

## **London Model Aircraft Club** **Wings Program (Electric)**

The Wings Program is an instruction program for training RC model aircraft pilots. It is approved and recommended by the Model Aircraft Association of Canada (MAAC). Its purpose is to teach the basic skills and attitudes of safe flying. Safe and responsible operation of our models is the only way to ensure preservation of flying sites and privileges. It is also the key to maximum enjoyment of our sport.

The Wings Program is administered by the Chief Flying Instructor (CFI). The CFI will assign you an Instructor who will become your primary club contact for the duration of your flight training. It is your responsibility to schedule training sessions with your instructor.

This manual is a Wings Program guide for students and instructors. Please read it carefully, taking particular note of safety guidelines and related aircraft control procedures.

This program is presented to student RC pilots by the London Model Aircraft Club (LMAC) on the following conditions:

1. Students must be paid up members in good standing of both LMAC and MAAC.
2. Students must carry their LMAC and MAAC membership cards at all times during the program.
3. The student's RC radio equipment must operate on a frequency that is legal in Canada for the operation of RC model aircraft.
4. The student agrees to faithfully abide by all MAAC and LMAC safety rules.
5. By participating in the Wings Program, the student accepts all responsibility and liability for accidents causing loss or damage to property, personal injury, or loss of life incurred by, or as consequence of, the operation of the model, regardless of whether the student or an instructor was operating the model at the time of accident.

## **Section 1 - MAAC and LMAC Safety Rules**

### **Applicable Sections of MAAC Safety Code**

#### General:

1. I will not fly my model in competition or in the presence of spectators until it has been proven to be airworthy by having been previously successfully flight-tested.
2. Where established, I will abide by the safety rules for the flying site I use, and will not willfully or deliberately fly my models in careless, reckless, and/or dangerous manner.

#### Radio Control:

1. I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.
2. I will not fly my model aircraft in the presence of spectators until I become a qualified flyer, unless assisted by an experienced helper.
3. I will perform my initial turn after take-off away from the pit, spectator and parking areas, and I will not thereafter perform maneuvers, flight of any sort, or landing approaches over a pit, spectator or parking area. In order to do so, I will always fly with my back to the pit, spectator and parking areas. I will also have the parking area at least 100 feet away from the flying area.

### **LMAC Field Rules**

1. Except for un-powered or electric powered aircraft no flying is permitted before 9:00 A.M.
2. Any member flying from the field is required to:
  - a) Have current MAAC membership
  - b) Use a legal aircraft frequency
3. Flying over the pit and parking areas is forbidden.
4. Do not fly lower than 75 ft. outside of the field area.
5. Do not fly higher than 400 ft.

6. The pit line and flight line shall be at least 10 ft. apart.
7. Take-off from the pit line is forbidden, taxiing to and from the pit to the flight line is permitted but taking off directly from the pit line is strictly prohibited.
8. Comply with the rules as specified in the MAAC safety code.

Note: The map in Appendix "A" of the LAMC field shows the location of the pit, spectator and parking areas, and our safe airspace zone as defined by the MAAC Safety Code. The safe zone maintains a minimum 100 foot separation from the parking area, River Road and the garage and fenced lot located immediately to the west of the field.

## Section 2 - Wings Program

### Program Content

1. Exhaustive airplane airworthiness check before initial flight.
2. Handling the airplane on the ground. Emphasis on safety and courtesy.
3. Flight training. Student develops basic skills of positional flying. Emphasis on staying in safe airspace and making safe takeoff and landings.
4. A solo check flight to demonstrate student's competence. The program is complete when two instructors judge that the student shows acceptable skill and safety awareness.

**Safety training has top priority in this program. Even though students may demonstrate superior flying skills, they will not be awarded wings unless instructors are satisfied that they understand and are willing to obey all applicable safety rules and procedures.**

## Instructor's Detailed Master Checklist

### General

- Do you have current MAAC membership?
- Do you have current Club membership?
- Did you fully charge batteries within the last 24 hours?

### Landing gear

- Main gear well secured to fuselage
- Main wheels properly aligned
- Nose gear well secured, undamaged, and properly aligned
- All wheel collars tight
- All wheels turn freely
- Model sits at proper attitude on ground

### Fuselage and tail

- Fuselage exterior free from cracks, damage, oil, dirt etc.
- Stab and fin solidly mounted, elevator and rudder OK
- No play in elevator and rudder hinges, hinges well secured
- Hinge lines have minimal gap and are unobstructed
- Control horns in good condition and well secured
- Clevises are closed and locked, jam nuts tight
- No play or springiness in control linkages
- All covering, trim, canopies, hatches accessories well secured

### Powerplant

- Motor mount secure, motor mounting screws tight
- Prop balanced, clean with no nicks and well secured
- Spinner well secured
- Battery fully charged

### Radio Compartment

- Servo rails in good condition and well bonded to fuselage
- All servo mounting screws in place and tightened
- RX properly positioned in anti-vibration material
- All servo connectors properly seated and secured in RX
- RX antenna in good condition and properly routed
- Switch and harness in good condition and mounted away from motor
- All push rods OK, clevises secured and lock nuts in place
- Check operation of all control surfaces for correct direction

## Wing

- No warps, free from cracks, damage, oil, dirt etc.
- Aileron hinges in good condition and well secured
- Hinge lines have minimal gap
- All covering and trim well secured
- Servo mounted correctly
- Control rods OK, clevises secured and lock nuts in place
- All linkages free of play and not springy
- Aileron servo wire(s) in good condition
- Ailerons operate in correct direction

## Final Assembly and Full System Check

- Mount wing on fuselage, take care to route aileron servo wire
- Tighten wing bolts or install elastic bands (at least 8 )
- Operational check: Observing frequency control, switch the radio on. Operate all servos, checking for problems. Pay extra attention to the ailerons to ensure that they still move freely after wing mounted. Also check for indications of interference between aileron horns and other components
- Control direction check: For the following checks, stand behind the model, facing the tail. Adjust the TX servo reversing switches if necessary to obtain the following:
  - Aileron: Push aileron stick right. Right aileron should move UP, left aileron should move down
  - Elevator: Pull elevator stick back, elevator should move UP
  - Rudder: Push rudder stick right, rudder should move to the right and nose wheel should turn right.
  - Throttle: Push throttle stick forward, throttle should open
- Control centering check: Ensure that trim controls on TX are centered. Then check that ailerons, elevator, rudder and nose wheel are correctly centered. Adjust linkages if not, making sure all clevises are closed and locked when finished.
- Control throws: Ensure that all throws are on-spec or reasonable. Too little is safer than too much.
- Range check: Perform standard range check. Do not fly if range more than 20% below normal (about 30 paces).

## Balance

- Centre of gravity at approximately 30% of wing cord.

This completes the initial checklist.

## Ground Handling Training Topics

1. Placement of equipment in pit area
2. Pre-flight inspection and functional checks
3. Range check techniques
4. Checking batteries
5. Battery charging times
6. Motor starting techniques – set fail safe
7. Safety:   Keep clear of rotating prop  
              Holding of model  
              Never release aircraft if motor running
8. Courtesy: Don't blast others with propwash
9. Flying space restrictions
10. Safe taxiing
11. Pre-takeoff checks:   Windssock  
                              Check field and airspace  
                              Wiggle controls  
                              Always announce your intentions!!!

## Flight Training – Basic Skills

The student will be taught the basic skills of flight. These will enable the student to fly straight and level, perform turns, climbs and descents, landings and takeoffs. Once complete, the student will be ready for his/her flight test.

The student will learn to control the aircraft in level flight. The instructor will taxi the aircraft to the runway, take-off and climb to a safe altitude before the student takes control of the airplane. The student will be given all basic instructions as the flight progresses ie. Right stick/left stick, up elevator/down elevator and more or less throttle. The student should follow these directions without questions at all times.

The following topics will be taught:

- Test Flight  
Your instructor will perform the initial test flight(s). Throughout the initial flight, the instructor will be trimming the aircraft so that it will fly “hands off”, that is, it will fly straight and level without any input from the transmitter. Once the instructor is happy with the way that the airplane flies, he will start your instruction.
- Straight and Level Flight
- Circles to both the right and left at cruise power. Student will be taught to perform right and left hand turns without losing or gaining altitude.
- Figure 8's  
Student will be taught to fly the aircraft in a reasonable figure 8 pattern without losing or gaining altitude
- Rectangular approaches  
Student will be taught to fly rectangular approach, both to the right and left.
- Procedure Turns  
Student will be taught the procedure turnaround maneuver
- Slow flight and stalls  
Student will be taught how to fly the aircraft in “slow flight” and practice stall recovery procedures
- Landing Approaches  
Student will be taught correct throttle use on landing approaches and correct runway alignment
- Aborted Landings  
Student will be taught how to abort a landing and return to cruise altitude
- Landings
- Take-Offs
- Dead Stick Landings
- Flight Test

## The Wings Program Maneuvers

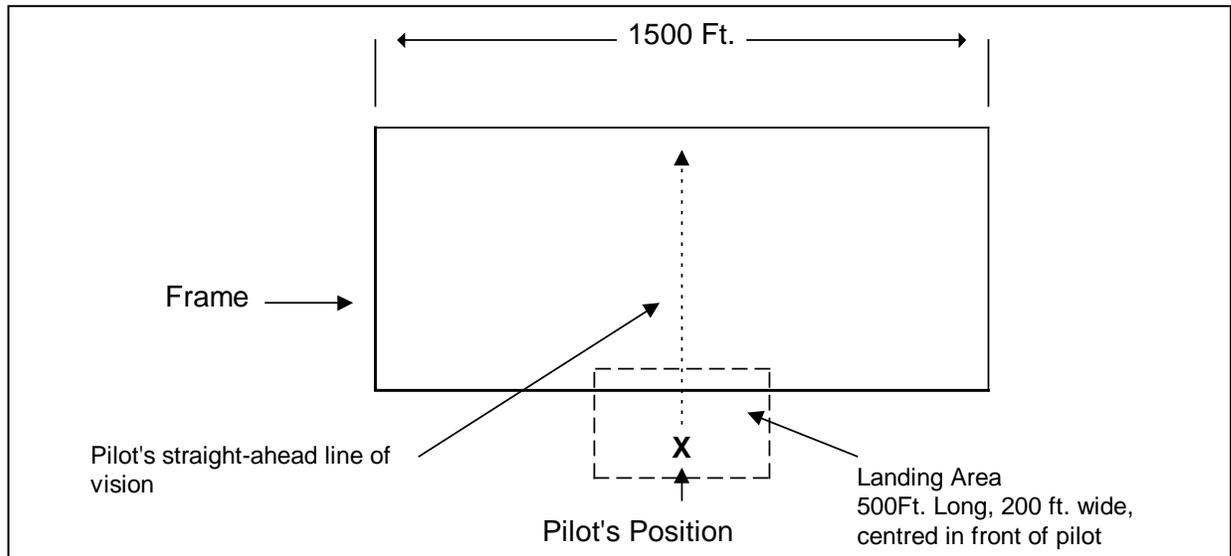
### A) The Frame

Wings Program maneuvers are flown in a prescribed area of the sky. This area is called "the frame". Understanding where the frame is will help students to position their maneuvers correctly and to keep the plane from getting too far away.

The diagram shows where the frame is, as if you were looking down on it from above. As an aide to visualizing the frame, note that:

- A) Its is centered directly in front of the pilot
- B) The side nearest the pilot lies directly over centerline of the landing area and runs at right angles to the pilot's straight-ahead line of vision.
- C) The two near corners of the frame lie slightly less than two field lengths away to the pilot's left and right, at slightly less than 90 degrees to his straight-ahead vision.
- D) The two far corners of the frame lie on lines about 50 degrees to the left and right of the pilot's straight-ahead line of vision.

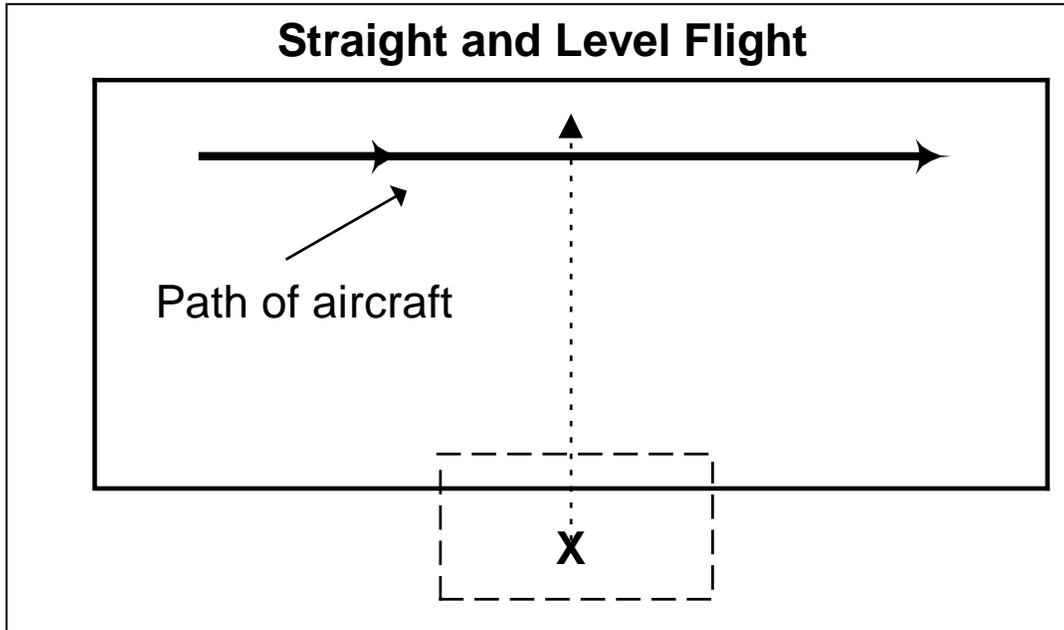
The altitude flown in the frame depends on pilot skills. For training, particularly at first, the plane should be kept very high, say 300 feet. For check flights an altitude of 200 to 300 feet is preferable. Whatever altitude is chosen, it should be held constant except when taking off and landing.



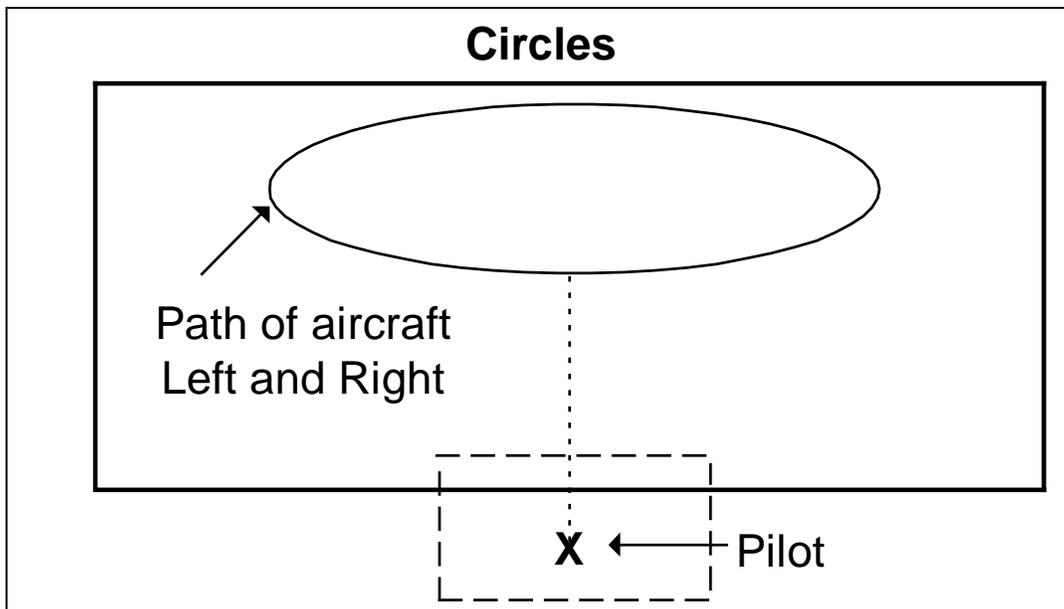
### B) The Maneuvers

The diagrams shown the maneuvers superimposed on the frame, looking down from above. Under no circumstances should any part of the flight take place over restricted areas. The section entitled "Performance Requirements for Checkout" gives standards against which students will be judged when flying maneuvers.

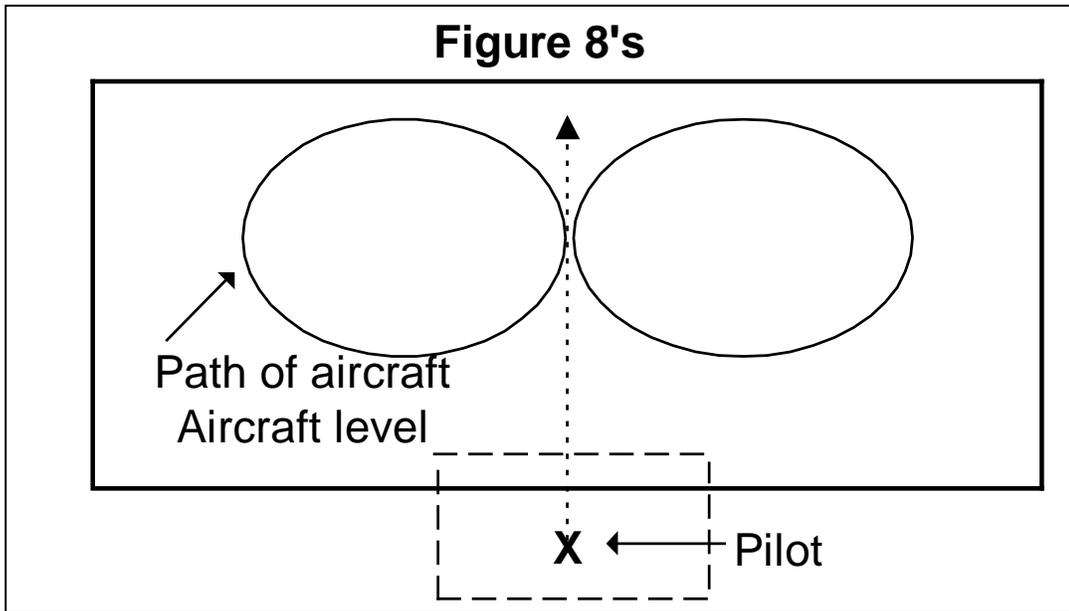
1. Test flight
2. Straight and level flight



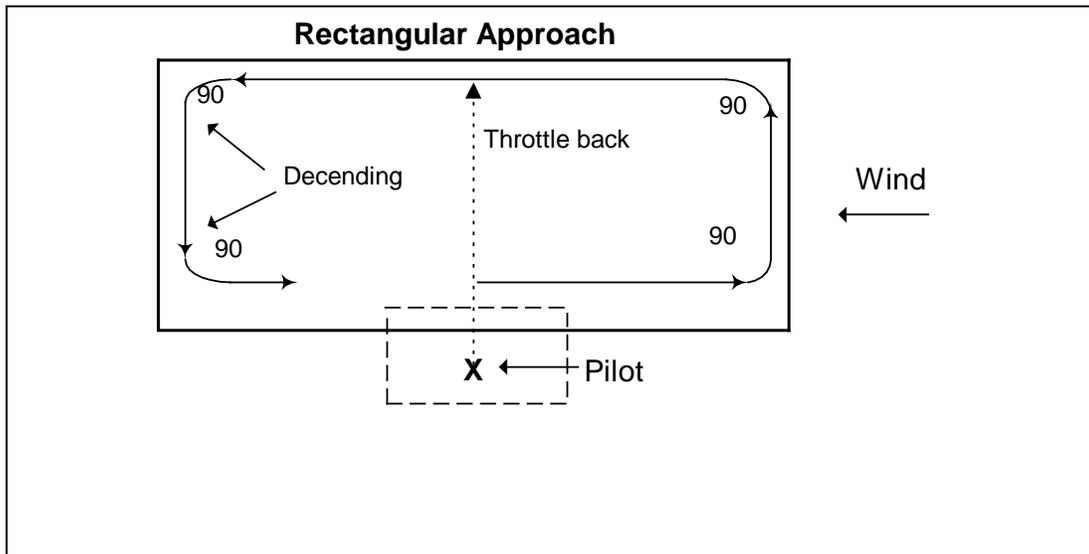
3. Circles



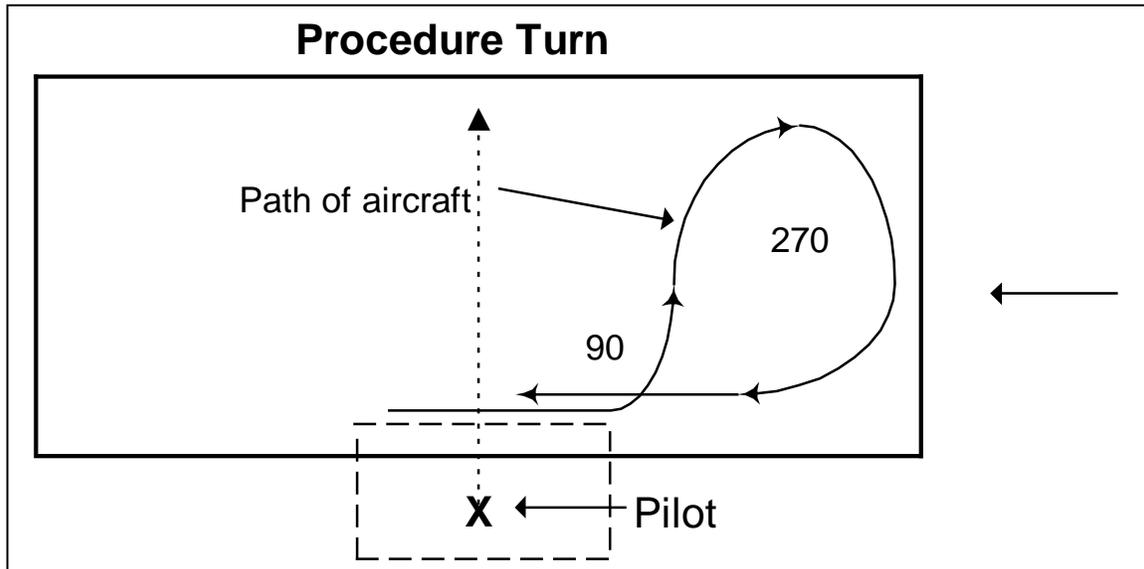
4. Figure eight's



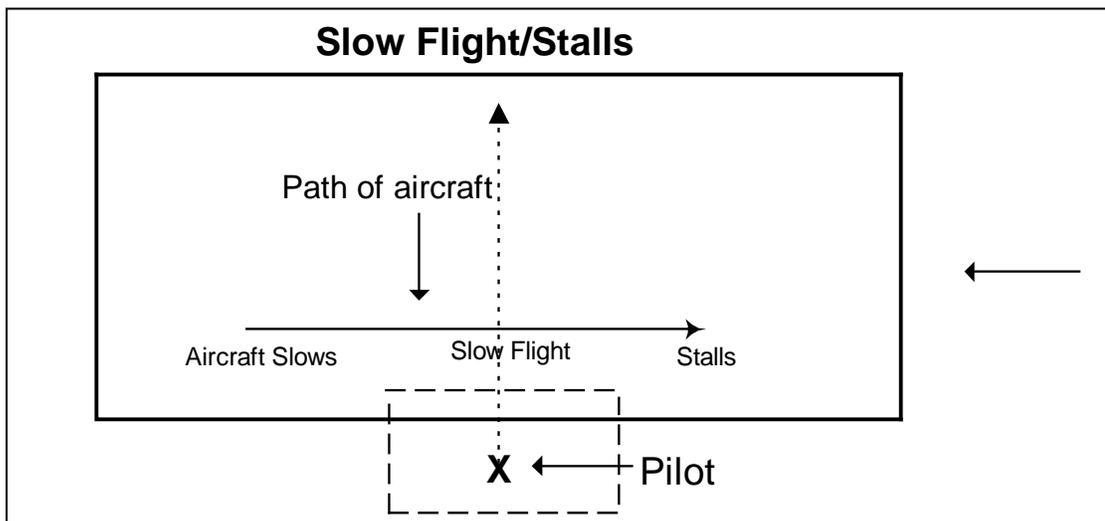
5. Rectangular approaches



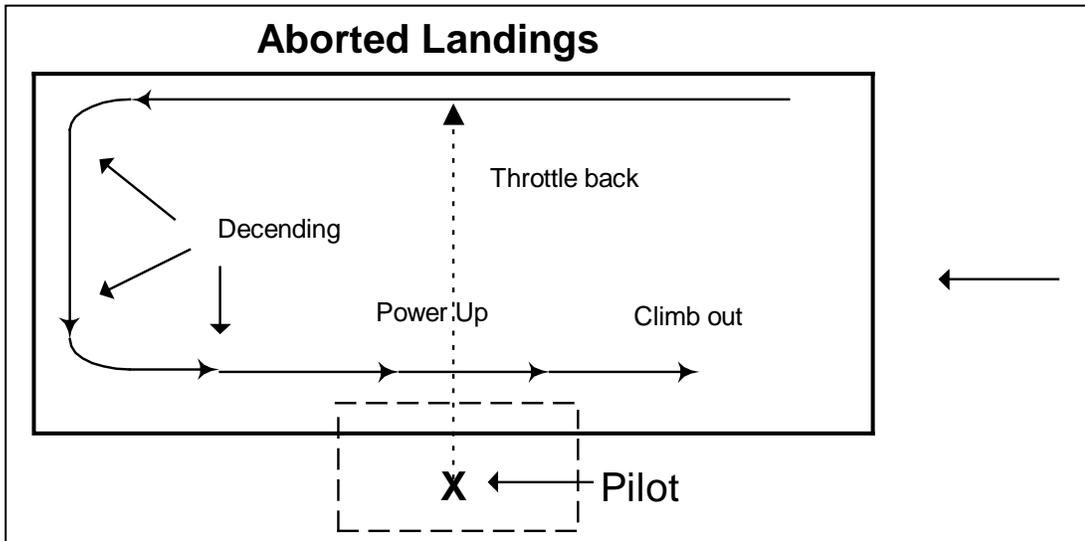
6. Procedure turns



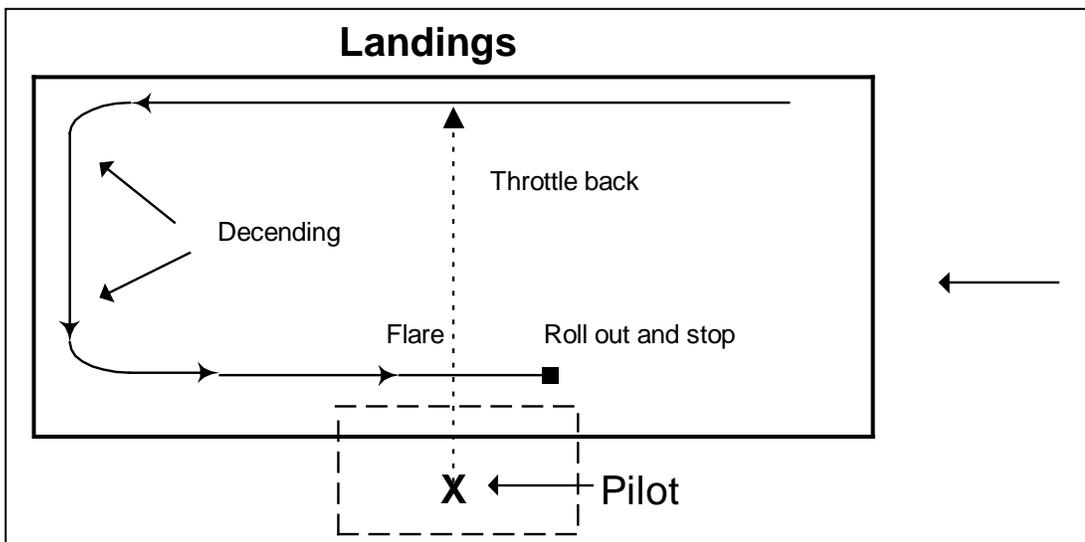
7. Slow flight and stalls



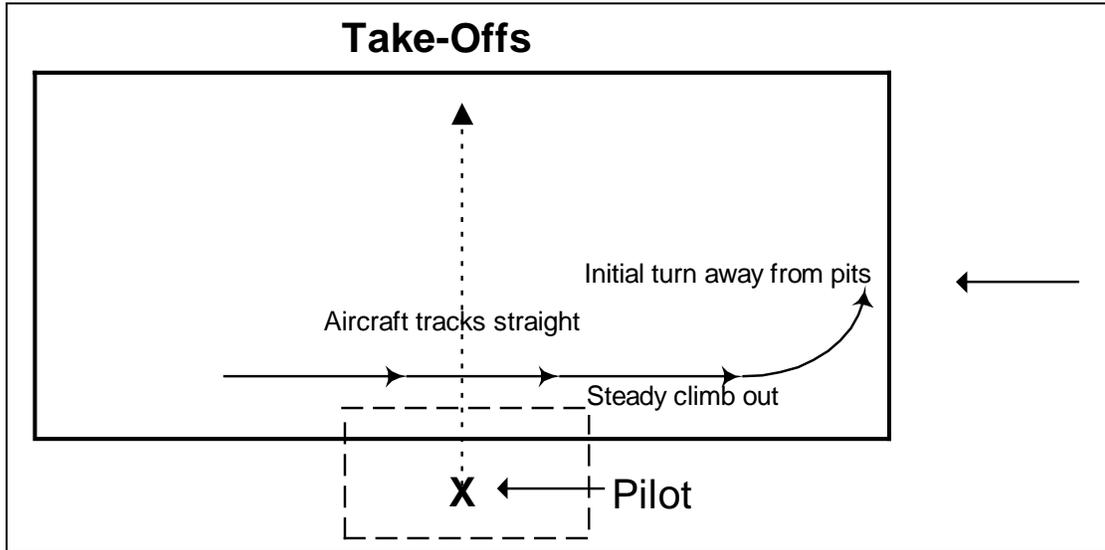
8. Aborted landings



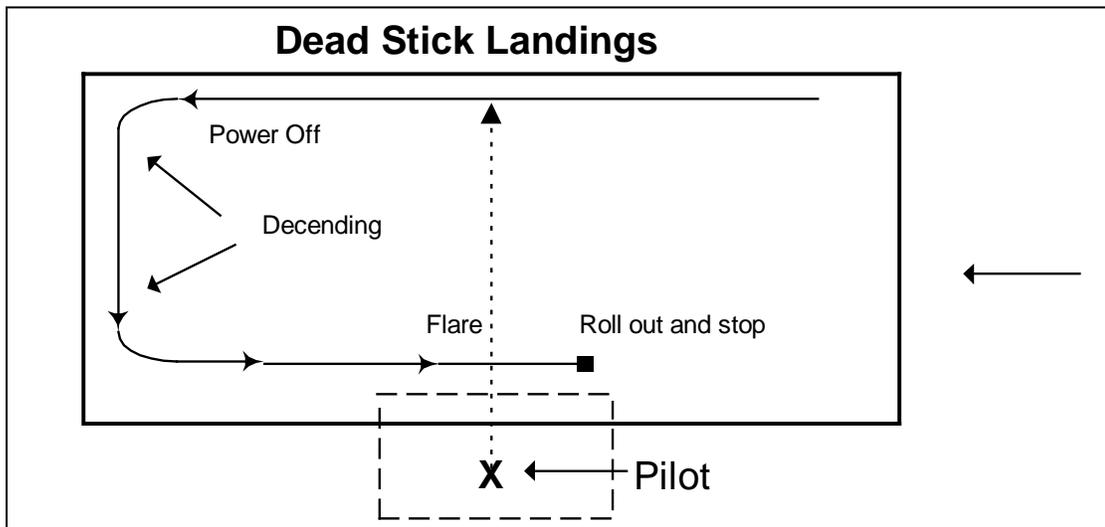
9. Landings



10. Take-offs



11. Dead stick landings



12. Flight test

## Flight Test

In order for the student pilot to receive his/her "Pilot Wings", he/she must pass a flight test. This test will be administered by a LMAC flight instructor. The flight test examiner will work with your instructor to schedule you test.

The Flight Test consists of:

### 1. Oral Exam

- A) Field Rules
- B) Safety procedures

### 2. Flight Test

- A) Aircraft pre-flight
  - range testing
  - aircraft preparation
- B) Ground handling
  - pit procedures
  - taxiing aircraft
  - runway clearance
- C) Takeoff
  - smooth application of throttle
  - good control of aircraft on ground
  - smooth lift off
- D) Climb-out and aircraft trim
  - smooth, consistent climb out
  - aircraft trimmed correctly for hands-off flying
- E) Maneuvers
  - circles to left/right
  - figure 8's
  - slow flight
  - stall
- F) Landing Circuits
  - positioned correctly
  - correct use of throttle
  - lined up with "frame"
- G) Landing
  - flares aircraft smoothly
  - straight rollout
  - stops
  - clears runway
  - shuts down motor after leaving runway
- H) Flight review

