

Ground Operations

The preflight should always be done just before the flight so as to minimize any damage or tampering with the airplane. However, for a night flight, it is best to do the preflight in daylight, or in a well lighted hanger. The reasons are obvious, it is easier to detect any damage or issues with the airplane, fuel, etc. during well lighted conditions. This may represent confusion as to what to do if there is a long period of time where the plane might be unattended before the flight. Certainly there is nothing wrong with making two preflights. While the one in the dark may be more difficult, it might just be that extra edge of insurance that prevents you from taking off with a damaged airplane.

Ground operations at night present a special challenge due to limited visibility and depth perception. Use a helper or an assistant when towing or parking an airplane. Be especially vigilant for FOD (foreign object debris) on the ramp and taxiways. Runways are not immune to FOD, I once found an entire muffler assembly on an active runway.

Taxi operations can be especially challenging, especially at small or poorly maintained airports where the taxi markings and taxi lights have not been repaired. Be sure to check the NOTAMS for any outages or lighting and any notes regarding construction or other obstacles that might become an unexpected surprise.

During taxi operations avoid looking at any bright lights that may impair your night adaptation.

Be sure to use your taxi light, both to see the runway as well as to be seen by others.

Takeoff

If the runway is equipped with runway edge identification lighting (REIL) be sure to use it. Become familiar with how to control it. At towered airports you may have to request the control tower to turn them on and/or change their intensity. At non-controlled airports they may be pilot controlled. E.g., here at KHYI they are pilot controlled when the tower is not in operation. Three clicks of the CTAF frequency for low intensity, 5 clicks for medium, and 7 clicks for high intensity.

Be well aligned on the center of the runway and make sure to stay on the centerline during the takeoff roll. Use your landing and taxi lights in the airplane to help see the runway and edge markings.

Once airborne there may be a loss of pitch visualization, especially when taking off from a runway that has no REIL. Anticipate this and be sure to transition to the attitude indicator, altimeter, airspeed indicator, and the VSI to ensure a proper climb out pitch attitude, airspeed, and rate of climb is maintained. Fly the runway centerline until at least 800 feet AGL.

Make all turns gentle and at no more than a 20-25 degree bank angle.

Climb Out

During the climb out there may be a dearth of ground lighting to aid you in where the horizon is. If so, continue to fly using instruments until you reach an altitude where the horizon is apparent.

Traffic Pattern

During the traffic pattern there is likely a loss of visible cues such as horizon lines, major landmark and other items you use to judge distances and turning points. Landing at an airport without any REIL, threshold, or approach lighting can be difficult and dangerous. In my opinion – don't attempt it! Use REIL, threshold, and approach lighting to establish a normal traffic pattern. Familiarize operation of pilot controlled lighting well before you need to activate it. The airport facility manual (AFM) is the best reference. Also check NOTAMS of all intended airports and possible alternate airports for any lighting outages.

Approach

While reviewing airport lighting, be sure to familiarize yourself with any approach lighting. These will help you maintain a safe approach, both from a lateral alignment and a safe glide slope perspective. For example, at KHYI runway 13 has a MALSR while runway 31 has a V4L (3 degree glide slope) lighting system. Therefore, landing at this runway pair can have a very different picture. You have excellent lateral alignment from the MALSR on 13, but no visual glide slope, while on 31, you have to rely on the REIL lights for lateral alignment, but have an excellent vertical glide slope picture.

Here is a picture of a 4 light system (not at KHYI). The pilot flies a specified glide slope (nominally about 3 degrees) when there are 2 white lights and 2 red lights visible, going low will cause the white lights to go red, going high will cause the red lights to go white. Note, the green lights mark the threshold of the runway.



Landing

“Night landing should be accomplished the same as a day landing.” This quote is from an FAA publication. While this is a true statement, there may be minimal cues at night that help you judge depth perception and altitude above the runway during the critical phases of the round out and flare. There is not a pilot alive that hasn't misjudged altitude and made a hard landing due to too high or too low of a round out. Some suggestions are: begin a round out when skid marks are just visible. Use REIL lighting in your peripheral vision to help judge sink rate and any ballooning. Focus down the runway just as you would during a day landing. Be aware of illusions when encountering runways that are larger/smaller or have a significant upslope or downslope. More on illusions in part 3 of night flying.