

Chapter 10: When It All Doesn't Work

Once you have learned to fly your plane, it is far less fatiguing to fly than it is to drive a car. You don't have to watch every second for cats, dogs, children, lights, road signs, ladies with baby carriages and citizens who drive out in the middle of the block against the lights. . . . Nobody who has not been up in the sky on a glorious morning can possibly imagine the way a pilot feels in free heaven.

— William T. Piper, president of Piper Aircraft Corporation

My first indication that my attitude indicator, or artificial horizon as it is sometimes called, was about to toast was when it began to jitter intermittently in level flight. The attitude indicator is the central focal point of all flight instruments. Its display reveals the relative position of the airplane in the three-dimensional world of flight. While not particularly important in VFR flight when a quick outside reference to the ground or horizon confirms whether or not the airplane is upright in the sky. Flying in the clouds presents a whole new set of problems. Without the attitude indicator, the pilot has to interpret other less precise flight instruments to determine his attitude in space.

It was bright, sunny morning as I motored to Buffalo's active runway, simultaneously going through the pre-flight check. As expected, the attitude indicator refused to spool up on engine start. My mission this day was a critical meeting with a potential client in New York City. What should I do?

Should I go or should I cancel the trip? By FAA airworthiness regulations, I had no choice but to cancel the flight, as the attitude indicator must be working for flight according to aircraft manufacturer. I had a legal out, however. Several years back I had a secondary attitude indicator installed for backup purposes. The only problem was its location in a remote corner of the instrument panel. Outside the normal instrument scanning sequence, it would prove to be a bit awkward to use effectively.

The skies were clear and visibility unlimited, so I elected to go. It was not until I leveled off at my planned cruising altitude of 13,000 feet that I recalled that, on my airplane, the autopilot was connected to the attitude indicator. Thus, if the attitude indicator was not working, neither would the autopilot.

Okay, I thought, two important systems were now inoperative. What next? Given the excellent weather conditions, I elected to motor on, manually controlling the airplane and using secondary attitude indicator and outside references to confirm my flight attitude. The remainder of the flight to the Westchester Airport just outside New York City proceeded normally.

I completed my business and returned to the airport for the night flight back to Buffalo. The weather was not as cooperative as it was on the inbound trip. Scattered thunderstorms, fog, and low clouds associated with a warm front passage would complicate the trip home. I was also tired from the press of the day's business. It was time for some serious risk-assessment thinking. The primary attitude indicator

was out as was the autopilot. The enroute weather was poor and I was experiencing considerable fatigue. This was not the best of situations. I spent about 20 minutes on the phone with a Flight Service weather briefer deciding if it would be possible to circumnavigate the line of thunderstorms over the northeastern corner of Pennsylvania.

Discussing my options with Flight Service, I decided to finesse the air traffic control system by switching my filed destination to Albany. This would take me north, around the eastern edge of the storms. Once clear of the worse stuff, my plan was to request a destination change to Buffalo. What I did not count on was the circuitous departure routing ATC gave me out of New York City's busy airspace. Worse, it was delivered to me by a fast-talking "New Yawker" with a deep Brooklyn accent.

My next task was to pull out the low altitude en route chart and locate the assigned en route fixes, then load them into the GPS. Tracing this unfamiliar routing in the dark with the engine running and a flashlight between my teeth was no easy task. Being tired, I quickly became frustrated trying to get everything done at once. I wanted to be home in bed. I gave a thought to shutting down the engine and finding a nearby hotel room. Nawh . . . let's roll.

With the navigation plan loaded into computers, I began a long convoluted taxi to the active runway. Night-time taxiing on unfamiliar airports requires the assistance of ATC's ground controller who, upon my request, issued progressive instructions at each turn along the way. Finally I reached the active runway, did a quick run-up and a final cockpit check. All systems were "go" except, of course, the defunct attitude indicator and autopilot.

With the take off clearance received, I advanced the throttle. Two Zero Yankee's high performance engine came alive. Like a race horse breaking from the gate, Two Zero Yankee rose up on its main gear and lifted its nose skyward. I felt the surge of power as we raced down the runway. Giving a gentle tug on control yoke, Two Zero Yankee broke the bonds of earth and became airborne. We lifted through the first thin layer of clouds, then into a much thicker layer that rose up to nearly 10,000 feet above sea level. Switching on the Stormscope quickly revealed the nasty line of thunderstorms about 25 miles to the west. The radar showed several benign level two and three rain cells off our nose. The absence of corresponding sparks on the Stormscope suggested that there was no hazardous convective activity within these cells. I proceeded accordingly.

Hand flying at night, in the clouds, with an inoperative primary attitude indicator is challenging. My growing fatigue compounded the situation as did the threatening weather and the circuitous departure routing given to me by ATC. The fact that I was also flying through the busiest airspace in the entire world provided an additional element of stress to this otherwise challenging flight. At least I was alone, with no distracting passengers to interrupt my concentration. My thoughts were interrupted by the New York departure controller.

Two Zero Yankee, where are you navigating to?

Hmm . . . that's a strange question, I thought. These guys have a data strip showing my entire flight plan. I read back my ATC issued clearance.

Your flight data strip never came up. We're just trying to sort things out.

Whoa . . . they are trying to sort things out! That seemed incomprehensible to me. Could it really be that I was maneuvering in directions unknown to New York's air traffic controllers? I guess I'll never know what was going on in the bowels at ATC that night in New York. I do know that no metal was crunched. That was good.

The line of thunderstorms were still menacingly close. I contemplated my next course of action. Should I proceed further east instead of north? Perhaps I should divert to Boston, or return to Westchester? My head was beginning to pound. I had been working and flying now for nearly sixteen hours straight with

out a break. At least with an operative autopilot I could close my eyes for a minute or two.

There would no such power nap this night. I continued north as planned, keeping a close eye on the Stormscope. The turbulence was beginning to build with the corresponding frontal passage. Without the attitude indicator, the only way to keep airplane upright in the clouds was to keep the directional gyro (DG) from turning.

The DG is located square in the middle of the instrument panel. With an adjustable "bug" set to the desired heading, it is a fairly easy process to keep the wings level. Adding the vertical speed indicator (VSI) and altimeter to the instrument scan provided the necessary pitch attitude information to keep me straight and level in the soup. These instruments, along with the airspeed indicator, provide critical information in the third of this three dimensional world aviators live in. The airspeed decreases as the airplane climbs (assuming constant power setting). The speed increases when the airplane descends. No change in airspeed signals level flight. Who, then needs an attitude indicator? Good question.

The stormscope continued to display the eastward advancing line of thunderstorms. I eased several degrees further to the right while keeping a close watch on the Level II rain cells rapidly approaching directly ahead. I called ATC and requested a heading change. The New York departure controller quickly granted my request. My directional choices, however, were becoming less flexible as the field of rain cells ahead were increasing in number and size. Still, the Stormscope was not revealing any connective activity within those cells.

As anticipated, rain began beating on the airframe as I continued on the northeasterly heading. The rain cells were popping up in all sectors of the compass. Along with rain came more turbulence.

I had not observed the ground since lifting off of the Westchester Airport nearly an hour earlier. I gave more thought to calling it quits and making a bolt for a nearby airport, followed by a hot supper, shower, and bed. That would have been the prudent thing to do. I elected to motor on. My plan was to continue for another 50 miles up to Albany. By then I would be out of this stuff and in the clear. If this worked out as planned, I would make the destination change request and proceed on a direct heading to Buffalo. I flew on another 30 minutes, then gave ATC a call.

New York Center, Centurian Four Seven Two Zero Yankee, destination change.

Two Zero Yankee, go ahead with your request.

I'd like present position direct Buffalo, final destination.

Centurian Four Seven Two Zero Yankee. You are cleared present position direct Buffalo as requested. Maintain 12,000 feet.

I banked Two Zero Yankee to a heading of 300 degrees. At 170 knots, I would be on the ground in about an hour. The line of thunderstorms I circumvented were safely to the south and the ominous rain cells were now well to the east. The skies ahead were clear and the stars above were shining bright. How wonderful, I thought, to have the onboard weather avoidance and satellite-driven navigation technology that was only dreamed of 20 years ago. General aviation has, indeed, entered a brave new world of flight.

This long day finally ended around midnight. It had begun 18 hours earlier with an hour of weight lifting and cardio exercise with my fitness trainer, Derek Alessi followed by six hours in the office, and concluding with this round trip flight to New York City. I was, indeed, ready for bed.

As this trip proved, the built-in redundancy of aircraft systems and accessories dramatically improves mission reliability. The key, of course, is to insure that the primary and the backup systems are both kept in working order.