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## What the Examiner Sees – Night Flight

by Larry Bothe, 3/8/2013

It may surprise some younger instructors to know that when I got my Private Pilot certificate back in 1973 there was no requirement for night training, and you could fly at night. It just went along for the ride, so to speak. Shortly thereafter the FAA began requiring night training for those who wished to fly at night, but there was an option to receive a Private certificate restricted to daytime flying. Still later, because there continued to be an unacceptable level of night accidents among low-time pilots, the FAA moved to where we are today; 3 hours of night training are required to hold a Private Pilot certificate. Since checkrides are typically conducted during daylight hours we end up testing night flying competency during the oral portion of the test. Knowledge required of the applicant includes aircraft and airport lighting, equipment, night vision, night X-C, safety and risk management, and night illusions.

In keeping with scenario-based testing, I might suggest that the applicant is planning a flight that will include a return home at night, and ask the applicant what additional preparation will be required. Hopefully, among other things, the applicant will tell me that he would add the aircraft lights to his preflight inspection routine. I then likely ask what lights the applicant's aircraft has, and of those, which ones are legally required for night flight. Sometimes I get a baffling listing of redundant lighting systems, especially if the applicant is trying to get by with rote memorization rather than true understanding. I often hear that the airplane has navigation lights, position lights, a beacon, flashing anti-collision lights, strobe lights, landing light and taxi light. By using the shotgun approach and mentioning every kind of exterior light he has ever heard of, he hopes I will say OK and move on. Too bad, but it won't do. The applicant is required to know about the aircraft he brought for the test, and to understand what he is talking about.

When presented with the shotgun answer to the lighting question I then take each item mentioned and ask where it is located on the airplane. Of course what I want to hear is that navigation lights and position lights are the same set of lights, and

be told where they are located, and what color. When I get told that the nav lights are the red and green ones on the wingtips, with no mention of the white one facing to the rear, I immediately know that the applicant doesn't understand the concept of determining the position and direction of travel of another aircraft from which color lights are visible. If I then inquire about position lights, I get a blank stare. I use the same approach to the beacon/anti-collision/strobe light answer. These may or may not be the same lights, depending on the airplane presented for the test. Many of the newer, composite airplanes, like Diamond and Cirrus, don't have flashing beacons at all. They rely on wingtip strobes to meet the flashing anti-collision light requirement.

The point of all this is that successful night training has to consist of more than meeting at the airport some evening after dark, doing a quick pre-flight, and then doing 8 takeoffs and landings, followed by another lesson where the obligatory night cross-country is accomplished. Proper night training begins with a ground school session where aircraft and airport lighting is taught, and the potential for duplication of terms explained. Other subjects covered in that ground session should include night vision, illusions, disappearance of the threshold lights, night cross-country flight planning (altitude to fly, visual checkpoint selection, etc.), engine failure at night, ground fog, night vision, and the rules for night currency and light usage. You can rest assured that your student will be quizzed about these things during the oral.

The word "beacon" can be very confusing to the low-time student. Are we talking about the flashing white and green rotating beacon at the airport, the flashing red light on top of the vertical stabilizer, or the non-directional beacon located 4 NM off the field? I see this confusion a lot on checkrides. Please explain to your students the various meanings of the word "beacon".

When discussing night cross-country flight planning, be sure to talk about selecting visual checkpoints. Applicants always want to pick large towns, the ones depicted in yellow on the sectional chart. Those larger ones are not always the best choice, especially when they are quite a distance, more than 5 NM, off to the side of the course line. If the visibility is less than severe-clear you might miss them entirely, and in any case it is difficult to know exactly when you are at the checkpoint because the distant large town is off your wingtip for some time. The better choice is one of the very small towns, represented by a tiny open circle, which is right along the route of flight. Even those small towns have some street lights in the

town square, and are actually easy to spot at night. You'll be able to mark your time accurately because you'll pass right over or just beside a very small spot.

Radio towers, by themselves, make very poor checkpoints. Why? Because even though they are easy to see, there are too many of them. You can never be sure if the one you are passing is the one you selected or another one just a few miles away. It is better to relegate radio towers to a confirming role. You come to a town you selected as a checkpoint, but you need to confirm that the town you see is the selected one. There's a radio tower just north of town, on the chart. Looking out the window, you see the tower north of town. The town is very likely the one you wanted.

I am very disappointed in the flight instructor if when discussing the need for a landing light (required only when carrying paying passengers, 135 or 121 flights) I learn that for the 8-landing lesson the instructor just sat there while the student did the 8 takeoffs and landings, and did nothing else. This is one of the hallmarks of the uncaring, time-building instructor. Typically, after 2 or 3 night landings, the student learns that they aren't much different or more difficult than day landings. If the instructor just sits there for 5 more, he's almost taking the student's money under false pretenses. It doesn't take any longer to run through a series of failure scenarios where the student gets to land without the landing light, no panel lights, no landing light or panel lights, and a simulated complete electrical failure with no panel or landing lights, and no (electric) flaps. While there is no FAA requirement for these failure scenarios, they don't take any extra time or cost extra money, and not doing them is huge waste of a golden training opportunity. If you let your student experience these simulated failures and realize how easy they are to deal with, then years later when one of them happens for real they won't be petrified and perhaps have an accident.

Another disappointment occurs if I find that the night cross-country consisted of a flight from one small, non-towered airfield to another one 50 or 60 NM away, and back again. It probably wouldn't have taken much more time to go to a Class-C airport. The student could have experienced contacting Approach Control, being vectored, perhaps being mixed in with air carrier traffic, seen full approach lights, runway centerline lights, taxiway warning lights, gotten a clearance, and experienced handoffs, among other things. Like the lighting failure scenarios discussed above, there is no FAA requirement to take you student into Class-C airspace and show him the more sophisticated airport lighting systems. However, you have to do the night cross-country anyway; why not make it truly productive?

I want to close this article by telling you some personal night-flying experiences early in my career. I think they illustrate the need for formal night training, and why examiners should be testing it thoroughly. At the outset I mentioned that back in 1973 there was no requirement for any night training for the Private certificate, and you could just go out and fly at night. A few weeks after getting my Private I bought a Cessna 150. I wanted to fly it at night so I could get more use out of the plane, but I wasn't comfortable just blasting off at night. After considerable effort I was able to convince my instructor to come in at night (he lived some distance from the grass field where I learned) and give me one night lesson. That consisted of no ground school; just a triangular flight to two nearby non-towered airfields and return. It took about an hour. During that flight the instructor casually mentioned that if I was ever on final approach and the threshold lights disappeared from view, that meant there was something blocking my path on final and I should immediately apply full power and climb. I sort-of noted that advice, but since I was concentrating on locating the next airport and making my 2<sup>nd</sup>-ever night landing I didn't pay all that much attention.

About a week later, on a Friday evening, I made my first night flight without an instructor. I took my friend Rick along for company. We went to Reading, PA, which was a towered field. It was a beautiful clear winter night. We were flying at 2500 or 3000 feet and spotted Reading probably 20 miles out. I had been there once before in the daytime. I called the tower from about 10 miles out, and since there was no other traffic they cleared me to land, straight in on runway 31. I could see it perfectly and was already lined up. I reduced power and began my descent. Rick and I were chatting about what a beautiful night it was when I realized that the runway appeared to be shorter. Then I noted that I could not see the green threshold lights. Still descending, I asked Rick if he could see them. He said no. Hmmm, what had my instructor told me a week before? Oh, if the threshold lights disappear, then something is in the way, and I should climb. Climb! I stuffed in the throttle and pitched up. Just as I did an unlit concrete tower flashed by me on the right, and I WAS BELOW THE TOP! I had narrowly escaped flying into the dark 900-foot ridge a few miles south of Reading.

Two other experiences, both at Mt. Pocono in northeastern PA, further illustrate the need for night training. After the Cessna 150 I bought a 172. On downwind to land one evening, I turned on the landing light. It burned brightly for about a second, and then went out. By then I had a fair amount of night time but had never experienced a landing light failure. I was scared; I didn't know if I could

successfully land without the landing light or not. Of course I had to land, so I did, but I didn't like it. If my instructor had done a landing light failure scenario with me I would have been a whole lot more comfortable. Still later, same airplane, after I was instrument-rated, I took off VFR from runway 5 at Mt. Pocono one night. The visibility was good, but there was a solid overcast. Runway 5 points away from any towns or ground lights. Immediately upon rotation the windshield looked like somebody had painted it black; there was no horizon reference. I had to climb about 1000 feet solely by reference to instruments before I could begin to pick up distant ground lights and establish a visual horizon. I should have been prepared for the instant-IFR situation, but my instructor never told me about that possibility. Had I not been instrument-rated I'm not at all sure we would have had a good outcome.

Flying at night can be very rewarding. The air is usually smooth, and once it is fully dark the visibility is quite good. However, as you can see, there are enough differences and potential pitfalls that proper training is required. When you do your student's night training please take advantage of all the new experience opportunities that training affords. Go into Class-C airspace. Explain the possible confusion of lighting terminology. Do failure scenarios. During the cross country, point out different checkpoints, good and bad. Show the student all the radio towers; they're everywhere. Three hours of night training is minimal at best. Please make the most of it.

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