

THE JOYS OF VFR

Most of my route flying is IFR these days and so it was an interesting challenge to fly an hour's VFR across southern England recently. The need to fly visually arose because my destination, Wycombe Air Park, has no IFR approaches. I had

considered flying IFR to an instrument cloud break at Benson and VFR thereafter, but the possibility of falling foul of one of the forecast CBs from 1500 ft upwards was sufficient to discourage me. On the day, the cloud base was forecast at 1500 ft with excellent visibility, so going low level was a practical plan. The forecast winds were obligingly on the tail at no less than 30 Kts at three thousand feet. The downside of all this rapid movement of air was to be lots of turbulence at low level. On offer therefore was a day of sunshine and showers with strong winds and clear visibility. So long as you can live with the turbulence that is my idea of a fun day, scooting along at low level, threading your way between the showers and trying to keep your finger firmly on the right point on the map through all the bounces.

Vital to a satisfactory flight was the fact that the wind, although strong, was from behind. This meant that I could slow right down so as to cope with the turbulence and still make good speed over the ground. Manoeuvring speed on the Arrow is 110 Kts and flying at even less than that will give a yet softer ride through the bumps. At low level the wind would be about 20 Kts. Add this on to 110 Kts and you get a reasonable 130 Kts ground speed. On the other hand, if the 20 Kts were a headwind you would be looking at a ground speed in turbulent conditions of 90 Kts or less. I can recall various past experiences of bouncing along low level in a turbulent headwind, wondering all the while whether to slow down some more and go for less severe bouncing at the expense of an even drearier ground speed. These journeys have been sufficient to convince me that in a strong headwind it is better to accept a stronger wind at higher levels above five thousand feet and out of the surface generated turbulence. With any luck the increased true airspeed at higher altitude will tend to balance out the stronger headwind and even it does not do so entirely you can now exceed your Manoeuvring Speed without risk.

In spite of having studied for and passed all sorts of ground school exams over the years, it was not until fairly recently that the true meaning of Manoeuvring Speed dawned on me. For decades I have been able to trot out to examiners the definition of Manoeuvring Speed as being the maximum speed at which the aircraft can cope with full deflection of the control surfaces. I have entirely understood that if you were to apply instantly a full upward deflection of the elevator when flying at more than Manoeuvring Speed, you would overstress the aircraft. I have reduced to this speed when entering turbulence on many occasions and then reflected that the chances of my opting to apply a full control deflection in such circumstances were extremely remote. When the truth about Manoeuvring Speed eventually dawned on me I realised what a misleading definition it was. In plain terms, the risk is not that the pilot is going to apply suddenly a full control deflection, but that Mother Nature is going to simulate one. Imagine flying at maximum cruising speed. At this speed your angle of attack will be only three degrees or so, because with this speed of airflow only a small angle of attack

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is needed to generate sufficient lift to maintain height. Now forget about the possibility of your applying a full control deflection: you have resisted the temptation all these years, so why should you suddenly take it upon yourself to do such a foolish thing? What might happen instead, if you are flying in turbulence, is that you might run into a gust with a strong vertical component. This could momentarily change the angle of attack to the maximum lift value of, say, fifteen degrees. Assuming that at any given speed, lift increases with angle of attack in a linear fashion, which is very approximately so, the lift developed by your wing will suddenly have increased five fold. Or, to put it another way, your airframe has suddenly experienced a five G loading. If it was designed for only three G you have overstressed it. So a much more helpful definition of Manoeuvring Speed is that it is the airspeed below which aerodynamic forces cannot overstress an airframe.

So with nose well up in the air and forward visibility which even a Mooney pilot would have found rather limited, we wallowed along beneath the cloud base. We tacked around various storms, negotiated our way across Boscombe and Benson MATZs, giving Farnborough Airshow a wide berth and arrived in a splash of brilliant sunshine at Wycombe. I have to say that all that ducking and diving, that precision map reading, that business of deciding the next bit of the route as the current one was coming to an end, was enormously enjoyable.

The journey home next day was equally enjoyable. The wind direction was unchanged so that it was now on the nose, but it had died to about 10 Kts, and CBs were no longer on the menu. We could have returned IFR at flight level six zero but I wanted more of the previous day's fun, so home we went below the cloud base once more. The ravishing English countryside sailed by at the same 120 Kts ground speed, and once again the journey was completed in a single delightful hour.

Looking back on these two flights I find myself wondering whether I have been overlooking the attractions of VFR in recent years. These include a much heightened sense of speed, a greater chance to enjoy the scenery, a more interesting journey for passengers and a continual challenge in the navigation department. There is of course a downside as well. Because VFR is more demanding and tiring, routes lasting much more than an hour or so are probably best avoided. Turbulence will often present problems, particularly for passengers. And finally there is the risk factor. On our way home we met opposite direction traffic. I did not see the other aircraft until we were about five seconds apart and I am not sure that he ever saw us. It was not a heart stopping incident, but only two or three seconds later and it would have been. You can talk for ever about lookout, but the fact is that even the most conscientious pilots fail to pick out almost as many other aircraft as those that they actually see. While keeping a rigorous lookout will always improve your chances of survival, truth to tell, it is the very vastness of the sky that uncontrolled aircraft mostly rely upon for separation when they are outside the circuit or other heavy traffic areas. Fortunately the mathematical chances of a midair en route are very small indeed. In 1918 for instance, there were more aircraft flying around over southern England below ten thousand feet than there have ever been since. They were all uncontrolled, and yet en route mid airs were still virtually unheard of.

Aside from the possibility of a midair, however, the chances of an AirProx are very much higher and an AirProx alone is enough to spoil most people's day.

My considered conclusion, therefore, is that VFR can be more stimulating and more enjoyable than IFR but it can also be more risky, more tiring and less certain. Next time I have a route to fly of less than about one and a half hours, I shall certainly give serious consideration to the VFR option. Nonetheless, I shall not lose sight of the fact that usually IFR is more dependable, more comfortable, simpler and safer.

NEXT MEETING

Saturday, 31 October, 1998, at Cranfield Airport (EGTC)

This meeting, which is being organised by Naomi Kelman, will start at 10.00 a.m. and end at about 3.00 p.m. Lunch will be available. While the exact agenda is not yet finalised, it is hoped to include:

- Transatlantic crossings
- The Instrument Weather Rating
- Dealings with Air Traffic, especially around London.

All are welcome. If you would like to attend what promises to be a very stimulating day, please send your name and contact details, and how many will be in your party, to: Naomi Kelman, Fax +44(0)171-240-1523. Tel +44(0)171-352-5823. E mail. <NayK@aol.com> If you will be arriving by air, please also include your Reg and Type. See you there!

REPORTS

THE REIMS WEEKEND

Ole Henriksen reports:

On April 24th through 26th, AOPA France held their annual member's meeting at Reims Prunay airfield. A PPL/IR forum was also held, and in addition to the meetings, tours of the Reims Cessna factory, which is resident at the airport, and of a nearby Champagne producer were arranged.

Present from the PPL/IR Network committee were Claude Leprince, our AOPA France liaison; Nicholas Dawney; George Irvin and yours truly. Nicholas took the long view and arrived Friday while George and I flew in separately on Saturday morning and were awarded with a good IFR experience.

The Approach

Prunay has a published VORTAC approach off the REM (Reims) VOR 7.5 NM to the northwest, but in view of the following note on the approach plate: "*APP and Aerodrome Control not provided on this airport. Pilots are responsible for the safety of their aircraft after the initial approach*" I must admit having considerable reservations as to how this would work on a busy Paris morning in the marginal weather which was forecast. French ATC, in my experience, is more noted for its *laissez-faire* than for its efficiency.

But on this Saturday morning we had the best of both worlds. Paris Control and de Gaulle Approach were their usual laid back selves (and, boy, have some of those lady controllers got voices that do things to a man), but it soon became clear that the considerable number of aircraft descending IFR on Prunay were being dealt with most efficiently.

It wasn't to everyone's liking, but I enjoyed the way we were shepherded into the REM hold and descended as if we were transatlantic early morning arrivals into Heathrow. Only difference was that we did not have an ILS at the end of the stack, but a procedural VORTAC, and the time in the stack was therefore considerable. I spent 40 minutes polishing those hold skills, being gradually descended from FL90 to 3500' under de Gaulle control. With the freezing level at FL90, icing in the hold was not a worry. There had been light rime icing during the lengthy vectoring prior to entering the hold - certainly enough to activate the anti-icing, but the 1/4" required on the leading edges before boot activation never built up. However, had the freezing level been a few thousand feet lower, icing in the hold would have been a real concern for those not equipped for it.

Then a handoff to Prunay information, and upon leaving the hold along the REM 147° radial, the rest was procedural. I broke cloud around 1500' QNH, or 100' above my (class B) minima, with the field right on the nose at about 2.5 NM. I turned downwind right hand for a visual to RW 25 and not until I landed was the aircraft behind me cleared out of 3500' in the hold. This caused the slow progress of the stack, but was necessary to allow for the go-around procedure. All in all not your usual quick "vectors to the ILS", but good procedural IFR flying, and full marks to both ATC and Prunay AFIS.

The Arrival

On the ground, Claude Leprince greeted me and soon saw me seated and fed. Meeting fellow Danish expats and other old and new PPL/IR members over lunch only served to enhance the meal. After lunch, on to the PPL/IR forum. This I will let George expand upon as, despite George's valiant efforts, I understood only the broad outline, French not being one of my fortes.

The Factory

As aircraft factories go, Reims Cessna is small, and they only produce one type of Cessna, the twin turboprop Caravan II, or 406. I naively thought they had also started making little new 172s, but no such luck (although they had one on hand for demo flights, and this was the first time I've laid hands on a brand new Cessna). Instead they make subassemblies for the well known Cessna Airbus 320 and 340. Didn't know Cessna were into fly-by-wire.

The walk through the factory revealed many interesting details about aircraft production, but one thing above all: that it is a craft more than an industry. The number of individual components each requiring skilled handling is staggering, even for a relatively

humble 406. Although machinery is used in manufacturing the components, the fitting is very much by hand. Impressive enough, but you can't help thinking that a Henry Ford would have a field day in this business. CAA and FAA permitting, which of course they won't.

The Dinner

The evening's dinner sat around 80 pilots down to a really very decent meal, and when Nicholas Dawnay told me that his *à la carte* the evening before at the same hotel had been quite memorable, I could well believe him. We were in Champagne, and guess what everybody had for aperitifs. Except that I stuck out like a sore thumb, Coke in hand courtesy of my personal 36-hour bottle-to-throttle rule (more about that some other time). Understandably I received a few odd looks from some of the locals.

The evening provided some good discussion, and as always where pilots gather, hands were seen fluttering describing a roll here, a loop there. Or, since we were many instrument pilots, was it an ILS and an NDB approach? But with a Champagne tour in the morning and flight back in the afternoon, midnight saw most pilots retire to the tiny cubicles that passed for hotel rooms at *Les Reflets Bleus*.

The early morning hours served up a downpour strong enough to wake me, leaving drizzle in its wake to last all morning. But despite cramped quarters, early call and soggy weather, we were all eager to go on the morning's Champagne excursion. After some navigational difficulties (or was it a wayward passenger; in typically French fashion it was never really clear) we arrived at *Domaine Pomery* in the south-east corner of Reims.

The Champagne

One of those lady air traffic controllers I mentioned earlier must have been moonlighting as a Champagne guide, for I swear I had heard that voice (and imagined that face) before. We were given a most thorough historic review of Madame Pomery and her family and the Champagnes they make. We then descended 100' and entered an underground world where 10 NM of galleries and halls store a whopping 29 million bottles at a constant 10°C, producing 6 million bottles of bubbles a year.

We did not quite walk the entire length of these caves (120 of which were converted Roman quarries having provided limestone for ancient Reims), but while we walked we were told a myriad of details about Champagne making which kept poor George on his toes as he was providing translation for those of us lacking in French. I shall not go into all this, only recommend you go and see for yourself if you're in the neighbourhood. Worth a detour, in Michelin-speak. After puffing our way up from this nether world, we were offered a taste of the precious drops, but this close to takeoff I was glad to see I was no longer alone in abstaining. Many did partake in the pursuant shop visit, though, and having been on the wagon all weekend, I bought enough to make up for lost time on my return home.

The Network

Next stop Prunay, and *affaires avioniques* again came to the fore. It had emerged over dinner, and again this morning, that many of our French colleagues did not receive NETWORK and were keen to sign up directly with the PPL/IR Network, even though AOPA France is supposed to provide Network contact for these pilots. I had brought some extra copies of NETWORK and (ever the Membership Secretary!) a stack of joining forms, all of which was quickly absorbed on the bus ride back to the airfield.

Our thoughts now turned to how to depart IFR out of Reims Prunay since adjacent Reims Champagne, which will normally provide IFR liaison with Paris, is closed on weekends. Opinions differed, from "just get airborne and sort it out in the air" to "we'll probably be here tomorrow", but both were wrong.

The Departure

Prunay ops was closed for lunch when we arrived, so those who had not already filed a flight plan did so via Minitel, kindly assisted by our French colleagues. Shortly after, ops and AFIS staff returned from lunch and told us that AFIS would pass us our IFR clearances from Paris prior to departure. Thus greatly relieved we proceeded to pay our landing and parking fees which proved much more difficult, as only cash was accepted. Then someone with a slot had the bright idea to ask if they could send the bill, handing over his business card. "*Mais oui, certainement*" - that solved the problem for those of us quick enough to follow suit. As a result, I started engines forty minutes after filing IFR to Guernsey, and ten minutes later I was at the 25 hold

receiving my ATC clearance: *Paris clears N84OLE to destination, FL60 to TARIM, squawk 7677, after departure Paris Radar 128.1. WOW* - this was clearance delivery stuff coming down from AFIS.

As soon as my wheels were in the wells, I had a Paris radar service, which was wonderful, for the ceiling was lowish and I did not relish mucking about. Ten minutes later, after a few vectors and a stepped climb, I was level at FL200, inbound CAN for sunny Guernsey.

The Lessons

While I'll leave it to George to pronounce on the heart of the matter, the PPL/IR meeting, I can say for my part that I enjoyed the Reims meet, and in particular the way French ATC and Prunay ATIS worked. Never thought I should say this, but it beat by miles anything we can do in similar circumstances in the UK.

It did, however, demonstrate the pressures on a small aerodrome when large numbers of aircraft choose to arrive or depart in a short space of time, whether IFR or VFR. If the weather is down, that imposes its own limitations, and if it's fine (especially on a weekend), the local fliers will be out in force and add to the pandemonium. We must take this into account when we choose venues for future meetings.

THE REIMS MEETING

George Irvin reports:

In fact there were two meetings, one of the French PPL-IR group at 15:00L and the other the AGM at 17:30L. I attended the first, opting to tour the Reims Cessna plant and marvel at the complexities of putting together a Caravan II rather than attend the AGM, so nothing on the AGM will be reported here. The number of non-French pilots who turned up was striking. Last year's IR meeting in Reims was attended by 35, of which all but five were French. This year's 'other EU' contingent numbered 25-30! One conclusion is that we shall need to think about providing proper translation at future meeting whether in France, Britain or elsewhere.

BRNAV and FM Immunity

For those who attended the Bournemouth meeting, the theme of the Reims PPL-IR meeting was familiar enough. French private IRs have been somewhat less concerned at the BRNAV requirement than other European pilots because an IFR certified GPS is required only for flight above FL245. This is mainly because the regional carriers have been well-represented enough at DGAC to buy a few years' time. The positive side of this anomaly is that it enabled other matters to be raised at the meeting; eg, FM immunity, 8.33 kHz and Mode-S. The negative side is that some French IRs are only just waking up to the fact that they need approved GPS *today* for IFR flights outside of France and that the GPS ceiling within French airspace can be expected to migrate downward in the near future. (As soon as DGPS appears, it will descend below FL095 throughout ECAC airspace).

Any smugness about lax GPS requirements in France is therefore pure illusion! As for other matters, the news for GA is generally bad. The FM immunity requirement is already in effect. As one French pilot noted in French (and Ole murmured to me in English), if you can identify the ILS at Geneva Cointrin rather than listen to pop music on FM, you must have bought those USD 1500 filters already - or else fitted new boxes at USD 4000 or more each.

8.33 MHz & Mode S

Then there's 8.33 MHz channel separation which will be with us sometime between 2001-03, probably at another USD 8,000 per box. Mode S (to be mandatory at a date still to be determined but probably much the same as 8.33) means buying not only another expensive box, but with it endless other encoders and wiring to transmit all that digital data to ATC. As the penny dropped, so the complaints of those in attendance grew louder. As if that were not enough, only *Monsieur le Ministre* knows how DGAC will handle the annual IR renewal process and in France *le Ministre* communicates with God alone.

New Chairman

Claude Leprince presided over the IR meeting with his usual calm dignity and firm grasp of the technical complexities of the discussion. Sadly, this is Claude's last meeting as Chair; he now steps down as Secretary of French PPL-IR and is replaced by Georges Beisson. I think I can speak for other colleagues in EU PPL-IR in saying that Claude's service to bringing European private IR pilots together has been invaluable, and that we wish Georges Beisson the best of luck in taking over from Claude in these difficult years for GA.

[Editor's craven apology: Somehow the above reports from Reims were left out of the last issue. Sorry!]

GPS Database Updates

David Bruford reports:

The cost of updating GPS databases on a regular basis is prohibitive to all but the wealthy so any method of reducing the expense is attractive. A small company in the United States offers an alternative. AeroTurtle offers update disks for Apollo, Garmin and Magellan at roughly half the UK cost. The European database disk for a Garmin GPS 90 for example, arrives in the UK for \$65 inclusive of postage.

Enquiries for individual prices are welcomed by e-mail to Keith at

SIAI Meeting – Near Bologna 26-27 September

The SIAI 205/208 club is holding its Annual General Meeting on 26-27 of September at the airstrip AERDELTA at Ozzano Emilia near Bologna.

The programme includes a slide show of the trip in July to Helsinki (two SIAI 205's of the club took part), discussion on maintenance and possible performance enhancements from the Italian airworthiness authorities, and a talk on a ferry flight from Wellington, New Zealand in an F22R Penguin.

All S205 and S208 enthusiasts are welcome. For further details contact Paolo Zecchini (Bologna) tel 051-537685 (off), 051-383193 (home); fax 051-6030685; e-mail <vcc5.vit441pz@memo.volvo.se> or Riccardo Filippi (Rome) tel 06-6634179, 0335-8342619, fax 06-6640156; e-mail <ricfil@tin.it>

The airstrip of Ozzano Emilia (Bologna) has a bar-restaurant and AVGAS is by PPR (tel 051- 795010) :
Grass runway 825 x 40 metres orientation 03/21 Radio frq 128.45
Coords: N 44 28.5 , E 011 32.5 ; elevation 105 feet
From Bologna VOR (112.20): radial 113, 11 miles

LETTERS

AOPA UK

Martin Robinson, Operations Executive, AOPA UK, writes:

Thank you for the July 1998 issue of your well written Journal. The results of your membership survey are indeed gratifying and we acknowledge your conclusion. As far as AOPA is concerned, I do not think that the Network and AOPA UK are in

competition with each other – in many ways the IR Network is similar to a big flying club, although your needs are a little different.

AOPA is very happy to support its members and likewise we are always looking for members to support AOPA. In its work the Network has some very good/keen people but I suspect, like AOPA, the real work is left to a handful of dedicated individuals.

AOPA welcomes your comments and, as I have suggested in the past, more communication on issues affecting all aspects of GA needs to flow between us. The input by Roger, David and others on BRNAV was excellent, although with hindsight perhaps we should have had greater communication between us prior to meetings.

Keep up the good work.

Martin Robinson

PRACTICAL IFR FOR THE PPL

John Lewis writes:

I have just read your article "The Private Pilot and the practicalities of flying IFR" on the web site of the PPL/IR Network. You asked for feedback so here is some!

It is excellent. The advice on specifics such as auto-pilot, PC, GPS is very useful. But, for me, even more valuable is the description of the context in which a private pilot finds him/herself and the contrast with that of a commercial pilot. My situation is that, starting less than two years ago, I obtained my PPL, (then AOPA Radio Navigation certificate), then IMC Rating, all at Exeter Flying Club. The PPL training has been done on C152, and the further training on C172.

Mixing with other student pilots and PPL's, I find, of course, considerable differences in their objectives. For me, the motivation is to be able to use aircraft to travel about, not just for the sake of it, but (e.g instead of a car or public transport) because I would like to get to the other end (and back!), including for business or other purposes. To this end, I envisage that, one day, time and finance permitting, I would like to train for an IR. Because without it, I expect the possibilities, particularly for European travel to be more restricted.

Of course, I cannot be sure that I have the aptitude and any other requirements to achieve this. My background is scientific (doctorate), and I work in information technology, I have been involved in a variety of different sports and pastimes over the years (43 of them!) and I have been able to progress at a reasonable pace through the flying training to date.

I have read a variety of books and articles on aspects of flying at various times, and, of course, one is continually receiving snippets of advice and viewpoints from others. The advice in your article describes the scene that I envisage ahead of me very well, and, in the context of the PPL/IR Network, gives me a very reassuring feeling that there are others out there who have already trodden this path. Without this potential for interaction, I think it would be a fairly lonely and, at times, bewildering journey!

At the moment, I am tentatively exploring a variety of aspects of flying, at a time when I need also to watch my budget! I would very much appreciate any advice on the most important aspects to concentrate on.

I have flown in the US during two trips there in the last year, negotiating the FAA airmen certificate and Biennial Flight Review, with help from several people but especially a good American flight instructor, who I already count as a friend. US flying, because of its differences, has helped significantly in improving my situational awareness.

I have moved up in complexity of aircraft to a TB20/Trinidad , (CSU, retractable, 140+ knots cruise) with so much better equipment (RMI, HSI, RNAV, autopilot and GPS (although I am being slow about getting to grips with that)). Of course, compared with a C172 it is wonderful, but I need to plan more "self-training"; also I am exploring an arrangement to fly with another pilot.

The advice one receives about the sensible usage of an IMC Rating varies enormously; so I have tried to listen, to understand my capabilities, to know the rules, to think and then to decide. My conclusion is that the sensible thing, for me, is to try to extend my experience by using it wherever it is safe to do so; otherwise there is a danger of becoming completely out of practice and, as a result, much less safe. Of course, the training I have is relatively limited, but my qualification and the regulations allow me to do quite enough for now. Also, I try to discuss what I am doing with those pilots whose advice I have started to learn to trust. (During the last few flights, I have flown IFR either on top or in fairly benign conditions, with adequate VMC below.)

Currently, I have approx 135 hours total (approx 10 of them on the Trinidad). I have no night rating, although that training is expected this winter. Any suggestions, pointers, advice or even indications of essential steps ahead, would be most welcome.

John Lewis

[This is a type of inquiry which I receive fairly frequently. One obvious piece of advice is to join the Network, which is for anyone interested in flying small aircraft IFR, not just those with an IR. Apart from that, however, would anyone like to write to me with advice for John Lewis and others in a similar position? Ed]

Dirk DeJonghe writes:

This is a good article. Just a small remark: in Belgium adding a VFR panel mount GPS such as the Garmin 150 will automatically make you plane VFR only.

There is now a new GPS155 XL from Garmin, which meets TSO C129a A1, has a nice moving map and is 1000 US\$ cheaper than the GPS155. They claim it is the lowest priced IFR GPS available. I am certainly very happy with my GPS155.

Another point: if using GPS or RNAV, the pilot should become **very** familiar with the reprogramming of the flight planned route. In most cases there is some kind of a rerouting and the box needs to be reprogrammed. Using VOR and NDB navigation, frequency changes are done much more easily for rerouting.

Dirk DeJonghe

THE ROYAL AERO CLUB TRUST

Fred Marsh writes:

I am sure that you do know that we have started a charity trust and been given permission to call it The Royal Aero Club Trust. The Trusts charitable objects are:

1. To promote the development of young persons in achieving their full physical, intellectual, social and spiritual potential by participation in aviation related activities;
2. To advance the education of the public in all aspects of aviation particularly by the preservation and conservation of the collection of exhibits related to flying and history of flying in such ways as the committee may from time to time determine;
3. To promote research into air sport and to publish the useful results of such research.

In a nutshell the Trusts mission is: Advancing the cause of air sport and aviation.

The various member associations of The Royal Aero Club were asked to nominate trustees and we now have brought together a number of highly regarded and dynamic persons including: Marc Asquith (BHPA), Diana Britten (BWPA), David Cole (Chairman, Royal Aero Club), Mike Goldby (BMFA and Vice-Chairman of Trustees), Keith Mansell (BGA and Trust Secretary & Treasurer), Keith Negal (BMAA), Robin Tracey (HCGB) and Sir Rowland Whitehead (BPA).

At our last meeting it was suggested that I should write to all RAeC member associations and ask them whether they would be able to give favourable consideration to make a donation to the Trust for pump priming purposes, i.e. to help us get the Trust off

the ground. These donations would initially be used to: design and print stationery, leaflets and brochures including Gift Aid Donation forms, Covenant forms and a range of Appeal material.

We have already received two donations, one for £500 from a non-member association and a promise of another for £200 from the Popular Flying Association.

I do hope that you may be able to give favourable consideration to our request which will ultimately assist your association, the Royal Aero Club and the Trust to: Advance the cause of air sport and aviation.

Yours sincerely

Frederick O. Marsh, Chairman of Trustees

THE COST OF DIVERTING

Charles Strasser writes:

Thanks for the paragraph in the latest PPL/IR NETWORK on the above and the fact that as AOPA CI Region Chairman I have been able to persuade the Airport Authority for Jersey, Guernsey and Alderney to waive landing fees for genuine diversions.

Please note that the list has been increased by Blackbushe, with whom I communicated on another matter and got them to join the list and Cambridge resulting from the efforts of another AOPA member. As you know I feel very strongly that there should be no financial disincentive or even worry when a decision to divert to an alternate has to be made, mainly due to weather.

Since among GA pilots such diversions probably occur among IR pilots on a number of occasions I wonder if you could enlist our PPL/IR Network members to negotiate this CAA recommended concession at their home airfields, for the use of others.

Charles Strasser

REVIEW

FLIGHT PLANNING SOFTWARE REVIEW UPDATE

NavBox ProPlan for Windows on CD. £60.00 from Skyways Aviation Services

Ltd, 133 Lovibonds Avenue, Locksbottom, Kent. BR6 8EN. Telephone 01689 605 664. Web site <http://www.avnet.co.uk/navbox>

In the last issue of NETWORK I reviewed NavBox and although most of the content was complimentary there were a few points that I took issue with. Happily, rather than grunt silently at my comments NavBox's coauthor Peter Mundy got in touch and set about defending his program and answering my criticisms.

I mentioned that entering a new waypoint was simple enough (provided you could point to a location on the screen map or knew the lat/long) but that it demanded a country code. Well I suppose it was logical that, as this is a flight planning program the United Kingdom's country code would not be UK (Ukraine) but EG, the ICAO designator. Perhaps to help the terminally dim the program should prompt "ICAO Country Designator" instead of "Country Code" and Navtor advises that this suggestion may be incorporated in the next update. Having used this program for a few flights since the review, I have come across a few ground station contact frequency errors. This is not a problem in the UK where the station dropping you confirms your next frequency before you go, but our European cousins, particularly French ATC has a tendency to say "Bye" which can leave you talking to static if your next frequency is wrong. I would recommend that users check the frequencies with an independent source and, whatever software you use it is inevitable that there will be some errors, send the company a fax or e-mail drawing it to their attention. They will be grateful and not only will your next update be correct but it will save some other pilot some grief.

Next, weight and balance. I mentioned that the format in the program was not one that I could use when referencing to my aircraft's manual. This is simply solved as, provided they are sent the data, NavBox will supply any purchaser with a file for their aircraft, and this can be by disk or e-mail. This personalised service is free, however, an ever expanding number of aircraft types are being supplied as standard in the database so unless you are lucky enough to fly something exotic you probably won't need help. Also I mentioned that the screen box is irritating when going into Weight & balance. The display filled the whole screen with the Cancel, Help and Select/Edit Aircraft boxes obscured. This turned out to be a problem that also affected my display for the ICAO Flight Plan form. The answer is that NavBox was written for an 800 x 600 display. If a computer is set up for anything less, normally 640 x 480 you won't see all of the boxes and in the case of the Flight Pan you won't see that as you go to each part of the form prompts appear offering assistance or 'rules' for each box. Changing your display setting can present other problems (mainly smaller text and icons) but doesn't mean rebooting each time so it can be changed back if it upsets other programs. If you're using Windows 95/98 there is an option in Control Panel – Display Properties - Shortcuts, where you can set up function key to toggle between the settings. But use something obscure like ALT + SHIFT F8 as it will override any function key commands in other programs.

Having changed the settings the now revealed help line at the bottom of the ICAO form is very useful and even if you haven't completed a flight plan for years it will talk you through.

NavBox advises that a GPS interface, improved charting with ground details and maximum elevations, aerodrome charts and incorporation of a log book are all in the pipeline. The battle to be the best program continues.

David Bruford.

ARTICLES

A BEGINNER'S GUIDE TO THE ATLANTIC CROSSING

By George Irvin

Flying the Atlantic in a single is not to be taken lightly. It requires careful planning and a well-maintained, well-equipped aircraft. It also requires an instrument rating and sufficient experience of weather flying to make sensible judgements. On the other hand, it is not impossibly daunting or dangerous. Some months ago, I planned a quick trip to Iceland as a way of accumulating experience for an Atlantic crossing I had hoped to do in the summer of 1999. In the event, as my planned departure grew nearer, I found I had two weeks free and the resources needed to stretch the trip. I therefore planned the legs beyond Iceland to Greenland, across the ice cap and eventually to Frobisher and Goose Bay in Canada. I would return to Iceland via Narsarsuaq. If as a pilot you have ever dreamt of such a trip, what follows may be of interest.

Before the Trip

Let's start with the charts. Jeppesen do an Atlantic crossing kit which includes both the northern and southern (Azores) routes; minimally, the Iceland and Greenland tripkit is required. Sporty's will have the Canadian low charts and approach plates; the latter like their NOS counterparts for the US come in foldover booklets organised by region. Minimally, you will need the charts for the Maritime provinces (LO7-8), Quebec (LO5-6) and the Northern Territories and Greenland (LO9-10) and well as CAPs 1, 5 and 7 which contain the plates. These will take you to the US border using, say, Bangor as the airport of entry. Additionally, I found two very useful charts to be the RAF's EU(L)7 which takes you from Scotland to Iceland, and RFC-52 used by SAS and Greenland Air which incorporates an excellent safe sector altitude grid for Greenland.

Next comes the survival kit. (Pilots who fly twins tend to skip this bit.) I own a helicopter-type vest and an immersion suit. I rented the raft and EPIRB beacon from SEMS of Basildon---the EPIRB is essential as is a good self-inflating, canopied raft with a sea anchor. SEMS will rent you the lot by the week. If you've not been on a ditching course, this is a real must---if only to put the fear of God in you! Wear your immersion suit permanently with the EPIRB in it and your vest on, learn how to use the raft and keep it strapped to the passenger seat. If you loose power even flying high, trying to diagnose the problem while raising help on the radio will keep you so busy that there will be no time to don a life vest. If you're well organised, though, ditching is survivable even at these latitudes. Not a few ferry pilots have lived to tell the tale.

My aircraft is normally aspirated and doesn't have built-in oxygen so I carry an oxygen bottle and 'oxymiser' cannula. Admittedly, a normally aspirated M20J-201 (pulled along by a mere Lycoming IO-360) at less than MTOW has a service ceiling of 17,000, considerably higher than a C-182 or a comparable normally aspirated Piper single. But the MEA for the airways crossing Greenland is FL120 and, if there's cloud about, your choice is between getting above it or going back.

For navigation, GPS is an absolute necessity. Because of poor satellite coverage---particularly over parts of Greenland---your trusty hand-held will simply not suffice unless connected to an external aerial. It is highly advisable to have an IFR-certified (TSO C129a) panel-mounted set, or else like many ferry pilots to carry a 'portable' panel-mount. I used a panel mounted GPS and carried my hand-held G-90 (with its 18 hour battery life) as a backup. If you lose your electrics or even your vacuum DG, a backup navaid is another lifesaver. In addition, I have a backup electric horizon. Equally, you need at least a single-axis autopilot with a bug; hand-flying the Atlantic is not on.

The two expensive items are HF radio and a ferry tank. Both are required for the Azores crossing and HF is required for some routes which take you into the Shanwick Oceanic Crossing Area. In truth, if your aircraft has a range of 1000 nm or more you can dispense with both HF and a tank by routing Scotland-Vagar-Reykjavik-Kulusuk-Sondrestrom-Frobisher which is what I did. This keeps you outside the Shanwick OCA. The three longest legs are each roughly 500 nm; between Reykjavik and Kulusuk on the east coast of Greenland; between Kulusuk and Sondrestrom in Western Greenland and between Sondrestrom and Frobisher in the Northern Territories of Canada. What ferry tanks give you is the option of flying longer legs and of diverting; alternates in Greenland are few and far between. Without that option, you must calculate a point-of-no-return (PNR), keep a running score of groundspeed and weather and be prepared to turn back. The M20J's range on 64 US gallons at economy cruise is over 1100 nm. Even so, I did the calculations religiously.

Three final points: first, the aircraft and its equipment must be in top condition. Before crossing in her Piper Dakota (*Pilot: May, 1998*), Polly Vacher wisely took oil samples every 10-15 hours and had them analysed. I am indebted to William v. Steenoven on the technical side; as a commercial pilot, he knows the value of good maintenance. Secondly, it's a good idea to spend several evenings printing out PLOGs under a variety of critical assumptions. Thirdly, elicit the advice of any pilot you can find who has done the crossing. My main sources were Mike Dunkerly, Flemming Pedersen (a fellow Mooney driver) and Polly Vacher all of whom provided invaluable information---and I do mean invaluable!

Eastbound

You can jump off from Stornoway if you wish, but there's less hassle and better service at Wick from Far North Aviation which is run by a doughty Scotsman named Andrew Bruce. Andrew will sort out all the routing and filing; he'll even drive you to the local B&B. I had thought the Rotterdam-Wick leg would be the easy part. In fact, I battled a 30 kt headwind component much of the way and just as I neared Aberdeen, Wick's weather went below its VOR-DME minima so I diverted to RAF Kinloss and went to Wick early the next morning.

Wick to Reykjavik seems a dawdle unless it's blowing from the West, but since on this leg you are often flying on the north side of a low pressure area, the effect is to sling you towards Iceland. Otherwise, you can land mid-way at Vagar in the Faeroes for fuel. If in doubt, check the weather at Vagar carefully since the preferred routing along G3 passes practically overhead the field. The natural alternate for Reykjavik (BIRK) is Keflavik (BIKF) where most of the heavy metal lands. Still, Reykjavik has good ILS and VOR-DME approaches so you'll not be in trouble unless both unexpectedly go below minima. Not much of a problem there. You should be aware, though that shortly after landfall at the ING VOR, the MEA rises to 7100 feet---ice at FL80 is a danger, so temperatures aloft are as important as winds aloft. If the problem of ice does arise as you near ING, you may be able to get a direct routing from Iceland radio from ING to ALDAN which is entirely over water and enables you to descend. The handling at Reykjavik is good---but like the Loftleidir hotel a stone's throw away, it's not cheap. Nor for that matter is fuel, food or anything else in Iceland. But the scenery is marvellous; Iceland is quite unlike anywhere else in Europe.

The problem with flying to Greenland---as Flemming Pedersen put it in an exchange of invaluable e-mail messages---is that on a good day the airports are fog-bound and the alternates too far, while on a bad day there's ice. Reykjavik is where you study the low level Significant Weather charts, the forecast winds aloft, temperatures and TAFs very carefully. One option is to fly from Reykjavik south-west to Narsarsuaq on the southern tip of Greenland. That's tempting but it's 700 nm and the further south you go, the more likely it is that you'll encounter westerlies; equally important, the alternate at Gothab is 200 nm further on. The other alternative is to fly 400 nm due west to Kulusuk (BGKK) and---if the wind is neutral and weather reasonable---continue directly to Sondrestrom (BGSF) over the ice cap, a distance of 750 nm. Sondrestrom is a favoured destination because,

since it lies inland from the west coast, it is less susceptible to fog. (One might just add that fuel at Kulusuk is USD 3.00 a litre with a minimum purchase of 200 litres!) But the route over the ice cap has a MEA of 11,000 feet---so unless you can climb very high, you should make sure the prognosis shows clear skies. Ice accrual in IMC over the cap at FL120 in an aircraft that won't climb is bad for the nerves. In the Mooney, I can cruise on oxygen at FL160; In my previous aircraft, an Arrow, I would have not attempted crossing the ice cap unless the sunshine came with an ironclad guarantee.

A cautionary tale.

Here is my first cautionary tale. I knew from the forecast that a 100-mile wide band of stratus was moving up the coast of Greenland from the south-east, the tops forecast to lie between 12 and 16,000. I crossed towards Greenland at FL100 planning to climb above the stratus. But the clearance took time to come through and I began the climb late. In consequence, I soon found myself taking on rime ice at FL130 in IMC. At FL160 I was still in cloud and the leading edges were still frosting, even at -12C. The unmistakable buzz saw sound of prop ice began. I could still maintain altitude---but I couldn't climb further without compromising airspeed, and my stall speed had increased. The situation persisted for about 20 minutes until the first patches of blue appeared above. Presently I emerged from the downward slope of the cloud into the bright sunshine where the ice sublimates. Once into cloud, I hadn't turned back on the assumption that the worst of the ice was being produced by the lifting effect of the east coast mountains. But I should have foreseen the dangers of the situation more clearly and climbed earlier.

Having pondered the weather charts, winds, freezing levels and TAFs, sensible scepticism requires calculating PNRs. I do two sets of calculations. One is the conventional calculation of total fuel required to return to the airport of departure (plus diversion and reserve) given the forecast wind. Remember, if you have a tailwind, its going to take *longer* to get back, so your PNR will be closer to the point of departure if the your weather at destination goes down. The other calculation is one of *target times* at each enroute waypoint at the *slowest groundspeed* required for getting to the destination and alternate with reserves. Unless I am ahead of target times all the way to the PNR and the destination weather looks good, I go back. That's why the continuously updated waypoint estimates provided by a GPS is so handy---you simply compare them to the target estimates on the kneeboard.

Waypoints over the water, incidentally, are reported as co-ordinates; eg, "X-Ray Juliet was six five north, two five west at one one two zero, flight level one two zero, estimating six five north, three zero west at one one five zero, Delta Alpha next". You are required to give these waypoint estimates since you are outside of radar coverage for most of the flight, and you can add the weather if you like; "level one two zero, wind one one zero diagonal two five, minus five." It sounds all very professional but, in practice, you will find at times that nobody can hear you. With luck, the occasional jet passing above will relay a message, particularly on the inter-aircraft oceanic frequency of 131.8. From my experience, if there's heavy weather on top of you not even relays are reliable. The remaining trick is to speak to Kulusuk when approaching them and get their weather--plus that of destination and alternate. If everything has gone down and you've passed your PNR, you're out of luck. It's unlikely---but not impossible.

NDB tracking.

Once past Kulusuk, Sondrestrom radio covers this sector well so you'll not lose VHF reception. You can chat to the controller occasionally merely to relieve the boredom since there's not much radio traffic in these parts. Sondrestrom itself has a LOC-DME approach which you pick up from the base turn having gone 11 nm outbound from the NDB at 5300 ft descending to 3000 ft---CAAUFU's obsession with NDB tracking can be useful! Once localiser established, one flies down the fjord between the surrounding mountains in four step-downs. Like everywhere up here, the airport has an on-site hotel. Everything is made out of Nordic pine or heavy steel sections which suggests that in mid-winter the whole place lies buried deep under the snow. The surrounding hills are barren and creased by rockfalls. The next morning, having refuelled and made the mandatory phone call to Canadian customs, I hurry to begin the short leg to Frobisher (CYFB), a mere 500 nm.

The leg to Canada crosses the sea to the Baffin peninsula and the bay beyond just south of the Arctic Circle. Far below, the ice floes below shimmer in the morning sunshine punctuated by iceberg tips; even to the south the sea is white. Soon I am past FIR boundary listening to the New World twang of Canadian controllers. The descent starts sixty miles out and the approach to Frobisher is a DME arc followed by another LOC-DME approach. Frobisher---now called by its Inuit name, Iqaluit---is more desolate than Sondrestrom and seems little more than an ice station. I've flown only 3 ½ hours today. Since it's only noon local time, I clear customs, refuel and head towards Goose Bay, 900 nm to the south.

Frobisher is where you begin to understand what the north of Canada is about. From 11,000 feet, there is nothing below but rocky hills and murky, pond-size lakes. There are two airports enroute between Frobisher and Goose Bay so if the wind shifts adversely, one can easily make a fuelling stop. Southeast of Goose a depression is forming; as I continue south, the tailwind subsides and gradually becomes a headwind. But enroute time is of little concern compared to the thought of losing an engine. Where would one land? The water looks safer than the ground. And who would hear a distress call? For hours there is no radio traffic and my radio checks elicit no response. Only an occasional voice of some far-away bush pilot confirms the radio is still working. There is far less radio contact here than over the ocean, yet this is Quebec Province. The wisp of low cloud ahead widens and soon envelops the ground beneath. One can only wonder at what it must be like in winter; a desolate snowscape into which one would disappear without trace. Ernest Gann wrote a classic tale about going down here in a DC-3. Kuujuaq airport lies beneath the cloud three hours after takeoff, then Schefferville two hours later. A hundred miles out I manage to raise Goose Bay, broken at first, then intelligible. It is perhaps the third time I have made proper radio contact since departure. There are thundershowers at Goose so I am vectored onto the ILS for Runway 08. Seven hours and five minutes after leaving Frobisher, a follow-me van marshals the Mooney towards the safety of Woodward Aviation's huge Esso sign. The fuel tanks top off at 199 litres.

Westbound

Saturday morning it's sunny and I'm tired of flying. I try to have my O2 bottle refilled but the local supplier has run out, so I hire a cheap Chevy at the terminal to do a bit of local sightseeing. Goose Bay may be closer to civilisation than Frobisher, but it's still pretty basic; perhaps 3000 people not counting the base. I am told by the rental agent that a condition of the contract is that I am not to drive on unpaved roads. As it turns out there's only one all-weather road leading to a lakeside village 46 km away called Melville. I drive there. Beyond a few dozen wood-framed houses and a country store, there is a small harbour where two cars are being loaded onto a ship. The lakes are all interconnected; the roads go nowhere. In Northern Canada one travels by boat or aeroplane. What keeps the few shops going in the twin towns of Happy Valley-Goose Bay is the NATO airbase. It takes about half an hour to see all there is to see; two motels, a Pizza Hut and more wooden houses lining the main road and side streets. In the town centre is a small Shopping Mall where the largest shop sells boats and fishing tackle. A gaggle of youths hang out at the Burger King chatting up the teenage waitresses. A posse of battered pickup trucks jockeys with a chromed-up Land Cruiser at the main intersection. Further along, a dark-skinned Inuit boy shuffles along the side of the road, the crook of his rickety legs betraying malnutrition of the sort one sees in Africa and India.

The NATO airbase is not what it once was. In front of the terminal, the RAF has parked a commemorative Vulcan bomber with a plaque beneath it recounting past glories. The Canadians, Americans and European allies used Goose Bay during the cold war to simulate sorties into Russian weather. The squaddies must have spent their spare time on simulated Russian vodka. I go back to the Labrador Inn, do my flight planning and write some postcards. I think it might be sensible to start back tomorrow, Sunday. As it turns out, Sunday morning it's raining, but the winds enroute are reasonable and the TAF for Narsarsuaq looks good. The problem is that Narsarsuaq is closed on Sundays which means paying an extra USD 250 in landing fees. Not on your life! I return to the motel where, on morning television, I watch France v Paraguay and the match analysis with Des and the lads--at least the Beeb is still in reach. I had thought to spend the rest of the day reading, but after a dozen pages I doze off and sleep for 14 hours.

Engine failure.

Monday morning the cloud base is higher but the enroute winds less favourable. The TAF for Narsarsuaq (BGBW) says it will be clear but blowing hard on the ground. That's far better than calm winds with low visibility---the Narsarsuaq NDB-DME plates require a 6 degree missed approach gradient to avoid the surrounding peaks. Judging from the actual and predicted significant weather charts, things will get worse on Tuesday. The deepening primary and secondary depressions which lie to the south-west of Greenland are tracking northward and trailing two occluding fronts; the satellite picture shows a plume of cloud intersecting my line of flight and stretching well south, but unlikely to reach the southern tip of Greenland before early tomorrow. I've done all the calculations and can always turn back, so I decide to go. At 10:00L I am airborne, strapped again into my orange survival suit and blue helicopter life vest. I climb to "one three thousand" under Gander Control and update my estimates. There's a tailwind component and the times are looking good though I know the tailwind will back into a headwind. The little Mooney is purring along happily again and I've leaned it carefully on the engine analyser to about 15F lean-of-peak for a TAS at -5C of 147 kts and a fuel flow of 7.3 gph, less than 30 litres. The M20J-201 incorporates a clever ram air intake device which, when open, bypasses the air filter and boosts the manifold pressure slightly. At this rate I could go eight hours, nearly 1200 nm in still air. It's only 650 nm to Narsarsuaq.

Several hundred miles later, the wind has come 'round and a headwind component is building. Gander Radio is no longer intelligible. The ETAs for my GPS waypoints are growing longer. Although the critical no-go value for the average headwind is an unlikely 40 knots, the wind is shifting against me faster than was predicted. As my PNR comes up, I am still ahead of the game but only just. I decide to go for it. The cloud is now building and the layers are slowly closing in. I redo my sums while cruising at 13,000, the lowest altitude Gander will give me. The fuel calculations are painfully slow; a pity I couldn't refill my O2 bottle in Goose. The world outside is now uniformly grey and the purr of the engine combines with the cabin heat to induce a tranquil reverie.

Suddenly the engine coughs and sputters and I come to my senses. The manifold pressure is dropping, the engine is dying and the only way to go is down. Instinctively, I close ram air lever, enrich the mixture and do the fuel pump, tank and mag checks. What has happened, I realise later, is that the ram air intake has ducted supercooled moisture onto the air flow sensors ahead of the throttle butterfly. These sensors tell the injector unit how much fuel to deliver. As they freeze over, they sense less air and less fuel is delivered. With the ram air now shut, one way of curing the problem to close the butterfly by retarding the throttle fully; the resulting build-up of warmer air should melt any ice on the sensors. But there's not enough time to reason it through. I continue down. The warmer air below, I hope, will cure any induction icing. Fitfully, the engine surges and sputters, regaining power only to lose it. The aircraft drops through the freezing level at 10, down to 8 and then to 6,000 ft where, at last, the sputtering ceases and the engine begins to sing with confidence. There are a few breaks in the cloud here so I descent to 4,000 beneath the overcast. I have not put out a Mayday call thinking to solve the problem myself. Belatedly I realise that were the engine to quit once more, it is unlikely that anybody would hear a distress call. I have not even thought about the raft. A wing and a prayer indeed!

At 4,000 ft, in the clear and with everything set correctly, my own adrenaline flow returns to normal. But now there's a new problem. With the fuel flow set up for best endurance, the TAS at this level is only 130 kts and the wind has backed resulting in a headwind component of over 40 kts. To climb again would waste fuel. I am 120 nm West of the "SI" NDB at southern tip of Greenland which emits a powerful signal. Beyond the beacon, there's another 40 nm of fjord to negotiate before reaching Narsarsuaq---160 nm in total at a groundspeed of 90 kts. I might as well be flying a C-150! It's going to take me nearly two hours to get to destination, and more than another hour to my alternate. The fuel flow analyser shows 8.2 gph and 34 gallons remaining, enough to get to Narsarsuaq but very tight if I have to divert.

I try raising Gander without success, so switch to Narsarsuaq Information where eventually I can make out the controller's voice. On the horizon, the uniform grey resolves into a distant cardboard cut-out of mountains. The headwind diminishes, the ETA readings improve and the ceiling appears to be lifting. Soon I report beacon inbound for the fjords. With a higher ceiling, good visibility and Polly Vacher's nine waypoints from the "SI" to runway 07 stored in my GPS, there's little chance of going wrong. Once we get into the main fjord, there's a good deal of turbulence and I throttle back to 120 kts (Va). At the bottom of the fjord, there's a fork where you bear left and descend. I call Narsarsuaq AFIS who report no traffic for runway 07 and the wind as "zero nine zero magnetic 35 knots gusting 43". It's not a comfortable approach and the runway slopes upward, but the twin PAPIs are helpful and I get it on without too much fuss. The taxiing is laboured; the Mooney shudders in the gusts as I turn for the Terminal. A marshaller's van steers me to shelter in the lee of a large hangar where the aircraft is tied-down and chocked firmly. My fuel analyser shows 9 US gallons (34 litres) but the bowser tops me off with 187 litres. There were 53 litres remaining, nearly two hour's reserve.

Blue West One.

Tomorrow's forecast is for 55 knots on the ground with a 1000 foot base; clearly, I shall not be flying. The hotel, a stone's throw from the airport, is sensible but expensive; the equivalent of USD 120 a night. The weather next morning is truly abysmal. The walk to the Terminal takes half an hour against a pelting wind. I check the aircraft tiedowns, realign the chocks and inspect the airframe for any sign of gust damage. In the tower, the forecast is for better weather by evening and reasonable flight conditions tomorrow. Tomorrow, Wednesday, I shall leave. Walking back, I pass a rough wooden building with the sign "Blue West One"---the Allies' name for the base during the war which explains the ICAO code, BGBW. Hewn into the base of the a steep rock face a hundred yards further is a concrete bunker still used for storage. Above the door the date of construction is still clearly legible: 1942. I was two years old then, and my own Dad was flying around in Dakotas covering the War.

It is Wednesday morning and I am spiralling skyward from Narsarsuaq into a scattered layer at 9000 ft, turning to cross the mountains and cruise over the sea on a direct course for Iceland. At sea level, the Mooney will climb at nearly 1000 fpm and it still manages a respectable 500 fpm at FL100 so I get up to FL130 pretty quickly, dropping back to FL110 when over the sea. Once again, the scenery glimpsed through the broken cloud is breathtaking; snow-covered mountains rise to 11,000 feet. I can

almost touch them. But as everywhere in Greenland, a single mistake can be fatal. If one fails to spiral straight up to safe sector altitude, if the rate of climb is anaemic or if conditions are solid IMC, this is not a route recommended for a normally aspirated single; one would be well advised to follow the fjord outbound to the south-west and route around the southern tip of Greenland even if this means adding an hour to the journey. Luckily, at a TAS of 147 kts and with a 20 kt tailwind component, the 750 nm leg is covered in 4 ½ hours and completed by a visual approach onto Reykjavik's humpbacked runway 20.

Thursday is the final day. Although the enroute forecast looks reasonable, the Reykjavik weather at 08:00 is miserable: 500 foot broken in light rain with layers above 8000 but the tops at infinity when I depart. The routing is via ALDAN intersection, then east-south-east to the Scottish FIR at 61N10W and south-east direct to EGPC. Once again, the forecast is for a tailwind with the FZL well above FL110. Although the gaps between layers prove elusive, 700 nm and 4 ½ hours later I do the VOR-DME approach into Wick. Andrew Bruce, irrepresible as ever, welcomes me back to Britain, oversees the fuelling, sorts the flight plan and met and even provides oxygen---at last I am able to fill the cursed bottle for contingencies I am now unlikely to encounter! The wheels retract again just after 14:00. In every pilot's story about returning to Britain from faraway places, there is an obligatory reference to the cheery warmth one feels upon hearing the familiar voices of NATS controllers. My feelings are no different; crisp, calm voices are guiding me homeward. The journey to Rotterdam includes a technical stop at Southend at 18:00 (for fuel and to leave my raft for collection by SEMS) followed by a one hour leg across the North Sea. Amsterdam radar and Rotterdam Approach/Tower provide the usual efficient service for the instrument approach to runway 06. I shut down at 19:45, almost exactly 12 hours after leaving Reykjavik.

Home

The entire trip from Rotterdam was accomplished in 10 days, six of which were spent flying, covering 5596 nm in 43 hours' flying time. While all costs are not yet in at the time of writing, my estimates in US dollars are: fuel: \$1000; handling \$600; insurance, rental and purchase of extra equipment including raft, etc. \$600 and all hotel and other living expenses \$1000, 50-hour service \$500 or a grand total of \$3800 (GBP 2300)---ie, about the same as a fortnight's holiday to an exotic destination.

What have I gained from all this? First, I have learned much about long-distance flying in an unfamiliar environment. Flying always involves risk, but risk can be greatly reduced by good planning. Good planning means knowledge: of the route, of forecast conditions, of your aircraft and of your own limits. I find myself re-reading parts of some of my technical books on engine and aircraft maintenance, weather and so on with more insight and appreciation. Second, I think I feel a good deal more confident about what can and cannot be done in a single. Richard Collins in his classic book, *IFR Flying*, examines the FAA database on fatal accidents amongst non-remunerated pilots flying IFR. He concludes that only 2 percent of fatal accidents are attributable to mechanically induced engine failure. Equally, he rejects the hypothesis that GA twins are safer than singles; without access to the data and rigorous statistical testing---which no European aviation authority appears to have done---debates about the latter cannot be settled. However, I do think a modern, well maintained single can be flown for long distances, the chances of engine failure being no higher (and quite possibly lower) than, say, the chance of having a fatal car accident on the *autoroute* headed for the South of France. Whether your long distance flying is over water or land is of little importance; what is important is how well you plan it.

The *real* danger typically arises from pilot error, and above I have given examples of my own ignorance. The greatest benefit comes from analysing what you did right and what you did wrong. And of course---like climbing mountains--- the satisfaction of having crossed the Atlantic is its own reward. Flying is incurably addictive. If one is going to throw money at aeroplanes, the challenge must at least be commensurate. To coin a phrase: go West young man!

George Irvin

THE PRACTICALITIES OF PRIVATE IFR

PART 3 - THE FLIGHT ITSELF

By Nigel Everett

In Part 1 I looked at what the private pilot might need for successful IFR flying from A to B and concluded that the first requirement is as high flying and as fast an aircraft as you can afford: this should help you to cope with adverse weather, especially ice. In addition, an autopilot, GPS and a personal computer were seen as basic necessities.

Preparation for the flight was considered in Part 2 and the core message was that the more time spent on careful preparation before a flight the less likely were you to become overloaded during the flight or confused by instructions from air traffic. Preparation for flying a strange route would take at least as long as the flight itself.

So now you are sitting in as good an aircraft as you can lay our hands on, passengers briefed, checks completed and ready for your clearance. When it comes you will, of course, write it down and read it back. For an off airways flight it might be something nice and simple like, "Climb en route to FL50 and squawk 7654". On the other hand an airways clearance may contain a good deal of detail and it is very important that you get it written down and understood. You will hear Air Traffic giving out complicated airways clearances which are unhesitatingly spieled back perfectly by the pilot and you may wonder if you will ever achieve this professional sounding practice. Do not even try. These practices are professional because the aircraft is on some regular flight and the same clearance has been issued by the same controller and received by the same pilot many times before, so it is no wonder that they are both word perfect. Taking off, as you are, in your light aircraft, no-one is going to imagine you are an ATPL anyway, so just concentrate on getting the clearance right, however long the exchange may take.

Before calling "Ready for departure" make sure that you have got fixed firmly in your mind exactly how the first five minutes of the flight are to be flown. There may be a Standard Instrument Department, there may be noise reduction requirements, your clearance may differ from what you planned and expected. Once you start the take off your work load is going to leap from low to high and that is no time to be wondering whether to turn left or right - was it 218° or 281°? - how do I find BSKO? - did I have to reach altitude 5000ft at 6 DME or 6000ft at 5 DME? - Where's the SID plate gone? - Where the hell am I?

Next to the approach and landing, departure is the most demanding sector of most flights and all the usual precepts of practical IFR flying apply here in spades. To recapitulate, these are:

1. Keep thinking ahead.
2. Use the autopilot if necessary to reduce work load.
3. Maintain situational awareness. A GPS with some sort of map may help here.
4. Watch out for terrain clearance.
5. Work calmly and methodically.

If you coped with the departure successfully, staying on top of the radio work and the engine handling as well as everything else, then flying the route from reaching cruising level is going to seem fairly simple by contrast. The greatest risk now is probably that you will allow your concentration to ease so much that you then make some elementary error. Here are some stupid mistakes that I will admit to, mostly made while blithely poling along in VFR on top with not a care in the world. O brothers, O sisters, I have done those things which I ought not to have done and left undone those things which I ought to have done and there is no health in me. Specifically I have reached a way point, carefully noted the time but forgotten to turn. With the OBS unchanged TO has become FROM and I have continued brainlessly onwards until Air Traffic has politely inquired of my intentions. If you fly **visually** from, say, Biggin Hill to Chichester (Goodwood that was) you will probably route via Crowthorne. When you get to Crowthorne, because you are situationally aware when visual, you will instinctively turn right to Chichester. However when flying IFR it is all too easy to forget about situational awareness and slip into the dangerous trap of thinking that if all the needles are in the middle all must be well. Pilots sometimes fly into high ground in just that frame of mind.

Further, I confess to serial mis-setting of the VOR. It is all too easy to find yourself on the wrong frequency (often the previous one because you forgot to change over), or with the wrong setting on the OBS (often the same problem). If you have an RNAV set of the VOR shifter type, the opportunities for this sort of finger trouble are multiplied considerably. You can have it set to "RNAV" when it should be on "VOR" or vice versa. A friend tells me of flying an entire VOR approach using a shifted VOR by mistake and emerging at 1200 ft above ground a long, long way from the airfield where he thought he was about to land. You can have your KNS80 displaying Waypoint 3 details but quietly using those for Waypoint 2. You can have it displaying the frequency of DME "A" while it is actually "held" on some other DME. There is any amount of opportunity here for getting seriously misled. Indeed the RLD in the Netherlands (their national aviation authority) require aircraft equipped with the KNS80 to have a separate DME for this very reason. Only rigorous procedures in setting up and careful checking will avoid these dangerous mistakes. While in the confessional box I may as well admit to wrong Com frequencies, turning the volume down and forgetting to turn it up, wrong engine settings, wrong altimeter settings, and a multitude of other offences which you may like to take into account before passing sentence. They are, alas, too numerous to relate here.

Regrettably, I am only human and perhaps you also are human and therefore fallible as well. Perhaps you are a better functioning human than me, but be sure that if you are human at all then it is inescapable that you will make some mistakes, even if less frequently than I do. To err is errmanlike. Apart from trying harder and concentrating more, what we all need are ways of overcoming our regrettable fallibility. Having another pilot in the cockpit, dividing the tasks and monitoring each other is the most effective measure, which is why it is compulsory on most public transport flights. Private pilots often have to resort to other measures, the first of which is the regular check. FRED A - fuel, radio, engine, DI and altimeter - is where you start. A check well known to most pilots and carried out in IFR at least every 10 minutes and expanded to include "ice" as well. FRED A-Ice **must** be carried out on passing each way point and on reaching each new level. At these points you should also have a nav check. This comprises a rigorous *de novo* check of how you are conducting your navigation. Explain to an imaginary examiner, training captain or whatever, precisely what is going on in the navigation department. "I am flying FROM MID with the frequency of 114.0 set on Nav 1 and identified. The OBS is set to 098°, the flags are away and FROM is showing. I am flying TO MAY. Nav 2 is tuned to MAY on 117.9 and has been identified. The OBS is set to 098°, the flags are away and TO is showing. The DI bug is set to my new heading of 101°. The Minimum Safety Altitude for this part of the flight is 2100 ft and I am above that."

This may sound all rather wearisome and unnecessary but you must be rigorous in this sort of procedure. A common alternative is to rely instead on something vague like "common sense" or "including the Nav settings in my scan". Use these methods and you will surely come unstuck.

If you are using Area Nav equipment, however, be it GPS or some sort of VOR shifter, you have more checking to do. If your GPS requires it, take very good care to see that you have inserted appropriate co-ordinates with absolute accuracy, and that you have set your equipment up properly. Having done that the rest will be easy. However, mistakes are often made. Co-ordinates, whether they be latitude and longitude or radial and distance from a VOR can very easily be wrongly transposed on to your nav plot or from the plot into your equipment. Just one digit wrongly entered can throw you miles out, and this sort of equipment is so beguiling that it is all too easy to sit there fat dumb and happy keeping nicely on the prescribed track and being quite confident that all is going well when in fact you are steaming along in quite the wrong direction. The entry of latitude and longitude into inertia navigation equipment on airliners is commonly carried out by three separate crew members entering the numbers separately. Only if all the entries coincide does the equipment accept the entry. The private pilot does not have this luxury and so you have to be very sure to check your entries after you have made them. A very common mistake with the KNS80 type of "VOR shifter" is to forget to switch from "VOR" to "RNAV". You will then find that instead of guiding you towards the waypoint of the "shifted" VOR, the equipment will guide you to the unshifted VOR, usually with fatal consequences to efficient navigation.

To face the very real risks of these easily made mistakes, you must be rigorous in applying two types of check. You must evolve a routine check with your Area Nav equipment, and some sort of mnemonic is useful here. Thus for a KNS80, I try to store the data of all the waypoints and double check the entries before taxiing out. When airborne as each waypoint is reached, the mnemonic as you embark on the next leg is: WIFOS, which is, being interpreted, as:

Waypoint - check that the next required waypoint is displayed
Identify the VOR and the DME ident
Flags away on the CDI
OBS adjusted to the required track

Settings on the KNS80 box. Specifically this means scanning all the indications on the box to see that you are using the waypoint displayed (you could be displaying one waypoint but using another), that you have selected RNAV or VOR modes as required and that you have not got DME hold engaged unless you wanted it.

For other Area Nav sets you will need to evolve other checks and mnemonics, but be in doubt that they all need very painstaking and careful setting if unfortunate mistakes are to be eliminated. Foolproof they are not.

The second strategy is to check your progress along the next leg by some other means. If you are flying IFR in VMC then a bit of map reading is called for. If you are in IMC this is not possible and a navigation check should be provided by some secondary navigation equipment and for those with GPS this is where the set can earn its keep. If you have IFR approved GPS you may alternatively use that as your primary navigator and the conventional kit to monitor progress. Use whatever arrangement is legal and convenient but be sure to navigate with one system and then check your navigation with something else. If they don't agree, wake up and search for a reason for the discrepancy. In practice for most of the time you will find yourself observing that the DME, say, gives 143 knots ground speed and an ETA at the next way point of 17 while the GPS says 141 knots and 18. The CDI says you are on track and the GPS that you are 0.7 miles right of track, so that's just fine and your Nav check is complete.

Once you have made quite sure that you have your Area Nav properly set up and functioning for the new leg you can relax on the navigation side of things and let all those clever chips do the work. But never allow yourself to relax until you are certain sure that all is as it should be. The one thing worse than being lost and knowing it is being lost and not knowing it because of your blind faith in misleading indications from an Area Nav set. If you are not where you think you are, you may be heading for a cloud stuffed hill without realising it.

Having now avoided the pitfall of the elementary mistake the other difficulty commonly met with on the cruise is the incomprehensible re-routing instruction from Air Traffic. "Climb to FL100 and route via NEXO" they tell you out of the blue. If you recognise NEXO and know where it is you may be thankful that in the course of your comprehensive preparation for the flight you have made the acquaintance of this, perhaps obscure, reporting point. If you do not recognise your new waypoint, request the controller to spell. If instead of a spelling you get "Oh NEXO (or was that METSO?) is 11 miles beyond BOM", stand out for a spelling and thus a positive identification. In this situation controllers can be mollified and perhaps impressed if you say, "I need the exact spelling to access my database".

Having positively identified your new waypoint, you now have to get yourself there. Unless it is a VOR within range you will have to do some setting up of instruments plus, perhaps, some calculations, and perhaps some pencil and protractor work on a chart. This will take a bit of time and is not to be hurried. To give yourself time look, at the chart and guess the new track, make an allowance for drift, set the new approximate heading on your bug and fly that. Alternatively, ask the controller for a vector and distance to NEXO: it is the work of but a moment for the controller as their screens are equipped with point and click equipment which handles this sort of request with ease. Only after you have changed to the new heading do you set about your own more serious navigation inputs and calculations to get yourself accurately to the new way point. Consult your primary system first, adjust the heading and note the ETA. Then consult the secondary system and check that the commands of both more or less agree. Where all else fails your primary system could be old fashioned dead reckoning and your secondary some non approved area nav kit such as a hand held GPS set.

Check the weather at half hour intervals during the cruise. Get the destination weather if you can or failing that find out the relevant TAFs from Volmet. Your understanding of how the weather along track was expected to develop should be compared with the actuals and appropriate conclusions drawn. If the weather turns out not to be according to forecast you need to form a plan of action in case both destination and alternate should fall below minimums. Soldiering on and hoping for the best is not a plan, it's plain stupid. Change tanks at regular intervals and keep a running log of fuel states. Running out of fuel is a major cause of engine failure and I have personally experienced a sudden increase in consumption by 50% because of an otherwise undetected mechanical breakdown. Keep a running picture of where the nearest airfield are, or be aware of this facility on your GPS. At airways heights in northern Europe you are frequently within gliding distance of at least one airfield.

Last but not least, keep checking for ice. The first sign is likely to be a need to trim back so as to maintain level consequent upon a small build up of ice on the propeller, leading to a small drop in air speed. So if you find yourself trimming back a bit, check to see if the airspeed has fallen a little. Next there is likely to be some build up on a particularly ice prone surface such as the outside air temperature probe. By the time build up becomes apparent on the leading edges as well you have already reached stage three. Airframe icing is too big a subject to deal with adequately here but there are two golden rules. Firstly get out of your present level as soon as you can get clearance. If you are reasonably certain of getting above the cloud tops with

only a small climb and you have ample climb performance in hand, then up may be best. Otherwise, go down to below the freezing level. This leads to Rule 2 which is always to have below you at least three thousand feet depth of air space between ground level and freezing level. Without that minimum you should not contemplate flying in cloud at or above the freezing level in a non de-iced aircraft. Even if you have that amount of leeway, you must also have a lightly loaded high performance aircraft and a good deal of skill and experience. Without such an aircraft, and without such skill and such experience you should not consider any flying in cloud above freezing level, however many thousands of feet there may be between the cloud base and the terrain. The slower the aircraft, the quicker the build up of ice. The less powerful the aircraft the less able are you to cope even temporarily with rapid ice build up. So if, iced up, you spin out of the clouds with the controls surfaces frozen and immovable, it may make little difference whether there are just three thousand feet to go, or all of six thousand.

The descent calls for a bit of forward planning. Four miles per one thousand feet is a common allowance for a light aircraft, so if you are looking for a descent of eight thousand feet to your initial Approach Fix, you want to have commenced your descent 32 nm before the IAF. Some controllers will be aware this need and others will not so it is best to start negotiating your clearance for the descent a few minutes in advance. Turbo and other high powered piston engines can easily suffer from expensive shock cooling in the descent and the usual way to avoid this is to limit power reductions to not more than two inches of manifold pressure per minute. So if you want to drop a number of inches of manifold for your descent you should start shedding them some minutes before you reach Top of Descent. You may also need to ask for a clearance which will avoid a step in the descent at or just above freezing level as your cold soaked aircraft will be particularly vulnerable to airframe icing.

On the way down take the opportunity to explain to the imaginary co-pilot or Skill Test Examiner in the other seat the details of the forthcoming approach. In some ways the instrument approach is the most familiar part of the flight to the recently qualified instrument pilot. You have flown around the hold until you are dizzy and have shot NDB approaches and ILSs until your proficiency has satisfied an examiner. There are two major areas of difference in the “real” world and the first is that radar vectors to the ILS are by far the most common type of approach and quite possibly you have never done one in training, still less on a skill test. The holds which you eventually mastered may never have to be repeated until your rating renewal flight and the procedural ILS is itself quite rare. You were never examined in the radar vectors to the ILS approach because that is easier than the procedural ILS, but you can still make a mess of it, especially if you are a novice. Provided that you can follow Radar’s instructions, there is not much that can go wrong while flying the radar vectors, but it is easy to become so beguiled by the ease and simplicity of it all that the instruction, “You are closing from the left. Report localiser established.” can come as a bit of a shock. All of a sudden you have to start thinking for yourself instead of just doing what the nice controller says. Not only are the checks not done, and the tower frequency not set up on standby, but you are not sure which way the airfield is, what the final Approach Track is, what the wind is doing, or even which way to turn when the localiser needle becomes active. With the radar controller doing all the thinking, your own mind has slipped into neutral and is now going into emergency mode (a very unreliable condition) to catch up.

The remedy is easy enough. While flying your radar vectors, get thinking ahead. Visualise your track on your approach plate so that you know where you are in relation to the airfield. Carry out your checks. Visualise where the localiser and glide slope needles will be when you are set up on your final closing heading. What is the wind doing? Will it carry you rapidly through the localiser or will you have to fight it to get there? What should your estimated heading be to maintain the localiser? At the time that Radar hands control back to you, your mind should be fully engaged and you should be well on top of the situation. This, like the initial departure, is another of those sudden leaps from low to high workload which can be tricky if not prepared for.

On the ILS approach itself you should be carrying out a number of checks and apart from the usual downwind and ice checks you will need to check the idents on both ILS sets, the inbound track set on the OBSs, the DA/MDA checked and bugged where possible, marker lights and audios set and tested, and so on. There is a great deal to be checked and only a set procedure which suits you and your aircraft will ensure that nothing gets overlooked. The real difference between the good and adequate ILS pilot is not whether the two needles stay fixed in the centre of the CDI all the way down the approach, but whether all the checks are carried out in good time and whether a running check is made on the descent by some means additional to the glide slope needle. The glide slope indicators can sometimes be faulty. Needles sometimes stick. So a cross-checking of height against DME or elapsed time is a very valuable precaution. Much better to accept deflections up to half scale but proper height and other checks rather than perfection with the two needles and blind hope on the rest. While in training the accent was all on how to keep the needles where they should be. In practical instrument approaches the accent must be on safety, with precise handling coming second. Be **absolutely** sure that you have the correct QNH/QFE set, the circling to land details, all the minima, and the overshoot procedure clearly understood, the checks properly completed, the wheels down, and a clear mental picture of what approach lights and runway pattern you will see on breaking cloud. All these are matters which are more important to a safe professional arrival than ultimate precision in flying the approach.

If that is so, then in my opinion, the auto pilot and the GPS with some sort of map, are valuable aids to safety on an instrument approach. The auto pilot will buy you spare mental capacity to monitor properly the vital safety issues that I have touched upon, and the moving map can assist greatly in the visualisation of where you are in relation to the airfield, the Final Approach Track, perhaps high ground and which way you should be going next. So save the fancy precision approaches for the next renewal test and meanwhile aim for safety first using whatever extra kit you may have.

To take off, enter cloud, fly a route, negotiate your way through assorted controller's areas and not see the ground again until your destination runway suddenly looms out of the cloud in front of you, is every bit as thrilling as a executing a perfect stall turn or sideslipping a taildragger into a difficult short strip. There is also a certain quiet satisfaction in safely completing a flight which would have been unwise or even impossible in visual conditions.

Nigel Everett

THE 1998 PPLIR NETWORK FLIGHT PLANNING SOFTWARE SURVEY

Compiled by David Bruford

The last issue of NETWORK featured a questionnaire for flight planning software and we would like to thank all those members who took the time and effort to complete the survey form. The following information may be useful to readers if they are unhappy with their existing program and considering a change, or for pilots considering bringing their flight planning into the computer age. The information contained below is purely a précis of reader's comments and not the author's or NETWORK's opinion of the software.

Flight Manager from Skyforce at £70 - £100+ was the second most popular program and won praise for having "very comprehensive output" and "easy map based flight planning" covering the UK & Europe. Users were split 50/50 on whether they used the programs log or their own but all cross checked the data with a chart. Frequencies supplied are for Approach, Tower and all navigation systems. Exceptionally for flight planning software, MSA, danger/restricted areas and restricted airspace warnings are provided. User waypoints can be added in Lat/long or VOR format and are permanently recorded in the database. ATC flight plans and a route map can be printed out. Respondents advise that the most recent versions have removed most of the bugs but that the PLOG could be improved. The program can be updated by disk or modem

FlightStar 4.52 for AppleMac at around \$800. Only one respondent supplied details of FlightStar which has now been taken over by Jeppesen but it deserves mention for the glowing reference. (For those that are not aware, AppleMac hardware is only used by people who are not interested in their machines locking and crashing on a regular basis and are unwilling to re-install their software on a bi-weekly basis.)

FlightStar uses the Worldwide Jeppesen database but although it produces a good flight log, ATC flight plan and map it offers only VOR & DME frequencies and no communication frequencies. User waypoints can be permanently added by Lat/Long only but if previously stored routes are loaded it offers no warnings that waypoints have been moved or deleted. The user updates his system three times a year by disk and the update service, previously lacking, is now very good. MentorPlus at around £145 per annum, including update service, is another program now acquired by Jeppesen but the respondent's versions only offered coverage for UK & Europe. MentorPlus has a usable flight log and ATC flight plan and the ability to construct routes in various ways; airport or waypoint names can be keyed, highlighted and dragged in by mouse or SIDs or STARs can be selected from a pop-up menu. Waypoints can be created from VOR or Lat/Long data and are permanently stored. MSAs are provided but are mentioned as being "quirky". Drawbacks are that the printouts are based on US sized letter paper and that the DUATS dial-up feature does not work in Europe.

NavBox Proplan at around £100. Although only the fourth most popular program attracted high praise from its users. Route planning is by keyboard or mouse and the airfield/beacon/waypoints data is user amendable. The system provides a flight log, ATC flight plan and a map at a user definable scale and the most commented point was that a full accurate route can be planned (by clicking the mouse over the map) in seconds. Waypoints can be permanently added by Lat/long only. The 'route waypoints' print out provides LARS frequencies as well as all communication and navigation frequencies. Updates are by disk.

Navigator at £65 - £95 is by far the most popular program with 50% of all respondents reporting that they support it and have done for three to five years in its various forms. Half the users rely on its accuracy exclusively and the others use a GPS to check route heading accuracies.

Updates range from "never" to "3 monthly" but when done, are completed by disk. The ATC flight plan and route log provided by the program is utilised by all users and the information provided also includes all communication and navigation frequencies. Several users stated that it was not possible to add waypoints whereas other stated that they can be permanently added by VOR or Lat/long data. Another commented that they disappeared a couple of years ago. Either this is due to differing versions (updates - never?) or they aren't getting the best out of their systems. Those that can't input waypoints should, perhaps, invest in the latest version.

Further contradictions arise from the comments; "It doesn't cover enough of Europe" to "Full EU coverage". The lack of a map is cited by many as a shortfall and the 'token' system, used to prevent illicit copying, is mentioned as being annoying by those that have experienced 'losing' one.

Plan2Fly.Xls is free if you ignore the endless hours spent writing and updating it. The author and only user has produced his own program for flights within Denmark, Norway, Sweden and Germany and updates it "once or twice a week". The program seems to have most of the attributes of commercial products so hats off to the man who modestly states; "It is presently not suitable for use by anyone else but me!"

Sierra 7.0. at £70 (trial version available on the Internet) provides a UK and European database but existing users check the data against their charts before take off and make up an alternative log to use in flight as opposed to the program's log. The system provides Approach, Tower VOR, ILS & NDB frequencies. Waypoints can be added permanently to the database and it will accept the input in VOR or Lat/Long format. As with most programs it produces an ATC flight plan and map but exceptionally it can be used to 'fly' the route from the comfort of your armchair. A very useful feature if you plan to visit a strange airfield with a complex approach procedure. It lacks airways intersections but, according to one user, has the support of a very responsive programmer, so this and any other shortfalls may soon be remedied. The program may be updated by modem.

Most program users seem loyal to their software with the average having used it, in various forms, for three or more years. 40% chose their system from a friend's recommendation, 40% from an advert and 20% after reading a review.

David Bruford

THE PPL/IR NETWORK FOR EUROPE

is open to anyone interested in the operation of light aircraft under IFR in Europe. The annual subscription is UKP 15 and more details are available from Ole Henriksen, tel ++44(0)1481-52565

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