Night Operations

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Night-Flying Rules

1. Night - IMC - Mountains => PICK ONE
2. File and fly IFR
3. If you wish to fly VFR, see Rule 2
4. Be night current to carry passengers

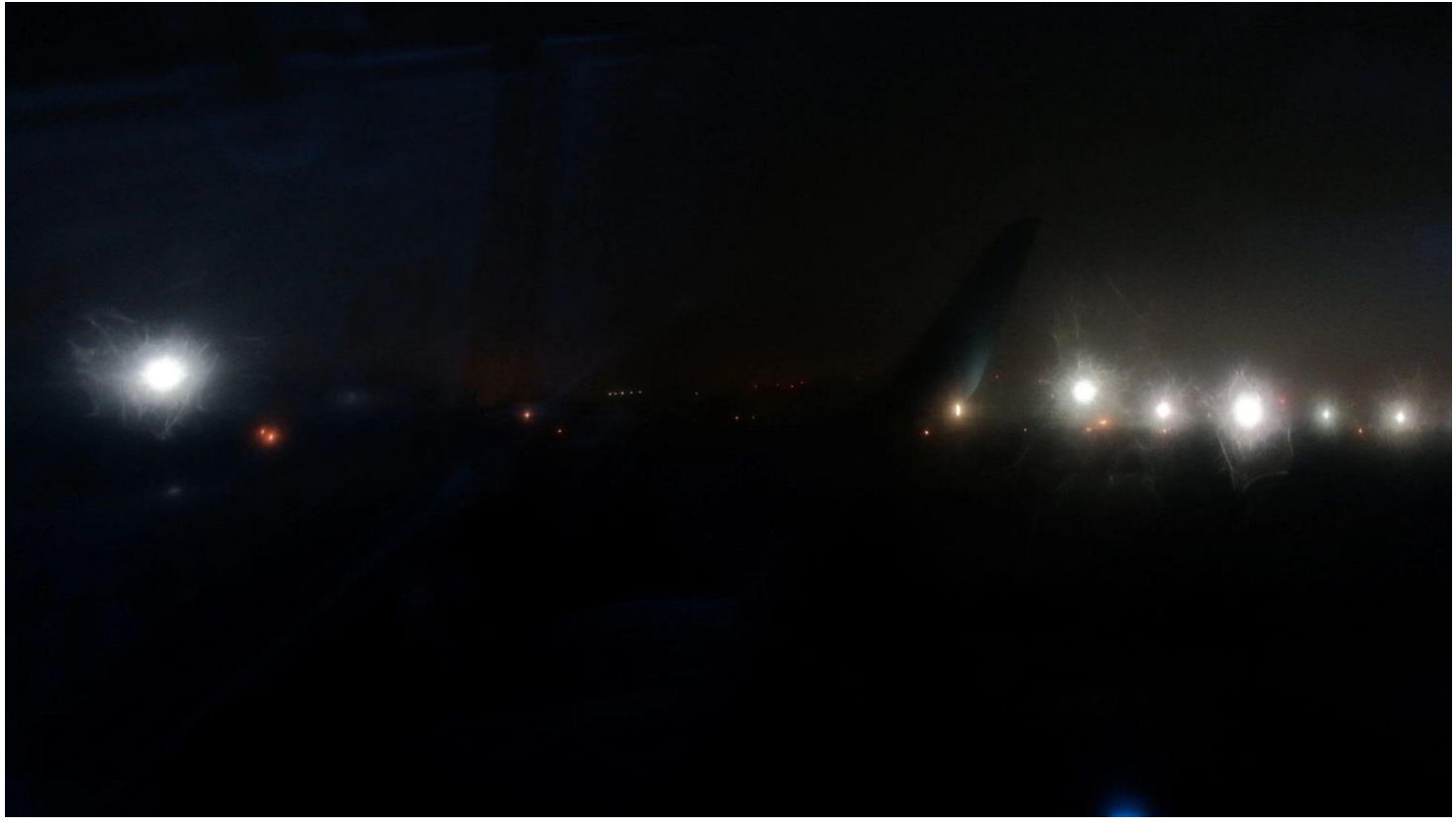
Preflight Preparation

- Everything you'd do for a day flight plus …..
- Flash light, head lamp with fresh batteries
- Weather - Clouds, icing
- Aircraft lighting
- Remove tow bar

Ground Operations

- Organize the cockpit
- Use landing and taxi lights to spot obstacles
- Do not multitask while taxiing
- Use *Safe Taxi* feature (if available) or iPad taxi display at unfamiliar airports

Night Takeoff



Takeoff and Climb

- Be prepared for lack of visual references
- Review airport obstacles and determine minimum safe departure altitude
- Maintain runway heading until above the higher of MSA or 400’
- Make every night takeoff an ITO
- Fly on the instruments while maintaining an outside visual scan

Instrument Takeoff

- Use TOGA if available
- Line up on runway centerline
- Set heading bug to runway heading
- Smoothly apply takeoff power while maintaining runway centerline
- At Vr, smoothly pitch up to command bar or 7^{o}
- Fly solely with reference to instruments until above MSA or 400’ AGL

So, What Could Go Wrong?

On October 11, 2023, about 2130 eastern daylight time, a Cirrus SR-22, N253BC, was substantially damaged when it was involved in an accident near Martinsville, Virginia. The pilot and three passengers were not injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot refueled the airplane, completed a preflight inspection, updated the airplane's electronic flight instrument system, and departed Blue Ridge Airport (MTV), Martinsville, Virginia, for a night, visual flight rules cross-country flight to Oklahoma. The pilot reported that on takeoff, after he established a positive rate of climb at an airspeed of 95 kts, he retracted the flaps, which had been set to 50%. Shortly thereafter, he reported that the primary flight display blinked off momentarily and then reappeared with a "Taxiway! Taxiway!" banner. He looked at the multifunction flight display and noted that it was "completely orange" and appeared to depict an autopilot track turning directly left, which made him wonder if the autopilot was engaged. He further reported that it was "an extremely dark evening" and he "just happened to look up" and saw that the airplane was flying directly toward a large pine tree. He attempted to avoid the tree; however, the airplane struck trees to the left of the departure end of the runway. The pilot was able to maintain control of the airplane and the engine was developing full power as it continued to climb to the traffic pattern altitude. The pilot stated that the airplane was very "shaky," and he was unable to see the altitude on the primary flight display. He was not certain if the autopilot was engaged, so he repeatedly pressed the autopilot disconnect button. He circled back toward MTV, trimmed the airplane for landing, and made a safe landing on runway 13, after which he immediately cleared the runway and shut off the engine.

Examination of the airplane by a Federal Aviation Administration inspector revealed that the airplane sustained substantial damage to the wings. The inspector also observed that the pitch trim was set in the full nose-up position.


NO STEP





What Happened?

- Well-executed night takeoff?
- Normal climb?
- G1000 malfunctioned?
- Pilot did a good job of staying calm and saving all on board

But Maybe There's More

- Perhaps not.
- If the G1000 flight director was set to TOGA with the HDG armed (runway 31) and the pilot drifted right that would activate the Taxiway alert.
- At 400' AGL HDG would engage and the flight director command a turn to the left.
- All that orange stuff, that's your synthetic vision warning you of terrain ahead before the audible warnings.
- Not sure of what page was displayed on the MFD but might have been terrain and that would have been colorful too.

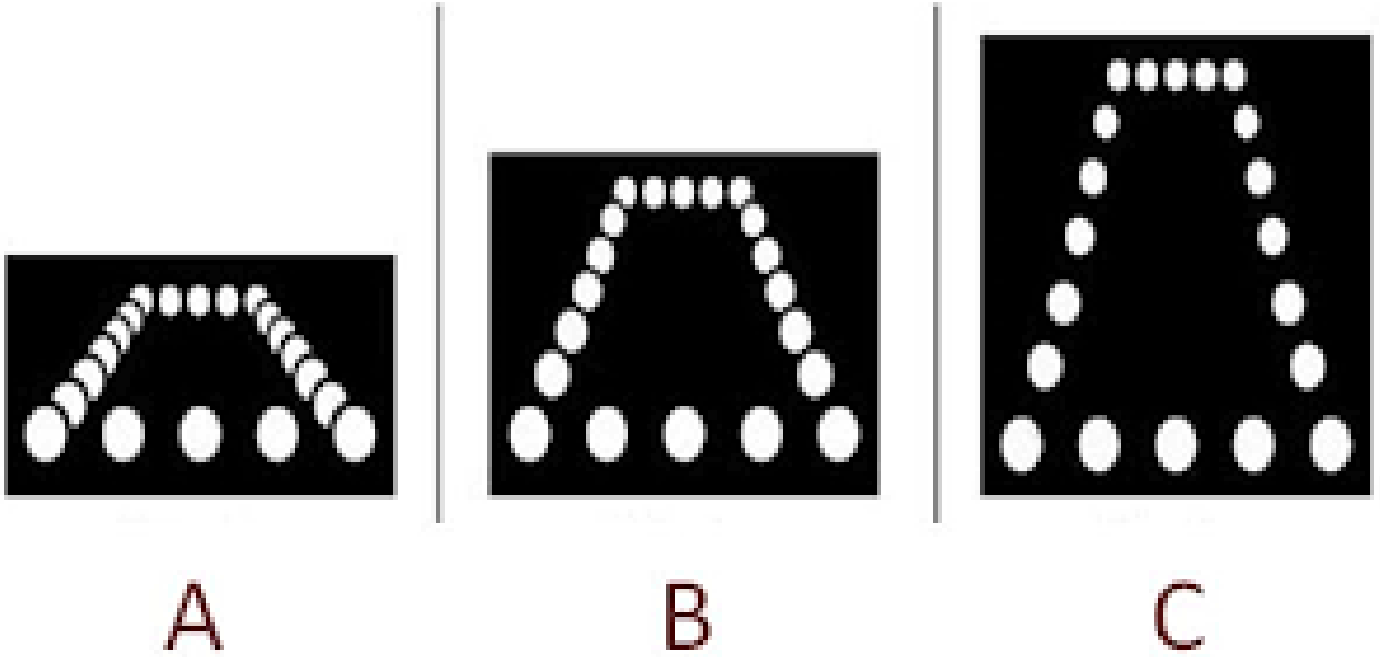
So, Maybe …

- A poorly-executed takeoff
- Did not maintain runway heading
- Aircraft likely not in coordinated flight
- Did not establish positive rate-of-climb
- Did not assure “clear of obstacles” before flap retraction
- Pilot did not fly an ITO
- Still, kudos to the pilot for salvaging a terrible situation, albeit one that he seems to have created

En Route at Night

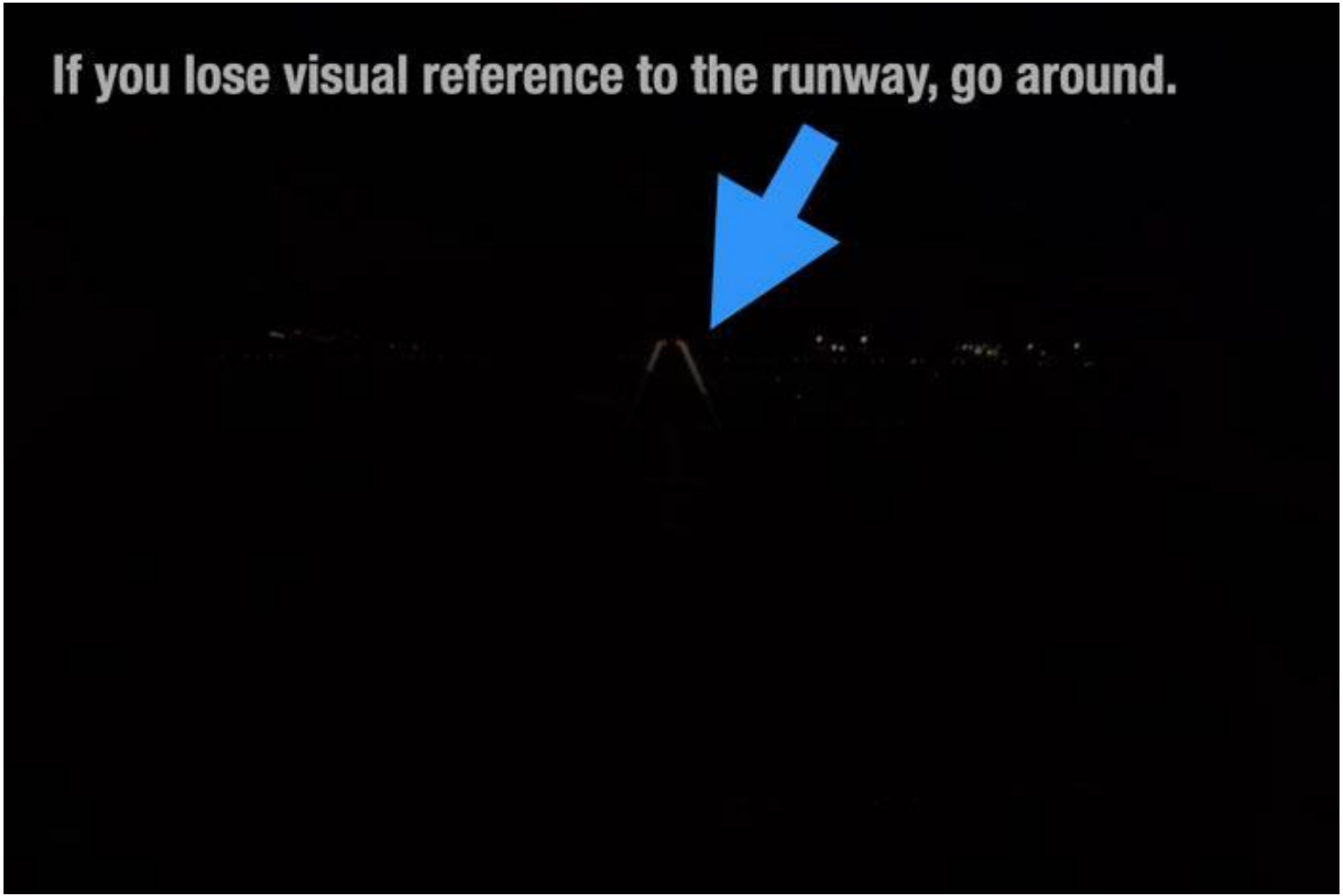
- Difficult to see clouds and restrictions to visibility
- Loss of ground lights or halo effect sign of entering IMC
- Crossing large bodies of water risks a night ditching
- Lights can cause illusions

Approach and Landing



Approach and Landing

- Fly an instrument approach even if VFR
- Stay above MSA until in a position for a normal landing
- Identify runway and airport lights as far out as possible
- With G1000 or GTN625, consider use of visual approach
- You will tend to flair too low - surprise arrival
- If on final and the runway lights disappear, you are about to fly into terrain - GO AROUND


If you lose visual reference to the runway, go around.

Emergencies at Night



Emergencies at Night

- Same as Day except finding a place to land
- Land in the dark spaces or the lights?
- Fly at highest reasonable altitude
- Monitor nearest airports - runway lights? runway orientation?
- Best option is probably a major highway - land with the flow of traffic and try to avoid overcrossings

Night Operations Q&A

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