

THE FLAP ABOUT FLAPS (using a Cessna 172 as an example)

Flaps

- ▣ Increase lift
- ▣ Increase drag
- ▣ Reduce stalling speed (about 5 knots or 10% in a C-172)

General Characteristics

- First increment of flaps increase lift more than drag
- Last increments increase drag more than lift
- Partial flaps increase lift without as much drag penalty

Increase Flaps

When you want to

- Get down
- Slow down

Decrease Flaps

When you want to

- Go up
- Speed up

Advantages of Flaps

- Greater rate and angle of descent without an increase in stall speed
- Better visibility over the nose
- Reduce floating in the flare
- Make for a less extreme nose-up touchdown

More Advantages of Flaps

- Slower touchdown
- Use less runway
- Less wear and tear on brakes

Disadvantages of Flaps

- Use on landing makes for slower speeds and tends to direct the airflow away from the tail, resulting in less elevator and rudder effectiveness and slightly more difficulty in crosswinds (you will lose rudder effectiveness first)

Disadvantages of Flaps

▣ Make the tires skid more easily, reducing control and braking effectiveness on the ground

More Disadvantages of Flaps

- Slightly reduced stability on the ground by increasing the area for crosswind to work on
- Require more trim changes
- Reduce the gust-load tolerance
- Make a go around more difficult

“Flaps can get you into trouble”

Flaps and a crosswind landing

- Landing with reduced flaps means
 - More air over the tail and more nose-wheel clearance from the ground
 - More weight on the main wheels when you lower the nose wheel to the ground

Cessna Says:

▣ “Use the minimum flap setting required for the field length. If flap settings greater than 20 degrees are used in sideslips with full rudder deflection, some elevator oscillations may be felt at normal approach speeds. However, this does not affect control of the airplanes.”

On takeoff flaps can

- Shorten ground roll
- Reduce rate of climb

On go-around

- Accelerate some first, then
- Reduce flaps in increments

Teaching the use of flaps

- 🎬 Some instructors teach
- 🎬 Some flaps downwind
- 🎬 More on base
- 🎬 Full flap on final

Why do they teach this?

- 🎬 Simplifies teaching
- 🎬 Standardizes the approach

What should they teach?

- 🎬 Use flaps as a tool when you want to
- 🎬 Slow down and maintain or increase stall margin
- 🎬 Get down

This requires better situational awareness

- 🎬 Harder to teach
- 🎬 Result is a safer student

Example

- 🎬 Tower has the student extend downwind
- 🎬 Student turns base four miles from the airport
- 🎬 Should the student increase flaps because they are turning base?

Some technique observations

- 🎬 Most people fly
- 🎬 Too big a pattern
- 🎬 Too fast
- 🎬 With lots of power and flaps out at the same time (like using brakes and the power at the same time)
- 🎬 Touch down flat
- 🎬 Land on the left side of the runway

What we think they should do

- 🎬 Fly closer to the airport
- 🎬 Gives a better view of traffic
- 🎬 More options if there is a problem
- 🎬 Fly slower
- 🎬 Use flaps to make a slower and steeper approach

What we think they should do

- 🎬 Touch down at slower speed, more nose up
- 🎬 Put centerline between your two feet

On takeoff

- 🎬 Most people do a slight roll to the left, corrected by aileron
- 🎬 Why?

They fail to

- 🎬 Add right rudder when they raise the nose wheel off the ground

Grateful appreciation is given to John and Martha King for this outline about the use of flaps during their presentation at the SAN FSDO CFI Workshop in May 2004.

Fly Safely,

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