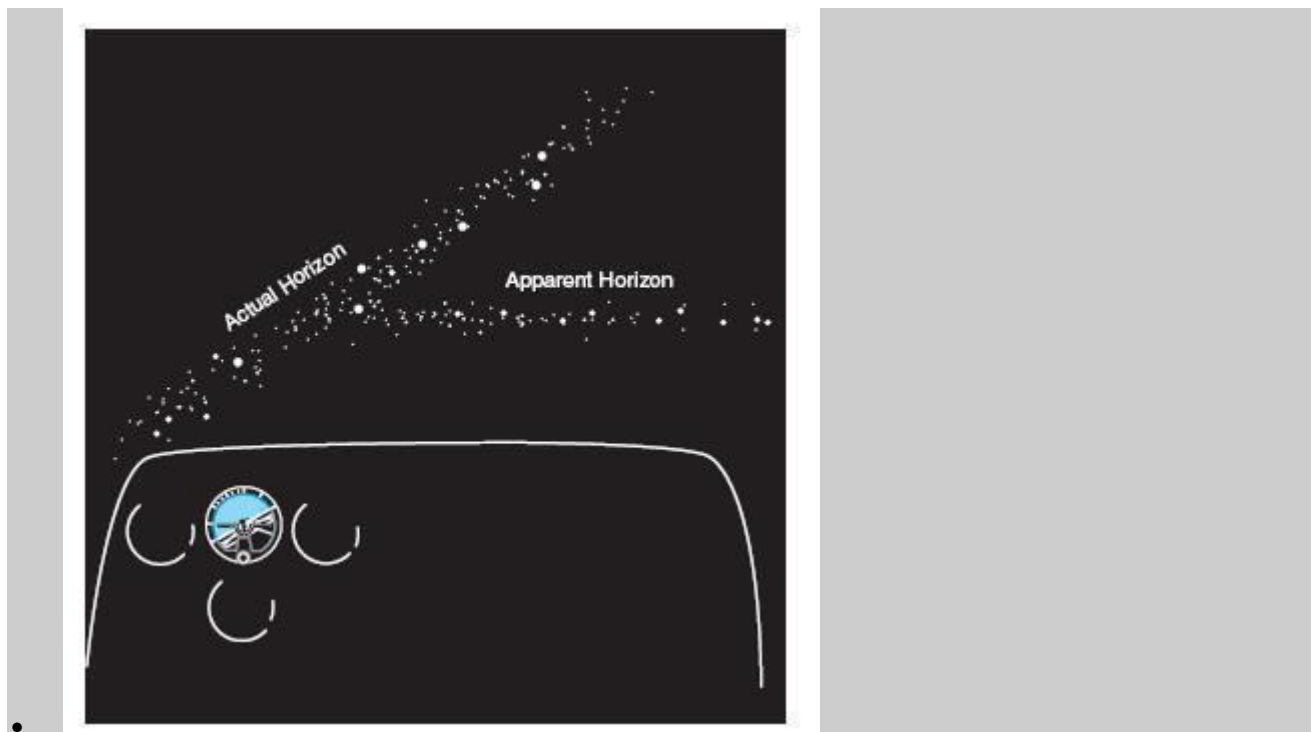


## Night Flying – Part 3

Before we get into the meat of this part, which is illusions that can happen at night, here is a link to an excellent article that covers night flying. <http://www.avweb.com/news/airman/190849-1.html>

**Illusions:** In addition to night vision limitations, pilots should be aware that night illusions could cause confusion and concerns during night flying. The following discussion covers some of the common situations that cause illusions associated with night flying.

**Lighting Illusions:** On a clear night, distant stationary lights can be mistaken for stars or other aircraft. Even the northern lights can confuse a pilot and indicate a false horizon.



Certain geometrical patterns of ground lights, such as a freeway, runway, approach, or even lights on a moving train can cause confusion. Dark nights tend to eliminate reference to a visual horizon. As a result, pilots need to rely less on outside references at night and more on flight and navigation instruments.

**Visual autokinesis** can occur when a pilot stares at a single light source for several seconds on a dark night. The result is that the light will appear to be moving. The autokinesis effect will not occur if the pilot expands the visual field. It is a good procedure not to become fixed on one source of light. Learn to develop a scan and use it both during the day and night flying

**Flicker Vertigo:** Distractions and problems can result from a flickering light in the cockpit, anticollision light, strobe lights, or other aircraft lights and can cause flicker vertigo. If continuous, the possible physical reactions can be nausea, dizziness, grogginess,

## Night Flying – Part 3

unconsciousness, headaches, or confusion. The pilot should try to eliminate any light source causing blinking or flickering problems in the cockpit.

Black Holes: A black-hole approach occurs when the landing is made from over water or non-lighted terrain where the runway lights are the only source of light. Without peripheral visual cues to help, pilots will have trouble orientating themselves relative to earth. The runway can seem out of position (downsloping or upsloping) and in the worse case, results in landing short of the runway. If an electronic glide slope or visual approach slope indicator (VASI) is available, it should be used.

If navigation aids (NAVAIDs) are unavailable, careful attention should be given to using the flight instruments to assist in maintaining orientation and a normal approach. If at any time the pilot is unsure of his or her position or attitude, a go-around should be executed.

A black hole takeoff can also occur especially when taking off from a runway that has no REIL and nearby lights to help define the earth from the sky. Be prepared to transition quickly to instruments on such a takeoff to maintain proper climb and bank attitude.

Distance Illusions: Bright runway and approach lighting systems, especially where few lights illuminate the surrounding terrain, may create the illusion of less distance to the runway. In this situation, the tendency is to fly a higher approach. Also, when flying over terrain with only a few lights, it will make the runway recede or appear farther away. With this situation, the tendency is common to fly a lower-than-normal approach. If the runway has a city in the distance on higher terrain, the tendency will be to fly a lower-than-normal approach. A good review of the airfield layout and boundaries before initiating any approach will help the pilot maintain a safe approach angle.

Runway Lighting Illusions: Illusions created by runway lights result in a variety of problems. Bright lights or bold colors advance the runway, making it appear closer.

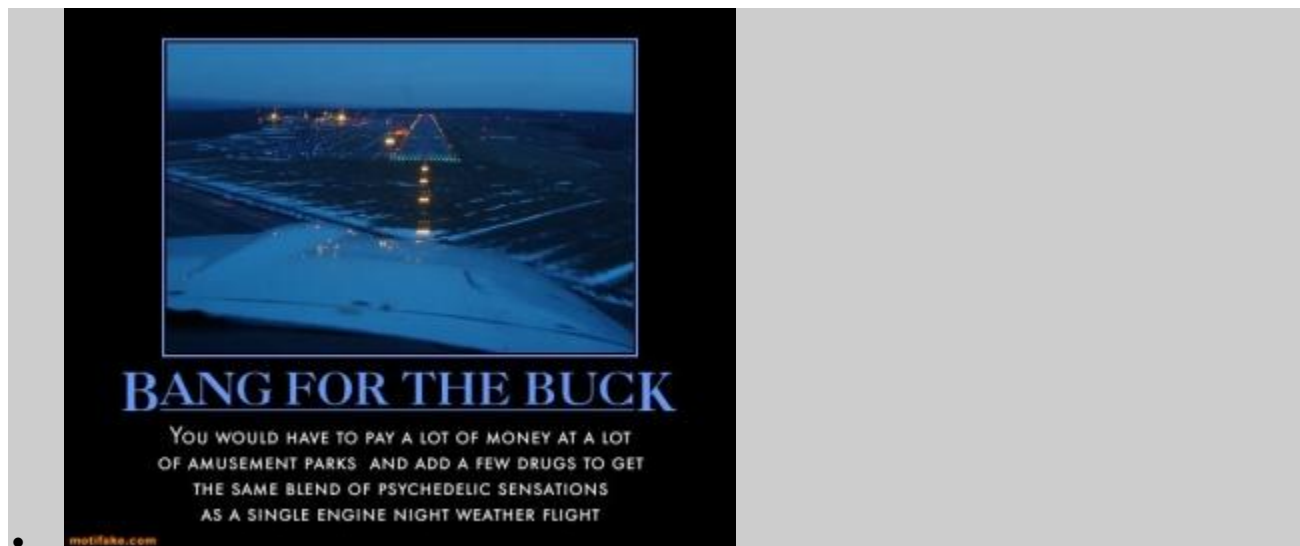
Night landings are further complicated by the difficulty of judging distance and the possibility of confusing approach and runway lights. For example, when a double row of approach lights joins the boundary lights of the runway, there can be confusion where the approach lights terminate and runway lights begin. Under certain conditions, approach lights can make the aircraft seem higher in a turn to final, than when its wings are level.

Runway Width: A narrow runway can fool you into believing you are high causing you to steepen your approach. Likewise a wide runway can fool you into believing you are low causing you to flatten your approach.

Runway Slope: A runway that has a down slope can have an illusion that you are low; likewise one that has an up slope can present an illusion of being high.

Weather: Rain, fog, haze, smog when coupled with lighting can all add to create illusions that are very confusing, even to experienced pilots. Normally such meteorological conditions are sufficient triggers for transition into flight by reference to instruments alone. **Whoops, no instrument rating, see below:**

## Night Flying – Part 3



My final words on night flying. 1. Don't attempt it until you gain additional night training after earning your private pilot license. 2. Only fly on very clear moon lit nights at first. 3. Go get an instrument rating.