

# Caribbean Aviation Training Center

## FLIGHT MANOEUVRES QUICK REFERENCE

**THE AIM OF THIS QUICK REFERENCE IS TO STANDARDISE TRAINING FOR BOTH INSTRUCTORS AND STUDENTS. BOTH INSTRUCTORS AND STUDENTS ARE EXPECTED AND REQUIRED TO USE THE REFERENCE MATERIALS USED TO CREATE THIS GUIDE.**

**EVEN THOUGH THE PROCEDURES AND RECOMMENDATIONS OUTLINE IN THIS QUICK REFERENCE GUIDE ARE DEVELOPED FROM YEARS OF EXPERIENCE AND OBSERVATIONS, IT MUST BE UNDERSTOOD THAT THE FINAL AUTHORITY PERTAINING TO THE CORRECT OPERATION OF ANY AIRCRAFT REMAINS IN THE PILOT OPERATING HANDBOOK AND AIRCRAFT FLIGHT MANUAL. THEREFORE, IN THE EVENT WHERE THERE IS A DISCREPANCY REGARDING THE PROCEDURE OR OPERATION OF THE AIRCRAFT OR EQUIPMENT CONTAINED THEREIN THE POH/AFM WILL TAKE PRECEDENCE.**

THIS IS TO BE USED ONLY AS A QUICK REFERENCE. THE MANOEUVRES ARE EXPLAINED IN THEIR ENTIRETY IN THE TEXT AEROPLANE FLIGHT TRAINING MANUAL AND THE FLIGHT PREVIEW LESSONS IN THE CESSNA COMPUTER BASED TRAINING COURSE .

### ADDITIONAL REFERENCE MATERIAL

- *FROM THE GROUND UP*(JCAA)
- *CLEARED FOR TAKEOFF* (CESSNA TEXT THAT SUPPORTS THE COMPUTER BASED TRAINING)
- FLIGHT TRAINING GUIDE(FAA)

**THE COMPLETION STANDARDS ARE OUTLINED IN THE FLIGHT TEST GUIDE (JCAA) AND IN THE PRACTICAL TEST STANDARDS GUIDE(FAA)**

ALL MANOEUVRES REQUIRE CLEARING TURNS AND A PRE MANOEUVRE CHECK

**PRE MANOEUVRE CHECK**( THIS IS ALSO REFERRED TO AS THE REVERSE L)- CLEAR AREA (USING CLEARING TURNS), FUEL SELECTOR IN CORRECT POSITION, UNDERCARRIAGE IS IN THE CORRECT POSITION, MIXTURE IS RICH, CARB. HEAT AS DESIRED, BREAKERS IN, MAGS. ON, AND PRIMER IN AND LOCK

**ORDER OF CONTROL** (Used when transitioning from one state of flight to another)

**D**irection - Choose a prominent point to maintain orientation during the manoeuvre

**A**ttitude – Select bank/pitch attitude that will yield the desired performance keeping a mental note of these will enable the pilot to quickly establish the aircraft without excessive instrument and distraction.

**P**ower – Smoothly adjust power to the required value.

**T**rim – Adjust the trim when the first three steps have been accomplished and stability is achieved.  
N.B. Trim is generally not used for transient manoeuvre.

**POSITIVE CHANGE OF CONTROL** –I HAVE THE CONTROL, YOU HAVE THE CONTROL, I HAVE THE CONTROL.  
METHOD WILL BE USED AT ALL TIMES.

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## TAXIING

- PERFORM A BRAKE CHECK IMMEDIATELY AFTER THE AEROPLANE BEGINS MOVING
- SAFELY MANOEUVRE THE AEROPLANE, CONSIDERING OTHER TRAFFIC ON THE APRON AND MANOEUVRING AREAS
- USE APPROPRIATE TAXIING SPEEDS
- ADHERE TO LOCAL TAXI RULES, PROCEDURES AND AIR TRAFFIC CONTROL CLEARANCES AND INSTRUCTIONS
- USE FLIGHT CONTROLS AND BRAKES CORRECTLY
- CONFIRM THE PROPER FUNCTIONING OF THE FLIGHT INSTRUMENTS
- IDENTIFY AND CORRECTLY INTERPRET AIRPORT, TAXIWAY AND RUNWAY SIGNS, MARKINGS AND LIGHTING
- AFTER LANDING, CLEAR THE RUNWAY/LANDING AREA AND TAXI TO SUITABLE PARKING/REFUELLING AREA
- PARK THE AEROPLANE PROPERLY, CONSIDERING THE SAFETY OF NEARBY PERSONS OR PROPERTY

## CLIMB ENTRY (70 kts)

- Pre- manoeuvre check
- Direction: Maintain a constant direction
- Attitude: Pitch to the climb attitude
- Power: 5 kts. within the desired speed increase power to full
- Trim to maintain climb attitude

## CLIMB RECOVERY

- Direction: Maintaining direction
- Attitude: Pitch to level attitude
- Power: 5 kts. within cruise airspeed \_\_\_\_\_, reduce power to \_\_\_\_\_rpm
- Trim for to maintain level flight

## POWER ASSISTED DESCENT ( kts)

- Pre- manoeuvre check
- Maintaining direction
- Reduce power to 00 - 00 rpm
- Pitch to descent attitude
- Required performance ( rpm & cruise airspeed)
- Trim for to maintain descent attitude

## DESCENT RECOVERY

- Maintaining direction
- Increase power to 00 rpm
- Pitch to level attitude
- Trim for level attitude

## GLIDE

- Pre- manoeuvre check
- Reduce power to idle
- Maintain approximately level attitude
- Fine tune pitch attitude to achieve glide speed \_\_\_\_\_kts + 5kts
- Trim to maintain glide attitude

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## **ESTIMATING GLIDE RANGE**

### **Calm conditions**

Looking through the point on the windshield where the horizon was during cruise flight to the ground will indicate how far you can glide to.

### **Wind conditions (whether tail or headwind)**

When maintaining glide attitude ie. glide speed, the point on the ground, which moves down on the windshield the airplane will glide past that point. The point which moves up, the airplane will fall short of. The point which is stationary, the airplane will glide to.

## **STEEP TURNS**

- Pre- manoeuvre check
- Roll aircraft into a co-ordinated bank
- Passing through 30° of bank, Pitch up above the horizon (a little higher than when in medium bank) and increase power by 1-200 rpm
- Continue rolling to a 45° bank
- 2 ½ turns of nose up trim

## **RECOVERY**

- Apply opposite rudder
- While simultaneously rolling wings level
- While pitching to level
- Passing through 30° reduce power by 100 rpm

## **SLOW FLIGHT ENTRY (50-55 Kts)**

- Pre- manoeuvre check
- Reduce power to 00 rpm
- Maintain level altitude
- Extend 10° of flaps at      kts C-172
- Extend 20° of flaps at      kts C-172
- Extend 40° of flaps at      kts C-172
- 5 kts. before reaching slow flight speed increase power to maintain level flight.

*Maintain direction and co-ordinated flight ie. control the increase in left yaw tendency(P-FACTOR)*

- Trim to maintain level flight.

## **SLOW FLIGHT RECOVER**

- Carburettor heat off
- While pitching to level
- Full Power
- Retract flaps to 0°
- Maintain level flight
- At      kts. retract flaps to 0°
- At      kts. retract remaining flaps
- 5 kts. before cruise speed reduce power to 00 rpm
- Trim to maintain level attitude

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## STALLS

### APPROACH TO LANDING STALL ENTRY

- Pre- manoeuvre check
- Reduce power to 00 rpm
- Maintain level flight
- Extend 10° of flaps at      kts C-172
- Extend 20° of flaps at      kts C-172
- Extend 40° of flaps at      kts C-172
- Reduce power to idle and maintain level flight until aircraft stalls

### APPROACH TO LANDING STALL RECOVERY

- Pitch to realign the aircraft with the relative airflow ie. slightly below the horizon
- Simultaneously increase power to full and retract flaps to 20°
- Positive rate of climb retract flaps to 10°
- At      kts. retract remaining flaps
- Climb to and level at assigned altitude
- 5 kts. before cruise speed reduce power to 00 RPM

### TAKEOFF AND DEPARTURE STALL ENTRY

- Pre- manoeuvre check
- Reduce power to 00 rpm
- Maintain level flight
- At Vy increase power to full and pitch to and maintain an attitude slight above climb attitude until aircraft stalls. (maintain direction and co-ordinated flight)

### TAKEOFF AND DEPARTURE STALL RCOVERY

- Pitch to realign the aircraft with the relative airflow ie. the horizon
- Accelerate to cruise speed
- 5 kts. before cruise speed reduce power to 00 rpm

## SPINS

This is an auto-rotation after an aggravated stall

### RECOVERY

- Power to idle
- Aileron natural
- Apply opposite rudder to stop rotation
- Pitch to break the stall
- Smoothly apply back pressure to recover from the resulting dive
- Power as necessary

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## SLIPS

**FORWARD SLIP** (This is where the aircraft's longitudinal axis is at an angle to its flight path and is normally used to lose altitude without increasing airspeed)

- Carburettor heat as necessary
- Power to idle
- Smoothly apply full rudder in one direction
- Simultaneously and proportionately apply aileron in the opposite direction to prevent aircraft from turning
- Pitch to maintain approach speed

## **RECOVERY**

- Carburettor heat as necessary
- Power as necessary
- Release rudder pressure, Simultaneously roll aircraft to level
- Pitch to maintain approach speed

**SIDE SLIP** (This is where the aircraft's longitudinal axis is parallel with its flight path and is normally used to complete a crosswind landing). See crosswind landings for procedure.

**SLIPPING TURN** (Used to lose altitude in a turn)

- Carburettor heat as necessary
- Power to idle
- Roll aircraft into a bank
- Simultaneously apply enough opposite rudder to cause a slip but not enough to prevent the aircraft from turning
- Pitch to maintain approach speed

## **RECOVERY**

- Carburettor heat as necessary
- Power as necessary
- Release rudder pressure, Simultaneously roll aircraft to level
- Pitch to maintain approach speed

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## **FORCED APPROACH**

Reasons/ causes that may result in a forced approach:

Engine failure due to:

- i. Air starvation
- ii. Fuel starvation
- iii. Oil starvation
- iv. Mechanical problem

**Always know the general direction of the wind and always be assessing potential fields to land.**

**Procedure:**

1. Glide - Controlling the aircraft (attain the glide attitude/speed kts)
2. Pick field
3. Plan the approach (see diagram)
4. Attempt a restart (simulated)
  - a. Fuel selector
  - b. Mixture rich
  - c. Carburettor Heat in opposite position (simulated)
  - d. Masters on
  - e. Magnetos on
  - f. Checklist

## **If no restart – make a distress call & squawk 7700**

This should consist of:

1. Aircraft registration
2. Position and intentions

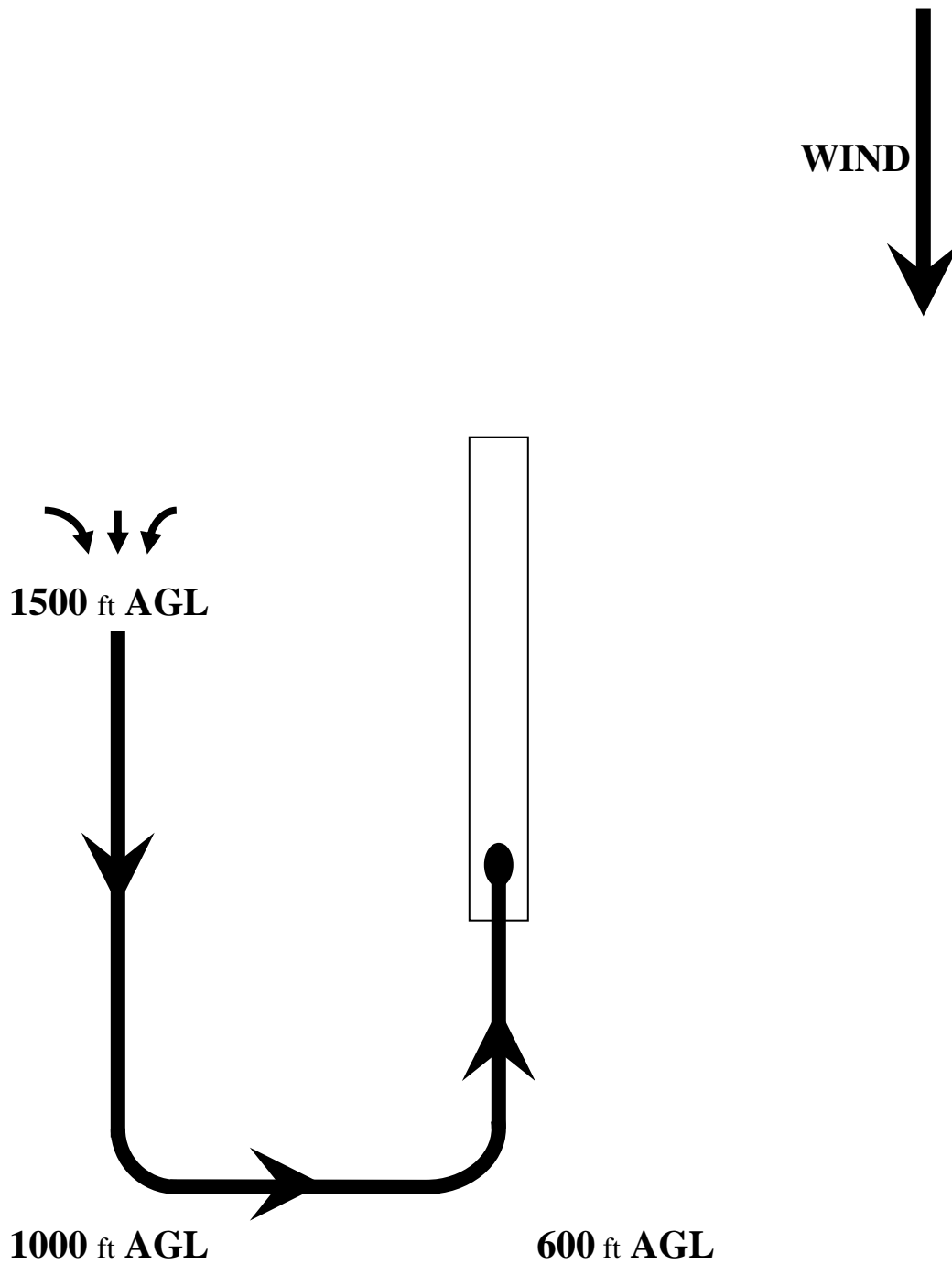
*EG:* “May day, Mayday, mayday, 6CH Bernard Lodge, Forced Approach”

- Make call early as possible (before a low altitude is reached – radios)

4. Shut down (simulated)
    - a) Fuel selector off
    - b) Mixture idle cut off
    - c) Magnetos off
    - d) Masters to go
    - e) Checklist
  5. Secure all loose objects & brief passengers
  6. When the field is made full flaps ajar doors then masters off.
- Note:** Initiate go-around at 500ft.

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## FORCED APPROACH



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## PRECAUTIONARY APPROACH

### HIGH INSPECTION

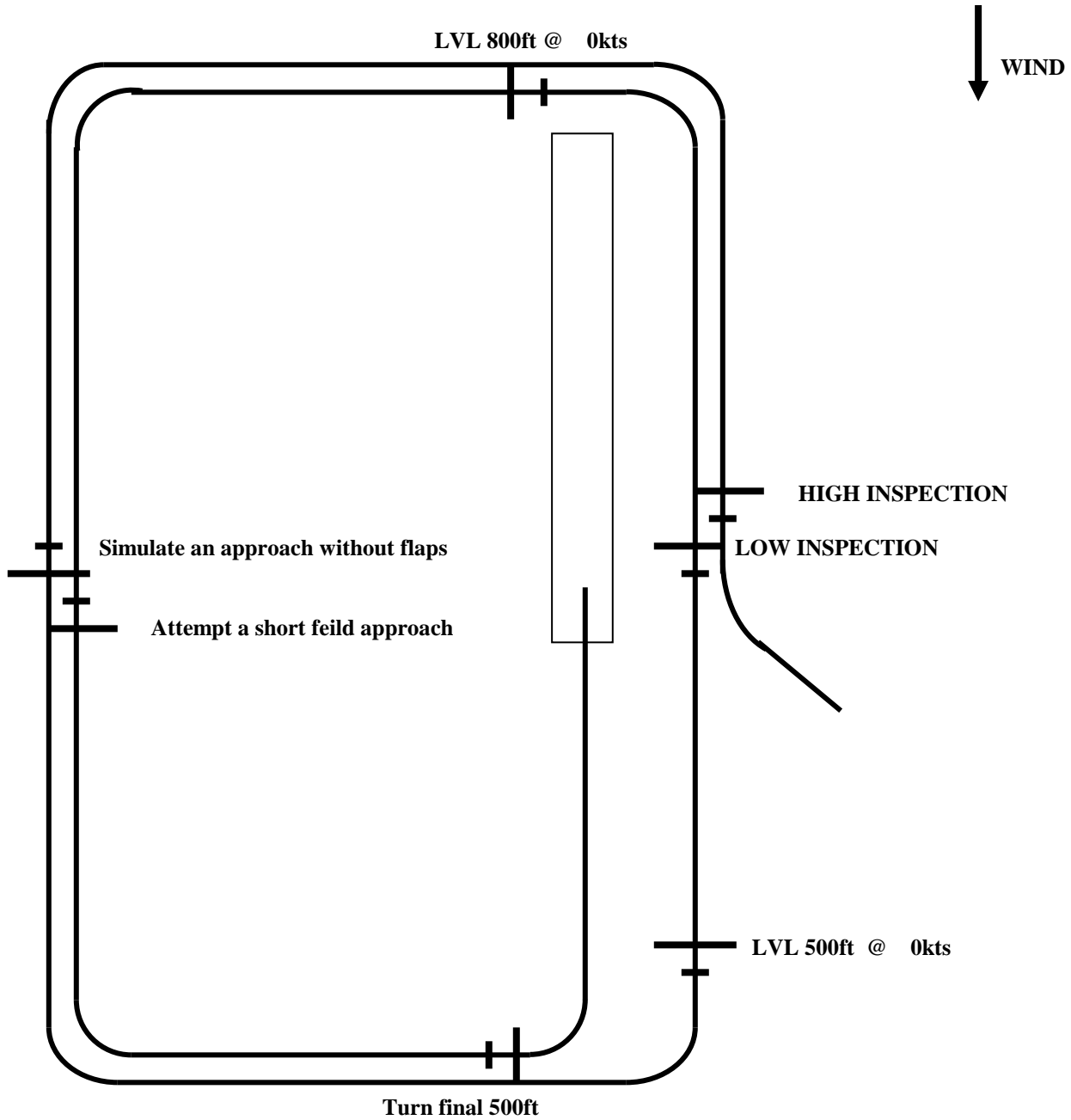
Length of field for take-off

Obstacles that would prevent a low inspection

Help

### LOW INSPECTION

Condition of the field surface



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## BALKED/GO AROUND

- Full Power
- Maintain slightly less than climbing attitude
- Retract flaps to 0°
- Positive rate of climb; retract flaps to 0°
- Pitch to maintain Vy
- Positive rate of climb; retract remaining flaps
- Trim for climb attitude

## TAKE-OFF (Normal)

- Take-off checklist complete
- Taxi forward to straighten nose wheel with the runway centre line
- Smoothly but positively increase power to full
- Maintain direction with rudder
- Verify full power rpm C-172
- Pitch to and maintain slightly less than climbing attitude at kts C-172

N.B.: When airborne, follow the order of control:

- **Direction:** Maintain runway centre line
- **Attitude:** Pitch to climbing attitude (approximately 5-7° depending on weight)
- **Power:** Lock the friction lock
- **Trim :** At airspeed kts, trim for that attitude

## SOFT FIELD TAKE-OFF

- Take-off checklist complete
- Extend 10° of flaps
- Control fully aft & minimum use of brakes
- Taxi forward to straighten nose wheel with runway centre line
- Smoothly but positively increase power to full
- Maintain direction with rudder (maintain centreline)
- Verify full power
- Pitch for slightly less than climbing attitude  
:aircraft will roll for a while and then smoothly come off the ground.
- When airborne: level off in ground effect to allow the aircraft to accelerate to Vx if an obstacle exist Vy if there is no obstacle
- Then pitch to an attitude to maintain that climb speed
- Retract flaps and climb at Vy at 200 ft agl or when all obstacles are cleared whichever is higher

## SHORT FIELD TAKE-OFF

- Take-off checklist complete
- Extend 10° of flaps
- After taxiing forward to straighten the nose wheel, hold brakes
- Apply maximum power
- Verify full power & release brakes
- Accelerate to kts C-172 and then pitch to an attitude to maintain Vx
- When airborne follow the order of control
- Retract flaps and climb at Vy at 200 ft agl or when all obstacles are cleared whichever is higher

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## **CROSS-WIND TAKE-OFF**

- Take-off checklist complete
- Taxi forward to straighten nose wheel with the runway centreline
- Ailerons into the wind
- Smoothly but positively increase power to full
- Maintain direction with rudder
- Verify full power
- As the aircraft accelerates reduce the deflection of the controls leaving a small amount.
- Accelerate to a little higher than normal rotation speed then pitch to the climb attitude.
- When airborne aircraft will start to roll into the wind
- Assume an approximate crab angle then roll the aircraft to level (co-ordinate)
- Complete the order of control

## **Normal Power – on Approach & LANDING**

1. Abeam the touch down spot reduce power to 1700 RPM and maintain altitude
2.     kts C-172 extend 10° of flaps and pitch for an attitude to give you     kts C-172 then trim for this attitude
3. Turn onto the base leg reduce power to 1500 RPM then extend 20° of flaps and pitch for     kts C-172
4. Play the turn to final at 500 ft, extend 30-40° flaps at pilots discretion, attitude to give you     kts C-172 and power as necessary to fly to the spot
5. At about 30 – 15 ft above the ground, pitch to less than level attitude & gradually reduce power to idle.
6. Close enough to the ground pitch to level attitude
7. Alternate your view from the top of the panel to the far end runway.
8. When you recognise a nose down pitch attitude of the nose, pitch to and maintain slightly less than climbing attitude until the aircraft touches down.
9. After touchdown, gently lower the nose to the ground
10. Brake as required

## **CROSSWIND LANDING**

1. Approach as per normal approach
2. Assume a crab angle when on final
3.     ft agl transition from the crab to a sideslip by aligning the longitudinal axis with the centre line using the rudder, simultaneously using the ailerons to maintain the centre line (this describes a cross control situation; normal to cross wind landing)
4. Touch down should take place upwind main wheel first then downwind main wheel next and finally the nose wheel
5. Remember to proportionally increase aileron inputs as aircraft decelerates

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## **Soft Field Landing**

1. Abeam the touch down spot reduce power to 00 RPM and maintain level flight
2.  kts extend 10° of flaps and pitch for an attitude to give you  kts then trim for this attitude
3. Turn onto the base leg reduce power to 1500 RPM then extend 20° of flaps and pitch for  kts
4. Play the turn to final at 500 ft, extend remaining flaps, attitude to give you  kts and power as necessary to fly to the spot
5. At about 30 – 15 ft above the ground, pitch to slightly less than level attitude & gradually reduce power to 00 rpm.
6. Close enough to the ground pitch to level attitude
7. Alternate your view from the glare shield to the runway, when you recognise a nose down pitch attitude of the nose, pitch to and maintain less than climbing attitude until the aircraft touches down.
8. After touchdown, gently lower the nose to the ground
9. Minimum of brakes

## **Short Field Landing**

1. Approach as per soft field
2. Land without power
3. When on the ground, lower the nose wheel; retract flaps and maximum braking without skid.