



# Checklists Are Just Too Long

Long lists leave little time to fly

**THE CHECKLISTS SUPPLIED BY** GA airplane manufacturers are so long and cumbersome that they have become useless as tools to enhance flight safety. I think they are written by lawyers, not pilots, because nothing, no matter how obvious to a person of normal intelligence, is left off the list of things to do.

I counted the individual tasks Beech wants me to perform on every flight and came up with 90. And that's for a normal flight. If something unusual happens, there are 97 more items to check or actions to perform. And those are on top of a preflight checklist that lists 57 items.

We all need some type of checklist to help us remember to configure the airplane properly for each phase of flight, but on the "takeoff" checklist do I need to be reminded to "set takeoff power?" If I followed the checklist I would fasten my seat belt and

shoulder harness at least three times on every flight. And if I abided by the "pre-flight" checklist, I would complete the multitude of tasks standing behind the right wing trailing edge, as far away from the cabin door as you can get.

This checklist diarrhea has infected all of general aviation, from large cabin business jets down to light-sport aircraft. I know of only one manufacturer that is successfully fighting back, and that is Embraer. The checklists for its new light jets, the Phenom 100 and 300, are mercifully short, even shorter than those for a typical piston single.

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## J. MAC MCCLELLAN

Part of the reason that Embraer is succeeding in making useful checklists is that it is new to building GA airplanes, and it is taking its cue from the airlines that are the core of its business. Airlines each create their own checklists and receive FAA approval to use them in their operations. And the airlines have learned that crews have more important and productive tasks to perform—such as looking out the window when taxiing—than to be head-down reading a list long enough to tell you how to build the airplane, not just fly it.

But, the good news is that unless you fly a transport category airplane, or fly under an operating certificate such as FAR Part 135 charter rules, there is no FAA requirement to use a checklist, or what checklist to use. In piston airplanes we are all free to make and use our own checklists and procedures.

The FAA's hidden club in the rules to punish improper use of checklists that leads to an accident or incident is FAR 91.103 with a preamble that reads, "Each pilot in command shall, before beginning a flight, become familiar with ALL available information concerning that flight." I capitalized the ALL, not the FAA, but you get the drift. And then there is the ever-popular FAR 91.13 that forbids "careless and reckless operation." The FAA gets to define what that is, and if you run out of gas or slide it on with the wheels up, you broke one or both of those rules, not a rule requiring that you use a checklist.

Before making your own checklist, it's a good idea to think about how you plan to use the list. Most instructors and flight schools teach the "do list" method of flying, but many, if not most, human factors experts believe that using the "checklist" to check is better.

Under the common "do list" operation you read an item on the list and then perform the function, such as moving a switch or checking the reading of an instrument. Using the "checklist" method you work your way across the cockpit—or around the airplane during preflight—in an organized manner performing the necessary tasks. Then you read the list to check that you haven't missed anything. The checklist method moves much quicker and interferes less with other flying tasks at critical times, such as on approach to land.

Another key element to a usable checklist is using so-called "memory items." These are actions that should be obvious, such as switching to a fuller tank if the engine falters or applying carb heat if engine power starts to sag. These are normal pilot actions that you must be able to accomplish more or less automatically because there is often no time to consult a list.

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### COCKPIT FLOW

The best-designed cockpits are intended to allow pilots to use a "flow" to perform specific tasks. For example, it's ideal to have the battery and other primary power switches on the far left so you can turn them on first and then move your eyes and hands across the cockpit to check and set instruments and systems. Many airplanes with certification roots many years in the past do not have good cockpit flow because systems and avionics were changed, added, or subtracted over the years. But even in airplanes that are a bit of a jumble, you can create your own flow pattern that may not move smoothly across the entire cockpit, but is a pattern that you can repeat on each flight. Repetition and predictability are the keys to using a flow and a list.

I don't recall having a printed checklist in my first airplane, a Cessna 140, or in the Piper Colt I flew some for primary instruction. But what I do remember, and still use in my Baron and in most piston airplanes as

a checklist, is the mnemonic CIGAR TIP.

The C stands for controls, which is the obvious sweep of the flight controls, but also secondary controls such as wing flaps and cowl flaps. The I is for instruments. The G is for gas, and that includes making sure you have it, and that the fuel selector and pumps are properly selected. A is for altimeter setting. And R is for run-up, which includes setting the power controls properly and checking the engine gauges.

The T in tip is for setting and checking the trims. The second I in the mnemonic is for interior, which includes belts and harnesses, but perhaps most importantly, security of the cabin door. Many pilots have reacted badly and lost control when surprised by a cabin door popping open right after liftoff. The P is for propeller, and it should be cycled and set for takeoff rpm if the airplane has a controllable-pitch prop.

The great thing about CIGAR TIP as a checklist is that it covers almost any piston airplane. For example, when you get to the T for trim, it doesn't matter if the airplane has only pitch trim, while other airplanes have aileron and rudder trim, too. You think "T" and confirm to yourself that you have checked all of the trims.

Many old-timers, particularly those who have flown larger airplanes, have an even shorter final list they run through as they line up for every takeoff. This short list is usually called the "killer items" because they are airplane configurations that can kill you before you ever get off the ground. There are variations of the killer items list, but they always include flap setting and pitch trim, and spoilers if the airplane is equipped with them.

The proper flap setting is crucial on any airplane for takeoff. Larger airplanes simply won't fly if the flaps are improperly set. But even in light airplanes, having the flaps either extended or retracted when you are planning your takeoff for the other setting can cause large and important differences in performance.

Pitch trim can be a killer in larger airplanes that move the leading edge of the horizontal stabilizer up and down to trim. In those airplanes the elevator is more like a trim tab to the stabilizer, and if the trim is

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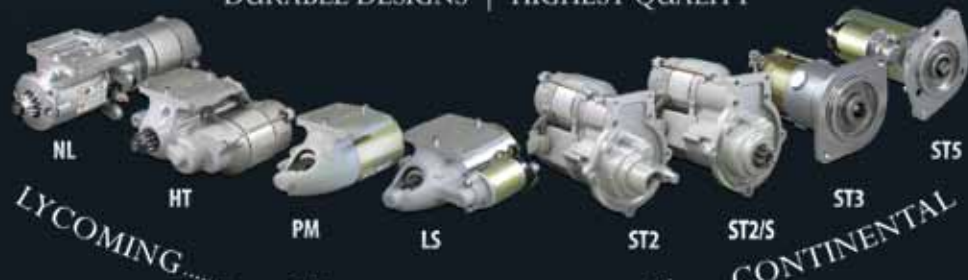
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incorrectly set for takeoff, there may not be enough elevator authority to rotate the nose up to liftoff. Or, if the trim is set too nose up, the nose may pop up into the air below flying speed and the elevator may not have the control authority to push it back down.

There have been a number of accidents in piston singles caused by miss-set pitch trim not because the airplane couldn't fly, but because the surprise forces caused the pilot to lose control. On most piston airplanes that use trim tabs, the authority of the elevator is not markedly changed by the position of the tab, but the control forces the pilot experiences can be dramatically different. If you expect a gentle pull to lift the nose on takeoff, but elevator trim is mistakenly set full nose-down creating a stick force of many pounds necessary to lift the nose, the surprise can cause you to think something else is wrong and not pull hard enough—even

### Simple Checklists: CIGAR TIP and GUMP

Here are two easy to remember checklists that are good for just about any GA piston aircraft:

#### TAKEOFF CHECKLIST:

**C – Controls.** Check the flight controls, such as the aileron, elevator, rudder, wing flaps, and cowl flaps.

#### I – Instruments

**G – Gas.** Check how much you have, and that the fuel selector and pumps are properly selected.

**A – Altimeter** setting

**R – Run-up.** Check engine gauges, and set power controls properly.

**T – Trim.** Set pitch trim, as well as rudder and aileron (if applicable).

**I – Interior.** Check belts, harnesses, and that the cabin door is closed and latched.

**P – Propeller.** Cycle the propeller, and set takeoff rpm if there is a controllable-pitch prop.

#### LANDING CHECKLIST:

**G – Gas.** Check to make sure the fuel is on the proper tank and pumps are properly selected.

**U – Undercarriage.** Make sure the gear is down if it's a retractable-gear aircraft.

**M – Mixture**

**P – Prop**

though you have the strength—and run off the runway. Or, if the trim is set too nose-up, the airplane can pop into the air prematurely, and the startle factor may delay you from pushing hard enough to get the nose back down and the airspeed up. Proper pitch trim setting needs to be on every pilot's list of takeoff lineup potential killer items.

#### IN FLIGHT

During the actual flight I don't think there is much need for a checklist in most airplanes, but what is required are good, dependable habits. For example, managing fuel is best done by using a predetermined schedule of changing tanks on a certain time interval. I don't think a checklist really helps here, but you do need the situational awareness of how long you have been flying, and how long you have been on that tank so you know when to switch.

The other phase of flight that demands a careful check is on approach to landing, and the good old GUMP check for gas, undercarriage, mixture, and prop setting really covers the key items. Actually, the only really critical one on that list is the landing gear. I say out loud even when I'm alone "three green" and look at the lights as I near the runway. The new avionics boxes with terrain awareness systems reinforce the procedure by calling out "500 feet" into my headset, which is the perfect opportunity to double-check the gear.

My suggestion is to go through the interminable checklist that came with your airplane, note the items that really matter, and make your own checklist. And then use that list to check, not as a command to do. Pilots run a tank dry and park it in a field with alarming regularity, and on average somebody somewhere in the United States lands with the wheels up once a day. Clearly those checklist tomes that come with the airplane are not working, so take matters into your own hands and create a list that works for you.

#### I'M RE-REGISTERED

The letter from the FAA arrived the other day telling me that the window was now open for me to re-register my airplane. As you probably know, all airplane owners are required to re-register over the next three

years, and the fleet is divided up according to the date your original registration was issued. The FAA gives you plenty of warning. The letter telling me to re-register, and how to do it, arrived nearly four full months before the deadline.

If your registration is up to date and accurate as mine was, the whole process will take less than two minutes online using a special FAA website listed in the letter. The actual re-registration was a single mouse click to confirm all information was accurate. The other 115 seconds were required to enter the credit card information so the FAA could collect the

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\$5 fee. And the FAA is uncharacteristically efficient in issuing the new registration card. Mine arrived in the mail two business days after I re-registered online.

The fee is a nuisance, but I am curious to see how many airplanes emerge from this process. Most of us in the industry believe that the 240,000, or some number like that, of registered airplanes is wildly inflated. That roster includes all airplanes that were never "un-registered" even though they no longer fly, or maybe no longer exist. So this new procedure with a life-limited registration should yield an accurate picture of the GA fleet size.

What is, however, totally bogus is the FAA claim that the re-registration will be an aid in preventing terrorism or smuggling. Only law-abiding pilots will re-register their airplanes, just like only law-abiding pilots show up at customs for clearance. For any bad guys—and there are very few—an N number is nothing more than a little paint. *EAA*



**J. Mac McClellan**, EAA 747337, has been a pilot for more than 40 years, holds an ATP certificate, and owns a Beechcraft Baron. For more information about aircraft re-registration, visit [www.SportAviation.org](http://www.SportAviation.org).