# Agenda

- Get into the act
- The countertrade of airfoils
- Drag of a wing
- The Pils/Leodolter-Story
- Once and forever slow
- Let it be...(things you should avoid)
- Tactics during distance task
- Tactics during thermal task
- Tactics during landing
- The art of walking to the start

# Get into the act

- What the hell are we doing here?

- Sounds funny, but did you ever try to answer this question seriously for F5B?

# Get into the act

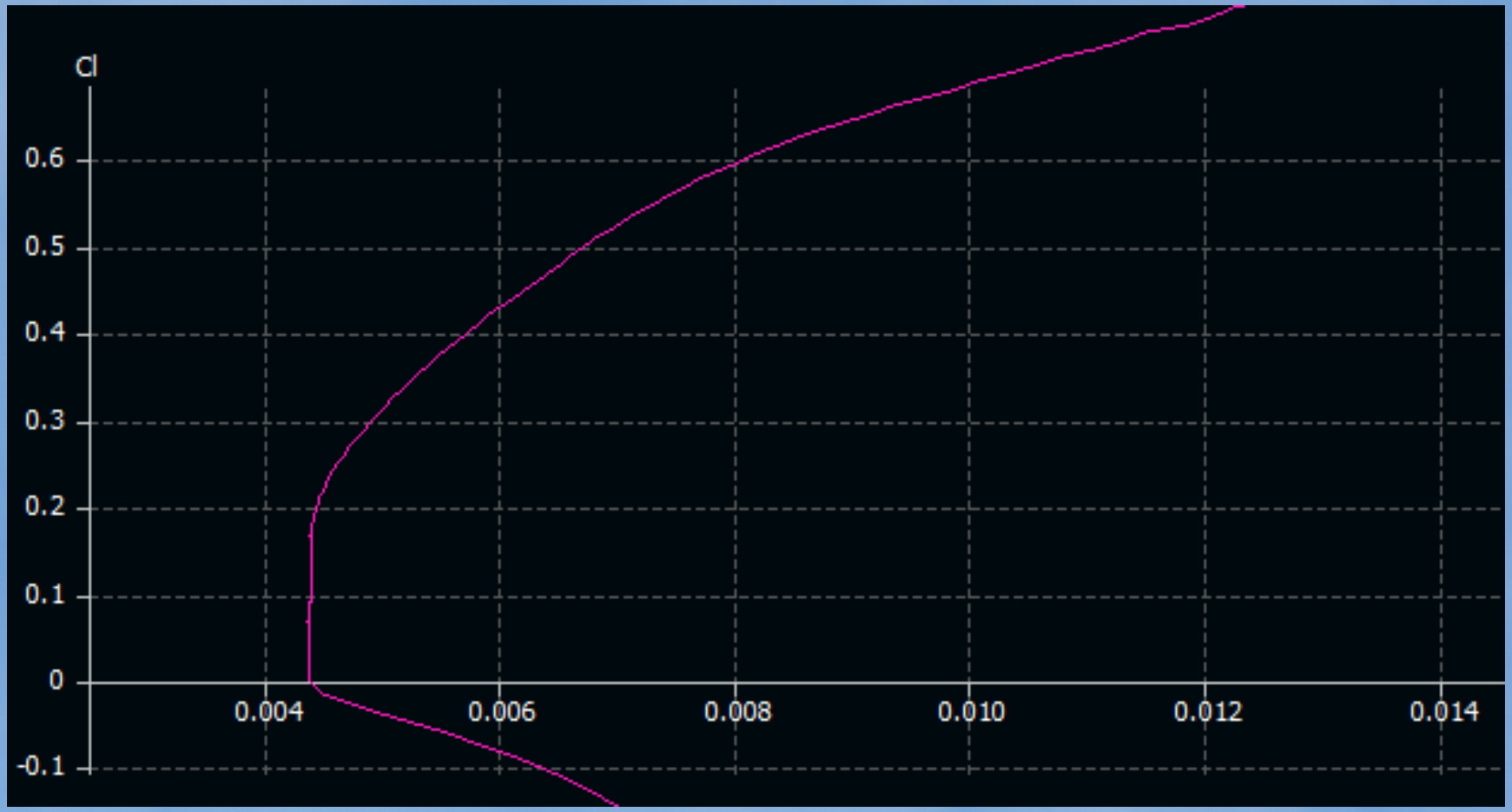
- Here is my attempt to answer this question:
  - Try to keep the plane running
  - Try to do nothing
    (everything you do slows down the plane)
  - Try to enter perfectly into the course
  - Try to fly in the right direction
  - Try to hit the turn at base A and B
  - Try to avoid errors
  - Try to relax & have fun
    (~~I must fly~~ → **I´m allowed to fly!**)

# The countertrade of airfoils

- You are getting nothing for free from an airfoil
- Airfoils are not interested in money, you have to do a countertrade:
  - For more lift you have to pay with speed
  - For negative lift you have to pay with even more speed
  - For more speed (or at least keep speed as long as possible) you have to pay with lift and height
- You can easily try this during a flight

# The contertrade of airfoils

- More lift (cl) creates to more drag

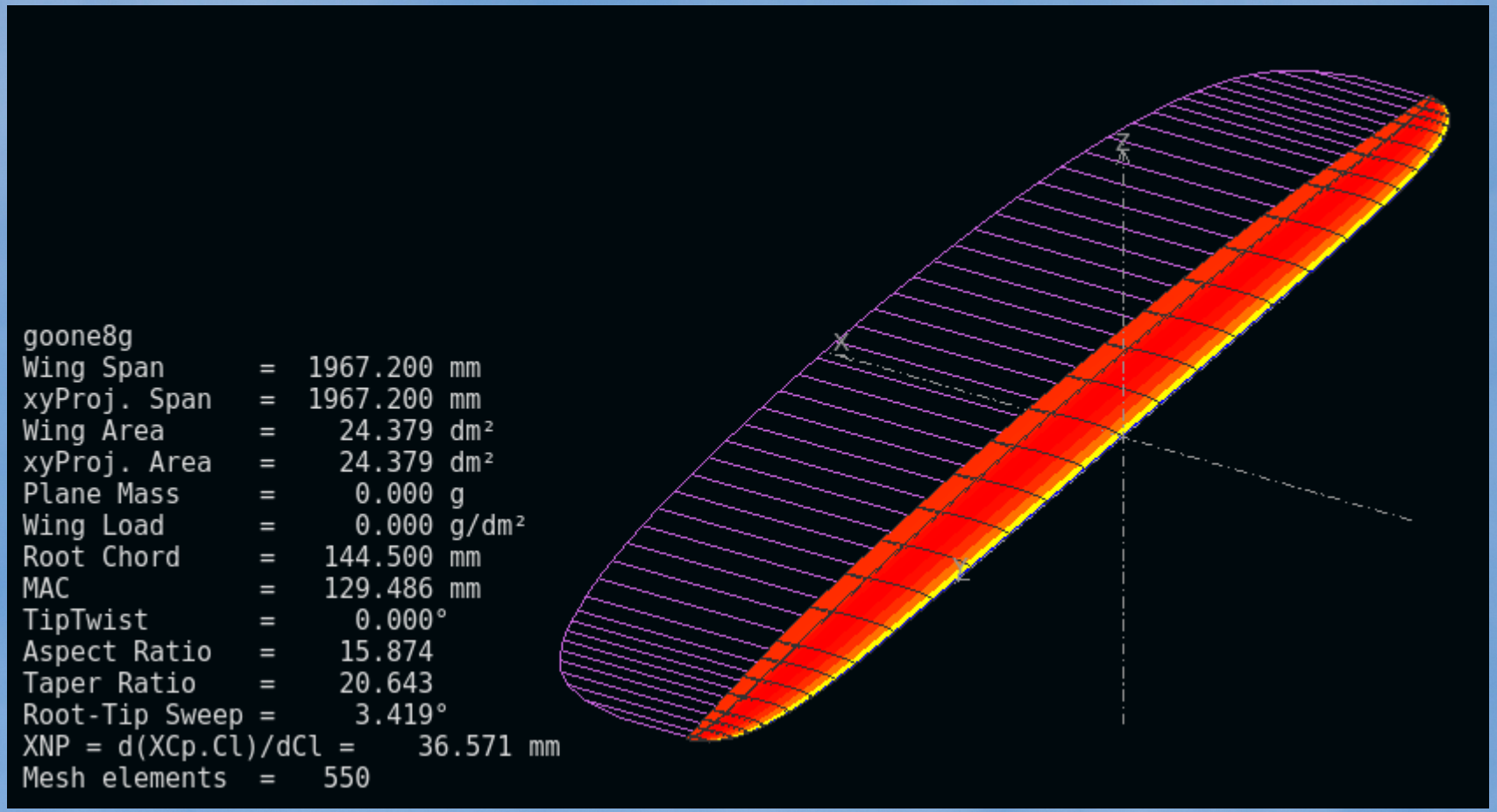


# Drag of a wing

- The drag of a wing consists of drag of the airfoil and induced drag
- Both is getting bigger with increasing angles of attack
- This is shown in the following slides

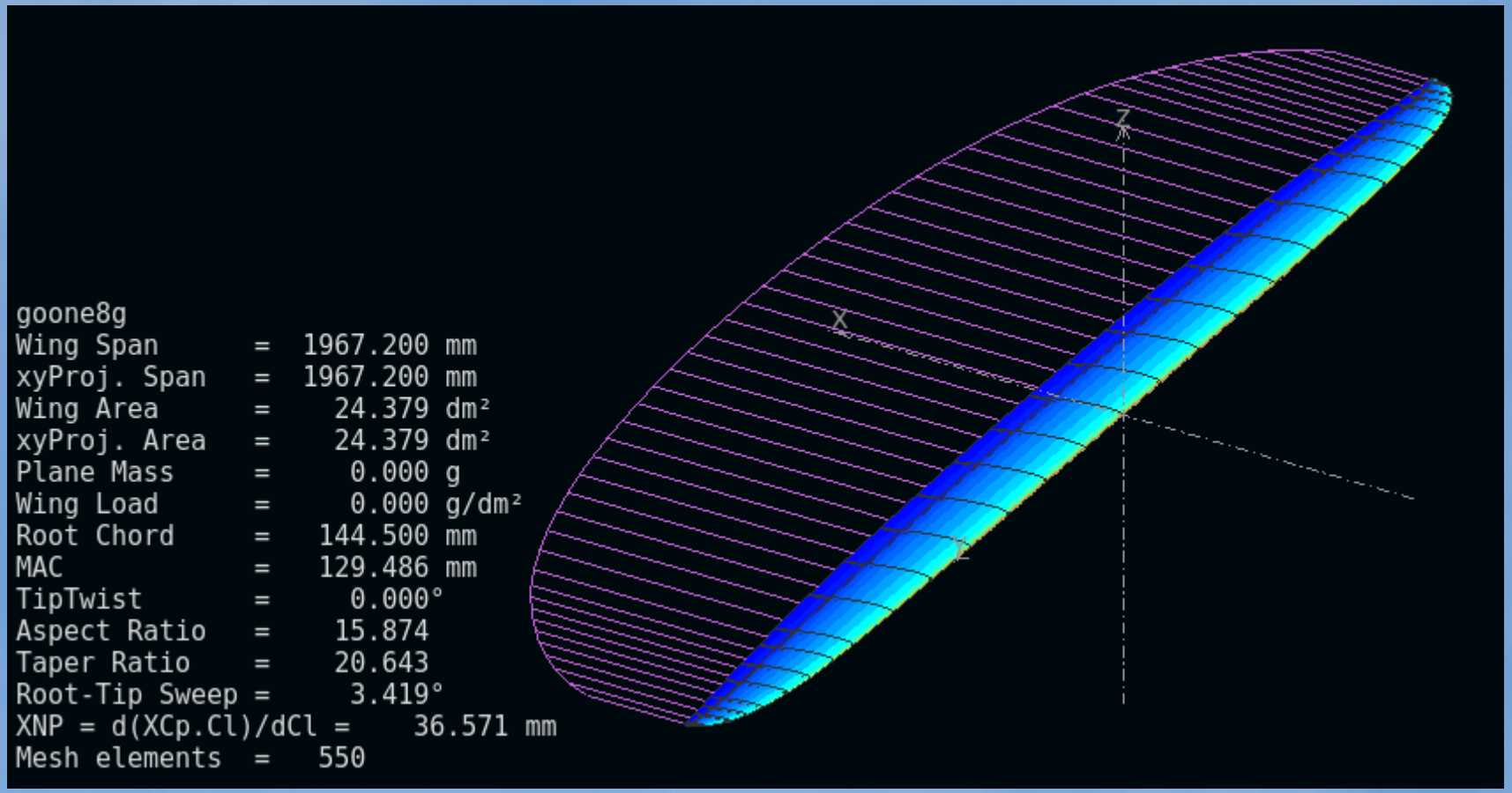
# Drag of a wing

- Drag of an airfoil, a=-1°



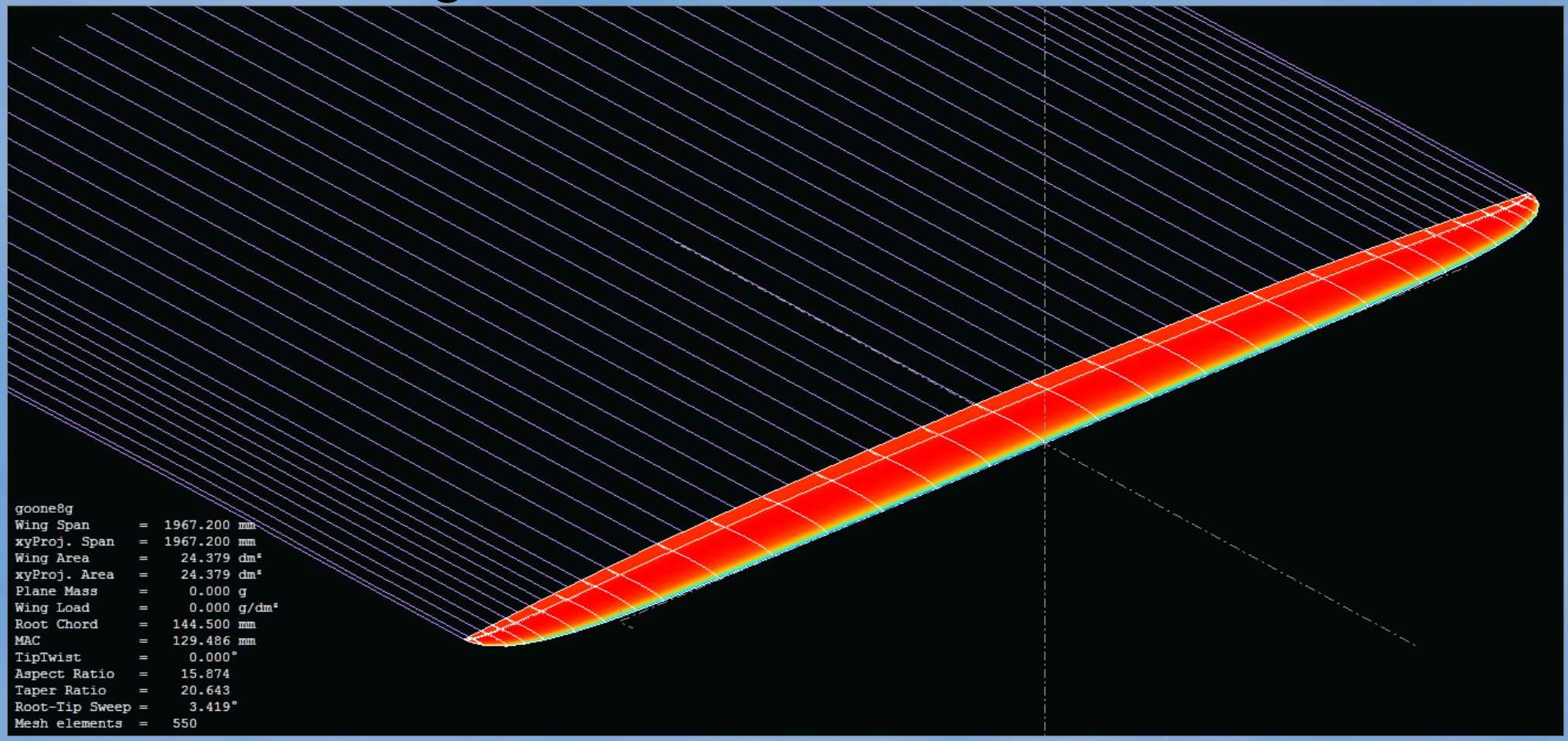
# Drag of a wing

- Drag of an airfoil, a=5°



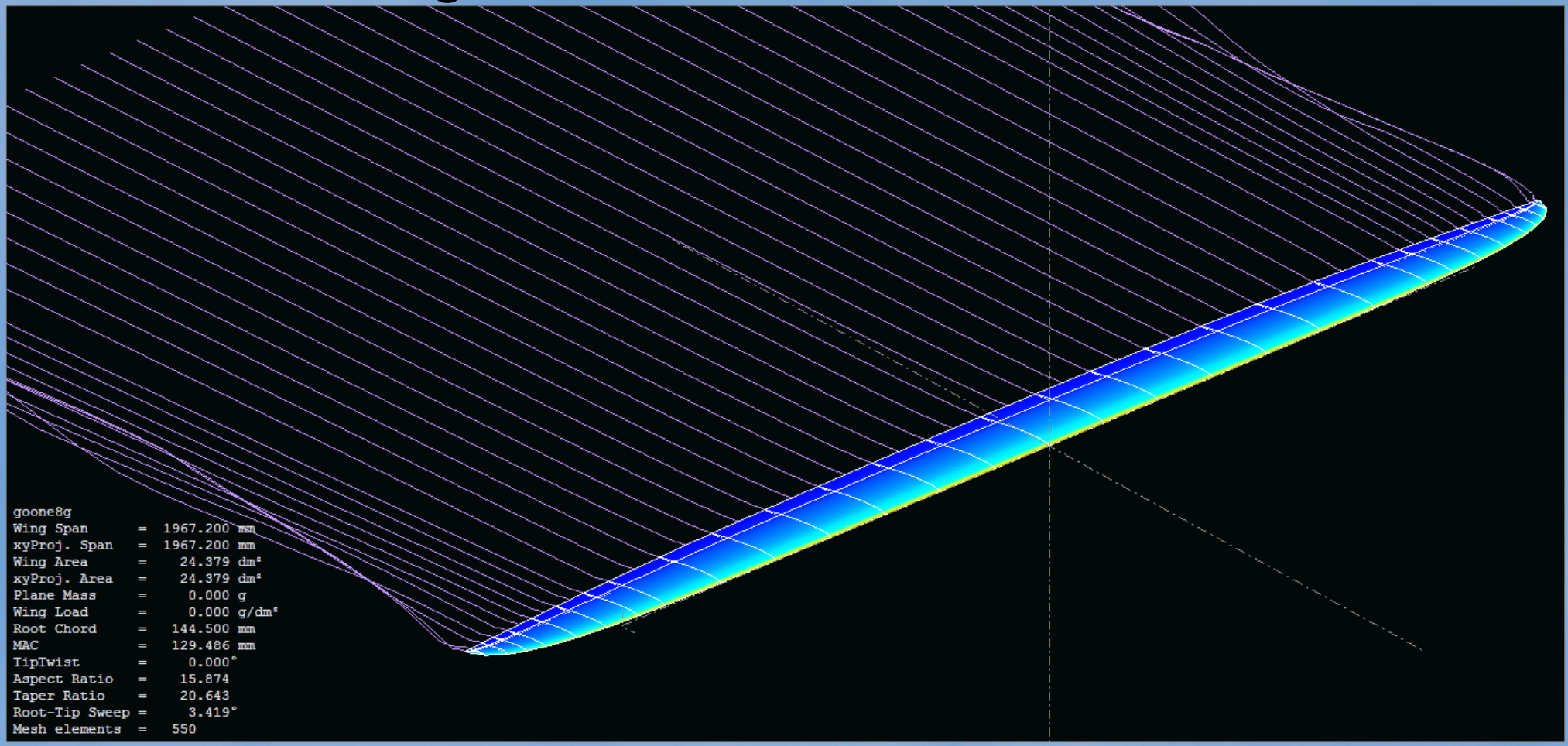
# Drag of a wing

- Induced drag – streamlines, a=-1°



# Drag of a wing

- Induced drag – streamlines, a=5°



# The Pils/Leodolter story

- We are writing the year 2002, WCH Winterthur
- Completely different flying styles of Urs and Thomas:
  - Urs was climbing up very high close to the course and did a short and slower entry
  - Thomas was climbing up lower further away from the course and did a longer, faster entry

# The Pils/Leodolter story

- Climbing time and used energy during the climbs was more or less the same
- Each of them won 3 Rounds
- The last round decided the WCH

| Rank | Name | Country | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Leodolter Urs | SUI | 993.21 | 1000.00 | 1000.00 | 984.83 | 983.73 | 978.95 | 1000.00 | **5961.77** |
| 2 | Pils Thomas | USA | 1000.00 | 997.08 | 998.10 | 931.75 | 1000.00 | 1000.00 | 954.46 | **5949.64** |

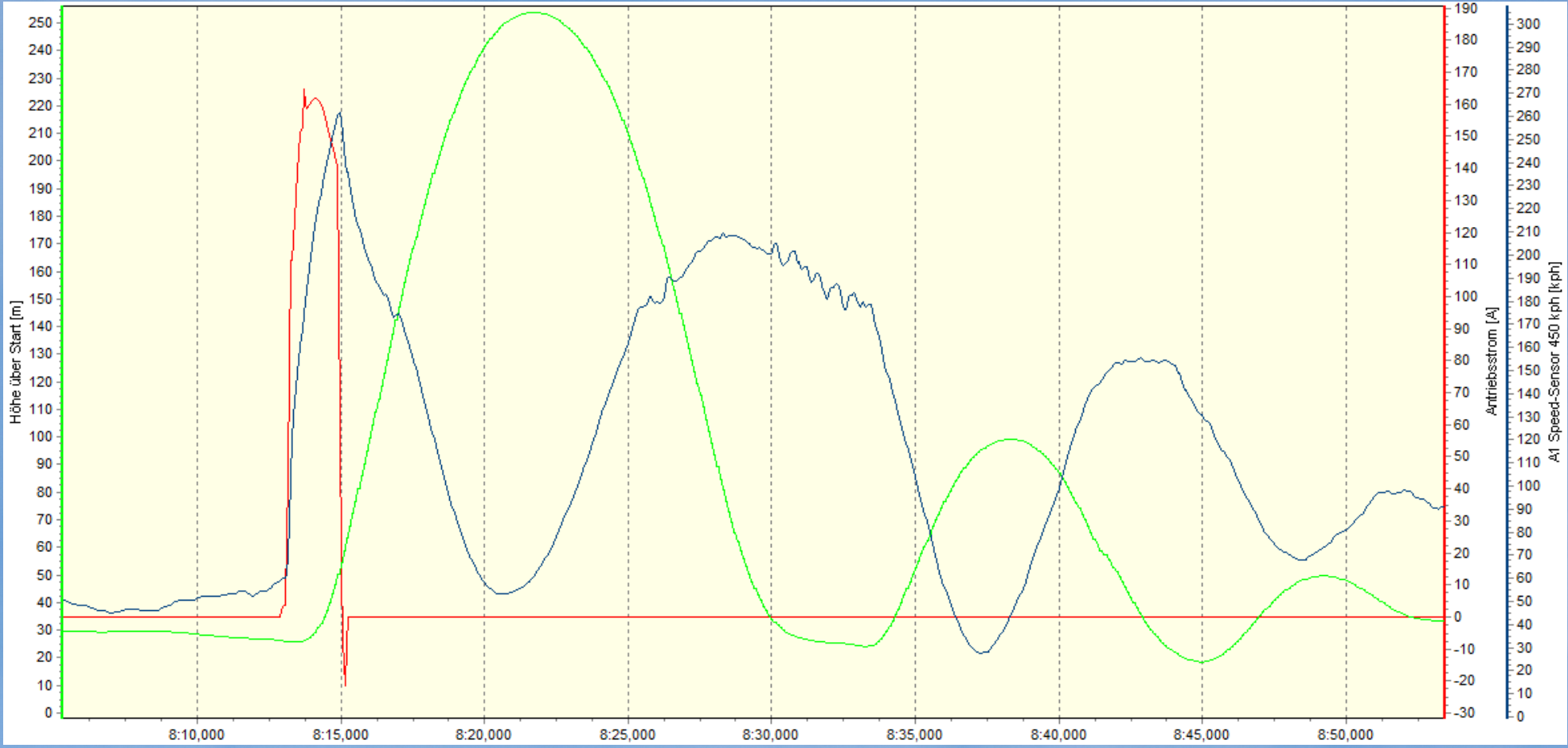
- **Totally different flying styles can lead to success in F5B**

# Once and forever slow

- A plane that had for some reason slowed down can only be slightly accelerated again until the next climb
- This is shown in the following log
- 2 seconds motor increases the speed from 60 km/h to 280 km/h
- 8 seconds dive increases the speed from 60 km/h to 210 km/h and costs 250m height

# Once and forever slow

- Green: Height / Blue: Speed / Red: Current (A)



# Let it be...(things you should avoid)

- Plane setup
  - Too big deflection of flaps / elevator / aileron
  - Not enough / too much motor-runtime
  - Have no flight phases for speed / thermal
  - „Something“ does not work
  - Have no landing pin
  - Have no posibility so switch on the plane from the outside
  - Have no snap-flap

# Let it be...(things you should avoid)

- Flying style
  - Turns flown with the nose pointing up after the turn (Plane is not lying in the correct angle for the turn)
  - Turns flown more than 180°
  - Push the elevator down
  - Fly like a kangaroo (up & down, maybe wrong setup of speed-phase or too big elevator deflection or wrong COG?)
  - Fly like a wild bee (left & right / maybe too big aileron deflection?)

# Let it be...(things you should avoid)

- Psychological
  - Wanting too much
  - Wanting not enough
  - Lack of concentration
  - Be too nervous

# Let it be...(things you should avoid)

- Others
  - Mistakes of helper
  - Sighting device of the pilot not properly aligned
  - Miss of base A or base B
  - Motor-In´s / Motor-Out´s

# Basic tactics during distance task

- If the conditions are good, start as soon as possible after preparation time starts
- If the conditions are bad, wait during the preparation time
- Indicators for conditions can be the Pilot flying before you, birds, wind,... but you never know for sure how the conditions evolve
- Start with set of 6 legs if you have to launch in direction of base B due to the wind conditions, and you are sure you will fly at least 42 legs

# Basic tactics during distance task

- As you have 10 climbs in 200 seconds for the distance task:
  - Everytime you fly faster than 20 seconds until the next climb you „win“ time.
  - Everytime you fly slower than 20 seconds you „lose“ time
  - Fly sets of 4 legs until you have „won“ enough seconds to fly a set of 6 legs
- If the air is fast, fly 6 legs even if you have not won enough seconds

# Basic tactics during distance task

- If you had a very close turn at base A or B fly the next turn at that base slightly wider. Judges that have been stressed by a very close turn will look closely at your next turn
- Within the 9th set of legs pilot/helper should decide how many legs can be flown in the 10th set.
- Time that is left after the 10th set should be used to climb for the duration task.

# Basic tactics during termal task

- Only fly in circles if you are sure that you are within a thermal
- Your helper should also watch for thermals in other directions / watch the other planes flying
- Fly slow, the least sinking rate is slightly above minimum flying speed
- One longer climb is more efficient than two short climbs

# Basic tactics during termal task

- Helper can have a look at the official scoring board – if you have used x,0 sec. Motor runtime you have a 0,9 sec. shot for free.

# Basic tactics during landing

- It´s much more important to hit the inner circle than to land after exactly 10 min
- Fly over you, a little to the side 30 seconds before landing
- At zero wind, fly 10s straight away, 10s for a 180° turn and 10s towards the middle of the inner circle
- Helper 1 does the countdown, helper 2 gives his opinion about height and speed

# Basic tactics during landing

- The helper responsible for timing can stop telling times approx. 5 sec. before landing if the pilot is disturbed by that. Concentration should be focused on hitting the inner circle for the last 5 sec.

# The art of walking to the start

- Watch out, that you are standing parallel to the safety line behind your sighting device(its easier to hit the right direction that way)
- There are 4 points to fix:
  - Feet (see point above)
  - Point where you plan to enter the course after the first c-limb
  - Area where you will place your upper B-Turn
  - Area where you will place your lower B-Turn
- If you change your Position fix the 4 Points again

# The art of walking to the start

- Try to imagine the flightpath you are taking for a few seconds
- Be sure that you will have a good flight!
- Start

- Maybe some think that what is written in the last chapter is overdone.
- But give it a try. At least this little ritual helps me to concentrate before the start