

## Checklists

How do you properly use a checklist? Before we answer that question, we need to define or clarify a couple of terms. First, everyone is fairly familiar with the terms pilot and co-pilot, or more specifically the Pilot in Command (PIC) and Second in Command (SIC). The pilot, or PIC, normally sits in the left seat and the co-pilot, or SIC, sits in the right seat. As you are now aware, there is also the student and instructor with the student typically sitting in the left seat and the instructor sitting in the right seat. In this normal scenario the flight instructor will typically be in the right seat while acting as PIC. This is simple enough, but by using these terms how do you know who is actually flying the aircraft? That can be difficult to do so there are a couple of additional terms used to clarify who is actually flying the aircraft regardless of physical position or rank - Pilot Flying (PF) or Pilot Not Flying (PNF). We will use PF and PNF when discussing checklist usage to avoid confusion.

So, again, how do you properly use a checklist? The best way is to use the Challenge-And-Response method. Look at your MXT-7 checklist and notice that there is a left-hand column and a right-hand column to each checklist. In the left column is the switch or control that needs to be changed or confirmed. In the right column is the action that needs to be taken with the switch or control. The left column is referred to as the challenge and the right column is referred to as the response. They are called this because you are "challenging" the checklist item to be changed to pre-determined "response". By verbalizing each challenge and response everyone in the cockpit knows what is occurring.

Now let's consider a two-person crew acting as a team in a cockpit. This concept of teamwork is called Crew Resource Management, or CRM, in the aviation industry. The PF will call for a checklist to be performed and the PNF will perform that checklist while the PF continues to fly the aircraft.

How the PNF performs the checklist procedures requires some more explanation and is really the core of how you properly use a checklist. There are actually two methods of performing checklist procedures: the Say-Do method and the Flow-Confirm method. In the Say-Do method the PNF will state the checklist challenge out loud, the task specified will be carried out by the PNF, and then the PF will verify the expected response has been carried out and state that response out loud to confirm that everything has been done correctly and nothing omitted.

In the Flow-Confirm method, the PNF actually has a pre-determined and methodical movement, or "flow", across all the items in the checklist. As the item is encountered it is manipulated as required in the checklist. After the flow is completed the PNF will then state each challenge and the PF will verify the expected response has been carried out and state that response out loud to confirm that everything has been done correctly and nothing omitted. This method basically requires that each checklist be memorized with a systematic flow developed that can be used the same way all the time. While at first this may seem like a lot of memorization and therefore less appealing than the Say-Do method, it is actually fairly easy considering you use the same checklist time and time again. The Flow-Confirm method allows the PNF to accomplish the tasks in the checklist in a quicker fashion without compromising safety. Because of this many airlines and corporate flight departments choose to use the Flow-Confirm method

instead of the Say-Do method. We want you to progress in your training so as to use the Flow-Confirm method as the primary way of complying with a checklist and using the Say-Do method as a backup should a flow be forgotten.

Mnemonics may help in developing a flow. A very common one used in general aviation aircraft before landing is CCGUMPSS (pronounced "see-gumps") and stands for:

C - Carb heat

C - Cowl flaps (in equipped)

G - Gas on both

U - Undercarriage down

M - Mixture rich

P - Propeller high RMP (on complex aircraft)

S - Seat belts and shoulder harnesses fastened

S - Switches: lights, fuel pumps, etc. on or off as appropriate

By using this mnemonic you will process everything the same way every time. After completing the flow, follow with the challenge-and-response to ensure everything was complied with appropriately.

Both methods of checklist usage subscribe to the following policy:

- When beginning a checklist always states the name of the checklist being performed, do the checklists, and when finished state the name of the checklist again followed with the statement "... Checklist Complete".
- Follow down the checklist with you finger so as not to loose you place.
- If interrupted during the checklist routine and there is any amount of doubt as to where you place is in the checklist, simply restart from the beginning (and state you are starting from the beginning).
- The "Two-Challenge" rule will be used for all flights. This rule provides for automatic assumption of flying duties when any crew member fails to respond to two consecutive challenges.

Up to now we have been describing checklist usage in a two-person crew. So how does a one-person crew perform the checklist? Simple - since there is no PNF the pilot will state the checklist needed and then perform the checklist either by the Say-Do or Flow-Confirm method with the appropriate challenges and responses. It is just as important in a one-person crew to verbally state everything in the checklist just as in a two-person crew. Human beings are more apt to falsely assume they have accomplished a checklist task when read and followed mentally as opposed to being carried out verbally. When the checklist is verbalized we are much more likely to catch omissions or mistakes even as a one-person crew.

Some checklist items are easily understood as to when and how to be used, but a couple of specifics need to be addressed. First, the in-range checklist is to be accomplished prior to reaching the terminal environment whether it is entering the local traffic pattern or contacting a control tower. Within the in-range checklist is the approach and landing briefing which is where

the landing (normal, short, or soft) is to be briefed. The before-landing checklist is the checklist to be used in the pattern. Typically you will call for the checklist somewhere on downwind, perform the flow, and then execute the challenge/response shortly after rolling wings level on final. Secondly, it is understood that you cannot perform a checklist while doing certain flying tasks such as the takeoff. The takeoff checklists are arranged so that the first set of items can be checked prior to applying power (sometimes referred as 'down to the line') and the rest after airborne as soon as conditions allow. With these checklists you will call for the takeoff checklist just prior to entering the runway, run the checklist 'down to the line', *brief* the items 'below the line', enter the runway and execute the takeoff, and then run the checklist items that are 'below the line' as soon as it is safely practical to do so.

Another item to address is the checklist responses of 'SET' and 'AS REQUIRED'. When the printed checklist response is 'SET' the verbal response is not just the word 'SET' but also the condition. For example, if the checklist item is 'Flaps.....SET' and the flap setting deemed best is 0° then the response should be 'SET ZERO', not just 'SET'. In similar fashion, the printed response 'AS REQUIRED' on a checklist is not included in the verbal response. Rather, the actual condition is to be stated. For example, if 2300 RPM is deemed the best power setting for the state of flight and the checklist item 'Power.....AS REQUIRED' is called then the verbal response should be just be '2300 RPM' – the words 'AS REQUIRED' are not used.

Let's review and summarize by asking again "How do you properly use a checklist"? It's easy. You start by stating the name of the checklist, perform your flow, state each challenge and response, and finish by stating the name of the checklist again along with the confirmation of "... Checklist Complete".