“Basic” Sailplane Aerobatics

Basic Aerobatics:

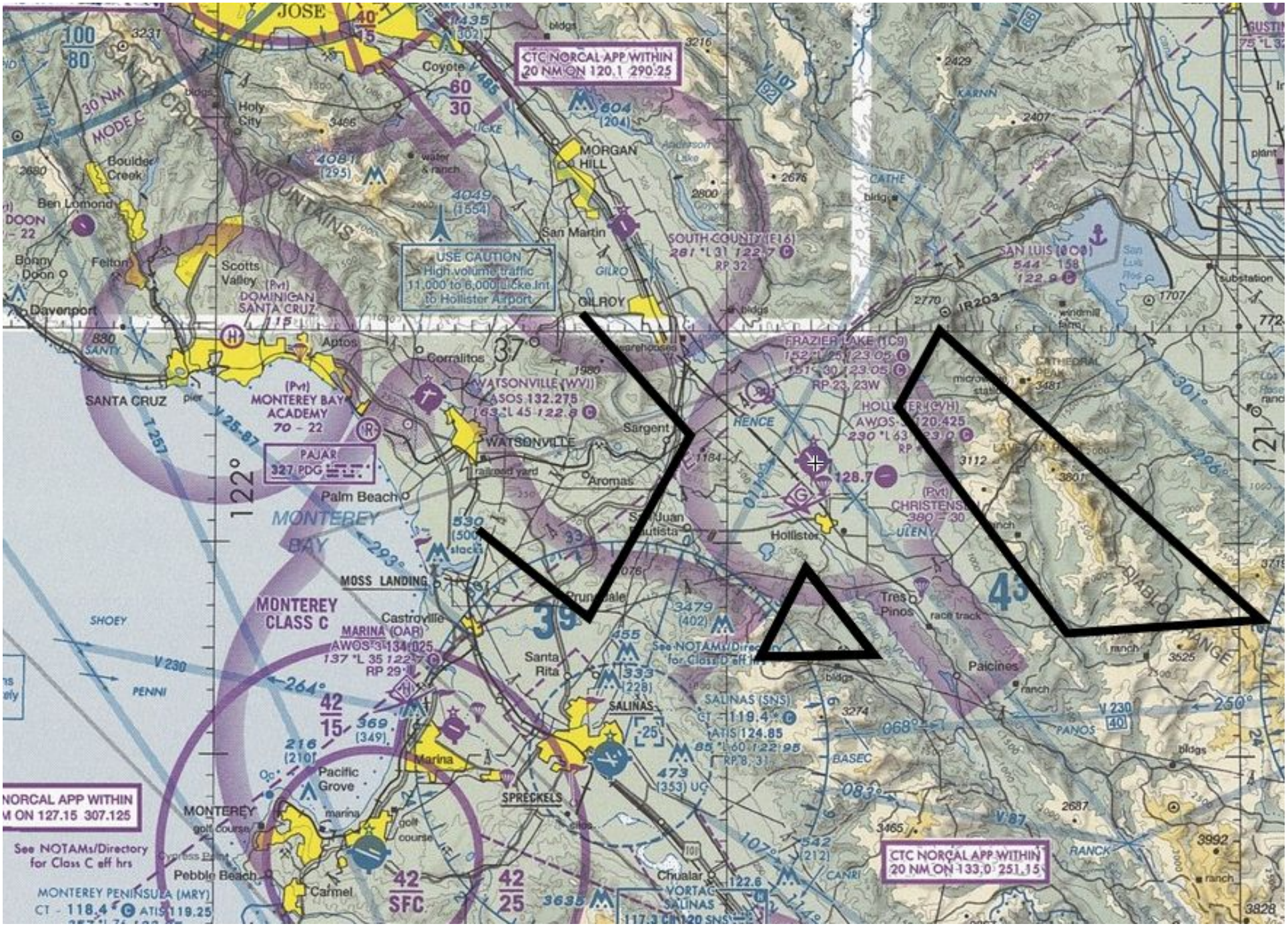
- Maneuvers allowed in club DG-1000 and DG-505
- Performed in either Utility or Aerobatic category
- Performed at altitude (above 3,000 ft)
- Simple maneuvers that don't stress the glider or pilot
- Can be linked together to make a routine for practice

Professional driver on closed course

Do not attempt

Why learn to fly aerobatics?

- Gain more confidence
- More precise control of the aircraft
- Something to practice on non-soaring days
- To have fun!



Hollister Aerobatic Areas

Rules and Regulations

14 CFR 91.303 – Aerobatic Flight

- Must be at least 4 nm from centerline of airway
- Must be above 1,500 ft AGL
- Must not be over “congested” areas (including open air assembly of people)
- Flight visibility must be at least 3 sm
- Within lateral boundaries of Class B, C, D, or E airspace designated for an airport

“Aerobatic flight means an intentional maneuver involving an abrupt change in the aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.”

Rules and Regulations

14 CFR 91.307 – Parachutes

- Must be repacked within the previous 180 days
- Each occupant must wear parachute if:
  - Exceed a bank angle of 60 degrees relative to horizon
  - Exceed a pitch attitude above or below 30 degrees relative to the horizon

No requirement to wear a parachute if doing aerobatics solo!

Approved Maneuvers in Utility Category

DG-1000:

- G.W. below 1650 lbs
- No water ballast
- Tail ballast used to compensate for rear pilot OK

Approved Maneuvers:

- Spins
- Inside Loop
- Chandelle
- Lazy Eight (Wingover)
- Stall Turn (Hammerhead)

More advanced requires Aerobatic category

Approved Maneuvers in Aerobatic Category

DG-1000:

- G.W. Below 1389 lbs
- No water ballast
- Tail ballast used to compensate for rear pilot OK
- 18 m tips

Approved Maneuvers:

- All in Utility Category
- Inverted flight
- Half loop and half roll (Immelmann)
- Half roll and half loop (Split-S)
- Slow roll
- Half flick roll from normal to inverted flight with half loop
- Half flick roll from inverted to normal flight

Variations of Approved Maneuvers

- Barrel Roll (Loop and Roll combined)
- Cloverleaf (First Half Barrel Roll – Second Half Loop)

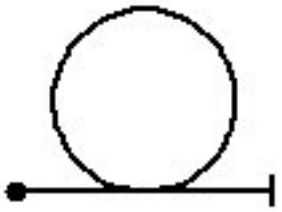
Before Starting Maneuvers

- Clear the area (clearing turns)
- Trim for 76 kts prior to inverted maneuvers
- Entry speeds for most maneuvers are 97 – 108 kts
- Top of the green arc is good place to start
- Remember do not make full or abrupt control movements above maneuvering speed (97 kts)
- Increase entry speed for half loop or half roll to inverted
- Decrease entry speed for half roll and half loop (Split-S)
- Most maneuvers should be less than +4 and -1.5 G's
- Remember that instruments are difficult to find inverted
- Know where to look to see correct attitude

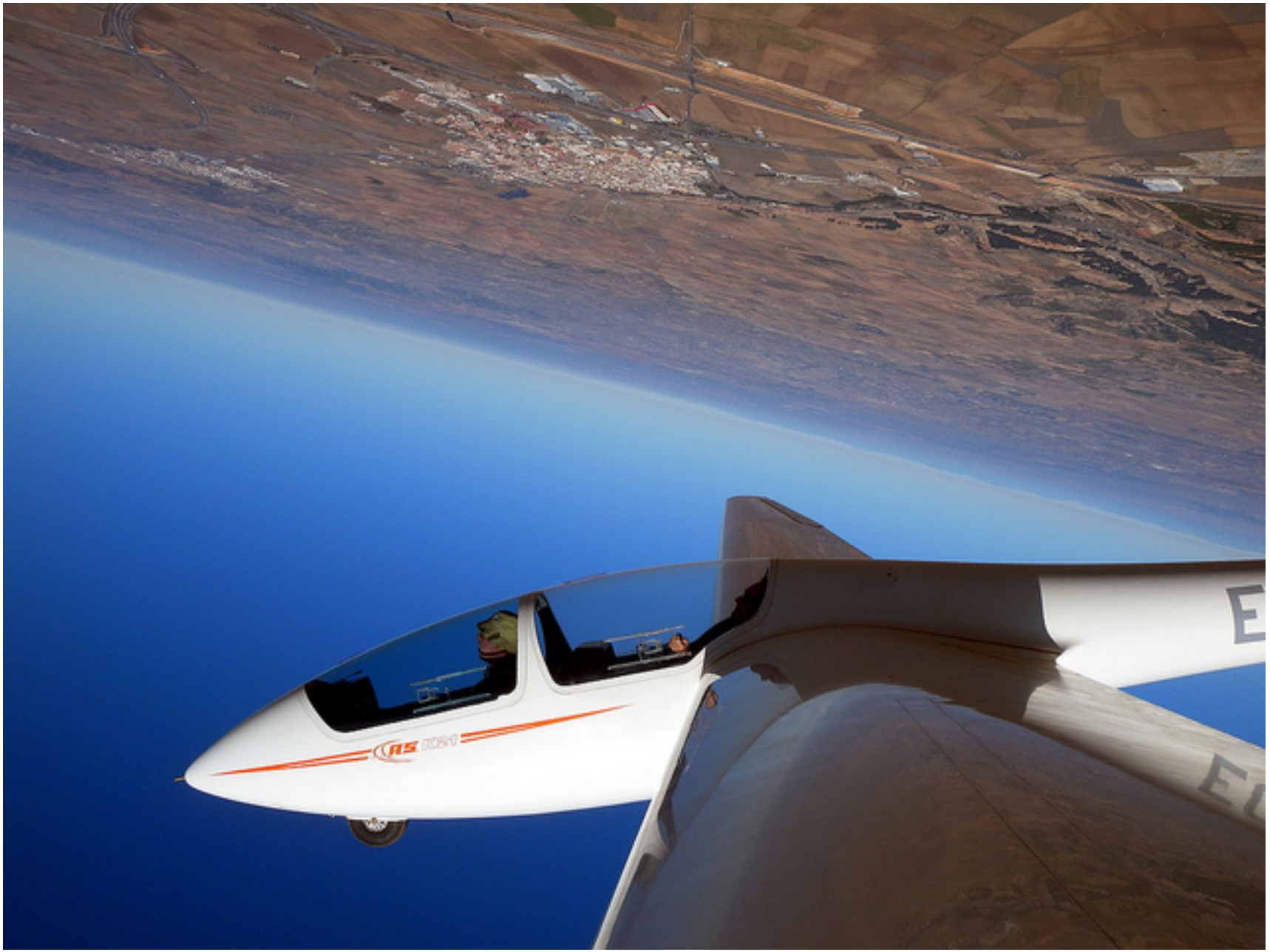
Wingover

- Easy maneuver to start with
- Entry speed ~100 kts
- Climbing turn 90 degrees
- Constantly increasing bank angle to 90 degrees
- Constantly decreasing bank angle to straight and level
- Descending turn 90 degrees
- Finish heading 180 degrees from start heading

Loop



- Easy maneuver to start with
- Entry speed ~100 kts
- Continuously increasing back pressure until inverted
- Float over the top (relax back pressure a little)
- Constantly increasing back pressure to pull out of dive
- Begin to push over around 65 kts to level flight
- Finish heading same as start heading

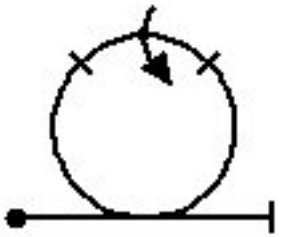


Cloverleaf

No Symbol for this maneuver

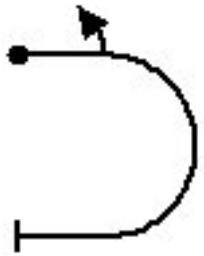
- Easy maneuver after mastering loops
- Entry speed ~100 kts
- Pick point on horizon 90 degrees off nose (wingtip)
- Continuously increasing back pressure
- When pitch attitude 45 degrees begin coordinated turn
- Float over the top (relax back pressure a little)
- Nose should drop through 90 degree point on horizon
- Roll out of turn and continue loop
- Constantly increasing back pressure to pull out of dive
- Begin to push over around 65 kts to level flight
- Finish heading 90 degrees off start heading

Barrel Roll



- A little more difficult than Cloverleaf
- Entry speed ~100 kts
- Pick point on horizon 90 degrees off nose (wingtip)
- Continuously increasing back pressure
- When pitch attitude level begin coordinated turn
- Float over the top (relax back pressure a little)
- Nose should drop through 90 degree point on horizon
- Continue turn and continue loop
- Constantly increasing back pressure to pull out of dive
- Begin to push over around 65 kts to level flight
- Finish heading same as start heading

Half Roll and Half Loop



- More advanced maneuver
- Entry speed ~110 kts
- Point nose at point on horizon
- Coordinated turn to 90 degree bank
- Forward pressure and switch to top rudder
- At 180 degree point nose should be above point on horizon
- Keep adding forward pressure to reduce airspeed
- Nose attitude is very high (don't let airspeed build up)
- Pull through quickly to prevent airspeed from building up
- Easy to exceed VNE or pull excess G's if too fast
- Finish heading opposite as start heading

Half Roll to Inverted

- More advanced maneuver
- Need to be able to get upright again
- Entry speed ~110 kts
- Point nose at point on horizon
- Coordinated turn to 90 degree bank
- Forward pressure and switch to top rudder
- At 180 degree point nose should be above point on horizon
- Keep forward pressure to maintain about 70 kts
- Nose attitude is very high (don't let airspeed build up)
- Finish heading same as start heading
- Inverted flight rudder works the same but ailerons opposite
- Very unstable as dihedral is now working against you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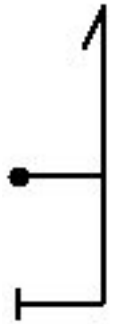
Stall Turn (Hammerhead)



- More advanced maneuver
- Can end up in tailslide if done improperly
- Entry speed ~100 kts
- Continuously increasing back pressure until vertical
- Look at wingtip to judge vertical line
- Continuously increasing rudder pressure beginning at 80 kts
- Add slight opposite aileron to maintain vertical plane
- Aircraft will come to complete stop momentarily (silent)
- Nose should drop sideways – not forward or backward
- Add opposite rudder to keep nose pointing down (pendulem)
- Add back pressure to pull out of dive
- Begin to push over around 65 kts to level flight

For more information:

- Les Horvath's Sailplane Aerobatics
- Read Flight Manual thoroughly
- Don't try to teach yourself
- Get training from Hollister Soaring Center, LLC