FLYING THE CIRCUIT WITH A C172

1. Introduction
This document describes how to handle a basic Cessna 172 in a circuit pattern.

Remember that, while flying the pattern, **the pilot shall maintain visual with the runway all the time.** This document is a summary of some real practices but will not show all aircraft and flight preparation as well as some Cessna 172 specifics.

This document does not cover the phraseology used between pilot and ATC (see VFR phraseology).

2. Start-up on apron
When we enter a Cessna 172, all switches are in the “off” position according to the screen below.

- **Power on** your aircraft using the battery switch [1]
- Push the red mixture command [2] to the full rich position
- Power on the strobes light using switch [3] in order to warn others that you are going to start
- Be sure that the brakes are pressed or park brake is set.
- Verify that the throttle command [6] is in idle position.
- Put magneto [5] on Both (1+2) position, then Start position.
- Monitor engine speed. It shall stabilize around 500 to 600 rpm.
- Set alternator to ON using switch [1] and avionics using switch [7]
3. Taxi to the runway

Get the taxi clearance from the air traffic controller (ATC) and study the airport charts in order to comply with ATC taxi instructions. Release the brakes and set a little power in order to start taxi. The speed shall not exceed 20 knots. When approaching the holding point (yellow marks on taxiways), stop the aircraft using the brakes.

4. At holding point

- Check battery and alternator switches are set to ON [1]
- Check magneto is set to both (1+2) [2]
- Check red mixture command [3] is set to full rich position
- Set flaps [4] to 10° only advised for rough and soft strips with obstacles ahead
- Check all flight commands (Aileron, Elevator, Rudder)
- Set trim to take-off position
- Check Altimeter value and setting
- Set navigation and landing lights [6]
- You can prepare your navigation frequencies in the frequency panel if needed
- You can perform an engine test with brakes on and monitor that the engine speed is reacting well
- Tell ATC that you are ready for departure
5. Lining-up
After receiving departure clearance:
- Line-up on the runway
- Check the heading indicator (runway QFU) and set if needed
- Set your squawk mode Charlie (Tx position on IvAp) [8]

6. Take-off
After receiving take-off clearance:
- **Set throttle command to full position**
- **Verify** engine power. It shall be 2600 rpm. If power is below that value abort the take-off.
- Release brakes (if the runway is long, you can release the brake before setting the power)
- When aircraft is moving, check that the airspeed indicator is active (speed shall increase)
- Maintain runway centreline.
- When reaching the rotation speed **55 knots**, smoothly pull back the elevator command in order to
  lift the nose of the aircraft. (Do not pull back too much and adjust the pitch to control the speed)

7. Initial Climb
- After take-off, maintain runway track
- Maintain minimum **70 knots** then accelerate to **75/80 knots**.
- When passing **300ft AAL**, set flaps to **0°** and continue to **adjust the pitch to control the speed**
  and **trim** the aircraft

    If the speed decreases, lower the attitude and trim the aircraft to maintain 80 knots. If the speed increases,
    raise the attitude and trim the aircraft to maintain 80 knots. The aircraft is in trim if no inputs are required to
    maintain the speed.

    Be aware you must act smoothly on the elevator command.
    **AAL** is the height above the airfield level. Do not confuse with altitude.

8. Crosswind leg
When passing 500 ft AAL or the end of the runway:
- Turn **left** on crosswind (90° turn)
- Continue climb until 1000 ft AAL, remaining perpendicular to the runway
- Reaching **1000 ft AAL**, lower to attitude gently to achieve a smooth level off.
- You are ready to **turn to downwind leg**.

    Usually, you must perform a left hand circuit pattern at 1000 feet AAL.
    Sometimes on VFR charts, other restrictions may apply: right hand circuit, other altitude, and/or non-
    standard legs: all the time consult the charts in order to comply with the published circuit.
9. Downwind leg

Now, you are ready to turn on downwind leg:

- Initiate the left turn (90° turn)

Now, we are on left hand downwind leg.

- **Reduce throttle while maintaining pattern altitude** (trim as needed). You can preset engine power to 2100 rpm. Maintain constant speed.
- **Keep a constant distance from the runway all along the downwind leg**
- Inform ATC that you are established on downwind leg

You do not need to reach maximum speed on downwind. Maintaining speed at 85 knots could be a good target.
10. End of downwind leg

When crossing the runway threshold on your left, prepare the aircraft for final:

- Reduce power around 1900 rpm
- Set flaps to 10°
- Adjust throttle in order to maintain speed around 70/80 knots

11. Base leg

When the touchdown point on the runway is on your ¾ back (7 to 8 o’clock):

- Turn left on base leg (90° turn)
- Reduce power to 1700rpm and set flaps 20°.
- Descent will start with approximatively -500 ft/min vertical speed, at 70 to 80 kts IAS

Starting the last turn for final does not obey to any specific rule. Estimate it by yourself using visual references (runway threshold or touchdown position from cockpit view).

Be aware of wind effects when turning on final as well as for correctly flying the pattern legs. For example:
If there is head wind on base leg, you must delay the last turn.
If there is tail wind on base leg, you must anticipate the last turn.
12. Final leg

Usually, after the last turn, you must be around 500ft AAL.

- Once established on final, **follow the PAPI or VASI indicator** if present, until runway threshold
- If you are not cleared to touch and go or land by ATC (if present), it is time to report that you are on final.

Continue the final approach:

- Set flaps to **full**.
- Reduce speed around 60 to 65 knots and adjust trim as needed. At this stage, power should be around 1700rpm.
- Change power according to the **descent profile** (Descent rate shall be around -350 ft/min).

When passing the threshold your point of reference should transition from the touchdown zone to the end of the runway to judge the flare and power reduction to idle (keeping level will require increasing amounts of back pressure on the yoke).

While on the ground, keep the runway axis until it reaches the ground manoeuvring speed, then vacate the runway using a taxiway.

13. On ground

After vacating the runway set your squawk mode to stand by position (STBY).

- If ATC is active, announce that the runway is vacated and wait for taxi clearance.
- Then, taxi to the general aviation apron. Announce when you leave the ATC frequency.
- Then perform a complete shutdown of the aircraft:
  - Set park brake
  - Shutdown lights and avionics
  - Cut off mixture
  - Set magneto to OFF, alternator and battery switches to OFF