Flying at Night

Tina landing at KBED at Night
When is “night”?

- Flying around: after civil twilight
- Landing: one hour after sunset to one hour before
- Good news: air tends to be much smoother at night
- Better news: unairconditioned plane much more comfortable at night

No Special Rating!

- Mexico: Illegal to fly VFR at night
- Canada: requires additional training and rating
- U.S.: Private includes 3 hours of night training, 10 night takesoffs/landings, a 100 nm cross-country flight (minimum: out and back 50 nm)

To carry passengers, three takeoffs and landings at night within the preceding 90 days.
Night Vision

- Rods 10,000 times more sensitive to light than cones
  - Rods primary receptors for night vision
  - Look 5° to 10° off center to view objects at night
  - Scan slowly with peripheral vision
- Can take ~30 minutes to fully adapt to darkness
  - Avoid bright lights before and during flight
  - Use red lighting (flashlights)
  - However, this distorts colors and washes out the color red

Source: Public Domain

Night Flying – Head Light

Looking very fashionable with red head light...
Night Illusions

• In a country of 325 million, a lot of bright lights on the ground; may look like aircraft
• Visual autokinesis: stare at light and it will appear to move
• “Black-hole” illusion when runway is surrounded by dark water or woods
• Bright runway lights make runway seem closer (so you’ll be too high); use VASI or PAPI or ILS and standard power and airspeed settings

Brandon Abel

91.205 - Instrument and Equipment Requirements

• VFR night:
  – Everything required during day operations plus...
  – Position lights (green, red, white)
  – Red or white anti-collision lights
  – Landing light if operated for hire
  – Adequate electrical source
  – Spare set of fuses
91.205 (VFR Day reminder)

- Airspeed indicator, altimeter, magnetic compass
- Tachometer, oil pressure, oil temperature, manifold pressure (for turbocharged engines)
- Fuel gauge, landing gear position indicator
- Red or white anti-collision lights (after 3/11/1996)
- Seat belt (built after 7/18/1978: shoulder harness in front)
- ELT (if required by 91.207)

91.209 - Aircraft Lights

- Sunset to sunrise:
  - Must have lighted position lights
  - Must operate anti-collision lights if equipped
    - Unless they interfere with ground personnel
Navigation Lights

- Aircraft lighting at night (at the same altitude):
  - Steady red and flashing red: crossing to the left
  - Steady white and flashing red: flying away
  - Steady red and green: approaching head-on
- Red light on the port side (think “port wine”)

Airport Lighting: Beacons

- On at night or weather less than VFR minimums (“field is IFR”)
- Civilian airport: alternating white and green
- Military airport: sequencing white, white, green
- Not on airplane test:
  - Heliport: green, yellow, white
  - Water airport: white, yellow

Figure 12-5. Airport rotating beacons.

Source: Public Domain
Airport Lighting: Taxiway/Runway

- Taxiway lights
  - Blue lights indicate edge of taxiway
- Runway lights
  - White lights indicate edge of runway (yellow for last 2,000’ on IFR runway)
  - Different lighting schemes for instrument runways
    - Threshold lights (green at near end, red at far end)
    - Approach light bars
    - Runway end identifier lights (white strobes)

KLWM PAPI Story
KLWM PAPI – 2\textsuperscript{nd} time around

Big Runways at Big Airports

- Bright lights in the touchdown zone
- Centerline lighting: white until 3,000’ remaining, then red/white until 1,000’ remaining, then red.
- Lead-Off lights, green and yellow, to the taxiway
Pilot-Controlled Lighting

At non-towered airports or after-hours at big airports... the lights are off and maybe nobody’s home.

Published “PCL” frequency, usually the control tower or CTAF.

Key (click) the microphone 5 times to turn on lights for 15 minutes.

<table>
<thead>
<tr>
<th>Key Mike</th>
<th>Function</th>
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<tr>
<td>7 times within 5 seconds</td>
<td>Highest intensity available</td>
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<tr>
<td>6 times within 5 seconds</td>
<td>Medium or lower intensity (lower FL 8, or FL 25, only)</td>
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<tr>
<td>5 times within 5 seconds</td>
<td>Lower intensity available (lower FL 8, or FL 25, only)</td>
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Source: Public Domain
Advice

- Try to take off before civil twilight; gives you time to adjust to the world of darkness
- Americans are not smarter than Mexicans: Treat any non-local night flight as an instrument flight. Use IFR approach to find the correct runway at the correct airport (alternative)
- Choose a big airport as your destination
- Ballistic parachute is comforting at night

Questions?
JFK, Jr: A night flight gone wrong

- New Jersey to Martha’s Vineyard in a 6-seat Piper Saratoga (36 hours in type)
- Departure delayed due to waiting for passenger
- No instrument rating
- Rejected CFI’s offer to copilot
- Elected to fly over Long Island Sound (dark) rather than from Walmart to Walmart along the Connecticut shore
- Did not seek VFR Advisories from ATC
- Hazy (but legal VMC) conditions plus dark water = no visual horizon