

# EFC NEWS

EDINBURGH  
FLYING CLUB

Edition – 1<sup>st</sup> April 2009

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## *Editor's Notes*

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This month I would like to begin by thanking those of you who have already renewed their subscriptions and request those who still wish to do so as soon as possible. Likewise the process of ensuring that all members have BAA ID passes is underway (thanks to those of you have already completed the form) and Jack is currently processing the references before Malcolm and Jack finalise the process and passes can be issued. The sooner this process can be completed the sooner 'normal service' can be resumed, so a speedy response from members would be appreciated. I would also like to congratulate Fraser McKay on his first solo and Paul Smith on completing his qualifying solo cross-country. Well done to you both.

This month we have a profile from Gerry, one of the six members of the FY users group, and an interesting one it is too. There is a safety matters section from Tom Ward about using GPS, and a piece from Malcolm about avoiding straying accidentally into controlled airspace. On the subject of controlled airspace, you may not know that the consultation on the change to the airspace between the Edinburgh and Glasgow zones has now closed. The proposal seeks to change the classification of the controlled airspace between Glasgow and Edinburgh from Class E to Class D, which will enhance safety by establishing the airspace as a "known traffic environment" where all aircraft are required to be in contact with Air Traffic Control (ATC). There are no changes proposed to the dimensions of the airspace or to the way in which aircraft will fly through it.

The figures below show the existing portion of airspace, currently Class E, that NATS proposes to reclassify as class D airspace. It is bounded in pink and extending from 2500 – 6000ft above mean sea level. It is currently designated Glasgow CTA.



NATS

GLASGOW AIRSPACE  
Proposal for Reclassification of the Glasgow Control Area  
from Class E to Class D

### STAKEHOLDER CONSULTATION



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If you want more information, the full consultation can be accessed at the sit below.

<http://www.nats.co.uk/uploads/GlasgowConsultationFinal.pdf>

There is a postscript to this, which has appeared since this draft of the newsletter was written and this can be summarised as:

- (a) A proposed raising of the Class D base in the north of the region from the original proposal of 2500ft to 3000ft within proposed lateral limits.
- (b) A proposed raising of the Class D base in the south of the region from the original proposal of 2500ft to 3500ft within proposed lateral limits.
- (c) A proposed return of a portion of Class D Glasgow CTR in the south west of the region to Class G from Surface to 3500ft

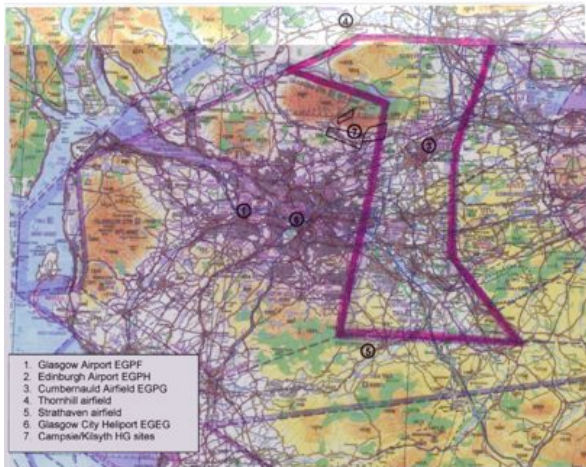


Figure 1: Existing airspace

- 6.2 To remove any ambiguity on airspace users' charts with respect to the ATC service provider, in September 2008, this segment of Class E airspace was renamed as Glasgow CTA from Scottish TMA. Other portions of class E airspace around the Glasgow CTA and Glasgow CTR remain designated as Scottish TMA, these will remain Class E airspace.
- 6.3 In late 2007 NATS undertook a number of stakeholder engagement meetings associated with this airspace change proposal to capture the views of those major airspace users whom NATS believed may be concerned about any proposed change in classification. A brief feedback description of all of the aviation stakeholders engaged to date is given below:
- a) MOD - by letter to interested airspace users under guidance from Sqn Ldr Skipp (So2 ATC (Area) Airspace 2) comprising:

The full text of the feedback from the consultation can be seen at:

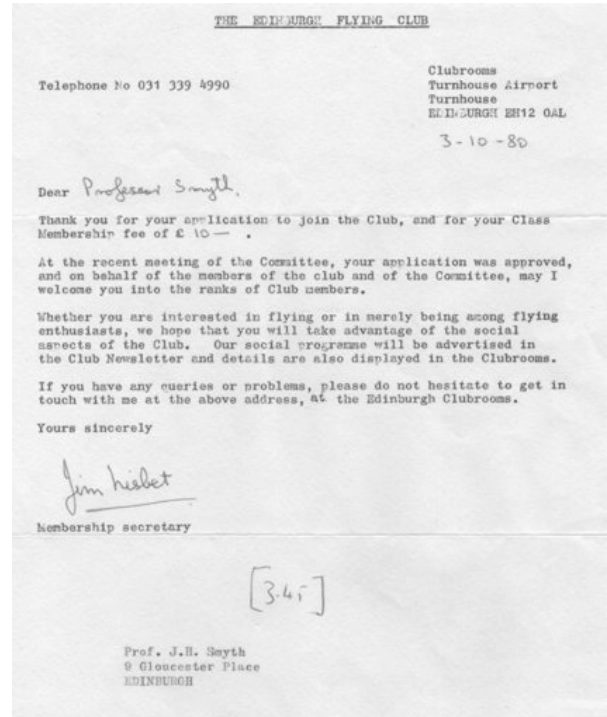
[www.nats.co.uk/uploads/GlasgowFeedbackFinal.pdf](http://www.nats.co.uk/uploads/GlasgowFeedbackFinal.pdf)

Also enclosed this month is a small reminder of the ground marshalling signals we all learned as part of our air law. Seems very distant!

**AVOID THE BIRDS AT ABERLADY**

Although most of us avoid over flying the area completely, we have been asked by the warden of the nature reserve at Aberlady Bay in East Lothian to avoid over flying the area at less than 2000 feet. A map of the requested avoidance area is on the notice board at the club. Please note also that the base of controlled airspace above the site is 2500 feet so if you plan to fly higher than that, remember to get a clearance from Edinburgh Approach first.

Finally, on a lighter note this month the letter below was received by John Smyth – his acceptance by the committee to join the Club in 1980, with a fee of £10!



**Member Profile**



**Name:** Gerry Robertson  
**Age:** 46  
**Job:** Software Engineer, Standard Life  
**Total Hours:** 530

**Flying Training:** Joined the RAF while at university and learned to fly at UAS completing the Bulldog course in 90hrs over 18 months gaining both Preliminary Flying Badge and Preliminary Instrument Flying Grading. PPL was issued on the back of this training, all I had to do was sit an Air Law exam and cough up the fee. Delayed entry to RAF College Cranwell for 6 months due to looking after wife and new baby! Subsequently found it too difficult 'keeping it all together' being 250 miles from home, only getting back once a month or so and with no chance of a married quarter until after advanced flying training was complete. My career as an RAF pilot was over before it had really started!



Had no ambitions to fly for the airlines and didn't fly again for another 15 years.

After taking a trial lesson at Cumbernauld I realised what I'd been missing and also that I was for the first time actually going to have to pay to fly. I knew it was going to get expensive! The CAA dictated that after 15 years I'd need 20hrs retraining and have to sit all the PPL ground exams. After 4 months, all the ground exams, 20hrs 20mins flying time and a skills test, I was the proud owner of a renewed PPL. Six weeks and a trip to Florida later I had another 40 odd hours, IMC and Night ratings under my belt too.

Having enjoyed studying for the PPL exams I wanted to continue learning and enrolled with Cabair spending about 9 months distance learning the ATPL courses and had a couple of trips to Cranfield for week long 'crammer' sessions prior to sitting exams. Now all I needed was to spend £25k to get CPL and multi-engine IR and I'd be sorted. Unfortunately with 3 kids by then, eldest not far off going to university, and the likelihood of substantially reducing my salary (even if I could get an airline job), I decided I didn't need a mid-life crisis career change and would just enjoy flying as a hobby.

Subsequent trips to the US allowed me to gain and keep for a few years a multi engine rating.

Joined the FY group at the end of 2000 and have enjoyed the thrill of navigating further afield than is generally possible with hire/club aircraft and have been to all corners of the UK, and Europe on 4 occasions.

Last year I visited Ultimate High at Kemble with a friend and had a fantastic time being reacquainted with formation flying in the Bulldog after 24 years. Especially enjoyed the tail chases (aka dogfights) and formation aerobatics. While it was quite expensive I believe that it was money very well spent and

hope to return in the summer for the AOPA Aerobatics certificate.

**Favourite Route:** Probably west coast to Plockton.

**Furthest Flight:** Via Corsica to the grass strip at Valdera in Tuscany, Italy to the Grumman owners club European fly-in with another FY group member Martin Walker. This was a fantastic trip with outstanding scenery over the Southern Alps, Cote D'Azur and into Calvi (Corsica) with its 8000-foot mountain at the end of the valley. Some challenging conditions on the way home saw us land at a glider field in the Alps we'd clocked on the way south, to sit out the passing of a dying front that threw some nasty weather at us.



**Worst SNAFU:** I've had a few of these, and don't know which is worst:

- EFATO practice, while performing touch drills almost bringing the mixture back to cut-off – boy that woke the instructor up!
- Shortly after being awarded my flying badge, and thinking I was God's gift to the piloting world, managing to get properly lost for the first time in one of those hot and hazy barely VFR summer days (no GPS, or radio nav kit to help out), thank goodness for VDF - location identified, Navex continued, God status returned, instructors none the wiser.
- Experiencing severe turbulence in a Grumman GA7 after lowering gear, fearing the worst but having 3 greens and the tower confirm gear appeared down - found that problem caused due to football sized bubble of air getting under the rubberised wing-walk compound causing turbulence over the tailplane!
- Loss of engine power after take off and only able to make 100 fpm climb. Emergency declared and landed pronto

- onto the cross-runway – turned out that the exhaust was loose/cracked/damaged.
- Mixture cable of FY breaking while on Corsica and no engineers available – determined mixture spring loaded to fully rich and safe to continue. Flew another 15 hrs before getting home but added @ 15% to fuel burn.
  - That single cough of the engine that caught our attention while mid way back across the Med on return trip from Italy with only water to be seen in every direction. (Glad we've just bought a new Fastfind MaxG PLB!)

**Future Dream:** Not sure, I'm incredibly lucky to have experienced some amazing flying while in the RAF:

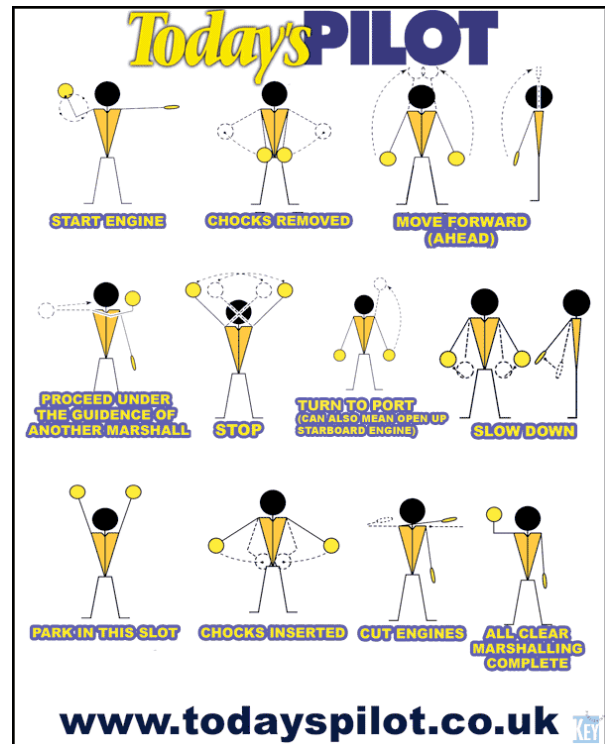
Aerobatics in IMC and knowing that every roll and loop was perfect, maintaining height and entry & exit directions – the instructor was an ETPS graduate and now chief test pilot at Cranfield University!

Nap-of-the earth flight at 140kt some 20 feet above ground over Salisbury Plain in a Lynx being flown by a nutter Army heli instructor who was transferring to the RAF and on my course at Cranwell.

Flying a 151sqn Hawk out of Chivenor Tactical Weapons Unit, being told at 200 feet 'you have control' and flying low level through the rolling hills and valleys of Devon at 400kts (seriously easy aircraft to fly), popping up to 6000 feet to fly some aerobatics, only handing control back once on finals.

Being strapped into an 11sqn Lightning at Binbrook and experiencing a 'Saturn V' take off where the a/c accelerates to the end of the runway (briefed max 16 secs of afterburner) before pulling to the vertical not stopping until some 35-40,000 ft reached, burning 8000lbs of fuel (@ 4,500 litres) in @ 35 minutes while chasing down a 360sqn Canberra.

Realistically, I guess to always have enough money to continue flying, get a full IR should we see the demise of the IMC and possibly to fly more formation and aerobatics, oh, and always stay safe.



## Safety Matters

### Reliance on GPS!

GPS users beware!

There was an interesting article in a recent edition of the New Scientist magazine, which may have major implications for GPS users. As a result of a 'leak' it is now known that engineers at the European Space Agency and the US Department of Defence are investigating a problem with satellite timing. A Risk Assessment has been carried out by these agencies and whilst the classification for civilian users came out as 'Class B – Undesirable', for the military it came out as a 'Class A – Unacceptable'. It would appear that on the 31<sup>st</sup> of December last year, when the atomic clocks around the world were adjusted to realign them with UTC, the clocks in the GPS satellites may not have been updated and are believed to be still operating on last year's time. Since 1972, atomic time and UTC run at the same rate, and these clocks, which are the international standard for UTC, had to be realigned to add an extra second to them, (known as a leap second) thereby realigning them with the earth's rotation period.

This was necessary because as they are both based on the 19<sup>th</sup> century rate of the earth's rotation, they are faster by almost one second a year than earth time, which is derived by today's rotation rate. This is because the planet

is decelerating at an average rate of two milliseconds per day. Apparently UTC should be kept within 0.9 sec of earth time and by delaying UTC by a leap second at the end of December, UTC falls behind earth time but starts to catch up again. Still with me? Good! Within each satellite, the timings providing the GPS signals are also controlled by atomic clocks, and their accuracy is monitored by the Master Control Stations on earth. Corrections or recalibrations are sent to the satellites when necessary, as in this case. Although these recalibrations were sent, it appears their atomic clocks may not have updated.

Initial investigations have ruled out the earth station monitoring system, and attention has now turned to the satellites; it looks as though it has increased the satellite ephemeris error, which is meant to be about 0.5m to 1m. This error results in the satellite not being where it says it is and, in turn, the timing signals received by your GPS, which are computed from at least two of the satellites, will give you an inaccurate position. What this error means in terms of earth distance is not known at this stage and that is the problem. So you may not be where your GPS says you are. In other words, you might not know where you are, unfortunately neither does your GPS. It might think it knows where it is but it really doesn't know because it doesn't know where it's been! If it could subtract where it is now, from where it was then, both you and the GPS would know where you are. But it can't!

Motoring organisations dismissed the problem because, as far as they are concerned, "you are where the road signage says where you are and not where the sat nav says, if we all followed our sat navs we would never get off the M25". However, according to the report, there are serious implications for aeronautical and marine users.

A spokesman for the Trinity House Lighthouse Service said they were "aware of the problem and about to conduct trials along with the Engineering and Physical Research Council to find if the methodology for assessing the integrity of GNSS for marine navigation in UK waters is still valid". If not, they suggest that "it may be necessary to develop new algorithms and software tools, so that assessing GPS integrity for safety critical operations, such as port approaches, berthing and harbour navigation, can be maintained".

In the air, aircraft GPS use what is known as a Receiver Autonomous Integrity Monitor in order to identify faulty satellites. The receiver uses an additional satellite to monitor the integrity of the system and, if a fault is found,

another satellite is used to isolate the faulty one from the system. But because the satellites are transmitting known 'good signals', albeit late ones, the RAIM in the aircraft do not see this as a fault, so the accuracy of the navigation GPS systems is being compromised. So if you're routing out the Kelty Lane don't be surprised if you happen to pass a Ryanair going in the opposite direction!



At the CAA, a spokeswoman said that, "whilst no decision has been taken at the moment, it may be that GPS systems in all aircraft will have to have their timings recalibrated by the manufacturers, and approvals for the recertification will have to be carried out via EASA and the CAA". She said that "this will entail a great deal of time, and the cost of the recertification work will have to be passed on to the users, in addition to the cost of recruiting staff to carry out the recertification program". Apparently, in an effort to be more cost efficient, there has been a reduction of 8.5% in staffing at the CAA, so extra staff will now have to be recruited to push through the large volume of paperwork involved.

When asked what effect will this have on the recent decision to allow GPS approaches into Shoreham aerodrome, she pointed out that "under the ANO, the commander of the aircraft has responsibility to operate his aircraft within the privileges of his licence as set out in Schedule 8, and the aircraft navigation system installations based on the GNSS receiver equipment has to be approved for the purpose". She referred to CAP 773 where all the requirements for flying the approach were

clearly and simply laid out. She also went on to remind pilots that "GPS is not to be used as the primary means of air navigation, merely as a back up to the more established navigational aids that are already in service".

So if you are a GPS user, it may be advisable to switch it off and revert to 'mark one eyeball and map' until this problem has been rectified. Whilst hill walking, it's unlikely to send you up the wrong 'Munro'! In the air it could however, present a problem especially if flying near CAS. And remember, the CAA takes a very dim view of anyone infringing CAS and don't bother trying to explain to the judge in court that it is the worldwide GPS system that is at fault and not your dodgy navigation, it will get you nowhere.

HAPPY LANDINGS

Tom Ward

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### ***How Not to Stray into Controlled Airspace***

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So there you are, it's a lovely day and you're flying along without a care in the world, just enjoying the view and thinking how lucky you are to have a pilot's licence, when ATC calls you up and says "Golf Golf Tango are you operating in the East Kilbride area?" How comforting that they're still keeping tabs on where I am, you think. But then you hear those ominous words "Golf Golf Tango contact us by phone after landing". You're told you've infringed the Glasgow Zone and caused three airliners to be diverted around you because you weren't in radio contact with Glasgow. You feel a real chump. But, far worse than delaying several hundred Glaswegian holidaymakers by a few minutes, you're going to have to admit your mistake to Bob!

So how can you ensure it doesn't happen?

First of all, we all have the capacity to be "temporarily unsure of our position". Luckily, we also have the tools to reduce the risk of infringing controlled airspace. At EFC, we are probably better equipped than many PPLs, because none of us are scared by the prospect of controlled airspace or speaking to ATC.

Here are a few tips:

- Always have a plan when you fly. Even if it's just a casual local flight, draw a line on the chart. That way, if you decide to go off-route, it will be a cue to spend more time checking where you are. In any case, disciplining yourself to preparing a PLOG will sharpen up your

flying and keep you current with navigation techniques.

- Before you fly, spend a few minutes studying the chart for the area you intend to fly in. Identify controlled airspace, ATZs and MATZs, prohibited zones, gliding sites which might be a factor; if you're planning a specific route, note them down on your PLOG against the relevant leg of your route.
- If you're flying without a PLOG, note your position and time on the chart at regular intervals. That way, if you do become "temporarily unsure..." you can at least work forward from where you knew you were a few minutes ago.
- Check your DI against the compass regularly. You may think you're on a safe heading away from controlled airspace but if you haven't checked the DI for 15 minutes you might be surprised by how much it can drift.
- Think about whose frequency you should be on. You may only be going for a local flight, but if you have left the zone and haven't spoken to Edinburgh Approach for a while, don't expect them to be monitoring your progress. If you don't know where you're going, nor will they, so don't expect them to transfer you to some other agency.
- Be aware of the places around Edinburgh where you are most at risk of going into airspace where you shouldn't be – Torness nuclear power station, Portmoak gliding site, the Leuchars MATZ and the Glasgow Control Zone, to name a few.
- Always have the transponder switched on, and use Mode C ("ALT"). It might not stop you breaching controlled/restricted airspace but it may reduce the consequences of any breach for other traffic.
- Use the radio nav aids in the aircraft. They're there to help you. For example, if you're operating just outside the Edinburgh Zone and don't want to breach it, tune the DME to 108.9 and make sure it shows comfortably more than 10nm. If you have an NPPL and haven't been trained to use radio nav aids, why not ask an instructor to show you?
- Use the instructors! If you feel unsure about any aspect of navigation, don't be afraid to ask an instructor to remind you how it's done. We're very lucky to

- have six instructors at the club now so there will always be someone available.
- Take a look at <http://www.flyontrack.co.uk/content/tips.asp> for more tips on avoiding breaches of controlled airspace.

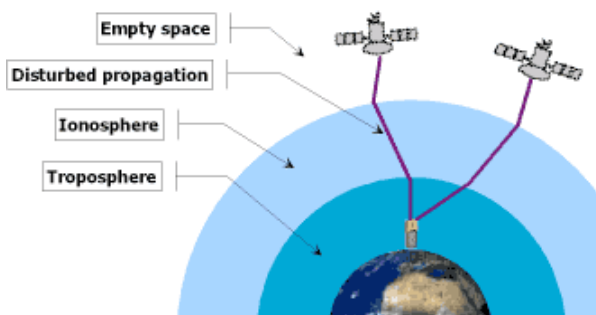
Finally, remember that a controlled airspace infringement doesn't just create a hazard for other aircraft and a red face for you – it reflects badly on other people who fly that aircraft, and on the club's reputation.

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### *Some Facts on GPS*



GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is. Now, with distance measurements from a few more satellites, the receiver can determine the user's position.



The errors of the GPS system are summarized in the following table. The individual values are not constant values, but are subject to variances. All numbers are approximate values.

Ionospheric effects +/- 5metres. Shifts in the satellite orbits +/- 2.5 metres. Clock errors of the satellites +/- 2metres. Multipath effect +/- 1 metre. Tropospheric effect +/- 0.5 metres and rounding errors +/- 1metre. Altogether this sums up to +/- 15 metres. Not bad really – if one could fix a position to that accuracy by dead reckoning you would be a better man than... well most!



A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. With four or more satellites in view, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination, sunrise and sunset time and more.

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### ***EFC NEWS***

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