Stan/Eval Newsletter
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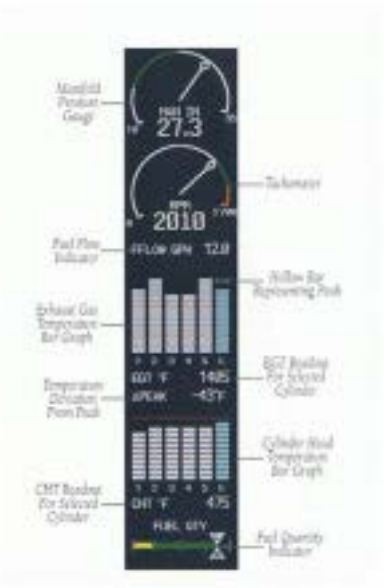
Magneto Checks with a G1000 (LtCol S. Lipson/LtCol M. Martin TXWG)..... 2
Keeping the CAP Fleet Fit..... 3
Runway Excursions, Circle-to-land Risks Eyed at BASS (AIN Online) 3
Check Pilot and Instructor Pilot Required Knowledge..... 3
Hot Spot Symbology 4
Flying Multiple Aircraft..... 5

Magneto Checks with a G1000 (LtCol S. Lipson/LtCol M. Martin TXWG)

We are all used to doing a standard run up where we increase the RPMs and then watch (and feel) for the RPM drop to remain within limits when evaluating each magneto independently. However, when I do a run up in a G-1000, I FIRST pull up the Lean Assist page (Engine -> Lean). Watching the EGT & CHT of the cylinders on the "Lean" page gives you tons more information, is far more sensitive and way more accurate than simply watching for an ### of RPM drop. An RPM drop out-of-tolerance during the mag check will only indicate the most severe mag failures. It won't tell you if you have a bad spark plug, induction leak or other more serious issues like pre-ignition or detonation.

GOOD RESULT:

When you go to one mag and stop one set of spark plugs from sparking (one in each cylinder), all EGTs should go up and all CHTs should go down very slightly. With only one spark plug firing in the cylinder, the flame front is still progressing across the cylinder when the exhaust valve opens, which means still-burning fuel is going past the EGT probe. EGT goes up (usually 50-100 deg F, but if it's rising it doesn't matter how much) and since less combustion is taking place inside the cylinder the CHT goes down very slightly (although it may take a minute to see it).



BAD SPARK PLUG:

If you have a bad spark plug, the EGT in that cylinder will drop off, and you can tell immediately which cylinder it is. As you try to run it up to try and bring it back to life (burn off deposits), you can see if you are being successful.

INDUCTION LEAK:

If you have an induction leak, that cylinder is already lean, so you won't see much EGT rise.

DETONATION:

If detonation starts to happen (maybe that mag is mis-timed), you'll see a spike in CHT. For those that follow Mike Busch out there, this is what he preaches also. In fact, he goes so far as to say to ignore the RPM gauge if you have an engine monitor because that is a much better test (although I think you can do both). Again, many of our non-G-1000 aircraft have actual engine monitors, so you can use the same technique.

The next time you do a run up, make sure to watch that engine analyzer and see how it responds. After a few times of seeing what it does "normally", you will immediately be able to spot anything abnormal.

Keeping the CAP Fleet Fit
The FAA Safety Briefing magazine featured a great article on CAP maintenance. Worth a read. You can find it here.

Runway Excursions, Circle-to-land Risks Eyed at BASS (AIN Online)
Runway excursions and circle-to-land approach accidents are raising concerns. They warrant greater attention and risk mitigation according to safety experts from the Flight Safety Foundation (FSF) and the FAA, having reported at the Business Aviation Safety Summit (BASS) 2022 in Savannah, Georgia. BASS is co-organized by FSF and NBAA.

More than 60 years of data covering 796 accidents involving 1,498 fatalities shows runway excursions accounted for 30 percent of the mishaps and they are "growing in proportion, in some years exceeding 50 percent," said FSF director of safety strategy and policy Henry Gourdji. About one in five excursions occur during the takeoff phase. With the U.S. accounting for more than half of all business aviation accidents (about 51 percent), Flight Operational Quality Assurance data from GE presented in a subsequent session revealed that most excursions occur in June, July, and August, when contributing factors such as ice or snow are absent.

Addressing circle-to-land operations, NTSB national resource specialist and senior accident investigator David Lawrence recounted the Challenger 605 and Learjet 35 repositioning flight accidents last year in Truckee and El Cajon, California, respectively. Both involved highly experienced crews, in reduced visibility, and the crashes occurred while making tight turns to align with the runway on final approach. Lawrence noted Part 135 operators have accounted for 16 accidents while circling to land, 12 of which involved fatalities and serious injuries.

Check Pilot and Instructor Pilot Required Knowledge
Instructor Pilots (IP) and Check Pilots (CP) play an important part in our quality program. They are the first and last line of defense in helping our pilots fly to CAP and FAA standards. Even if someone is a highly experienced pilot with all conceivable ratings, they should not be considered for an IP or CP appointment until they are familiar with and can teach the CAP way of flying. This includes being able to coach pilots in the use of eServices and WMIRS. You may be the greatest CFI and Check Airman in the world, but if you can't teach the CAP way of doing business, you won't be appointed. Here is a list of the basics you need to be familiar with if you are a CAP IP or CP. If you are currently an IP or CP and are not familiar with these, you have some homework to do!!!

Standards:
S71-1 Aircrew Training Airplanes
S71-2 Aircrew Training Gliders
S71-3 Aircrew Training Balloon
S71-4 AFAM Approved Proficiency Profiles
S71-5 Corporate Approved Proficiency Flight Profiles
S72-2 Mission Symbols
S72-5 Aircrew Evaluation
S72-6 Aircrew Evaluation Criteria

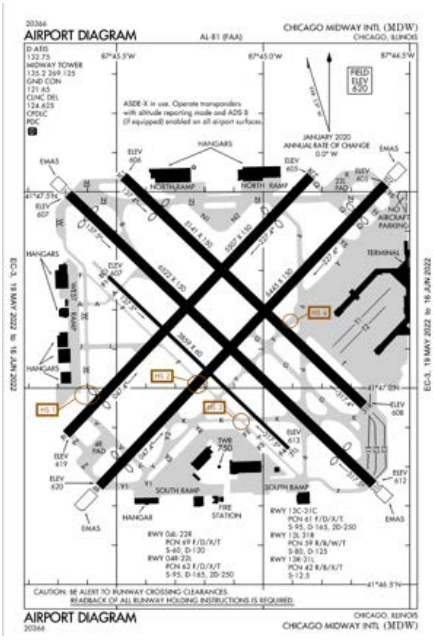
S73-1 Operations Procedures Airplane
S73-2 Operations Procedures Glider
S73-3 Operations Procedures Balloon

Regulations:
R70-1 CAP Flight Management
R130-2 Aircraft Maintenance Management
R160-1 CAP Safety Program
R160-2 Safety Reporting and Review

Pamphlets:
P60-40 Cadet Orientation Flight Program Guide
P70-4 Guide to FAA Exemptions
P70-10 Aviators Code of Conduct
P70-11 Aircrew Code of Conduct
P70-12 Pilot Onboarding (includes useful "how to" for eServices and WMIRS)

Forms:
F60-86 Cadet Independent Flight Instruction
F70-1 Pre-flight Risk Assessment Worksheet
F70-1G Pre-flight Assessment Worksheet Glider
F70-5A Pilot Flight Evaluation Airplane
F70-5B Pilot Flight Evaluation Balloon
F70-5G Pilot Flight Evaluation Glider
F70-5Q-A Pilot Flight Evaluation Questionnaire Airplane
F70-5Q-B Pilot Flight Evaluation Questionnaire Balloon
F70-5Q-G Pilot Flight Evaluation Questionnaire Glider
F70-9 Release
F70-11 G1000 Transition Training Record
F70-91 Mission Pilot Checkout
F104 Mission Flight Plan/Briefing Form

Hot Spot Symbology
Beginning 19 May, we now have new symbology on hot spots. You can read about it in this AOPA article here.



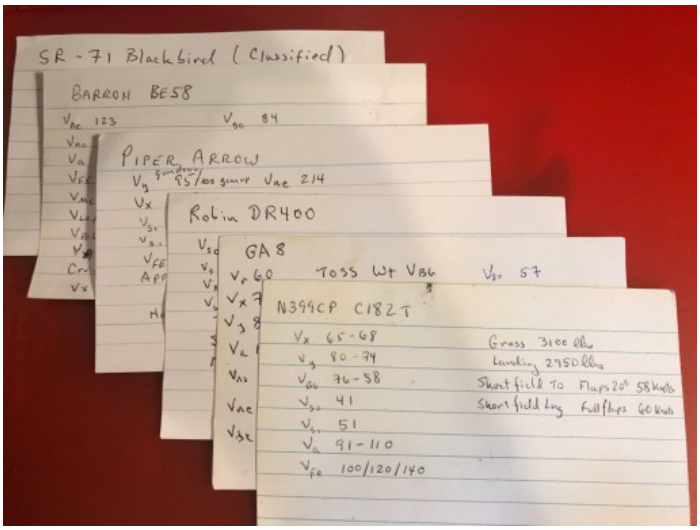
Flying Multiple Aircraft

Some pilots fly the same aircraft all the time. Because of this, they are (or should be) very knowledgeable about the aircraft. Still, it's a good idea to review the POH periodically to confirm what you think you know about the aircraft. It never ceases to amaze me how I always learn something new when I review a POH for an airplane that I fly often.

But many pilots fly multiple aircraft. They may fly their personal Piper Arrow today but the CAP 182T tomorrow. Unless you have a photographic memory, a quick review of the important operational characteristics is useful and avoids any confusion caused by trying to remember too many V speeds or emergency procedures across multiple aircraft. For example, let's take a recovery from an inadvertent spin. Spin recovery in most aircraft follows PARE:

- **P**ower- reduce
- **A**ilerons- neutralize
- **R**udder- opposite the spin
- **E**levator- forward

But there can be some subtleties which can mean the difference between recovering and spinning into the ground. In some aircraft you must apply full up elevator as you apply rudder. In these aircraft, full up elevator increases airflow to the rudder and makes it effective. Without up elevator the rudder may not break the spin. Once the spin has stopped, only then do you push the stick forward. For other aircraft, this could be exactly the wrong thing to do. There are many other "small" differences that can become significant especially in an emergency. It can be hard to keep all this straight so beware when you are jumping from one aircraft to another even though you are "familiar" with both.



Reviewing the POH each time you fly a different aircraft is a good way to refresh your knowledge. Although sometimes it's hard to figure out where to find a particular characteristic in the POH. For example, where do you find Vy in a POH? Give up? Me too. A helpful way to keep track of the important characteristics and emergency procedures is to list all the important V speeds and procedures on either a paper index card or an electronic version. You can also note any specific items needing special intention. So now instead of hunting and pecking in a POH you have all the important stuff summarized. This can be a very effective technique but only works if you are already familiar with an aircraft. If this aircraft is new to you, sit down and study the POH!

Some things you don't have to write down are parameters already on the instruments. Airspeeds like Vs, Vno, Vne, Blue Line (Multi Engines), Vmca (Multi Engines) and so forth are on the ASI. Acceptable oil temps, manifold pressure, RPMs and so forth are usually denoted by green whereas red indicates an out-of-range parameter. But airspeeds such as Vx, Vy, Va, Vbg, Cruise Climb and others are not readily available and can be hard to find in a POH (yeah, they are there but usually buried). Some checklists can have useful parameters as well including emergency procedures but check before you go.

Articles for the National Stan Eval Newsletter:
These articles have been written to present ideas, techniques, and concepts of interest to CAP aircrews rather than provide any direction. The articles in this newsletter in no way should be considered CAP policy. We are always looking for brief articles of interest to CAP aircrews to include in this newsletter. CAP has many very experienced pilots and aircrew who have useful techniques, experiences, and tips to share. Please send your contribution to stephen.hertz@vawg.cap.gov. You can view past issues here.