

Flight Planning in the modern age.

More and more people are using flight planning software and apps these days. The problem with that is some gaps may start to appear in some basic skills. There are a lot of people who would immediately respond to the previous sentence by suggesting going back to paper maps, wizz wheels, pencils, compass, rulers and dividers. I am not of that school and am quite definitely a proponent of Electronic Flight Bags (EFB). I believe these holes have appeared due to a lack of training. A responsible flight school/instructor will add the teaching of EFBs as part of a syllabus, even though it seems to still not be specified in the Manual Of Standards (MOS) by CASA. The wording in the MOS is still taken to exclude EFB but I think this is just an issue of interpretation. When asked to extract information from WAC or other AIP charts, you can do that with maps in any format as long as they are an approved source (eg Ozrunways or Avplan). When asked to use "a navigation computer" or "calculate" there is also no reason that this can't be done using a recognised/approved electronic calculator as opposed to the manual slide rule. The problems that have seemingly arisen could be attributed to so many people adopting EFBs with minimal training and very few training syllabus catering for this modern approach. I firmly believe that flight schools and instructors have a responsibility to look at how the student will fly post-training and adapt training to suit. There is no merit in training and assessing on paper maps and wizz wheels when that person will not use them once they walk out the door and will try to figure out an EFB by themselves in flight. It's not only the use of the EFB itself that needs to be taught but also how to incorporate it into operational flight, cockpit management, organisation, placement and the like – eg Single Pilot Resource Management (SRM) or even under the banner of threat and error management. All of these bugs should be ironed out while there is an instructor on board for a bit of added safety.

One of the reasons I believe the use of EFBs has not progressed to where it should be is a lack of understanding of their workings. In order for someone to prove competence to training or testing personnel, a student must know how to demonstrate that they know how to flight plan – NOT just how to put data into an app. For example, when asked how fuel calculations were derived, "I put the correct times into the downloaded aircraft profile" will not suffice whereas "when I created my aircraft profile in my app I referenced the POH to get this (point to it in the POH) fuel burn figure and then the app calculated on the time I put in and it also satisfies a reasonableness/rule-of-thumb/idiot check" should suffice. Generally, a thorough knowledge of how your app arrives at its calculations will satisfy the learning outcomes you are being assessed against. If using an app then it also removes some human factors issues in calculation, transcribing, precision etc and (once understood) makes quick and accurate flight planning a dream. You just need to be aware of the new human factors it introduces and address them using the threat/error model as an example. All of these items could be separate articles in themselves but the crux of this article is just planning a flight and tips on how not to let the app fly you into trouble.

In order to look at this process, let's look at a simple flight plan in general terms. The terms will be kept generic so the theory can be applied to any location as required. You all know the local nuances of your areas so you can simply apply those to this basic framework. Let's start with a basic plan – I want to go from A to B.

I know there are many ways where you can put a departure and destination into an EFB and it will suggest routings for you. The problem here is this is where a lot of people start letting the iPad fly them. Keep it simple and just put your departure and destination in as a direct route (I used to do this on either WACs or ERCs to have a look at the route and get a general feel for it). With the EFB you now have a line on a map that allows you to easily visualise the rough route and any complications it may throw at you. You can zoom right out and have a look at the entire route and where on the map it will take you and, at this stage, just look for big things like the EFB trying to take you right across Sydney, through a large restricted airspace or over a large body of water. Your app may even have a feature that will allow you to view the PRDs for the route so this will come in quite handy. Each of these considerations has its own unique requirements that you should consider now. Do we cater for them? Do we plan around? If you decide to plan around areas then keep them in mind for when you start to amend the route in a moment.

Now that you have the big picture in your mind we can start to zoom in. Let's look at the departure first. Are there any flight planning requirements that need to be satisfied such as in AIP, ERSA flight planning requirements or AIC H22/15? Are you IFR and should plan from airport to navaid and then on (eg YBAF AF LAV.....)? Are you VFR and have a specific departure procedure (eg YBAF LMC)? Have a look at departure altitude requirements. Will you need to dodge any restricted areas or be careful of flight training areas? Have a look at local weather and NOTAM at this stage and see if your departure plans are possible and compliant. Now you can amend your route from your destination, past these points to your jumping off point where you transition from the terminal phase to the enroute phase of your flight. Once you are fully briefed on your departure you can move on to your arrival at destination.

Does your destination have specific tracking requirements like those mentioned above? Just like you would have done with the departure, pan and zoom the EFB map (such as a megaVFR or similar) and have a good look around. Do you need to plan by a STAR or another arrival route? Is it better to comply with local traffic flows for ease and safety? Consider all of this and also go and look at the weather and NOTAM and see if this destination is achievable for you within your personal minima. Any points or routing that need to be added at this stage can easily be done graphically by some means – usually pressing and holding on the map or bending the route to add a new point to the flight plan. You can now do this so you have an appropriate route from where you transition from the enroute phase back into the terminal phase.

Now that we have the departure and arrival all sorted out we can go back to the bigger picture of the enroute segment. First, zoom in a bit and have a look at terrain, heights, lowest safe altitudes etc and see what limitations you are dealing with. Then have a look at the weather and see if cloud, icing, SIGMET, head office NOTAM, FIR NOTAM (eg YBBB/YMMM), or anything else is going to present you with level (or even routing) limitations. Now, considering aircraft type, you have a selection of levels you can operate so choose a correct hemispherical one that suits you. At this stage you can also consider winds and fuel burn and choose an appropriate level (some EFBs will help with that even).

You now have most of the big picture so you can do a bit more amending and graphic rerouting via waypoints as appropriate along the route. Here I tend to look at what routes I should be travelling on, what restricted/controlled airspaces I come near and want to avoid a bit further, what navaids I want to track over, how long direct legs by GPS are and if they are AIP compliant, etc etc. I can also assess how far off track each of these little graphic re-routes takes me and if that is feasible. The other thing I tend to look at here is major traffic flows and whether I want to join them or avoid them – for example, trying to join major routes that RPT use may result in delays and a simple re-route away from them may make your flight a lot smoother (and quicker if you avoid holding or denial of a clearance!).

It should have already been in evidence by quick rules of thumb but you should now consider if you need any fuel stops. If you are ever unsure, always plan for a stop to stretch the legs and adjust the fluid balance in both the fuel and bladder tanks (a largely ignored human factors issue that is often overshadowed by a hairy chest – yes you too girls!! – and press-on-itis). Once you have made some more accurate assessments of your needs in flight, it is always easier to overfly a planned stop (simply proceeding straight to the next stage of your flight plan) than to try and divide a single plan and add a stop in (where essentially a further stage needs to be created from scratch).

A full fuel plan and weight-and-balance should be calculated and you can do that using the app if you like. There are a few traps though. For every aircraft profile you use, you must make sure it is your own. When loading an aircraft into an app for use, don't just download a similar one and use it as a template. You need to go through templates like this with a fine tooth comb and amend everything to fit your particular aircraft. A more accurate method is to simply create your own from scratch and that way you will know everything is exactly right. Not only is this for safety but also so when your instructor/examiner asks how you came to get those calculations you know exactly where and how the figures were derived and can justify them. Trust me, an answer of "I dunno, it was in the download" does not actually demonstrate any competency in the MOS! Another trap is knowing how to use your app for this properly – for example, in Avplans aircraft loading don't just put weights in the blank holes, use the "persons on board" blue hyperlink and add people properly (names included) as this will give you a proper load sheet to use.

A few more points are to review the weather/NOTAM just before you go and submit a flight notification. The weather/NOTAM should be easily accessible in your app and some will even draw where troughs etc are on your map for you. I have also noticed that the latest update has mine decoding the weather into plain English – brilliant. Consider all of the weather and use the same segments I mentioned before – terminal phase (can I get out of here), enroute (cloud, icing, turbulence etc), and terminal (can I get in at the other end). Also of note is my use of the term Flight Notification. I have come to use this correct term for our NAIPS submission more often so it is not confused with a flight plan – which is what I have described above. Just because you have submitted a "flight plan" (flight notification) does not mean you have planned the flight.

There are many more details that could be probed but I do have a word limit so let me make a summary and a few final points. By now you should have:

- Set up your app properly and know how to use it

- The big picture of your intended flight
- Examined the terminal phases (departure and destination) including weather and NOTAM
- Examined the enroute phase including weather and NOTAM
- Made a fuel plan
- Done a weight and balance, and
- Submitted a flight notification.

Once you have this process embedded it will be easier each time and the same theory can be applied to paper planning when you need to (or just don't fly when that happens....:)).

Now you can go and fly your plan!

Don't forget that you are using an EFB – this is an approved version of maps and charts. As you will have seen above I refer to either an app or an EFB. I consider the EFB to be the part that has the maps and charts and the app to be the part that has the associated flight planning tools and other toys which are fantastic but are above and beyond the basic EFB function. Learn to recognise when you are using the app or EFB part – if you spend too long in the app part you are probably missing some basics.

Remember to select the correct mode before you go (eg switch from 'plan' to 'fly').

Preserve your battery. Keep the device cool. Don't let it float around the cabin. Don't leave it in the sun. Whenever you are in range, update the weather/NOTAM. All of these basics can be forgotten due to a bit of familiarity or complacency and they can cause big dramas.

Some apps will also upload your flight plan to your aircraft. If you do this also recognise the threats/errors and do some checking of the data that was transferred against your actual plan.

Also remember it is an EFB, not a replacement for all aircraft avionics and systems. If you want a map of the area then select it, zoom to where you want, lock the screen, stop stuffing around with toys and use your map to navigate. The app may place an approximation of your position on the approved map but this is not an approved means of navigation – look outside or use your avionics for that. Many people infringe airspace as a result of this.

Finally, always have a backup and chargers. Yes I know what the rules say and how people interpret them but a prudent pilot will have a backup, be it a few bits of paper or another ipad (and in this case a maintained, updated and charged ipad not the one the kids are using in the back seat). This may seem simple but I have seen a lot of people try to wheedle a way around it by interpretation of rules or gossip. It's not worth it as it can be the difference in calling home when you land or the police knocking on the door with a somewhat more sombre message.

So please, use these devices as they are of great benefit. Use them properly so we can progress their use and acceptance. Encourage your instructors to help you learn them. Most importantly, use them as the great tool they are to help YOU plan, fly and enjoy!