight Proficiency Scheme*' by providing all affiliated members the opportunity of obtaining three categories of achievement.

Bronze Wings	Available to affiliated members who fly aircraft with an all up weight up to 2 kg.
Silver Wings	Available to affiliated members who fly aircraft with an all up weight greater than 2 kg.
Gold Wings	Available to affiliated members who fly aircraft with an all up weight greater than 2 kg. This category has a higher level of achievement.

The '**Bronze, Silver and Gold Wings**' are recognised by clubs through-out Australia as higher levels of achievement.

Aim

The pilot is required to demonstrate skills necessary to safely fly the aircraft through a set pattern of manoeuvres which includes a smooth and stable landing on the runway in front of the Pilot Safety Barrier followed by a controlled, powered taxi off the runway into the taxi-way towards the '**Holding Point**'.

Phoenix Model Aviators Inc.

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Bronze and Silver Wings

Flight Schedule

Bronze and Silver Wings (Power) are awarded when a member demonstrates, in the course of one session, that he/she has the skills to perform the manoeuvres listed in the tasks below, in a competent manner and to the required standard.

Please note:

The Pilot, standing behind the '**Pilot Safety Barrier**', is required to perform the manoeuvres in a smooth and stable manner whilst maintaining flying proficiency.

- | | |
|--|---|
| 1. Pre-flight Training | 8. Outward Figure Eight from left to right |
| a) Dexterity of pilot with his/her equipment | 9. Procedure Turn from right to left |
| b) Theoretical knowledge | 10. Procedure Turn from left to right |
| c) Pre-flight checks | 11. Simulated Dead Stick Landing |
| 2. Start Up, Taxi and take off positioning | 12. Landing Circuit from right to left |
| 3. Take off | 13. Landing Circuit from left to right |
| 4. Trimming of aircraft | 14. Landing (into wind) and roll to stop with the engine running |
| 5. Inward Figure Eight from right to left | 15. Taxi off the runway into the taxi-way towards the ' Holding Point '. |
| 6. Inward Figure Eight from left to right | |
| 7. Outward Figure Eight from right to left | |

Definitions

1. Pre-Flight Training

(a) **Dexterity of pilot with his/her equipment**

This refers to the ability of the pilot to locate all transmitter controls (including switches) without fumbling.

(b) **Theoretical knowledge**

This refers to the pilot's ability to name all major components of the aircraft, defining all functions including the effect of controls.

(c) **Pre-flight checks**

This refers to the pilot's ability to ready the aircraft to ensure it is properly airworthy. Other safety requirements (such as Tx range check), use of the Tx keyboard, awareness of flying & local conditions and safety rules are to be observed.

2. Start up, taxi and take off positioning

Ensure that your aircraft and equipment are safely positioned and that foreign objects cannot be drawn into a spinning propeller(s).

It is a very good idea to restrain your aircraft and/or have another flyer help you with the start-up process.

*Before taxiing the aircraft past the '**holding point**', ask the other pilot/s (whose aircraft are already in the circuit) for 'clearance' to enter the runway.*

*Such a request should be '**OK for line-up?**'*

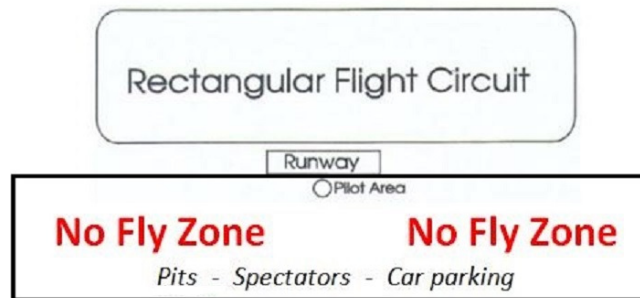
*This request should be given with a loud, audible voice to alert all pilots behind the '**Pilot Safety Barrier**' who in turn, can advise you of their present intentions or grant permission to '**Line-up**'.*

*When permission has been granted, taxi the aircraft forward to the '**Line Up position**'.*

3. Take Off

Emphasis is on the gradual application of power whilst keeping the aircraft straight, and using a little elevator to achieve lift-off.

The model should climb out gently (into wind) down the runway with wings level until a safe altitude is reached before making a left or right turn.



4. Trimming of Aircraft

The pilot demonstrates his/her ability to trim the aircraft in flight.

Displacement and re-trimming both the primary roll control and elevator should be demonstrated.

5. Inward Figure Eight from right to left – (Horizontal Manoeuvre)

This manoeuvre is a horizontal (flat) eight circuit without loss of height and with the change of turn directions directly in front of the 'Pilot Safety Barrier'.

Each circuit is 'round'. A Lazy Eight is disallowed.

The manoeuvre starts with the aircraft flying parallel to the runway, past the pilot (towards the far left-hand outside of the Figure Eight) turning right into the first circuit of the Figure Eight. The aircraft continues the first circuit towards the pilot who is standing on the centre-line of the manoeuvre before commencing the second circuit in the opposite direction.

The manoeuvre is completed when the aircraft rejoins the original flight path parallel to the runway.

6. Inward Figure Eight from left to right – (Horizontal Manoeuvre)

Same manoeuvre as in 5 above but directions are reversed.

7. Outward Figure Eight from right to left – (Horizontal Manoeuvre)

This manoeuvre is a horizontal (flat) eight circuit without loss of height and with the change of turn directions directly in front of the 'Pilot Safety Barrier'.

Each circuit is 'round'. Lazy eight are disallowed.

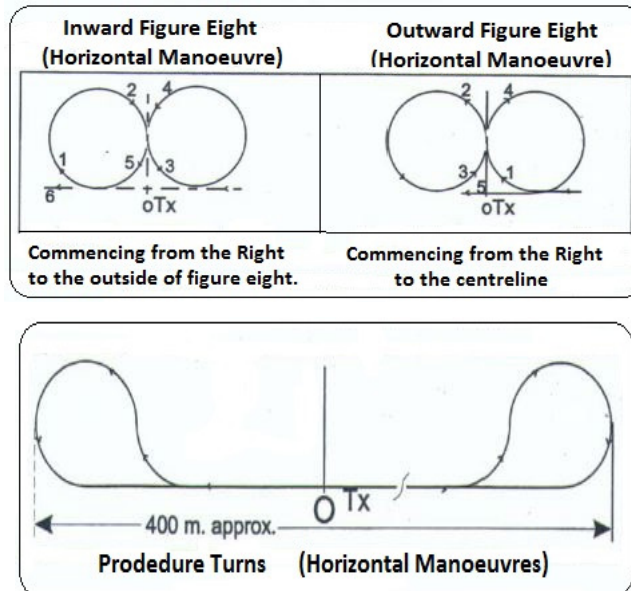
The manoeuvre starts with the aircraft flying parallel to the runway, and then turns away to the right in front of the pilot (centre of manoeuvre) before commencing the first left hand circuit of the Figure Eight. The aircraft continues the first circuit and when it reaches the centre-line of the manoeuvre it flies away from the pilot before commencing the second circuit in the opposite direction.

The manoeuvre is completed when the aircraft rejoins the original flight path parallel to the runway.

8. Outward Figure Eight from left to right – (Horizontal Manoeuvre)

Same manoeuvre as in 7 above but directions are reversed.

Review the diagrams on page 4



9. Procedure Turn from right to left – (Horizontal Manoeuvre)

10. Procedure Turn from left to right – (Horizontal Manoeuvre)

The pilot is to demonstrate his/her ability by approaching the runway centre line from one direction and then manoeuvring the aircraft away from the runway into a smooth horizontal (right or Left) 90 degree turn plus 270 degree turn to approach the runway from the opposite direction.

- (a) *Level flight segments should be straight and level.*
- (b) *Aircraft should pass directly over the landing area.*
- (c) *Turns should be at a constant altitude.*
- (d) *Turns should be completed in order that upwind and downwind tracts are superimposed.*

11. Simulated Dead Stick Landing

At a safe and high position, the pilot will reduce the throttle to idle and perform a descending circuit to show his/her ability to safely glide the aircraft without engine power to a position where a landing can be safely executed.

The aircraft is to 'Go Round'.

12. Landing Circuit from right to left

13. Landing Circuit from left to right

The pilot is to demonstrate in both directions, an engine assisted circuit with all turns of 90 degrees followed by a landing approach, using a suitable power setting that allows the aircraft to descend, controlling nose attitude with elevators (airspeed), and using the throttle to stabilise the rate of descent. The aircraft should be flown over the threshold at an appropriate height with the intention of executing a 'Go Round'.

The upwind and downwind legs are to be parallel to the landing strip. The first three legs are to be maintained at a constant height with a gradual approach angle starting at the beginning of the base leg.

With high performance aircraft, the power needs to be reduced much sooner than at the turn onto base leg.

Review the diagrams on page 5

Landing Circuits

Wind Direction

Downwind leg (level flight)

Crosswind leg

Runway

The Approach

○ Pilot here irrespective of the wind, sun or circuit

Landing Approaches and ... The LANDING itself

The Approach - summarised:

This must be understood, and cannot be over-engaged to the Pilot.

- Engine assisted - 1/4 power.
- Control nose attitude and therefore airspeed with elevators.
- Use throttle to place the aircraft where you want it to be.

NOTE: It is very important that the Pilot realises that when an approach becomes difficult to control and/or out of reasonable tolerance of control, that the approach or landing should be aborted and to 'Go Round' and try again.

No power used - correction made only by use of elevator.

Using ELEVATORS as prime means of controlling approach is WRONG

NORMAL APPROACH

- Approximately 1/4 power.
- Attitude level with elevators.
- Control flight path with throttle.

HIGH

- Reduce Power
- Lower nose only slightly.

Correct Approach Path

LOW

- Increase Power
- Keep nose level

Runway

GLIDE APPROACH

- Use elevators to maintain slight nose-down attitude.
- Manoeuvre the aircraft for height control.
- Base leg is closer than normal

Common Approach Faults:

- Downwind leg too close.
- Base leg too close.
- Excessive speed prior to or during approach.
- Tailwind component on base leg and/or final approach.

14. Landing (into wind) and roll to stop with the engine running

*This procedure is the same as landing circuits above except that the aircraft should be flown over the threshold of the runway at an appropriate height with the intention of landing the aircraft within the **'centre section of the runway'** in front of the **'Pilot Safety Barrier'** and then rolling forward to a stop with the engine running. A touch down at either end of the runway is disallowed.*

15. Taxi off the runway into the nearest taxi-way towards the 'Holding Point'.

*To free up the runway, the aircraft should be taxied as soon as possible into the nearest taxi-way towards the **'Holding Point'**.*

Terminology

Every pilot needs to know the meaning of the following:-

Dead Stick Orbit Up Wind Crosswind Downwind Base Final
Go Round Flightline Approach Touch & Go Holding Point
Left Hand Circuit Right Hand Circuit Rectangular Flight Circuit Line Up Position

Recommended Aircraft Criteria

(Bronze Wings)

Although the requirement for the **Bronze Wings** is based on the aircrafts all up weight (**2 kg being the maximum**), we recommend that the pilot choose an aircraft that can perform all of the required manoeuvres in a smooth and stable manner.

Any abrupt vertical, horizontal or tight manoeuvres will be disallowed.

We recommend the aircraft meets the following criteria:-

- Type:** High wing or low wing aircraft.
Wingspan: 815mm (32") or greater.
Motor: Electric or IC (internal combustion) equivalent.
U'carriage: Attached. A conventional aircraft (two main wheels) or Tricycle aircraft (three main wheels).
Radio: A radio set with a minimum of 4 channels.
Endurance: Able to have a sustained powered flight for a minimum of 6 minutes with a preferred duration of 10 minutes.
The aircraft must be able to be flown for three (3) flights on the same day.

Once you have obtained your '**Bronze Wings**', we encourage you to further develop your flying skills by working towards obtaining your '**Silver and Gold Wings**'.

Gold Wings

Flight Schedule

- | | |
|--|---|
| 1. Pre-flight Training | 12. Three inside Loops from right to left |
| a) Dexterity of pilot with his/her equipment | 13. Three inside Loops from left to right |
| b) Theoretical knowledge | 14. Cuban Eight from right to left |
| c) Pre-flight checks | 15. Cuban Eight from left to right |
| 2. Start Up, Taxi and take off positioning | 16. Spin, three turns at centre of flight line |
| 3. Take off | 17. Inverted Flight, 5 seconds, from right to left |
| 4. Outward Figure Eight from right to left | 18. Inverted Flight, 5 seconds, from left to right |
| 5. Outward Figure Eight from left to right | 19. Three Horizontal Rolls from right to left |
| 6. Inward Figure Eight from right to left | 20. Three Horizontal Rolls from left to right |
| 7. Inward Figure Eight from left to right | 21. Landing circuit from right to left |
| 8. Procedure Turn from right to left | 22. Landing circuit from left to right |
| 9. Procedure Turn from left to right | 23. Landing and roll to stop-engine running |
| 10. Immelman Turn from right to left | 24. Taxi off runway into taxi-way towards Holding Point. |
| 11. Immelman Turn from left to right | |

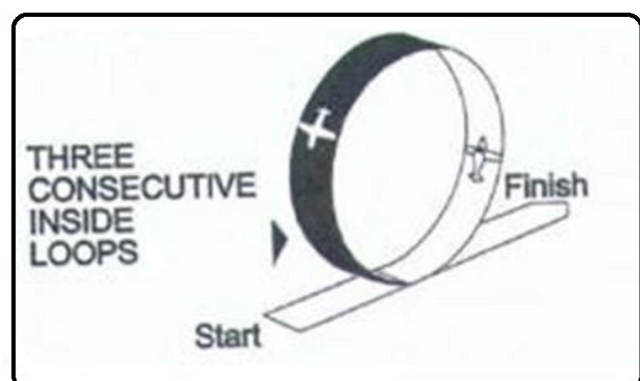
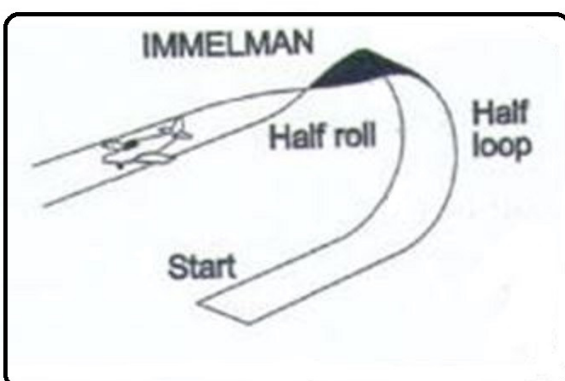
10. Immelman Turn from right to left

11. Immelman Turn from left to right

The manoeuvre starts with the aircraft flying parallel to the runway at a safe distance out in front of the 'Pilot Safety Barrier'.

The aircraft pulls up into a half loop. At the top of the loop the aircraft levels off inverted for one and a half (1.5) seconds before commencing a half roll.

The aircraft, now in the upright position at a higher level, returns in the direction from which it came.



12. Three Inside Loops from right to left

13. Three Inside Loops from left to right

The manoeuvre starts with the aircraft flying parallel to the runway at a safe distance out in front of the 'Pilot Safety Barrier'.

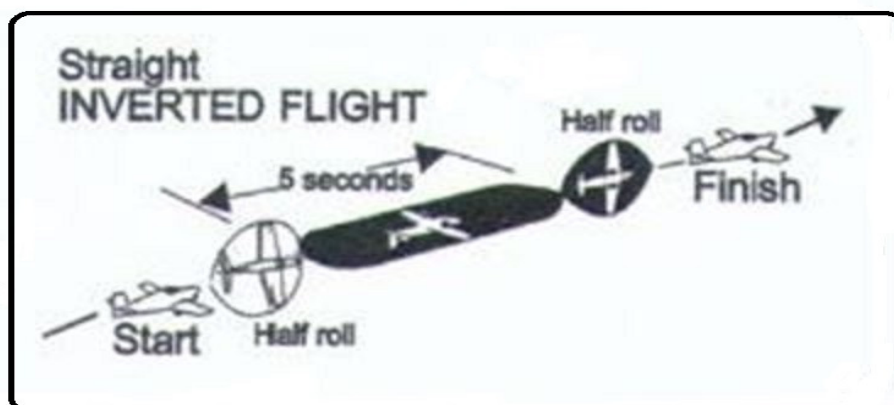
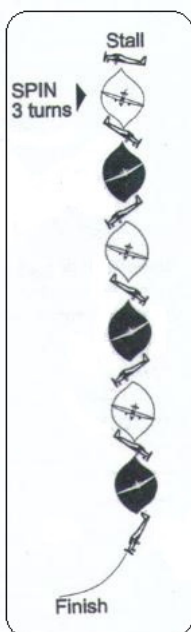
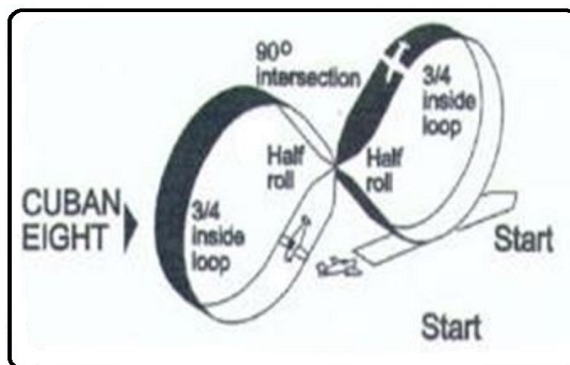
The aircraft pulls up into a loop. On completion of the first loop, the aircraft continues on for the second and third loops. Now in the upright position, the aircraft continues level in the same direction it was going.

- 14. Cuban Eight from right to left
- 15. Cuban Eight from left to right

The manoeuvre starts with the aircraft flying parallel to the runway at a safe distance out in front of the 'Pilot Safety Barrier'.

The aircraft pulls up into a loop. After the aircraft passes 'top dead centre' the aircraft descends in a 45 degree angle. At the half way point, a half roll is executed. Now in the upright descending position, the aircraft continues into the second loop in the opposite direction.

When the manoeuvre is complete the aircraft continues in the same direction as before.



- 16. Spin, three turns at centre of flight line

The manoeuvre starts with the aircraft climbing to a safe height (300 to 400 feet) at a safe distance out in front of the 'Pilot Safety Barrier'. The aircraft is stalled.

As the aircraft descends vertically, it is placed into a spin. After three (3) turns, the aircraft is recovered into level flight in the same direction as it entered the stall.

- 17. Inverted Flight, 5 seconds, from right to left
- 18. Inverted Flight, 5 seconds, from left to right

The manoeuvre starts with the aircraft flying parallel to the runway at a safe distance and height.

Before reaching the 'Pilot Safety Barrier', the aircraft performs a half roll into inverted level flight and flies level for five (5) seconds, passing the 'Pilot Safety Barrier'.

The aircraft then performs a second half roll into the upright position and completes the manoeuvre in level flight.

19. **Three Horizontal Rolls, from right to left**

20. **Three Horizontal Rolls, from left to right**

The manoeuvre starts with the aircraft flying parallel to the runway at a safe distance and height.

Before reaching the 'Pilot Safety Barrier', the aircraft performs the first roll and whilst passing the 'Pilot Safety Barrier' the aircraft performs the second roll followed by the third roll completing the manoeuvre in level flight.



21. **Landing Circuit, from right to left** (refer pages 4 and 5)

22. **Landing Circuit, from left to right** (refer pages 4 and 5)

23. **Landing and roll to stop with engine running**

24. **Taxi off the runway into the taxi-way towards the pit area.**

Recommended Aircraft Minimum Criteria (Silver & Gold Wings)

We recommend that the pilot choose an aircraft that can perform all of the required manoeuvres in a smooth and stable manner.

Any abrupt vertical, horizontal or tight manoeuvres will be disallowed.

We recommend the aircraft meets the following minimum criteria:-

Type:	High wing or low wing (wing removable) aircraft.
Wingspan:	1420mm (56") or greater.
Motor:	Electric or IC (internal combustion) equivalent to or greater than .40 cu.in IC motor.
Undercarriage:	Attached. A conventional aircraft (two main wheels) or Tricycle aircraft (three main wheels).
Radio:	A radio set with a minimum of 4 channels.
Endurance:	Able to have a sustained powered flight for a minimum of 6 minutes with a preferred duration of 10 minutes. The aircraft must be able to be flown for four (4) flights on the same day.

Some Examples of Training Aircraft

Classic Trainer 40	Hustler
Boomerang 40	Sport 40

Other similar, better and/or larger aircraft are acceptable.



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