Reflections on becoming an Instrument Rating Instructor

by Paul Sherry

Why did I decide to take the IRI (Instrument Rating Instructor) course? For some inexplicable reason, I have always been interested in the idea of acquiring an instructor qualification to add to the list of other ratings that I have on my licence. Maybe it is the slowly advancing years and the realisation that I am notably nearer to the end of my career (as an orthopaedic surgeon) than the beginning. Maybe it is giving some thought to what I might actually do in 'retirement'. Maybe it is just that I love flying and am always looking for new challenges.

So, in 2016, I finally managed to find some spare time and take some annual leave to try and fulfil this personal goal. The editorial team of IP, always looking for a willing volunteer to put finger to keyboard, encouraged me to reflect on that experience and the result is this article.

The Commitment

Before starting out on any aviation venture, it is probably sensible to undertake some research on exactly what is involved – not only to include the time and financial investment required but also any additional requirements such as homework, preparation for any exams (in the case of an instructor this is called an Assessment of Competence), etc.

For the budding instructor (and indeed for any issues regarding to Flight Crew Licensing) the relevant information is all contained with the snappily entitled Commission Regulation (EU) 1178/2011, most recently amended 8th April 2015. It is easily located either on the EASA website or through an internet search engine. Subpart J (Instructors) outlines the requirements. I had decided to combine the IRI course with both an SEP and MEP CRI (Class Rating Instructor) course. So, in my situation, the appropriate sections are FCL.905 CRI through to FCL.940.IRI Pages 104-106.

The training course requirements from FCL.930.IRI are:

1. 25 hours of teaching and learning instruction.
2. 10 hours of technical training, including revision of instrument theoretical knowledge, the preparation of lesson plans and the development of classroom instructional skills.

3.(i) for the IRI(A), at least 10 hours of flight instruction on an aeroplane, FFS, FTD 2/3 or FNPT II

3.(ii) and 3.(iii) apply to helicopters and airships respectively so are not quote here.

It should be noted that there is cross-crediting the 25 hours of teaching and learning instruction – in other words once an instructor has done it once, they do not have to do it again for other instructor certificates.

1. and 2. above would suggest that the classroom element of the work totals about 35 hours, of which 25 hours are generic and 10 hours specific to the IRI course. 25 hours means, effectively, the best part of a working week allowing for suitable breaks and taking things at a sensible pace. For several reasons, I selected On Track Aviation at Wellesbourne as the school that met my specific needs. On Track Aviation very clearly state that they work 09:00 to 17:00 Monday to Friday and they usually take 3-4 days to cover this part of the course. However, the approach to this is not proscriptive and it may well be that other schools take a different approach, with evening and weekend teaching.

When it comes to the flying, 10 hours is required. Almost every pilot (myself included) believes they can easily fly three times a day but I think if we are honest with ourselves, something closer to 2.5 hours is a sensible practical limit. Practically, this equates to two flights a day – one in the morning and one in the afternoon. It is not just the flying (certainly for the instructor course). Firstly, there is the briefing. Am I really sure I know how to fly a hold, including the entry, wind correction angles, timing adjustments, gates, allowance for dip, etc? If I do know it, can I explain it to someone who isn't so sure in a way they can understand and take into the air for the exercise? A substantial part of the course is learning how to structure a flight and get the right outcome for the student. Then there is the debrief – both from candidate instructor to 'student' and then from the instructor to the student (candidate instructor) as to how the 'student' debrief was performed and how it could be improved.

So, if a pilot is taking only the IRI course then I would suggest that a two week block of time is sufficient to cover all elements of the course including classroom instruction, flying and the final assessment of competence. This does of course depend, to some extent, on the weather and aircraft availability. I decided to add the SEP and MEP CRI qualifications – just short of an extra week.

Choosing a School

Approved Training Organisations (ATO's) that have the relevant authorisation for the IRI are not easily found – there are not that many of them about. Thus, I spent some time discussing this with other instructors and examiners and On Track Aviation at Wellesbourne was repeatedly reported as excellent. It proved to be a good choice for me and I was not disappointed.

The needs of a student are many and varied and I believe it critical to define your individual requirements and limitations at the outset. With that in mind, research and choose a school that recognises the practical realities that affect us all and makes sensible efforts to work with your requirements. In my situation, taking the 'odd day' off work here and there simply does not work well, it is better to block out a week of time from the daily schedule and immerse myself in the process - morning, noon and night. Of course, others may have different needs but provided they are clear and defined at the start, then it gives your chosen school a better chance of meeting them.

At the time of doing the course, I did not have easy access to an aircraft, thus selecting a location within reasonable driving distance was certainly a consideration. Wellesbourne is situated just south of Birmingham and an acceptable drive from my home in Knutsford, Cheshire. My plan was to drive down very early on the Monday of any given week, stay overnight in a B&B from Monday to Thursday and drive back home

on the Friday evening.

I eventually settled on doing the course at On Track Aviation in two parts – one week in March for the teaching and learning (principles of adult education) and then a block of three weeks in June for the flying element. It should be noted that, alongside the IRI course, I also wished to complete the CRI (Class Rating Instructor) for both SEP and MEP. Doing three courses at once added to the time requirement but when one is in the instructor learning mode, it is not really so much additional work. I originally intended that the three week block in June would be one week flying, then a week off, then another week flying. I ended up using 3 days of the middle week to do some flying to stay on schedule.

In summary, when choosing a school, reflect on how you learn best. Then communicate clearly with your chosen school to explain your needs and your practical limitations. I should say that once I had established a good channel of communication with On Track Aviation, I had explained the issues and we had agreed dates, then everything I had asked for was delivered on the date it had been booked. In aviation, that is a rather unusual experience and On Track Aviation are to be commended for their thoroughness and attention to detail.

Pre-entry qualifications

It is a rather trite statement but it is wise to just confirm that any applicant for an instructor rating meets the entry requirements for any chosen course before committing the money. For the CRI SEP, there is a minimum requirement of 300 hours PIC, with a minimum of 30 hours on the applicable type or class. For the CRI MEP it is 500 hours PIC with a minimum of 30 hours on the applicable type or class. However, for the IRI an applicant requires 800 hours IFR. In the 'old days' the UK CAA would allow 1 hour of genuine IMC to count for 4 hours IFR which is much more achievable practically. PPL/IR Europe is lobbying to have this very restrictive demand changed to something more appropriate to the GA IFR community. Whilst UK pilots holding an IMCr/IR(R) can genuinely claim IFR hours outside controlled airspace there is no such capacity on continental Europe so this effectively limits the pool of possible instructor candidates to the commercially qualified community as only the most enthusiastic and active PPL IR holders would reach the 800 hour IFR threshold as part of their normal flying activities.

I have been fortunate to own some aircraft that are in their natural environment under IFR so have thus logged up an adequate amount of hours that count toward the course. I also added an IMCr qualification to my licence fairly early on in my flying career and was wisely advised by my then instructor, Brain Pownall, to keep a thorough log of my IFR hours. Even with all the above, it required some very careful calculations to ensure that I met the minimum entry requirement. Indeed, when I added it all up it came to about 837 hours IFR – phew…! That's why I had to wait until 2016 having first got my basic PPL in 1999.

The Course

There are broadly two parts to the course: theoretical (generic teaching skills) and practical (flying).

Theoretical

Our instructor from On Track Aviation handled the theoretical (teaching how to teach) part of the course very well. It could easily have been 'death by Powerpoint' but it was enjoyable, engaging and a good opportunity to practice our ground instruction style. It was done in the usual aviation process of 'give' and 'give back' i.e. Simon would perhaps give a summarized presentation then we would be tasked with putting something together, presenting it and then receiving a critique. This is also beginning to introduce the candidate instructor to the process of constructive criticism – how to break down a performance by a student and give appropriate feedback. Another new skill to learn…

I have been fortunate to spend a significant part of my professional life involved in teaching at some level – students (medical, nursing, allied health care professionals), as well as junior clinical staff. Preparing lectures and tutorials is a common requirement for senior clinicians and many of us have stood up on our feet in front of conferences and had to give presentations – both short and long. However, not everyone has been presented with the same opportunities that I have enjoyed and some might approach this part of the IRI course with a little trepidation. It does need a little work and application but it is perfectly achievable and certainly not to be feared in any way. In fact, being taught how to organise your ideas with some structure, put together a few well constructed slides or prepare a whiteboard and have the confidence to stand up and present to an audience is a skill which many will find useful in other life spheres. There are some basic principles which, if followed, will result in a moderately predictable outcome. It can come across as a little formulaic but that is where the natural enthusiasm and wider background knowledge of an experienced PPL IR can make the difference.

The 25 hours of teaching and learning instruction is generic and need only be done once and it applies equally towards all instructor certificates. A course completion certificate is required which is forwarded to Flight Crew Licensing at the CAA as part of the application for the instructor certificate.

Flying (the 'fun' bit; well, actually the whole course was fun!)

On Track Aviation does not have access to any approved synthetic training device so the minimum 10 hours of flight instruction was spent in the right hand seat of a fairly basic Piper Archer fitted with the standard analogue '6 pack' and a single, non-WAAS, Garmin GNS430. Having recently been used to aircraft with slaved HSI's, electronic Primary Flight Displays, Multifunction Displays and as many glass screens than one could wish for, I found it challenging to go 'back to basics'. That having been said, I came to understand that, as an IRI, I would need to learn to be able to adapt my instructional technique to whatever equipment is fitted to the aircraft in which I would be teaching. So, starting again from the basic analogue installation was a valuable lesson.

Appendix 6 of 1178/2011 informs us about the training course for the IR which an instructor needs to be able to deliver. It is divided into two parts – the Basic Instrument Flying Module (BIFM) and the Procedural Instrument Flight Module (PIFM).

The modular IR for the single engine aircraft is a 40 hour course. The BIFM is, in theory, the first 10 hours and the PIFM makes up the balance. I would strongly argue that being able to teach the basic instrument flying skills properly is critical to success in the latter part of the IR. In other words, get the basics right and the rest will follow.

The first thing I had to learn in the Piper Archer is how to fly the aircraft, on instruments, from the right hand seat (with no instruments in the P2 panel) and then

how to teach the person in the left hand seat how to do it. Allowing for parallax is a significant challenge for the more traditional instrument set up. For example, working out whether the aircraft is in proper balance is not so easy when one is looking at the balance ball at perhaps greater than 45 degrees to the face of the instrument. However, after a while one starts to get used to what is normal when looking across the cockpit. I also discovered that I had become a little lazy having got used to a large electronic PFD and Flight Director so it took me a while to adjust to using a standard round attitude indicator (AI). Nonetheless, it was excellent practice to be forced to focus properly on the AI, quickly pick up and immediately correct, any deviation from the desired attitude. I can assure anyone who takes the course that, unless their own instrument flying is already top notch, they will rapidly see a step change in their own psychomotor skills. This could be a reason all on its own to take the IRI course.

Getting the basics right and ensuring that your student has a proper understanding of what they are actually trying to do when performing basic handling on instruments is, in my opinion as a very inexperienced IRI, a critical building block. Being able to get the aircraft to do exactly what you want it to do without having to work too hard is essential when one moves onto the procedural section. An example - flying a hold should, in theory, be easy. It consists of straight and level flight for one minute holding a pre-selected heading within tolerance, a level 180 degree Rate 1 turn holding altitude, another one minute of straight and level, and then another level 180 degree Rate 1 turn. It sounds easy and, in theory, it should be. If the BIFM has been correctly taught and the basic principles properly embedded then it should present no major challenge.

I am sure if I took a PPL student who had completed their basic instrument flying skills and talked them through the above without any distraction they could manage it quite successfully. But throw in a holding fix, an entry, a wind that isn't quite what was predicted at the planning stage or a runway change leading to an unplanned hold in the opposite direction, a slightly out of sequence or unexpected instruction from air traffic control, then that is when significant spare mental bandwidth is needed. And that is whilst having the aircraft perfectly in trim, at the right speed, at the right altitude without having to think about it too much becomes important.

One controversial area is trimming in the turn – do you or don't you? I was always taught by John Dale to trim in the 180 degree turn for the hold and it works for me. I roll into the turn, tweak the elevator trim by the correct amount (which I have previously found by trial and error during the BIFM) and then reverse the procedure on the exit. This means (for me at least) that when I have to 'do something' in the turn, re-tune a radio, write down a clearance given by ATC, for example, then that momentary attention taken away from flying the aircraft, does not result in the nose dropping and me suddenly finding I am 50ft low trending toward going out of limits. Some instructors disagree. Actually, it doesn't really matter – it is the output that matters. So, I brief students on both techniques and let them choose which one works best for them. That is what the course is there to do – to allow you to develop your own personal instruction technique.

The same is true of being able to produce consistent performance of the aircraft in a climb or descent. On the course I got the opportunity to experiment in a more detailed way with what power settings produced what performance. The Archer had a fixed pitch propeller and it is a broad truism of such aircraft that, if one reduces the RPM by around 500, and does nothing else then the aircraft will settle into a 500 fpm descent at the same speed and without touching the trim at all. Reverse the process and the aircraft will smoothly level out – again not requiring much, if any trim change. For those aircraft with constant speed propellers the same effects can often be achieved by reducing the MAP by 5 inches. Reinforcing this natural aircraft behaviour is key to making life easy for the instrument pilot. And the easier one makes the basic flying, the more capacity is left over to deal with all the other matters arising. Embedding this behaviour makes the PIFM much more straightforward.

For example, on the last day of the course, we had about 45 minutes to 'fly off'. We went to Coventry to do an SRA. I was 'demonstrating' from the right hand seat. We established the inbound track which worked quite well and I started the descent at 4 miles by reducing power by 500 RPM with no trim change. The aircraft settled, as predicted into a 500 fpm RoD. At 3 miles we were spot on the ground track but 50 ft above the vertical profile. I reduced power by 100 RPM and the descent rate increased by 100fpm. At 2 miles we were spot on the profile so I re-introduced 50 RPM – and it worked. No trim change, no control column movements of note – just a proper understanding of how the aircraft flies and letting it do the work.

My instructor from On Track Aviation, Stephen Thompson, was excellent and made it fun, enjoyable and instructive of course.

The Test (or Assessment of Competence (AoC))

Let me let you into a little secret known to many examiners. There are three types of candidate – those that are going to (almost) definitely pass, those that are going to (almost) definitely fail and those where the examiner is unsure. Of these three scenarios, which do you think gives the examiner the most work? The answer is the marginal candidate as it means the examiner has to pay attention the whole time and concentrate!

A candidate (for any exam) that is well presented and gives the impression of being well prepared immediately puts the examiner at their ease. No examiner that I have ever met can keep high levels of attention for an extended time period and thus the candidate that has already made a good start may well be able to make small errors without them being noticed.

As an examiner in the medical arena, the question I am asking myself is would I be comfortable if the candidate in front of me was involved with treating a friend or family member? Am I really concerned if a few minor errors are made which have no significant influence on the overall performance? The simple answer is 'no'. It is highly likely that aviation examiners are much the same and are looking for overall captaincy (which is slightly hard to define). If the examiner needs a reason to fail a candidate then one can always be found but it more likely reflects a lack of confidence on behalf of the examiner in the overall performance.

The AoC for an instructor consists of 3 parts – the long briefing, a flight assessment (including a preflight and post flight briefing) and an oral exam. The latter can be fairly wide ranging for the budding IRI.

The long briefing has to be prepared in advance and pre-agreed with the examiner. It lasts about 40 minutes; it is timed and is followed by Q&A. It may be delivered to an audience (students, other examiner candidates, etc.) or just the examiner.

Feedback is given on content, accuracy, delivery, use of visual aids, etc. The majority of candidate instructors use Powerpoint but nothing is proscripted.

During the flight one may be asked to demonstrate, 'patter' or teach a certain skill. There is usually a combination of all three. The candidate might be asked to demonstrate a fully developed stall and recovery that means just flying the exercise with no audio commentary. The examiner is assessing the quality of the demonstration. The next step up is to 'patter' which means, effectively, to demonstrate the skill but with an audio overlay – 'we are now approaching the NBD, you can see the needle falling as we overfly the beacon and now I am starting a rate one turn to the right as well as letting ATC know we are taking up the hold at 3000 ft'.

The most demanding (to me at least) exercise is to teach a skill. This means breaking it down into its component parts and then letting the student have a go. All the examiners are experienced and will undoubtedly throw in a few errors – some minor, some major – to see what happens. How does the candidate instructor respond? Does he correct the error then and there and let the student have another go? Does he note it down and cover it in the debrief?

Finally, it is time to head home and then comes the debrief. What went well? What could do with more work and preparation for next time? The debrief morphed into a fairly extensive oral evaluation which covered a wide range of topics including technical aspects of instrument flight (how VOR's work, what are the errors in an AI, where to find certain information in the AIP, etc.) through to issues related to instruction and paperwork. The latter is considered an 'open book' section. It is not necessary to know the answer to everything – just where to find the answer.

Conclusions

This is a challenging yet rewarding course: One must make a significant commitment in terms of time, money and energy. The effort involved in the theoretical part of the course is not to be underestimated and the 'fun' flying part certainly highlights any deficiencies you might have in one's necessarily significant experience. Having said that, it's very rewarding too - I have a better understanding of how an aircraft performs and how to make it perform in a way I want with the minimum of control input and importantly, how to explain and teach all this to a student. Teaching is in itself rewarding and teaching something you enjoy is doubly so. So, if you're wondering what to do in your retirement – I hope this is the answer at least for me.

Events

"Weather to Fly" Seminar

Teuge Airport (EHTE) SkyDeck Hangar

21st - 22nd January 2017

hosted by AeroPlus Aviation in association with *PPL/IR Europe*

Sjoerd Jan ter Welle/AeroPlus Aviation, in association with *PPL/IR Europe*, is hosting a "Weather to Fly" masterclass. The first Dutch "Weather to Fly" event in 2014 was well received with over 120 participants.

Our objective for this weekend event is to bring pilots the latest in weather planning and monitoring information. Numerical weather models such as the GFS model are providing pilots with new ways to look at the weather. Nowcasting and cheap datalink satellite weather solutions offer crews a way to stay up-to-date with the latest weather developments even during flight.

This time, together with *PPL/IR Europe*, the range of topics is expanded to cover IFR as well as VFR weather. In particular, Alan South will present a major 3-hr instrument weather seminar and Jason Carley will talk about flying in remote areas such as Greenland.

The basic cost of the 2-day seminar is €95 per participant and covers:

- A full 2-day event ticket
- BBQ party, food buffet, beer, house wine and drinks on Saturday night

Not included are:

- Landing and aircraft parking fees at EHTE - special negotiated rates can be booked during registration
- Hotel accommodation - https://www.vandervalkapeldoorn.nl/ - special negotiated terms can be booked during registration
- Sandwiches and coffee during the day on Saturday and Sunday.

Full details of the event can be found at: http://www.aeroplusaviation.com/events/weather-fly-aviation-event where you should register and book your place.

Answers to the Quiz on page 20

1. RNP-1 means Required Navigation Performance, where the accuracy of the system must be within one nautical mile 95% of the flight time and where there is on board performance monitoring that will alert the pilot if the accuracy deteriorates so that there is a greater than 0.001% chance that the flight will be outside of two nautical miles. GNSS receivers capable of achieving this utilise EGNOS. EGNOS is the the European Geostationary Navigation Overlay Service which is a satellite based augmentation system (SBAS) developed by the European Space Agency, the European Commission and Eurocontrol. It supplements the GPS, GLONASS and Galileo systems by reporting on the reliability and accuracy of the positioning data. The US augmentation system is called WAAS, Wide Area Augmentation System. RNP is an ICAO standard concerned not only with equipment but also with the aircraft and the pilot, both of which have to be authorised. A practical way of complying with RNP-1 requirements is to have a Garmin navigator with WAAS capability. Pilot authorisation to use RPN-1 does not apply in the UK but pilots should be trained to used the equipment.
2. The circle means that the waypoint must been flown over before making a turn.
3. Above 500 feet
4. 17 Degrees West
5. According to the SID plate the first leg must be flown in VMC above altitude 500 feet.