



>> SEVENTH IN SERIES

What's involved in...

The IMC Rating

Add safety, skills and scope to your piloting with the UK's unique rating

By Ian Davies

THE IMC RATING is one of those topics which splits the aviation community. Instrument Meteorological Conditions – what a mouthful! Is it a huge boost to flying freedom (given the UK's mixed bag of weather) or simply a siren call to the relatively inexperienced, providing false confidence and leading to shipwrecks?

We can look in the reference books and find the privileges the rating confers, but I can find no clear definition of its purpose. Is it really only intended as a 'get you home safe' rating when you unexpectedly find yourself facing non-VFR conditions? Or is its purpose to allow you to regularly fly in conditions which would ground the non-IMC holder. This is the root of the debate.

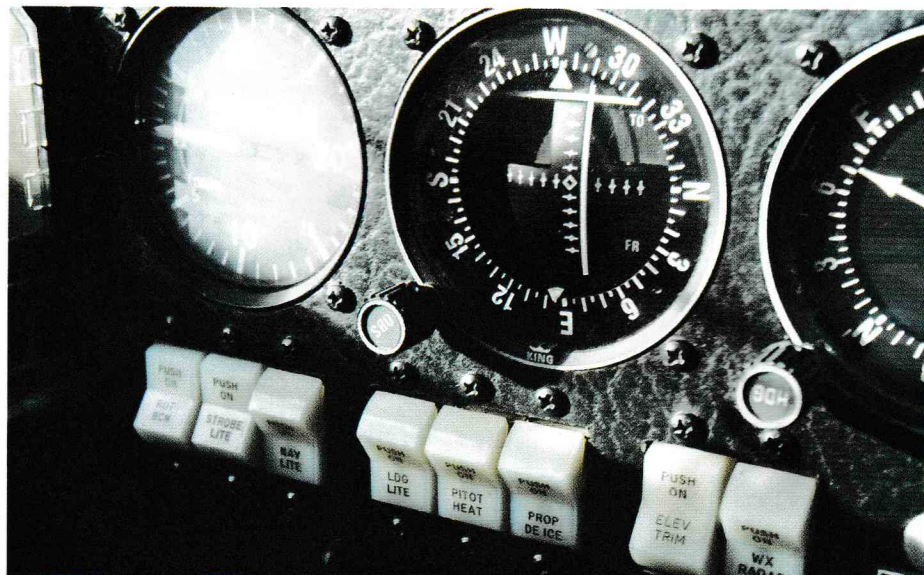
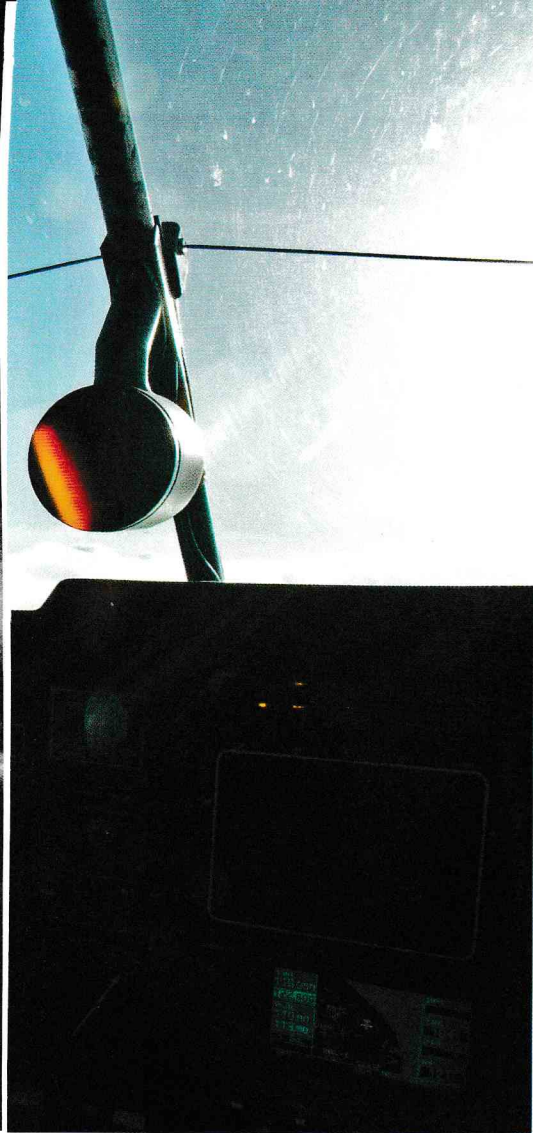
What is clear is that it is not intended to replace the demanding Instrument Rating. It doesn't permit flight in IMC in Class A airspace. Check possible flying schools at which to complete an IMC course and you will find their websites making statements such as, 'It is not a licence to take off, cruise and land in poor weather... it is more a get-out-of-jail card,' or 'The IMC Rating allows you to fly in much worse weather than a standard PPL'. Even the schools don't agree on the purpose of the rating.

Undoubtedly, the privileges are valuable in our climate. If you remain current with instrument flight you can improve safety margins by exploiting the main privilege, which is the removal of the need to fly in sight of the surface. Climbing into, or above, cloud saves

you having to grope around in low visibility at low levels.

The non-IMC rated pilot is restricted to flight in sight of the surface, flight visibility of 3 km outside controlled airspace, and 10 km on an SVFR clearance inside controlled airspace. If the flight requires compliance with Instrument Flight Rules, you are grounded. The IMC pilot gains the ability to comply with Instrument Flight Rules outside controlled airspace, to take off and land providing there is 1,800 metre visibility below cloud, to fly in the open FIR (Class G) with visibility down to 1,500 metres and to fly on an SVFR clearance in controlled airspace when visibility is greater than 3 km.

That is the legal benefit. The practical benefit is that the training prepares you to fly safely on



You will be expected to remain within half-scale deflection on the ILS



This ADF also has a stopwatch for timing holds

instruments and to deal with weather which could otherwise disorientate you. Even if you are flying visually in relatively poor visibility, if you can fly the aircraft accurately you give yourself more capacity to find your way around. The IMC also opens up the potential to climb through overcast and to experience a stunning cloudscape of undulating cloud-tops equalling any landscape. With a low sun the valleys and mountains of cloud can be picked out in relief by the pink glow. The non-IMC pilot is prevented from experiencing this delight.

WHAT'S INVOLVED?

The IMC course is a fifteen-hour dual course during which you need to spend ten hours flying by sole reference to instruments. At the end of the course there is a flight test. You will also have to pass a written exam and most schools will offer a groundschool to prepare you for this.

If most of your flying has been 'seat of the pants', looking out of the window and progressing via a series of corrections to hit visual waypoints, the IMC course is going to be either a bit of a shock or a valuable extension of your flying skills, depending on which way you look at it. If your flying has included regular scans inside the cockpit, maintaining an accurate height and heading, the transition to IMC style flying will be less demanding.

There's a range of skills and technicalities to

learn during an IMC course, but the greatest challenge is to unlearn the belief that the body and brain knows what's going on around it from what it feels. We are, and this is common to all of us, badly designed for spatial accuracy. Many of us will have tried the swivel chair trick where you put on a blindfold and sit on a swivel chair. A colleague rotates you and then after a minute - or far less - stops you. The chair is stationary but you believe that you are rotating in the opposite direction. Quite fun as a party trick but potentially fatal if you rely on your senses in an unusual attitude in an aircraft.

The primary input needs to be the eyes. The brain has to be convinced that what the instruments are telling you through the window of the eyes is the truth and what your body might otherwise be feeling is the result of a design fault in the human senses (at least a design fault for the purposes of instrument

flight). In the early stages of instrument flying this can be a difficult process.

After you have learned to rely on the instruments' ability to tell you what the aircraft is doing, you need to develop the capability of safely getting the aircraft to do what you want rather than simply following its own agenda. Straight and level flight and accurate rates of turn, without climbing or descending, using instruments as your only reference is the basic toolkit. If you are going to fly in reduced visibility this skill is paramount.

You must be prepared for things to go wrong - such as ending up in an unusual attitude without a visual reference, or some of the instruments packing up. Unusual attitude recovery requires a quick assimilation of what the instruments are telling you. What is the airspeed and trend? What about the climb



Plate and stopwatch. For procedures without a DME the student is required to use time to assess distance

and descent indicator? What does the artificial horizon or attitude indicator indicate? How about the turn-and-slip? If you know what you are looking for, it doesn't take a great deal of practice for the assessment to become almost instant. Similarly, the control corrections become close to reflex.

Instrument failure is normally a result of problems with the vacuum pump, which causes the DI and AI to give up (or read incorrectly). During the IMC course, the failure of these instruments is more likely to be due to them being covered by a special cover or one of those round pieces of rubber covered in small suckers used for holding a bar of soap in the bath! With these instruments out of the equation, you are reduced to compass, climb and descent indicator, altimeter, airspeed indicator, slip ball, and maybe an electrically-driven turn indicator. This basic set of instruments can tell you all you need to know. The presentation might not be as direct as you are used to, but if you time a rate one turn, you can calculate the approximate heading you will turn out onto, then make small adjustments with the aid of the compass. Maintaining a constant height is possible using the climb and descent indicator.

The second major element of the course is instrument-based navigation. Being able to control the aircraft with a reduced visual reference is life preserving but being able to find your way to your destination saves the embarrassment of landing at the wrong airfield or worse, having to put down in a field as your fuel dwindles.

The two forms of instrument navigation are pilot interpreted and controller interpreted.

Pilot interpreted aids include VOR, ADF, ILS, and DME (GPS eventually). Your course will teach you to plan using these aids and to fly a course by interpreting what they tell you. If you are used to GPS navigation, all of the other aids are less intuitive. The fly left or fly right indicator of the VOR can confuse if you haven't taken notice of the 'To' and 'From' flag. The VOR display becomes more sensitive the closer you get to the ground station. ADF is much less easy to interpret if you are using a basic ADF display as the needle simply points at the station; it doesn't tell you whether you are left or right of track, and it doesn't take into account airflow. If you simply peg the needle at the top of the dial and there is a cross-track wind you will fly a curved track. ILS offers a direct instruction for flying left, right, up or down and is possibly the easiest to interpret (though it takes some practice to fly accurately). DME on its own is of limited use - combined with a VOR, ADF or ILS, it can provide either a fix or a choice of two possible fix candidates.

Controller interpreted aids include RADAR and VDF. These can be used to provide position, en route vectors, or talk down approaches (in the case of RADAR) or your direction from a ground station (in the case of VDF).

On your course you will be expected to master route navigation using VOR and ADF, and to fly two different approach types.

As with all skills, early attempts will be poor and you will wonder about the wisdom of this

sort of navigation. Keeping the VOR needle where it should be, crossing the ADF precisely on the ideal four-minute mark during a hold, and maintaining the ILS crosshairs within limits - all are challenges which serve to induce sweat and swearing in equal measure, but as you relax you start to gain confidence in what you are doing and it all fits into place.

When you become rusty in the future, it's worth remembering how difficult it was in those early hours. Instrument flying is a skill which requires constant honing. When you are awarded your rating it is worth organising life to practise regularly.

In addition to the flying, there is a multiple-choice written exam with a 75 per cent pass mark. There are a number of books, videos, and software training modules to assist with the required study and most schools offer groundschool sessions totalling between 10 and 20 hours.

WHAT DO YOU NEED?

The starting point is a PPL, an NPPL won't do, it has to be a PPL issued in the UK.

The main flying requirement is to satisfy the experience minima laid down by the CAA. This refers to the minimum number of hours prior to applying for the rating, not the minimum number of hours prior to starting the training. You can, therefore, in theory at least, go straight onto the IMC course after completing your PPL. The hours requirement is for 25 hours as pilot since applying for the PPL, of which 10 hours need to be as pilot-in-command and 5 hours



Making a balanced rate one turn while maintaining an accurate height

have to be cross-country. These figures can include the 15 hours of IMC training. If you think you might complete 10 hours of solo during the time you are completing the IMC course, there is no reason why you can't embark on the course straight after completing the PPL.

The 15 hours is a minimum and you should allow for the possibility that your training will take longer. You will also need to allow 1.5 hours for the flying test.

SKILLS REQUIRED

The required levels of accuracy for the IMC test are more relaxed than the IR.

- Height in level flight: full panel +/-100 ft
- Height in level flight: partial panel +/-200 ft
- Height initiating approach go-around +50/-0 ft
- Tracking VOR +/- 5°
- Tracking ADF +/- 10°
- Heading full panel +/- 10°
- Heading partial panel +/- 15°
- Speed: full panel +/-10 kt*
- Speed: partial panel +/-20 kt*

*and not below threshold speed
 ILS half-scale deflection, glide and localiser

PRIVILEGES

The IMC Rating is a UK only rating and the benefits it provides can only be used in UK airspace. With European harmonisation there was concern that the rating would fade into oblivion but it remains as a national rating. Once obtained, it is valid for 25 months at which point you have to take a revalidation test. You also need to show evidence of having made an instrument approach of a type different from that which you complete on your revalidation (if you haven't completed an instrument approach during the 25 months, you can carry out two

different approaches on your revalidation). If you allow the rating to lapse by up to five years you can renew on a retest. More than five years and you will have to undergo further training, at the discretion of the CFI. Leave it more than ten years and you will also have to redo the ground exam.

- The rating allows you:*
- ** in Classes F and G, to fly VFR in visibility less than 3 km but greater than 1,500 m (1,800 m runway visibility required for take-off and landing);
 - ** in Classes D, E, F and G, to fly IFR down to zero in flight visibility, providing the aircraft is equipped for it; you don't need to be in sight of the surface; 1,800 m visibility required for take-off and landing;
 - ** for Controlled Airspace (including Class A designated as a CTR) to fly Special VFR down to 3 km visibility.

The rating doesn't allow you to fly in Class A CTAs or airways.

WHERE & HOW?

Most flying schools offer IMC training. The course can either be residential or ad hoc. Some schools will offer an 'all in' price, which includes groundschool, others will charge by the hour and make an extra charge for any groundschool you participate in. As with all forms of flying training, it is best to ask questions and feel comfortable with the training environment before committing to a school.

These are a couple of typical offerings, selected simply by thumbing through from the back of *Pilot*, looking for schools mentioning the IMC in their adverts.

Wycombe Air Centre www.wycombeaircentre.co.uk quotes a £2,480 course package (plus

charges for instrument approaches at suitably equipped airfields), with a 'free IMC simulator assessment' before you pay a deposit.

Mid-Anglia School of Flying www.masfcambridge.com doesn't quote a package price, most instrument approaches are available at the field, groundschool is considered part of the briefing, and there is the added interest of possible trips to try approaches on the near-Continent - that said, they calculate the total (for a minimum-hours student) is going to be fairly close to the package price quoted above.

Getting the IMC Rating is an investment in safety, skill and experience. Even if you don't plan flights where the privileges are necessary, it certainly adds another dimension to your flying - and makes you a more capable and, used sensibly, a safer pilot. ■

WHAT'S INVOLVED IN...



Aerobatics, Contest	Nov 06
Air racing	Aug 06
Ballooning	Dec 06
Formation flying	Oct 06
Precision flying	Jul 06
Tailwheel training	Jan 07