

## VII.F1. Normal Approach and Landing

**About:** A normal approach to landing is what is considered to be a “normal situation”; that is, when engine power is available, the wind is light, or the final approach is made directly into the wind, the final approach path has no obstacles and the landing surface is firm and of ample length to gradually bring the airplane to a stop.

**How:** The key to having a good normal landing is to have a good stabilized approach and landing. This means to establish an angle of descent and airspeed that will permit the airplane to reach the desired touchdown point at an airspeed which will result in a minimum floating just before touchdown.

This is accomplished by using power and pitch control as well as flaps to aid the airplane if needed to better give a stable descent angle.

### Discussion Points:

1. As in slow flight: **Pitch** for airspeed: **Power** for Altitude
2. On base ask student if we are high or low
  - a. You want student to make a decision on whether to add additional flaps.
3. Only add a few hundred RPM at time on final if you are low.
4. Ask student to look at the runway edge line (left side) and what that looks like 2000 ft down the runway. This will help them have a view of center
5. If you are not down in the first 1/3 of the runway execute a go around.
  - a. There is nothing wrong with going around. Better to be safe than sorry.
6. The distance at which the pilots vision is focused should be proportionate to the speed the airplane is traveling over the ground
  - a. Focus too close, reference is blurred, reaction is either abrupt or too late. Tendency to over control, round out high and make full stall drop in landings
  - b. Focus too far, accuracy in judging closeness to the ground is lost, reactions are slower since there does not appear to be a necessity for action. This results in nose first landings
  - c. Focus should be changed gradually being brought progressively closer as speed is reduced.

### Procedure (Flap Landing):

1. Before Landing Checklist (Procedures below for 1965 C172)
2. Fuel selector- BOTH

#### **Downwind**

3. On downwind at pattern altitude (mid-field CARB HEAT)
4. Mixture RICH
5. Abeam touchdown point (power 1500rpm, 10° flaps in white arc)
6. Hold same level attitude- TRIM 80 MPH
7. When touchdown point is 45° off shoulder turn base (< 30° bank)

#### **Base**

8. Call out if we are high or low
9. If desired, apply 20° flaps, if trimmed correctly AS will slow to 75 MPH.
10. Check for traffic on final, Turn final (< 30° bank)

#### **Final Approach**

11. If desired, apply 30° flaps, if trimmed correctly AS will slow to 70 MPH.
12. If you are on the glide path the space between the top of the cowling and the runway will appear to stay the same.
  - a. If it expands you are too low
  - b. If it shrinks (or runs under you) you are too high
13. As in slow flight: **Pitch** for airspeed: **Power** for Altitude
  - a. Only change RPM a few hundred at time on final.

#### **Round Out**

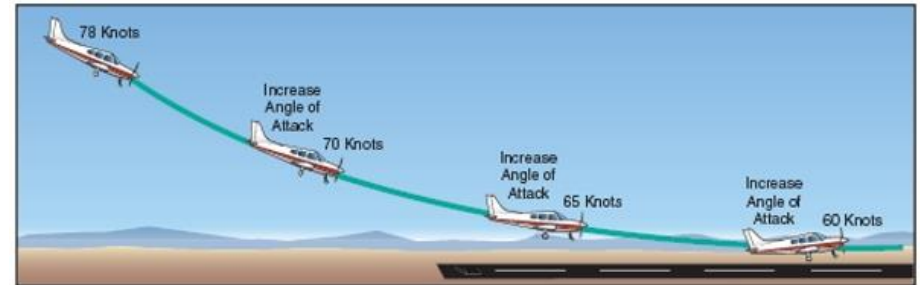
14. Slow the decent when we get over the runway (~10ft)
15. Power to idle
16. Hold the airplane off the runway as long as possible to bleed off speed.
17. Progressively raise the nose to hold the airplane just above runway as airspeed slows to approx. stalling speed.

#### **Touchdown**

18. Transition the weight of the airplane from the wings to the wheels at the slowest possible airspeed
19. Touchdown on the main wheels first and hold nose wheel off with back elevator pressure
20. Keep straight with rudder and wings level with aileron
21. Gently lower nose wheel to runway
22. Once clear of the runway come to a complete stop
  - a. Perform after landing checklist

### Common errors:

23. Failure to establish and maintain a stabilized approach:
  - a. Not establishing the correct airspeeds for downwind, base, and final segments.
  - b. Not adjusting power and pitch attitude as necessary to control airspeed and rate of descent.
  - c. Not using flaps as necessary to control speed and rate of descent.
  - d. Not correcting for wind drift on downwind, base, and final.
24. Improper procedure in use of power, wing flaps, and trim:
  - a. Not using pitch and power to control airspeed and rate of descent.
  - b. Not extending flaps as necessary.
  - c. Not trimming aircraft for appropriate airspeed.
25. Inappropriate removal of hand from throttle – not keeping hand on throttle for power increases and reductions.
26. Improper procedures during round out and touchdown:
  - a. Rounding out too late resulting in, if not corrected, a hard landing followed by a bounce and a stall and another hard landing.
  - b. Rounding out too high resulting in, if not corrected, an eventual loss of airspeed followed by a high sink rate and a hard landing.
  - c. Rounding out and “ballooning” down the runway; usually caused by misjudging the rate of descent and over-controlling.
  - d. Rounding out and “floating” down the runway; usually caused by excessive airspeed on final approach.
  - e. Touchdown followed by a bounce as a result of an excessive rate of descent on final.
27. Poor directional control after touchdown:
  - a. Allowing a wing to rise after touchdown.
  - b. Allowing touchdown while in a crab.
  - c. Over-controlling with rudder.
  - d. Ground loop – may be caused by a crosswind or over-controlling airplane; this problem can be significant in tailwheel aircraft.
28. Improper use of brakes:
  - a. Not using aerodynamic braking
  - b. Excessive use of brakes
  - c. Skidding the tires
29. Failure to ensure receipt and acknowledgement of landing clearance.
30. Failure to review airport diagram for runway exit situational awareness to avoid a runway incursion after landing.



### Evaluations/ Standards:

31. Consider the wind conditions, landing surface and obstructions, and select the most suitable touchdown point.
32. Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required.
33. Maintain a stabilized approach and the recommended approach airspeed, or in its absence, not more than 1.3V<sub>so</sub> (+10 / -5 knots for Private, +-5 knots for commercial) with gust factor applied.
34. Make smooth, timely, and correct control application during the round out and touchdown
35. Touch down smoothly at the approximate stalling speed (at or within 400 feet of Private, at or within 200 feet for commercial) beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway centerline
36. Maintain crosswind correction and directional control throughout the approach and landing
37. Complete the appropriate checklist