

Stage 4 Lesson 2A  
- Checkride Prep-

# NIGHT FLYING

Tiziano Bernard, CFI

# Mission Objectives

- Recognize FAA requirements compared to other countries
- Understand the definition(s) of night time
- Identify the required personal equipment
- Understand night time minimum equipment required
- Recognize the ease of identifying aircraft and cities
- Familiarize with airport lighting
- Discuss psychology and imagination concerning night flight
- Understand Night visual illusions
- Operations with and without landing lights



# FAA PRIVILIGES / DEFINITIONS

“Night rating? What’s that?” – any FAA pilot

# Thank you, FAA.

- Flying at night introduced new challenges.
- The FAA recognizes such, and requires dedicated night time training under the private pilot certificate.
- It also requires night time requirements for Airline Transport Pilots.
- Many countries require a separate rating to fly at night (i.e., “night rating”).



# Definition of Night

- Night-time has three definitions... cause one would be too easy...
- To log night flight time [FAR 1.1]

*The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time*

- For the almanac... use Google to figure out actual sunset...
- To log night currency (landings to carry persons) [FAR 61.57(b)]

*1 hour after sunset to 1 hour before sunrise*

- To turn on navigation / position & anticollision lights [FAR 91.209]

*During the period from sunset to sunrise*



# EQUIPMENT

“Uhhhhhhh... do we *really* need that?” – pilot realizing the strobe is inop

# Required Equipment

- Remember **ATOMATOFLAMES**? Well, yeah, there's a night version, too.

**F**uses

**L**anding Light, if for hire (commercial ops)

**A**nticollision lights (strobes / beacon)

**P**osition Lights (NAV lights)

**S**ource of electricity (battery, etc.)



# Recommended Equipment

- Flashlight!!!!
  - White light for preflight
  - Red light for operations
- Note, a red light will hide red ink!
- Phone works, but a dedicated flashlight is the best option.





Be creative?



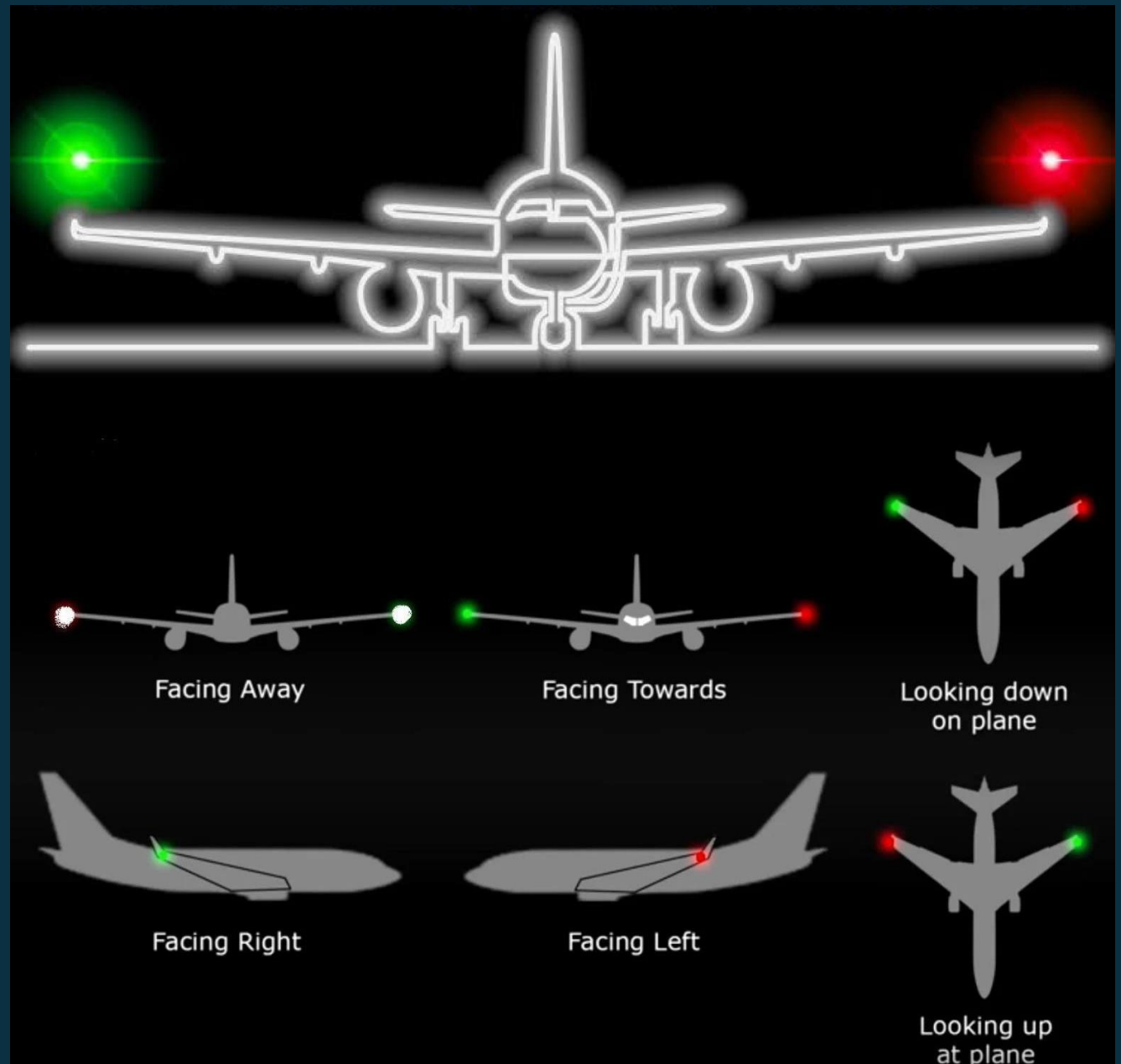


# LIGHTS AND LIGHTING

“It’s going that way. No, this way. Maybe that way?” – night time pilot

# Aircraft Light Configuration

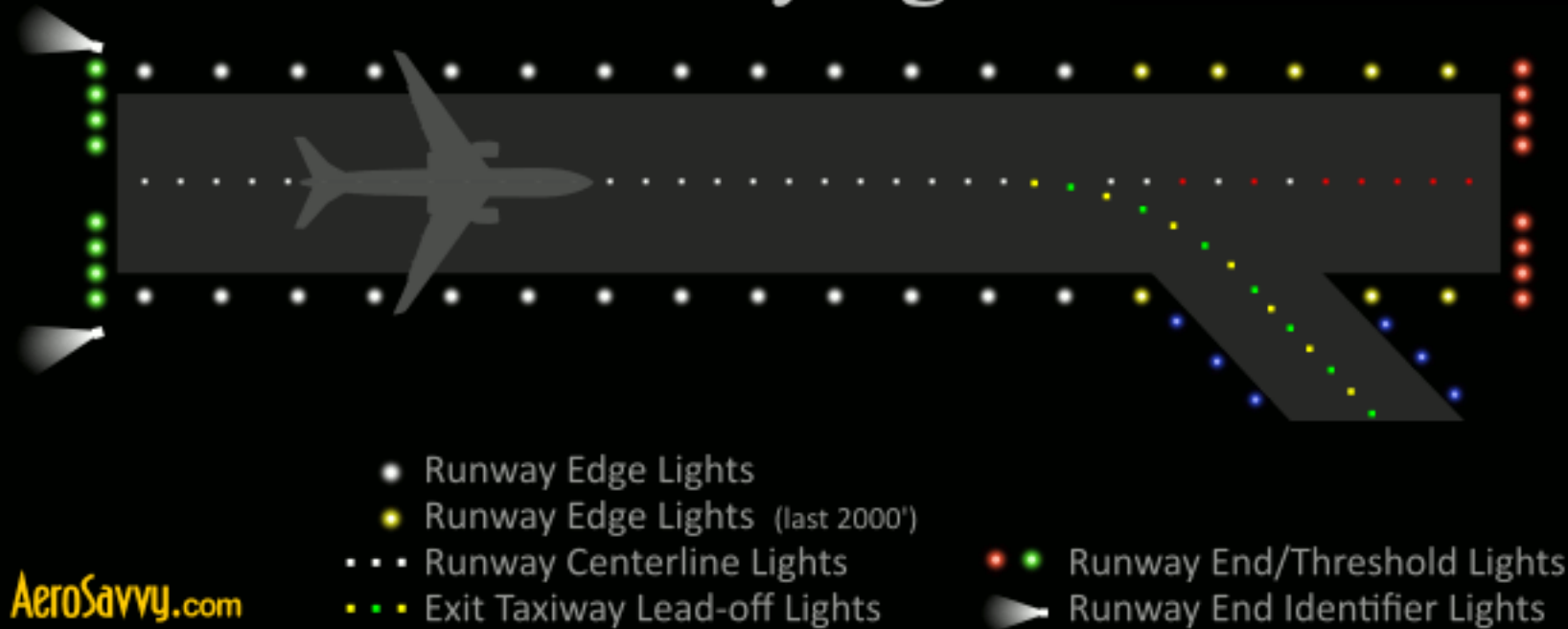
- Night flying scares many pilots.
- The “void”!
- Consider:
  - Easy to see cities!
  - Easy to see airplanes!
  - Moon-light helps.



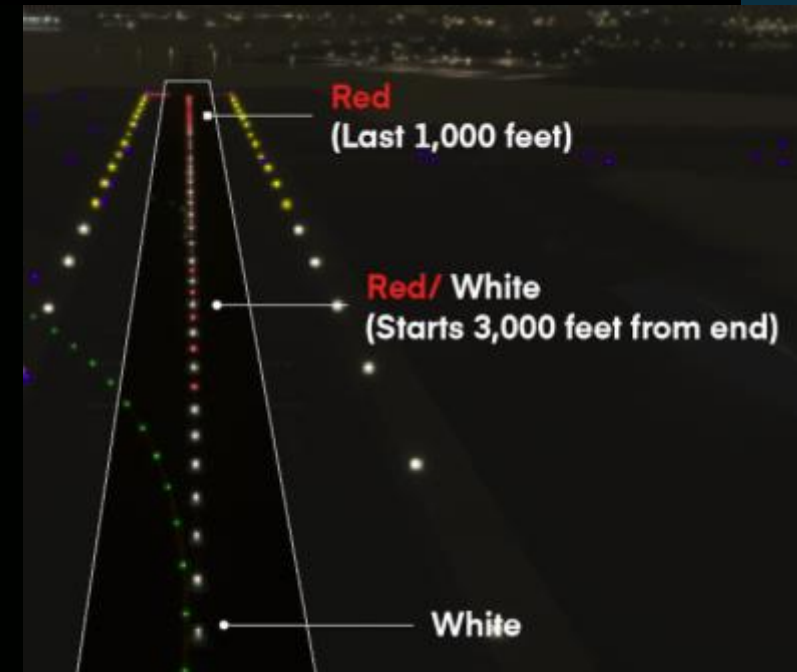
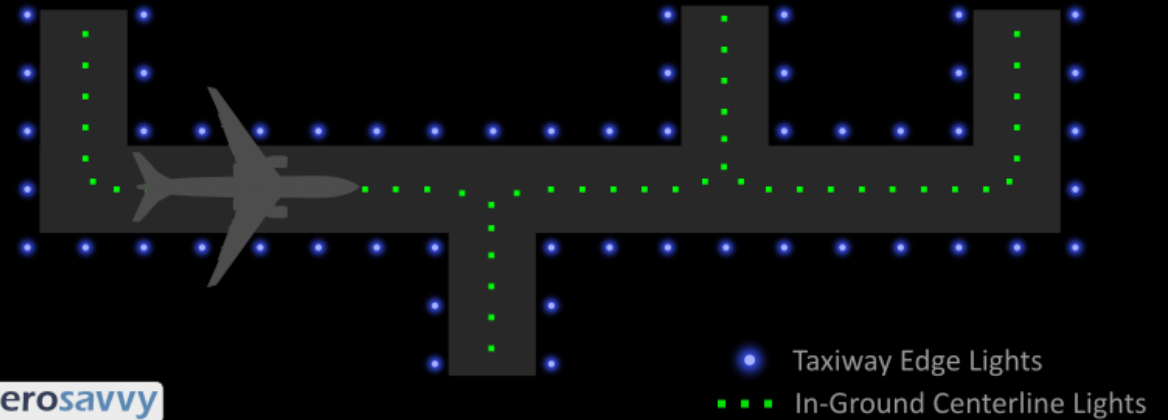
# Runway Light Configuration

## Runway Lights

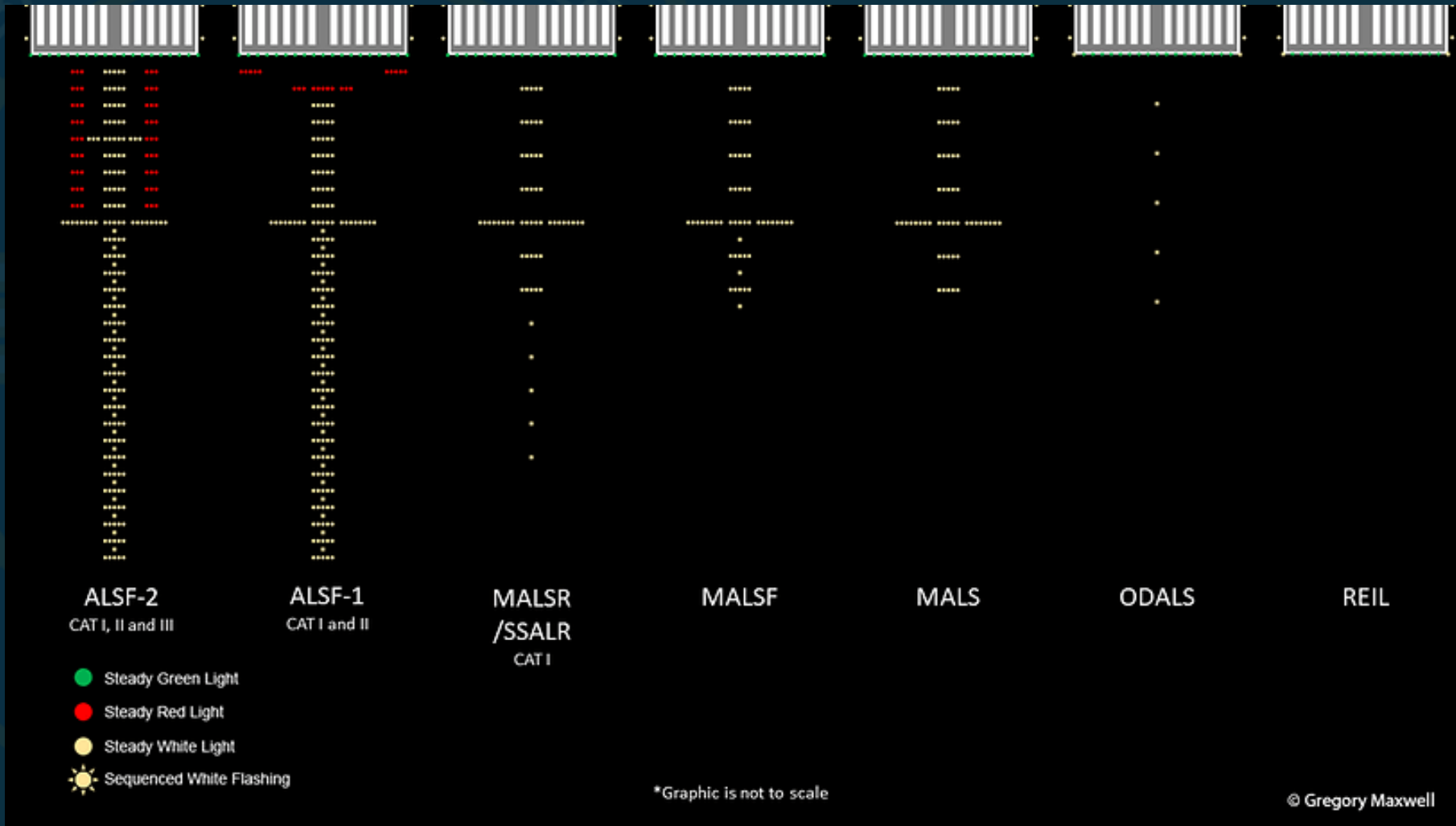
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## Taxi Lights



# Approach Lighting Systems (ALS)





# ALS – Day vs. Night





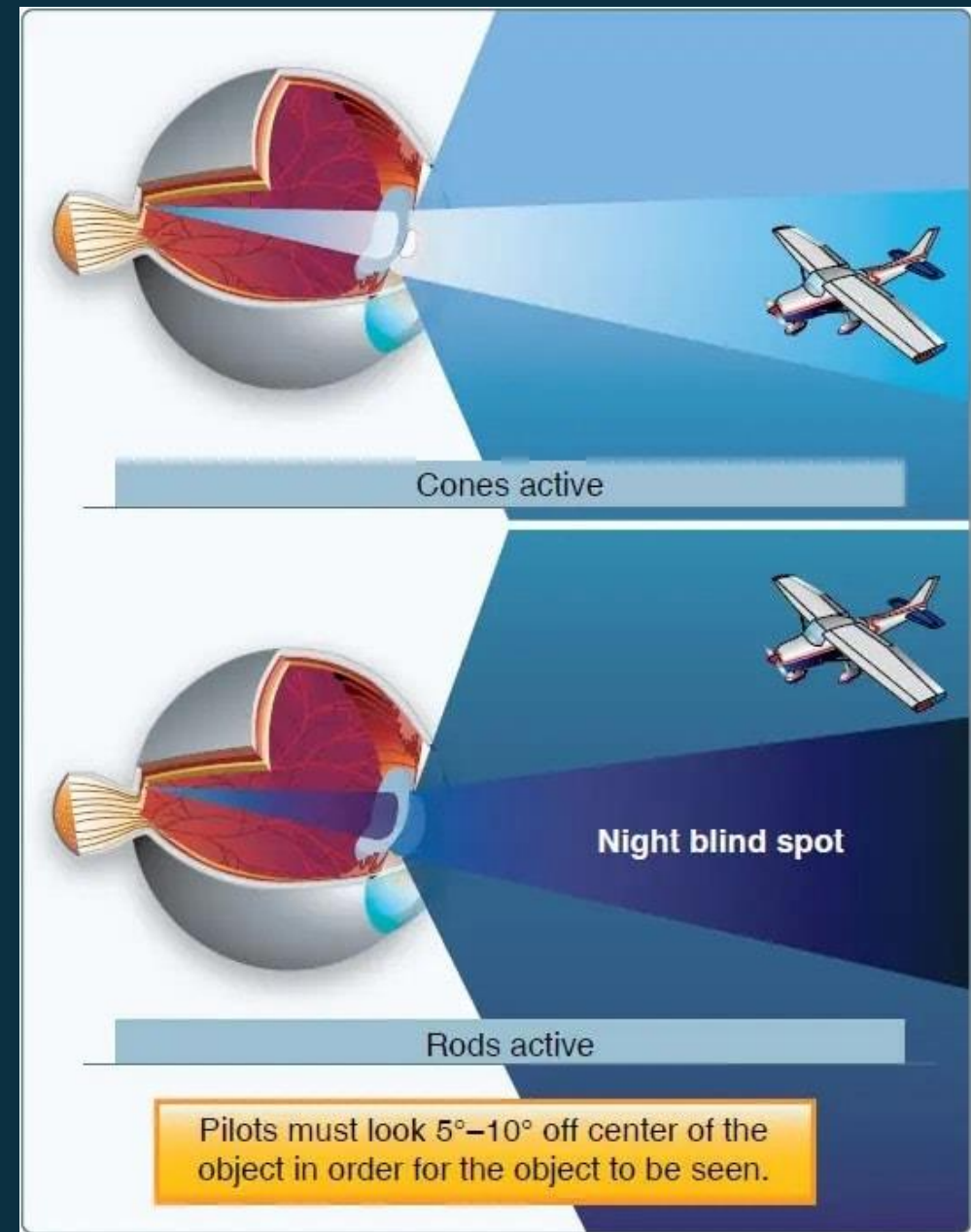


# PHYSIOLOGY

“And now I’m blinded.” – pilot who just received a call on their phone

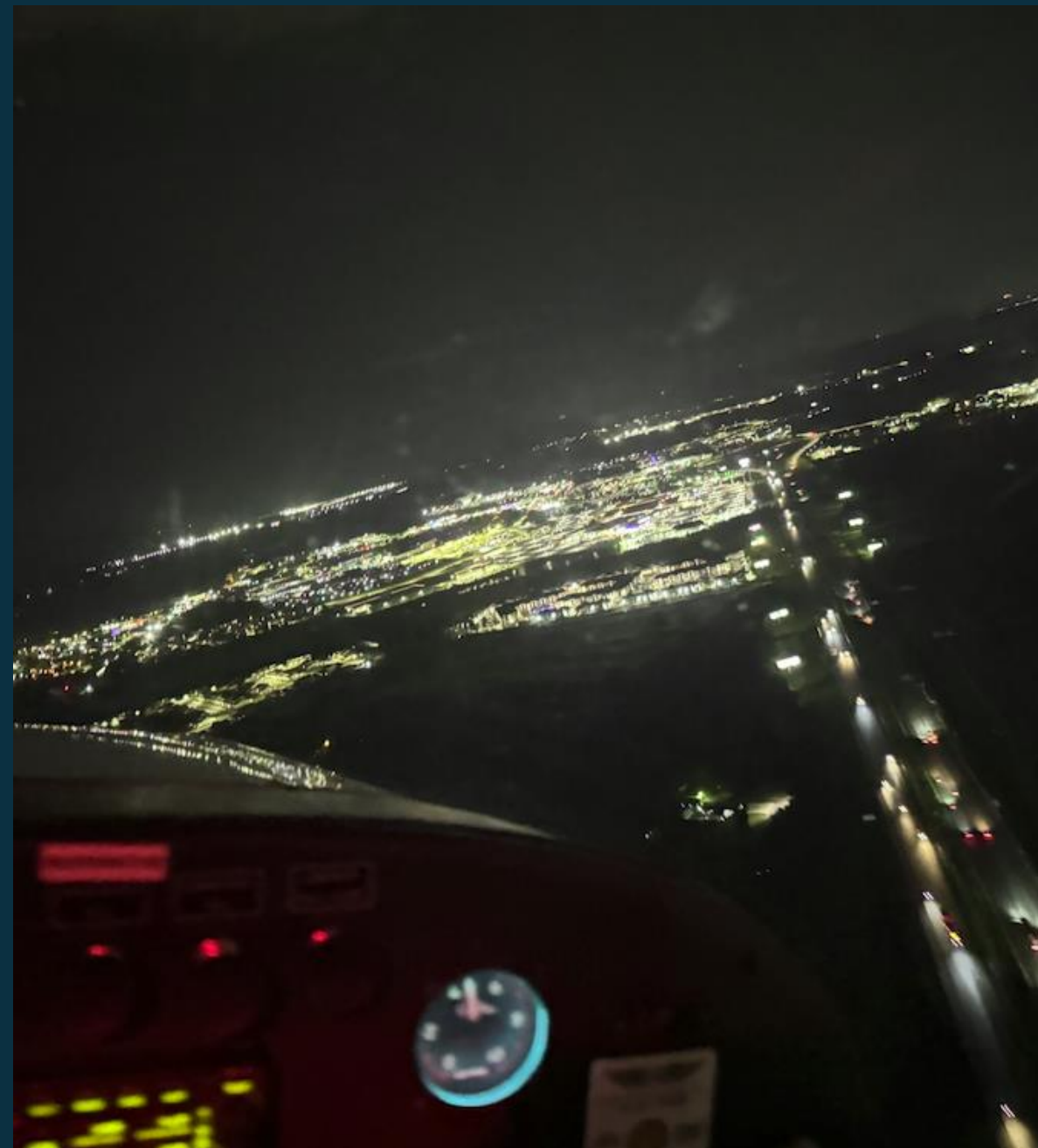
# The Eye

- Physiology is a huge part of night – flying.
- Cones vs. Rods
- Central vs. Peripheral Vision
- Can take ~30 min to adapt to night-time



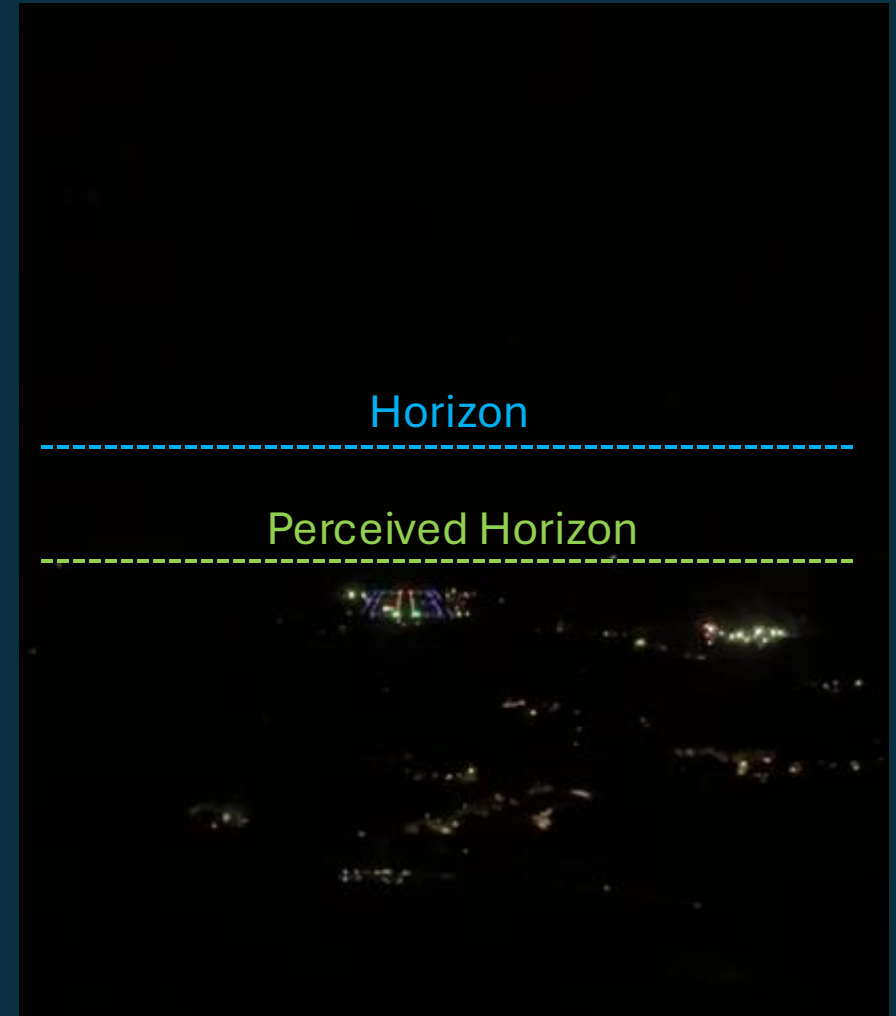
# Imagination

- New environment means new sensory inputs.
- Most pilots fly during the day.
- Calmer air, cooler air, less ambient noises in the atmosphere and surroundings.
- “Automatic Rough” – imagination making the engine sound rough after dark...



# Illusions: Controlled Flight Into Terrain

- Flying into a sparsely lighted area
- Fixation at a specific light on the ground near the horizon
- Possible altitude loss and CFIT.
- TRUST YOUR INSTRUMENTS!



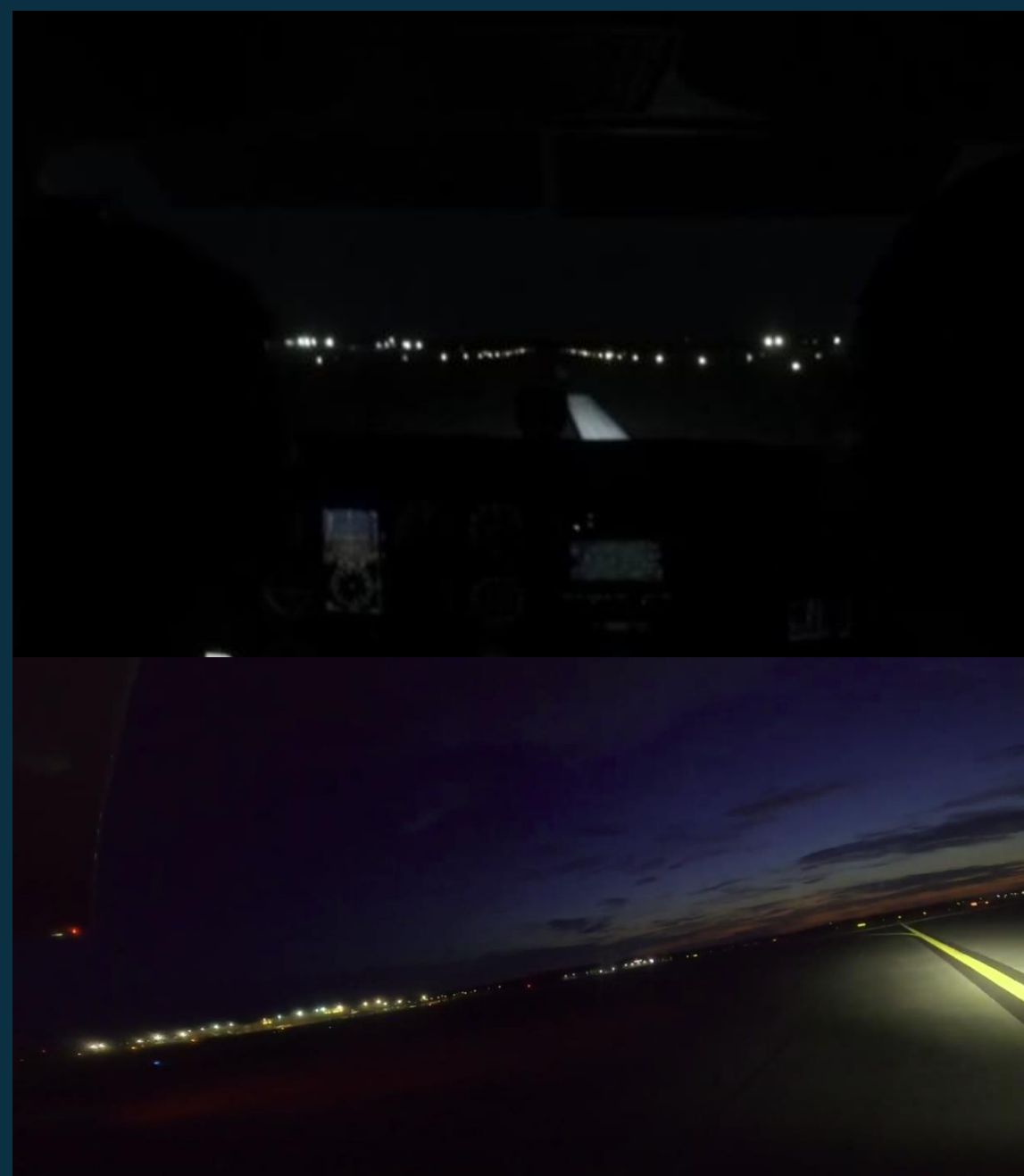
# Visual and Physiological Illusions

1. **Black Hole Effect:** bright runway in a dark area (e.g., KCVV). Depth perception is challenging.
2. **Autokinesis:** Fixation on a single light source may appear it to move. Confusion in motion perception.
3. **False Horizons:** spatial disorientation wondering where is “level flight”
4. **Somatogravic Illusions:** Perceived attitude based on acceleration or deceleration.
5. **Runway Lights Illusions:** confuse runway with other lights, like stars or airplanes.
6. **Flicker Vertigo:** induced dizziness from stroboscopic lights.



# Landing Lights

- Landing lights are critical for better depth and altitude perception.
- Absence of landing light (non commercial ops) need careful consideration and acknowledgement.
- Advise ATC if landing lights are inop.





But,  
hey,  
it's beautiful...





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