

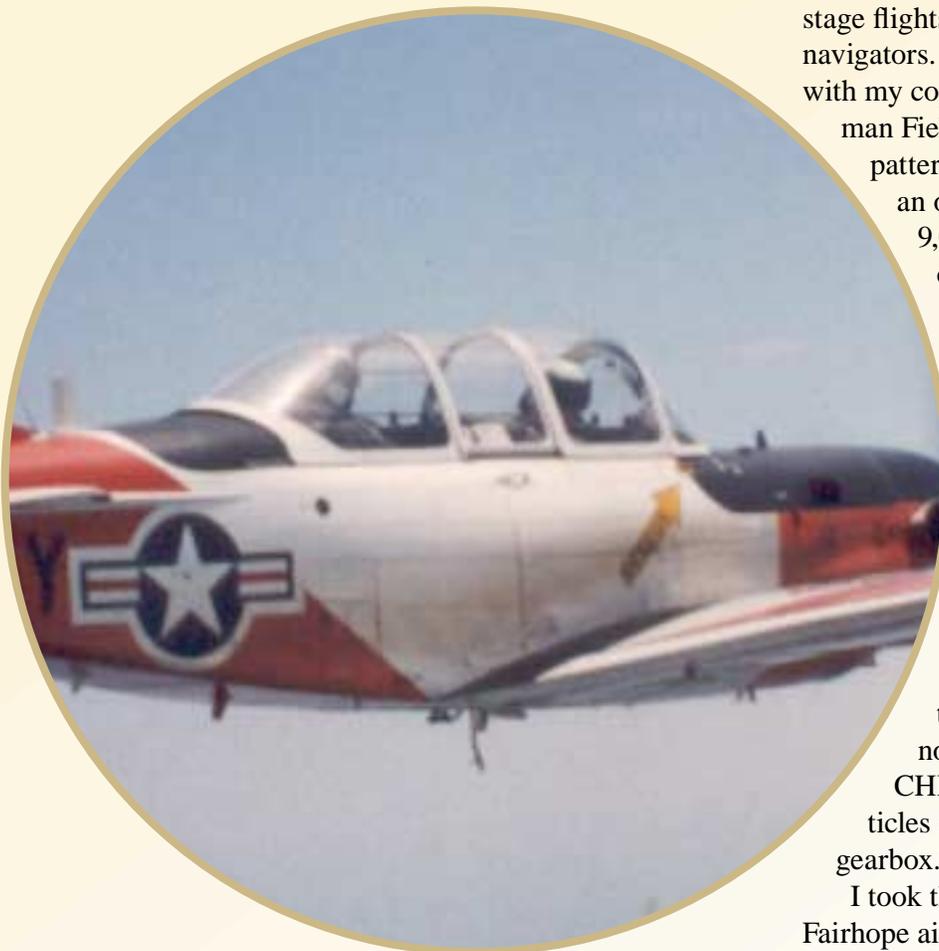
Aircraft to Pilot—How Do You Read?

By Lt. Jim Pratt

I was scheduled to fly with another instructor and give him a fam check ride. This qualification would allow him to instruct the fam stage flights for student naval flight officers and navigators. I was in the front seat of the T-34C, with my copilot in the back. We departed Sherman Field and completed all the landings and pattern work early in the flight at Silverhill, an outlying field. We then climbed to 9,000 feet and completed stalls, spins, out-of-control flight recoveries, and aerobatics.

Descending through 6,000 feet, my copilot gave himself a simulated HAPL (high-altitude power loss), and I commented we should stay clear of Fairhope's airspace. He was running the HAPL procedures when I felt a slight vibration, like a mild hum, in the airframe. I asked him if he felt the vibration, and, before he could answer, "No," the CHIP light illuminated. NATOPS notes, "Illumination of the magnetic CHIP detector light indicates metal particles are present in the propeller-reduction gearbox."

I took the controls and turned toward the Fairhope airport, setting 850 foot-pounds of torque. Realizing we were only a couple of miles south of the airport and at 5,000 feet, I reduced power to 200 foot-pounds, lowered the gear, and slowed to 100 knots. My copilot declared an



emergency over the working-area common frequency and called out the VHF frequency for the airport. I glanced down at the VHF control head and noticed the frequency was already in standby, so I toggled it to active. My copilot then made two calls to Fairhope Unicom, announcing our intentions. Having recently completed my NATOPS-instructor check, I was aware of the need to get on the ground as soon as possible. I chose not to fly the standard, circular, emergency-landing pattern but instead dropped the flaps, S-turned and slipped to a straight-in landing to runway 1. Somewhere on final, I realized I would be landing with a light-quartering tailwind, but I knew that would be better than trying to reposition for the other runway. We completed the checklists and set the emergency code in the transponder.

While descending toward the runway, my backseater noticed a burnt-electrical odor in the rear cockpit. At the time, I was too absorbed flying the plane and didn't notice any unusual smells. In the flare, I tried to reduce power to idle, but the throttle was already all the way back against the stop, and the torque still was indicating 200 foot-pounds. NATOPS warns, "Torque indications may be erroneous because of reduction-gearbox failure." I used beta upon landing, easily made the first taxiway, and shut down the engine. I finally noticed the electrical odor my copilot had identified during the approach. Our best estimates indicated we were on the ground within five minutes from the time the CHIP light first illuminated.

While we waited for maintainers to drive to the airport, we discussed what went right for us. First, crew coordination could not have been better. With my copilot handling the radio and calling out the procedure, I was free to concentrate on flying the airplane. Declaring the emergency and making the Unicom calls helped

greatly. At least one other T-34 heard our call and flew over the airport to make sure we were OK on the ground. A Cessna, inbound to runway 19, stayed clear until we had taxied off the runway. I would have hated to end up beak-to-beak with another airplane when my engine probably would not have allowed a go-around. The landing was smooth and easy in the first 1,000 feet, leaving plenty of room for rollout.

Replaying the flight over in our minds, we realized we had a few signs that could have warned us of the impending failure. None of these by themselves were out of limits, but, when combined, they indicated something bad could happen. During engine start, ITT peaked at 725 degrees Celsius. This is well within limits but a little hotter than normal. While in the landing pattern and simulating low-altitude-power losses, we consistently needed slightly more than 200 foot-pounds to maintain our flight path. We discussed this while in the pattern, but neither of us thought it was a problem—probably a misaligned torque indication. After we climbed to altitude, with maximum torque of 1,015-foot pounds set, every over-the-top-aerobatic maneuver (loop, one-half Cuban eight, and Immelmann) would get slow at the top with rudder shakers. We decided we should have entered the maneuver with more airspeed. Once I felt the vibration, it was obvious something wasn't right. The plane had been trying to warn us in its own subtle way, but we were focused on completing the event and ignored the warnings.

When the mechs arrived about two hours later, we could not freely turn the prop or the air-conditioning belt. Both sections of the engine had seized. Mechs pulled the oil filter and took oil samples for analysis. Instead of being clear oil, it was thick and black, with glittering metal particles throughout. Maintenance changed the engine before that plane flew again. 

Lt. Pratt flies with VT-4.

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