CluedUp

SPRING/SUMMER 2013

Civil Aviation Authority

SAFETY MATTERS FOR GA PILOTS

INSIDE

SEEING IS BELIEVING

Are you really spotting what's out there?

PLUS / *NEWS* / ***NEW NAV AIDS*** / *MICROLIGHTS* / ***HELICOPTERS*** / *INCIDENT REPORTS* ***AND MORE***

TORGOEN
SWISS

NOTHING IMPOSSIBLE

WWW.AVIATIONWATCHES.CO.UK

The TORGOEN Swiss T16302 Limited Edition, in association with the Royal Air Force Typhoon Display Team 2012

NEW YEAR, **NEW LOOK...**

Welcome to the latest issue of *Clued Up*, the Civil Aviation Authority's safety magazine for General Aviation. The good news is, *Clued Up*, which is sent to all private pilots with our compliments, will be expanding to two issues from this year. The copy you are holding, and an Autumn edition, will focus on general safety issues. Sandwiched in between the two, you will receive a dedicated Airprox edition – analysing in depth a selection of incidents where the separation between two aircraft was reduced beyond safe limits. I hope you find all three publications both entertaining and educational.

If you are a recently qualified pilot, congratulations! For your information, *Clued Up* is now in its fifth year and aims to bring you all the latest safety news, topical issues and advice from across the UK's General Aviation community. The magazine features contributions from pilots, air traffic controllers and, of course, safety experts.

After a dismal winter, I am sure many of you are desperate for some decent flying weather. However, as David Phillips points out in his article on pre-flight planning, it is vital not to forget the basics of preparation in your haste to take-off.

For those of you still unsure about how the pilot licensing changes introduced in 2012 affect you, we take a look at the benefits of EASA's new Light Aircraft Pilot's Licence.

With tips on how to negotiate final approach to Cambridge Airport; a focus on the human factors leading to safety events; and the unique set of challenges faced by helicopter pilots, amongst other things, this edition of *Clued Up* should have something for everyone.

As always, we greatly value feedback so please get in touch either by email *infoservices@caa.co.uk* or Tweet us *@UK_CAA* Enjoy your flying! CU

Gretchen Haskins
Group Director, Safety Regulation
Civil Aviation Authority

> it is vital not to forget the basics of preparation in your haste to take-off

An electronic version of this magazine is available at **www.archantdialogue.co.uk/cluedup**
To keep up to date on all airspace safety issues, **follow@airspacesafety on Twitter.** CAA Flight Operations Inspectorate (General Aviation), Safety Regulation Group, CAA, Aviation House, Gatwick Airport South, West Sussex RH6 0YR ***caa.co.uk***

/ CONTENTS

SAFETY MATTERS FOR GA PILOTS

Cover photo
Keith Wilson

ARCHANT DIALOGUE

Publisher
Archant Dialogue, Prospect House, Rouen Road, Norwich NR1 1RE

Tel: 01603 664242 **Fax:** 01603 627823
Email: mail@archantdialogue.co.uk
Web: www.archantdialogue.co.uk

Consultant Editor Nick Wall
Editorial Director Jonathan Arnold
Production Editor James Gill
Assistant Editor Jenna Leeds
Junior Art Editor Craig Pearce
Creative Director Nick Paul
Ad Production Assistant Andy Copland
Account Manager Laura Stringer
Managing Director Mick Hurrell
Publishing Director Zoë Francis-Cox
Advertising Sales Director Stephen Price

Advertising team

Andy Grant
Sales 01603 772554
andy.grant@archantdialogue.co.uk

Dean Brown
Sales 01603 772325
dean.brown@archantdialogue.co.uk

Corporate Communications Department
CAA

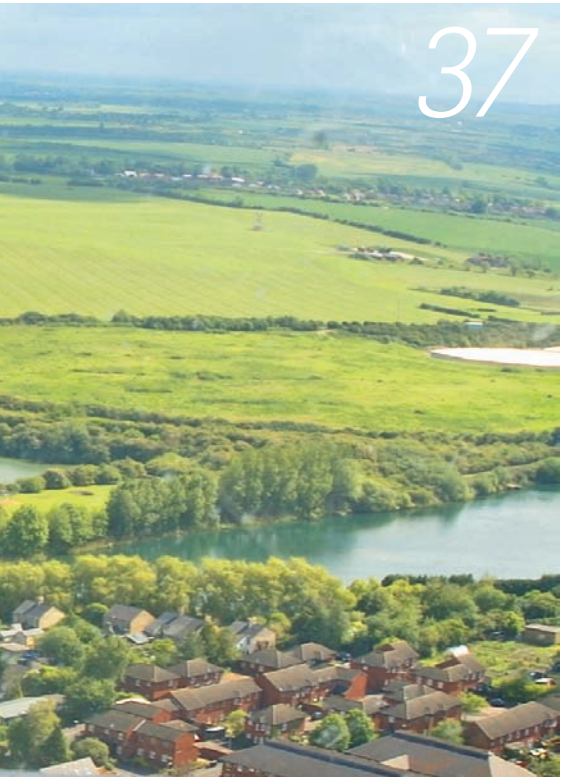
Civil Aviation Authority

CAA House
45-59, Kings Way
London
WC2B 6TE

FOR FURTHER INFORMATION VISIT:
caa.co.uk

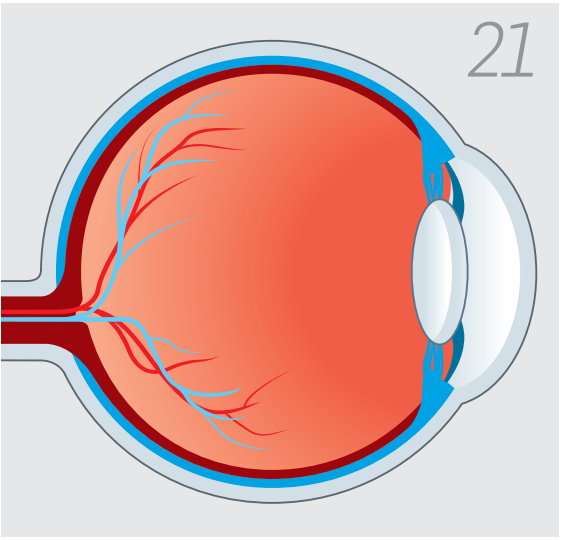
27


17



What's inside...

Clued Up magazine brings you the latest news in aviation safety, topical issues, advice and contribution from pilots, air traffic controllers and safety experts from across the UK's General Aviation community



It's odds stacking up like this that can lead to disaster – p33

MENDELSSOHN PILOT SUPPLIES

EUROPE'S LARGEST STOCKIST OF QUALITY NEW, USED & OVERHAULED AVIONICS

As our inventory changes daily, please call to discuss your requirements

t. 0131 447 7777 f. 0131 452 9004 w. WWW.GPS.CO.UK

GARMIN

Supplied with harness for LAA aircraft

G3X SYSTEM single display without EIS **£2850**
G3X SYSTEM single display with EIS **£3175**
G3X SYSTEM dual display with EIS **£4695**

System includes display(s). ADAHRS, temp. probe, magnetometer with or without optional EIS (engine information system). For autopilot and other options for the above systems please call

GTR 225A Com 8.33 kHz .. **£1795**
GNC 255A Nav/Com **£2695**
GTN 650 Nav/Com/GPS **£6995**
GTN 750 Nav/Com/GPS **£9995**
GNS 430W Nav/Com/GPS **£5995**
GNS 430 (recertified) from **£3995**
GTX 328 Mode S transponder **£1750**
GTX 23 Mode S transponder **£1580**
GMA 240 Audio panel **£650**
GMA 340 Audio panel **£950**

iPad ACCESSORIES

Bad Elf Pro GPS **£120**
Bad Elf 1000 GPS **£85**
Garmin GLO GPS **£68**
Garmin GLO Aviation **£87**
GNS 1000 GPS **£58**
GNS 2000 GPS **£68**
DUAL XGPS150E GPS **£82**
Kneeboards
i-Pilot for iphone **£30**
i-Pilot for mini ipad .. **£35**
i-Pilot for ipad **£40**

LEVIL AHRS-G mini SW **£549**
LEVIL AHRS-G mini AW **£649**
*(AW can connect to aircraft pitot/static)
This remarkable AHRS is iPad/iPhone compatible. Battery powered attitude and heading system pitch/bank information, magnetic heading, inclination, gravity load, & yaw rate connects wirelessly to your portable device.

DYNON AVIONICS

EUROPEAN DISTRIBUTOR FOR DYNON AVIONICS

SKYVIEW

SV-D700 7" display **£1740**
SV-D1000 10" display **£2340**
SV-ADAHRS-200 ..... **£800**
SV-EMS-220/A **£400**
SV-XNPDR-262 Mode S **£1200**
SV-GPS-250 GPS receiver **£140**
All other Skyview parts in stock

NEW D1 Pocket Panel .. **£995**
portable true attitude indicator
EFIS-D6 ..... **£1075**
EFIS-D10A **£1475**
EFIS-D100 ..... **£1635**
EMS-D120 ..... **£1450**
FlightDEK-D180 .. **£2175**
SV-32 Auto Pilot servo **£500**

HANDHELD GPS

AWARE 5

ÆRA 795

GARMIN ÆRA 500 ..... **£479**
GARMIN ÆRA 795 ..... **£1475**
GARMIN GPSMAP 695 ..... **£1150**
Bendix/King AV80R GPS **£140**
Bendix/King AV80R ACE GPS **£395**
AIRBOX Aware 5 ..... **£166**
AIRBOX Aware 5+ **£249**
AIRBOX Clarity 3 ..... **£291**
AIRBOX Foresight 3 ..... **£416**
SkyDemon Mobile GPS **£374**

GNS

GNS 5890 ADS-B USB stick **£99**
Displays ADS-B equipped aircraft within 150 miles radius on your PC

ENCODERS

Ameri-King AK350-30 ..... **£130**
ACK-A30 ..... **£199**

PLB's and ELT's

Prices include programming
AMERI-KING AK-451 ELT JTSO approved 406 MHz ELT **£599**
complete system with 2 antennas
FASTFIND 220 PLB **£199**
GME MT410G PLB **£249**

VERTICAL POWER

Electronic Circuit Breaker
VP-X SPORT **£875**
VP-X PRO **£1330**

AVMAP

EKPV GPS **£1195**
EKPV GPS with docking station and ADAHRS module **£1950**

BENDIX/KING

KX165 Nav/Com with 8.33 comm **£3995**
KRA10A Rad Alt (recertified) from **£3500**
KY196A/197A VHF (OHC) comm **£1500**
KR87 ADF (OHC) system ... **£1695**
KN64 DME (OHC) **£1295**
KMD 250 GPS **£1995**

BECKER

AR6201 VHF Com 8.33 ..... **£1195**
BXP6401 transponder **£1595**

TRIG

TT21 Mode S transponder .. **£1395**
TT22 Mode S transponder .. **£1560**
TT31 Mode S transponder .. **£1650**
TY91 VHF transceiver **£1295**

FUNKWERK

ATR833 transceiver **£1095**
ATR833 with LCD display .. **£995**

MICHEL / TKM

MX170C Nav/Com **£1195**
Direct replacement for King **KX170/175B** Nav/Com

TRANSCEIVERS

Icom

NEW IC-A15* **£199**
IC-A6E* Sports pk **£208**
IC-A6E* Pro pack **£308**
IC-A24E* Sports pk **£275**
IC-A24E* Pro pack **£375**
IC-A110 ..... **£625**
*approved for ground use only.
We stock a full range of Icom Accessories
IC-A6E and **IC-A24E** transceivers now have 8.33 kHz channel spacing

Receivers

Intek AR109 ..... **£ 58**
Icom IC-R6 ..... **£150**
Icom IC-RX20 ..... **£339**

LIGHTSPEED

The revolution continues with **ZULU.2**
Improved comfort and noise attenuation
blue tooth connectivity and aux music imput

ZULU.2 ANR GA version **£595**
ZULU.2 ANR Helicopter **£595**
ZULU.2 ANR GA coil cord **£595**
ZULU.2 ANR Lemo panel version **£595**
Sierra ANR GA version **£449**
with blue tooth and music input

HEADSETS

HM51 child headset **£89**
Peltor 8006 GA headset **£175**
Peltor Helicopter headset .. **£199**
David Clark H10-30 ..... **£199**
David Clark H10-13.4 ..... **£229**
David Clark H10-13H **£249**
David Clark H10-60 ..... **£259**
Sennheiser HME95 ..... **£135**
Sennheiser HME110 ..... **£189**
Sennheiser HMEC250 ..... **£315**
Sennheiser HMEC26BK **£499**
Sennheiser HMEC46BK **£425**

BOSE

A20 GA twin plug **£691**
A20 GA twin plug w/bluetooth **£762**
A20 Helicopter w/bluetooth ... **£762**
A20 Lemo installed version **£691**
A20 Lemo w/bluetooth **£762**
Installed wiring harness ..... **£ 32**

HARRY'S HM40

STAR BUY

Harry's HM40 ..... **£99**
24db noise reduction
Volume Control
Liquid filled earseals
Mic. sock and headset bag
Mil. spec. cabling
Padded headband

AIR GIZMO

Panel dock **ÆRA 500** **£99**
Panel dock **ÆRA 795** **£149**
Panel dock **GPS 695** **£149**
Panel dock **296/495** **£75**
iPad knee dock **£99**

INTERCOMS

HM2 place portable **£99**
HM2 place for Icom w/PTT **£119**
HM4 place portable **£119**
Sigtronics SPA400 ..... **£169**
PS Engineering
PM 500EX panel mount 4 place **£199**
PM 1000 4 place prices from **£249**
PM 3000 stereo 4 place **£329**
PMA 4000 Audio Panel **£549**

INSTRUMENTS

RC ALLEN
(TSO approved)

RCA2600-3 electric horizon **£1850**
RCA2600-2 electric horizon **£1850**
RCA22-7 vacuum horizon **£575**
RCA15 series electric D.G from **£1485**
RCA11A-8 vacuum D.G. **£575**
RCA82A electric turn coordinator **£575**

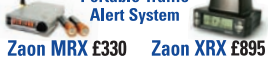
JP INSTRUMENTS (TSO approved)
FS450 fuel flow **£495**
EDM 700 series engine management system for most engines from **£1195**

PRECISION
PAI700 vertical card compass **£249**

MID-CONTINENT
4300-411 LIFESAVER Electric Horizon with 1 hour emergency battery backup **£1995**
MD200-306 3" Course Dev. Ind. **£1195**
1394T100-7Z Turn Coordinator ..... **£ 530**
7000C.31 Vertical Speed Ind. ..... **£ 450**
MD90 Quartz Clock ..... **£ 165**

TRAFFIC ALERT

Portable Traffic Alert System



Zaon MRX £330 **Zaon XRX £895**

NON TSO INSTRUMENTS

MINGDA
GH030 vacuum horizon **£299**
GH025 electric horizon 14volt **£695**
GD031 D.G. vacuum **£299**
GD023 D.G. electric **£695**
BC2A Vertical Speed Indicator **£199**
BZW-4B Turn Coordinator **£249**
BG-3A Altimeter 20,000' 3 pointer **£235**
BG-19 Altimeter 10,000' 2.25" **£149**
BK13A A.S.I. 20-100 KNOTS **£119**
BK15 A.S.I. 20-160 KNOTS **£119**
MC022 Vertical card compass **£149**

SURVIVAL EQUIPMENT

Survival Products
4-6 Person Rafts

The Lightest most compact raft in the World
Raft with canopy **£999**
Raft with equipment ... **£1150**
HM Survivor Slim line lifejacket with whistle and light **£65**

REVERE
Aero Compact Raft

2 Person Rafts
Raft **£699**
Raft with canopy **£799**
4 Person Rafts
Raft with canopy **£899**
Raft with std equipment ... **£999**
Raft with deluxe equip. .. **£1495**

FAMILY RUN BUSINESS FOR OVER 25 YEARS

ADD 20% VAT - UK & EU ONLY

VISA MasterCard Maestro

OPEN MON-FRI 9am-5.30pm—BULK ORDERS AND TRADE ENQUIRIES WELCOME
If you are not completely satisfied with your purchase, please return the goods in original condition within 28 days for replacement, exchange or a full no quibble refund. **All prices subject to change.**

CAA/EASA APPROVED
RUN BY PILOTS FOR PILOTS

49-51 Colinton Road • Edinburgh EH10 5DH

SkyDemon now on Android

SKYDEMON HAS RELEASED a version of its very useful pre-flight briefing and navigation software for Android.

Much of the usability of the iPad version has been carried over; key features include ultra-clear dynamic vector charting; NOTAM briefing with graphical depiction; live TAFs, METARs and winds aloft; airspace warnings while planning and navigating; weight-and-balance and fuel consumption calculations.

There is also integrated access to airfield plates; and flight log analysis. For the first time, SkyDemon charts will have an Airways mode to complement the existing VFR mode, with easy switching between the two styles. This feature will also be available on SkyDemon's iPad and PC products.

An annual SkyDemon flight-planning subscription costs £119 in the first year and thereafter £59 a year to maintain. The enhanced subscription, which includes in-flight navigation, costs £179 for the first year and then £89 annually.

A 30-day trial subscription that allows access to all SkyDemon products, including SkyDemon for Android, is available at *skydemon.aero/start*

Preventing infringements? Win an award

A NEW AWARD TO recognise any flying club or school that goes the extra mile to prevent airspace infringements has been introduced by NATS.

The award acknowledges the work of the General Aviation community in helping to reduce the number of infringements during 2012.

It is open to any flying club, association, school or group that has made a special effort to prevent and mitigate the risk of infringements and to educate and support pilots who do.

"There can be no doubt that the continued and proactive efforts of the General Aviation community have underpinned the fall in the number of incidents last year," said Jonathan Smith, NATS Infringements Lead.

"This new award is NATS' way of recognising the important contributions made by our GA partners."

Stapleford Flight Centre in Essex was the first recipient of the award, having successfully halved the number of infringements by its members last year.

Colin Dobney, Stapleford's Head of Training, commented: "I am delighted the sustained campaign to reduce airspace infringements, led by Deputy Head of Training, Brian Peppercorn, has received official recognition from NATS. Air safety is the priority in all Stapleford's training programmes for tomorrow's airline pilots and our Private Pilot club members.

"We will continue campaigning to reduce infringements even further, aiming to achieve an even better performance this year." Jonathan added: "It is in everyone's best interests to reduce the risk associated with airspace infringements and NATS is keen to work with additional GA partners to achieve this."

You can nominate a club or school for the Infringement Prevention Award on the NATS website at *nats.co.uk/news/infringement-prevention-award.*

Infringements into controlled airspace are a safety concern for private and commercial pilots alike, but there are a number of simple, practical and low-cost initiatives that any club can introduce to minimise the risk.

Prevention
New hirers undertake a navigational exercise with an instructor to include Air Traffic Control liaison.

Pilots to be made aware of SkyDemon Light.

Pilots to be briefed on the benefits of using AWARE, or other similar airspace warning devices?

Mitigation
Ensure all pilots are aware of the transponder operation with particular emphasis on the safety benefits of Mode C (ALT) selection.

Encourage all pilots to call ATC or D&D (121.5Mhz) immediately they are in any doubt regarding their position.

Encourage the use of the Listening Squawks.

Investigation
Pilots are expected to inform the CFI/FI of an airspace infringement as soon as practicable.

NATS to be advised when a pilot reports an infringement event that occurred within any airspace it controls.

Pilot debrief to be undertaken as soon as possible by an appropriate member of a flying school or club.

Identification of any remedial action required to prevent a recurrence.

Dissemination
Feedback to NATS by the completion of the infringement questionnaire.

Lesson-learning material to be shared with other members of the flying school.

FOR MORE NEWS ON INFRINGEMENTS AND TIPS ON HOW TO AVOID THEM, GO TO *FLYONTRACK.CO.UK*

SRG and Airspace merge together

THE CAA IS TO MERGE the Safety Regulation Group and Directorate of Airspace Policy from July 1. The new, merged department will be led by Mark Swan, currently the CAA's Director of Airspace Policy.

The change follows Safety Director Gretchen Haskins' decision not to seek a reappointment to the CAA Board when her current fixed term expires. She will remain at the CAA supporting the transition and working on a number of strategic safety projects in the UK and internationally, before leaving the organisation in the Autumn.

CAA Chief Executive, Andrew Haines, said: "Merging the functions of our airspace policy and safety departments has been a possibility that has been considered for a number of years, not least in the 2008 review of the CAA undertaken by Sir Joseph Pilling. In the light of Gretchen's decision not to seek reappointment to the Board, now seemed like the right time to make that change. There are real safety benefits from consolidating our safety and airspace management activities in one place.

"It has been an absolute privilege to work with Gretchen over the past three years. Her understanding of and commitment to aviation safety is exceptional and she has made an enormous contribution to the CAA.

"Mark Swan brings huge strengths to his new role. His leadership of our airspace work has won him considerable respect both within the UK and internationally and he spent many years as a pilot during his service in the RAF."

More paperwork goes online

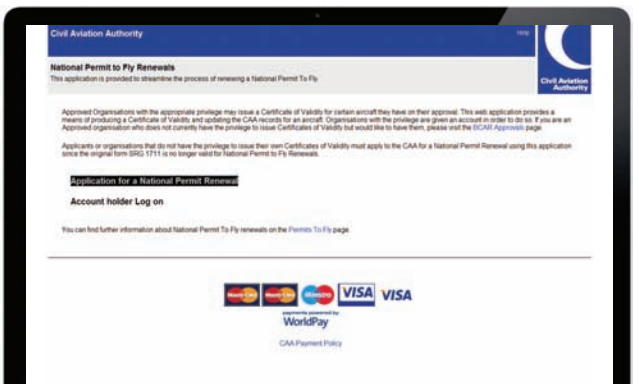
MORE PAPERWORK CAN now be done online with the CAA, including secure online payments.

UK-based aircraft maintenance organisations, for example, can now apply for, or apply for variations to their 'Part 145' approval electronically, without the need to submit paper forms.

The new electronic services are intended to help improve performance and processes across the CAA and ensure that applicants for licences, certificates and approvals, receive a more efficient and consistent service.

Under the new systems, organisations applying for UK CAA-issued Part 145 maintenance approvals will be able to submit online documents, such as company expositions, for initial review. The organisations will then be contacted to arrange an audit visit and any findings following assessment will be sent to the organisation electronically. More details are available at caa.co.uk/default.aspx?catid=1461&pagetype=90&pageid=8338. National 'Permit to Fly' renewals for aircraft such as ex-military types can also be made online, including secure payment; see *caa.co.uk/permitstofly/*

Similar online payment options, and other service enhancements, will be rolled out to cover most other applications in the future.



Self-fly hire for gyroplanes

TYPE-APPROVED GYROPLANES can now be permitted to be used for self-fly hire, including instruction and testing, provided certain conditions are met.

Previously, Permit to Fly gyroplanes were prohibited from engaging in public transport flights - which prevented them from being hired for private use. This meant that once gyroplane pilots had obtained their licence, there was little provision for them to fly without purchasing their own aircraft.

Under an exemption from the Air Navigation Order 2009 (which says that if an aircraft is hired for a flight, for example from a flying club, then that flight is deemed to be public transport for airworthiness purposes), type approved gyroplanes can now be used for hire, including instruction and testing, if the aircraft is owned or operated under arrangements with a flying club and where the owner and the pilot hiring the gyroplane are both club members.

The CAA has introduced the rule change following consultation with key stakeholders in the gyroplane community.

Tweets, too

If you want to keep up to date with changes at the CAA, you can follow it on ***twitter.com/UK_CAA***

STEP UP.

MIRAGE | MATRIX

Raise Your Game.

Perhaps it's time to step up. The Piper Mirage and Matrix are, in fact, a giant leap in why you fly: speed, climb, ceiling, range, versatility, capability and cabin room to name but a few of their superior qualities. You'll cruise at flight levels above most of the world's weather, while dual turbochargers assure an economical fuel burn of less than 20 gph at altitude. All the while, your passengers will enjoy the trip in expansive cabin-class comfort.

Piper UK Limited
Authorised Piper Dealer for the UK
based at Shoreham Airport EGKA
www.piper-uk.co.uk | +44.800.243.018

Piper®


Swiss *movement*, English *heart*
CHR.WARD
MARK II
AUTOMATIC
C8 PILOT MKII VINTAGE EDITION
Swiss made / 26 jewel automatic movement / 38 hour power reserve / Balance wheel viewing window / Old radium SuperLuminova™ hands and indices / *Diameter:* 44mm / *Calibre:* Sellita SW200-1
EXCLUSIVELY AVAILABLE AT christopherward.co.uk
CHR.WARD
LONDON

Personal guidance to help reduce airspace infringements

TO HELP TRY TO REDUCE the number of infringements in UK airspace, the Airspace & Safety Initiative will be at several aviation events this year to offer advice to pilots and pass on knowledge.

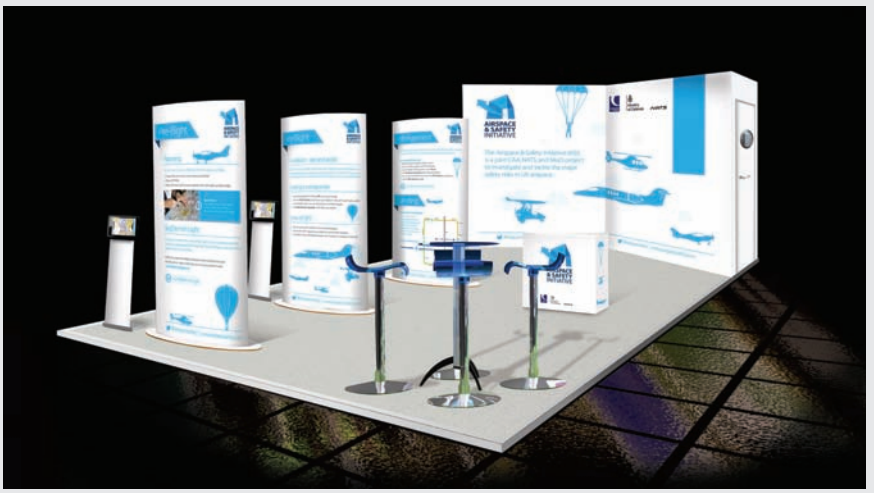
Pilots attending AeroExpo, at Sywell, will be able to receive a personal safety briefing on the ASI stand. Experts will be on hand to guide private pilots through a virtual flight, highlighting potential risks and advising on good practice to help avoid, in particular, infringements of controlled airspace.

The new stand (below) will take the pilot on a journey through the main stages of a flight, from running pre-flight checks through to joining the circuit and landing. Along the way pilots can discuss with an ASI safety expert how they tackle various situations and what they can do to further mitigate safety risks. It is very much a proactive approach, which aims to encourage interaction with pilots and not simply hand out leaflets. This concept will be taken to other shows during the year, including the Flying Show in December.

Anyone taking part in a briefing will be automatically entered into a prize draw to win an Aware GPS device or one of several annual subscriptions to SkyDemon's comprehensive pre-flight planning tool.

ASI – a joint initiative between the CAA, NATS, and the Ministry of Defence, to improve airspace safety – will be occupying stand C13 at AeroExpo, the UK's largest general aviation event, from May 31 - June 2 2013. Attendees, whether arriving by air or land, will receive more details on the ASI's weekend activities and prize draw on arrival, as part of their greeting pack.

Similar safety initiatives will be run by ASI at other GA events during the remainder of 2013 as part of its campaign to reduce the number of infringements occurring in UK airspace, currently averaging 800 per year.



Proposed Class F changes

A CONSULTATION HAS been launched concerning the proposal to replace Class F Advisory Routes in the London and Scottish Flight Information Regions.

The decision follows an International Civil Aviation Organisation (ICAO) audit of the UK during February 2009, as well as consideration of the airspace classification requirements of the Standardised European Rules of the Air (SERA), scheduled for UK implementation by December 4 2014.

The CAA is proposing to replace Class F Advisory Routes with Class E airways, enhanced by additional SERA-compliant conspicuity requirements.

The consultation will run until July 12 2013, and replacement of Class F will occur no later than November 13 2014.

For more information visit www.caa.co.uk/consultations

Mike Barnard to lead GA regulation forward

MIKE BARNARD has been appointed as General Aviation (GA) Programme Manager for the CAA.

Mike's main role will be leading a programme to develop and implement policy on how the CAA regulates the GA sector in the future to ensure it is safe and the regulation is proportionate. Building on the CAA's 2012 review on the future regulation of GA, and the European Aviation Safety Agency's GA strategy review, he will be helping to define the sector's future regulatory oversight. The work will cover both EASA-regulated and national Annex II areas.

Mike has extensive experience of GA, being a Director of the Light Aircraft Association and the General Aviation Safety Council and a qualified private pilot since 1994. He also brings extensive management experience to the role from his career in the automotive industry.

"GA is an extremely important sector of UK civil aviation and Mike's appointment is part of our commitment to work more closely with GA to ensure that our oversight is both appropriate and helping improve safety," said Andrew Haines, CAA Chief Executive. "Mike is obviously passionate about GA and this enthusiasm, coupled with his industry background, will help to ensure the success of the programme."

Mike said: "I'm looking forward to starting work on what will undoubtedly be an exciting role at a pivotal period for GA. Bringing all the parties involved together, and working in both a European and national regulatory system to ensure the regulation of GA is both proportionate and increases safety levels, will be both rewarding and challenging."

Met Office on your phone

THE MET OFFICE HAS UPDATED its range of mobile weather apps, introducing the ability to share the latest weather forecast with friends and followers direct from both the iPhone and Android apps.

While not being true aviation forecasts, the free apps give simple access to the most up-to-date and accurate local weather forecasts and warnings 24 hours a day. The latest update allows users to share the latest forecast directly on *Twitter*, *Facebook* and by email.

In addition they give three-hourly forecasts and five-day weather predictions. As well as the likelihood of rain or snow, sunshine, cloud cover and temperature, there is a 'feels-like' temperature – ideal if it's 6°C but will actually feel like -5°C accounting for the wind chill factor.

There are approximately 5,000 UK locations available.

The Android and iPhone apps are available for free from the App store and the Android Market. There is also a Windows Phone 8 weather app available free from the Windows Phone 8 app store.

Radio cards online

THE RADIO FREQUENCY Reference Cards are no longer being distributed with the VFR charts as printed copies. They are now only available as downloads (which can be printed) from National Air Traffic Services, and will be updated as required. When a card has been amended, it will be published on the first AIRAC date after the change. To download a frequency card, go to *nats-uk.ead-it.com*.

One-Second Check

WHEN YOU SWITCH your transponder on before flight, or change the code in flight, to the general conspicuity code 7000 take one second to check you have not inadvertently set one of the special purpose codes: 7500, 7600 or 7700.

Selection of these special purpose codes will bring your flight to the attention of the military authorities and you may be met by local police at your destination.

PPL ground exams rise to nine

THE NUMBER OF ground-based exams for the Private Pilot's Licence (PPL) are set to rise.

Students will sit nine exams rather than seven to accommodate new European Aviation Safety Agency (EASA) regulations. These will require students to undertake at least 100 hours of theoretical knowledge training, including some formal classroom work as well as other interactive forms of training. Each exam will feature between 16 and 20 questions, with a pass mark of 75 per cent.

The changes follow extensive consultation with pilot representative bodies. The CAA has also revealed it will extend the definition of a 'sitting' to ten days to help students cope with the increase. Rather than the current classification of a sitting being 'one day', the new arrangements will allow an exam sitting to take place over ten consecutive days. Only one attempt at each subject paper is allowed in one sitting, however.

The CAA said it had responded positively to industry concerns over its initial intention to define a sitting as three days, which some flight examiners felt would be insufficient for many students.

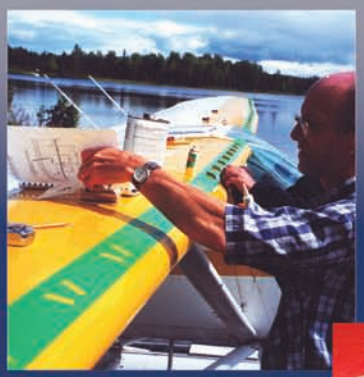
Ray Elgy, Head of Licensing and Training Standards at the CAA, said: "The new exam syllabus which will take effect in the autumn offers a practical and fair arrangement for student pilots training for a PPL. We very much welcomed input from industry in formulating these changes which represent a constructive outcome for everyone involved in pilot training."

The changes will come into force on September 1 2013. The CAA will publish in due course details of arrangements for students who find themselves midway through their exams on that date.

MICRO VORTEX GENERATORS

Installed on the leading edge of the wings and on tail surfaces, ***Micro VGs*** *help keep air attached longer at slower speeds. This reduces Vmca and Stall Speed, improves controllability, improves characteristics, creates a more stable instrument platform and gives better aileron response and rudder authority.*

Over 200 Models EASA Approved



- Improves Controllability at Slow Speeds
- Improves Characteristics
- Improves Aileron Control
- Lowers Lift Off Speed
- Lowers Stall Speed
- 1 Day Installation
- EASA STC Approved
- FAA STC & PMA Approved
- Compatible with other STOL modifications

Visit us at: www.microaero.com/pages/international.html

MICRO AERODYNAMICS INC.
Vortex Generator Technology

+1 360 293 8082
4000 Airport Road, Suite D
Anacortes, Washington 98221
(800) 677-2370 FAX (360) 293-5499
micro@microaero.com http://www.microaero.com

Available for Twins & Singles
Kit Price
$695 to $3950 USD

Come fly with me...

Dragon Wings Microlights

In association with Mid Wales Airport

10% DISCOUNT
WHEN YOU BUY 10 HOURS UP FRONT

Mobile: 07833 684 654
Welshpool Airport: 01938 555560
nick@dragonwingsmicrolights.co.uk
www.dragonwingsmicrolights.co.uk

How well do you know the Zones?

PILOTS WILL BE VERY FAMILIAR with the term 'Aerodrome Traffic Zone' (ATZ), but what might not be immediately apparent is that, unlike many other countries, the UK has taken the basic concept of an ATZ further than the ICAO definition ('an airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic') and fixed their dimensions.

The legal basis for ATZs as established in the UK is Article 258 of the Air Navigation Order. Essentially, subject to runway length, ATZs will have a lateral boundary of either a 2 or 2 nm radius centred upon the mid-point of the longest runway. In all cases ATZs extend vertically from the surface to a height of 2000ft above the level of the aerodrome. So the upper limit of an ATZ will vary in amsl terms.

Laterally, ATZs may not overlap, meaning that a number of adjacent ATZs have abutting boundaries. ATZs will assume the background classification of the airspace in which they are established. In practice, most ATZs are encountered in Class G airspace but airfields within Control Zones will also have an ATZ. For details of ATZs at licensed aerodromes check out individual aerodrome entries the AIP AD-2 section; details of ATZs at unlicensed and Government aerodromes are at ENR 2.2 (the online version of the AIP can be found at nats-uk.ead-it.com/public/index.php.html).

Not only are the boundaries of an ATZ defined in the UK, there are also established requirements to be met when flying in any one of the 150+ ATZs that currently exist.

These requirements are set out at Rule 45 of the Rules of the Air Regulations 2007 and are repeated in the UK AIP. Why are they needed? Well, the aim of an ATZ is to provide a degree of protection to traffic in the immediate vicinity of an aerodrome. That said, ATZs are not established with the aim of providing segregation between various (and potentially disparate) operations but with the goal of enhancing the safe integration of these in the immediate vicinity of an aerodrome.

Rule 45 Requirements: Every year a number of ATZs are infringed by pilots. Some of the affected airfields provide air traffic control (ATC) services, some provide Aerodrome Flight Information Service (AFIS), while others have Air-Ground (A/G) facilities. Individual AIP AD2 entries will tell pilots what level of air traffic service is available at each airfield, and this information also appears in commercial VFR guides. While 'TWR', 'AFIS' and 'A/G' indications are provided on VFR chart Frequency Reference Cards, the VFR charts themselves don't provide any such clues.

As part of their pre-flight planning it's essential that pilots understand the communications requirements associated with any ATZs that may be crossed along their intended route. It's equally essential that contact is established with the controlling authorities of affected ATZs before entering them. This is a requirement of Rule 45 – so the pilot of an aircraft crossing an ATZ without establishing this contact is in breach of the Rules of the Air.

To dispense with any of the 'myths and legends' associated with operating in an ATZ that seem to exist, it's essential that the fundamentals of Rule 45 are readily understood. These can be summarised as follows:
During the notified times of ATZ activation:

- Pilots are required to establish and maintain RT contact with the appropriate ATC, AFIS or A/G communications unit before operating within an ATZ and throughout the period of operations within it.

- Where the ATZ is served by an ATC unit, operations within it are subject to the permission of the ATC unit. In other words a clearance to enter the ATZ must be obtained before entering it.

- Where the ATZ is served by AFIS or A/G only the pilot must obtain information from the FISO or A/G Operator such that he/she can ensure that that the flight within the ATZ can be conducted safely.

In a nutshell, and subject to certain conditions that might facilitate non-RT operations, a pilot wishing to fly within an ATZ needs to establish and maintain two-way communications with the relevant ATC, AFIS or A/G communications unit prior to entering an ATZ.

A Common Myth

Some pilots seem to believe that if they call three times on the assigned frequency and don't establish two-way contact as required by Rule 45, then it is okay to enter the ATZ. Or is it? No, it isn't!

Any suggestion that upon receiving no reply to any number of calls on the appropriate frequency a pilot may operate within an ATZ that is notified as being active is incorrect and contrary to the provisions of Rule 45. Put simply, if for whatever reason you are unable to establish two-way communications with the aerodrome during its notified ATZ hours you cannot comply with Rule 45 and therefore should avoid the ATZ.

Outside the notified hours of any ATZ the requirements of Rule 45 do not apply. However, given that it is quite possible that the aerodrome might still be active beyond the ATZ notified hours, it remains a sensible option to call on the published frequency to establish what activity is taking place.

Military Air Traffic Zones (MATZs) and their ATZs

Pilots need to be mindful that military airfields that have a MATZ around it will also have an ATZ. When crossing a MATZ it is a pilot's responsibility to ensure that permission is also obtained to transit the ATZ – Rule 45's requirements apply here too.

As ever, thorough pre-flight planning is essential and checking aerodrome and airspace times is a key part of preparation. Check the AIP and NOTAMS. Know the rules and requirements for each, remain aware that notified ATZ hours may not be the same as notified aerodrome opening hours, and that aerodromes can be active outside notified opening hours.

Any ATZ queries? Contact Mark Smailes (Directorate of Airspace Policy) ora@caa.co.uk, or by phoning 0207 453 6545.

£4,100 cost of airspace bust

A PILOT WAS FINED £3,400 after admitting entering controlled airspace over Stansted and Luton airports.

Henry Marriott, 25, of Farnham also pleaded guilty to flying as a commander without an appropriate licence. He had failed to renew it when its five-year period expired on October 3 2011.

He also asked for an offence of failing to carry secondary navigation equipment, including a transponder, to be taken into consideration.

Marriott – who was flying a Piper Super Cub – entered Stansted-controlled airspace at 1320 on September 30 2012 and remained inside for 11 minutes, during which time all departing flights were halted.

The aircraft was not IFR equipped and had no GPS or transponder – the latter being required in controlled airspace. The court heard that Marriott made no radio calls with ATC and they did not know the height at which he was flying.

Marriott's Cub then drifted into Luton's airspace and three inbound commercial flights had to be alerted about an unknown aircraft in the airspace.

Marriott, who represented himself in court, said he was returning from visiting a friend in Suffolk on the same route he had used to get there. He said that the wind was strong and, although he was a confident navigator, he became lost. He also said that he recognised Stansted, but then misjudged the distance and did not make radio contact because he was concentrating on his flying and navigation.

Chelmsford Magistrates' Court fined him £3,400 and ordered him to pay an additional £712 in costs.

In 2012 there were almost 800 incidents of an aircraft infringing controlled airspace. Of these, the CAA only prosecuted five of the pilots involved. Infringements are a serious safety concern and cause major disruption to other airspace users. The CAA will only resort to legal action, however, in the most serious of incidents. CU

IKARUS C42

The Ikarus C42 is today's equivalent of the long-standing Cessna 152 but with a Rotax engine and modern lightweight materials this aircraft is in the microlight category which gives many benefits over a Cessna.

- **COST**

  The average fuel burn is around 10-12 litres/hour of normal unleaded car fuel in comparison to 25 litres/hour of Avgas. This equates to around one third or less of the cost per hour to fly in comparison to a Cessna. Also many airports have a reduced landing fee for microlights.
  Fly for less cost or for much longer and further without breaking the bank.

- Prices from €51,500 + VAT

- C42 Bravo model fitted with a ballistic recovery parachute system as standard … if the worst should ever happen.

- Glider tug variant available and being a CAA type approved factory built aircraft means it can also be used for training and hire.

- **PERFORMANCE**

  Max level speed 105 knots (VNE 121 knots)
  Economical cruise speed 85 knots.
  Climb 800-1200 feet/minute
  Take off and landing distance <100 metres

- **MAINTENANCE**

  Comes under the 'Permit to Fly' system so can be maintained by owner/operator or by low cost specialist sport aviation companies. Typical cost of a 100 hour service £150, or £70 for parts for owner/operator maintenance. Annual inspector for permit to fly renewals of around £100 + CAA fee of £144. No need for expensive EASA maintenance agreements.

- **TRAINING**

  The C42 has been voted as the best training aircraft in Europe due to its safe, predictable handing and as it is "Made in Germany" it has an excellent reputation for overall toughness and reliability. More than 1300 have been produced and are flying throughout the world.

  With a minimum of only 25 hours training required at a much lower hourly rate than a Cessna for restricted licence, the C42 represents the lowest cost option to obtain a pilot's licence.

PUT THE FUN BACK INTO FLYING!

red-air

IKARUS

red-air UK
The Yak Hangar, Halfpenny Green Airport, Bobbington, Stourbridge, West Midlands. DY7 5DY
Tel: Office +44 (0)1384 221600 or Malcolm +44 (0)7790 045959 Lisa +44 (0)7971 613387
Website: www.red-air.co.uk Email: sales@red-air.co.uk

GOOD TO GO?

We all plan our flights – but, be honest, do we really plan them properly?

David Phillips explains

There have been a few times in my 30 years or so of aviation where I have taken-off only to realise that I shouldn't be in the sky. Invariably, this has been due to inadequate pre-flight preparation. I can put my hand up and admit that in the distant past I may have departed without really knowing my fuel state, haven't properly checked the NOTAMs or have been distracted by poor health or stress.

Of course, the nature of the flight defines the amount of pre-flight preparation required but there are some fundamentals that we should always apply before any flight.

In this article I aim to describe the process I now follow before taking to the skies. In simple terms, I split my preparation into three core themes: pilot, aircraft and environment.

I'M SAFE

Pilots may have heard of the mnemonic, I'M SAFE (illness, medication, stress, alcohol, fatigue and eating). Many elements of I'M SAFE are self-explanatory but others are worthy of further discussion. Looking at stress, I think it important to note that this does not fall into the illness category. The stress that most of us associate with flying can be created by elements such as time pressure, personal distraction or unfamiliarity with the task. Regardless, it is important for pilots to ensure that they are aware of such pressures and they manage these as part of their pre-flight planning process. Combine such stress with missed meals or a changed diet and there is an increased likelihood that pilots will not be thoroughly ready for flight.

THE AIRCRAFT

It is at this point where we should start to look in detail at what we are about to do. Many of us rent aircraft and may not be as familiar with the specific airframe as a private owner would be with his pride-and-joy. This should make us more aware of the potential pitfalls and limitations, but we often fall foul of assuming the aircraft will be airworthy in all aspects, paying cursory attention to the basics.

Pilots should remember that they are ultimately responsible for ensuring their aircraft is safe and legal to fly. Many flying clubs and schools help in this area by providing a folder containing all necessary documents; this is always worth a check. At the very least, pilots should check the Certificate of Registration, Certificate of Airworthiness (or Permit to Fly), the Airworthiness Review Certificate, the Certificate of Release to Service, or the Technical Log (or engine and airframe log book), and the aircraft insurance. If any of these documents are not available, do not take the aircraft.

A recent addition to pre-flight planning protocols is that EASA will insist on all training flights requiring a weight and balance (W&B) and performance plan. While some may feel that this is overkill, there are too many examples of aircraft having foundered due to inadequate performance planning.

In summary, make sure that the aircraft you are planning to take is fit for task and do not assume that it is airworthy because you have just seen it land.

THE ENVIRONMENT

This is probably the most complex element of pre-flight preparation as it includes assessment of the weather and planning of the route.

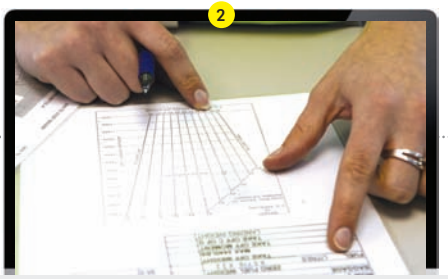
There are numerous sources of weather which can include satellite and radar imagery and webcams in addition to the ubiquitous TAFs, METARS and Forms 214/215. My advice here is to use the TAFs and METARS first and then back these up with the fantastic data available from weather websites that provide imagery.

If you are planning a local flight, another consideration may be to plan the flight towards any approaching bad weather as this will allow you turn back towards your home airfield with some significant confidence that you will beat the weather. Understanding the current weather and forecasts of what is coming is probably the most important element of General Aviation flying.

Turning to the route planning element of the environment, we now need to combine a number of elements: airspace, weather, NOTAMs and any other activity.

Taking a hypothetical journey, we may have a number of potential airspace hurdles. These include a busy regional airport with a Class D CTR, a Danger Area and a MATZ. Taking each of these in isolation, the first thing to do is ensure that all these obstacles are actually going to affect us. The CTR probably will but how many more miles would we have to fly if you go around the outside? I ask this question for two reasons.

Firstly, do we need to think about going through the CTR or can we take a short detour that will only add a few miles to our trip? If the answer is the latter, why not take



this course of action as it will reduce both our workload and that of ATC? Secondly, it is prudent to plan this alternative route anyway as we cannot assume we are going to get clearance to enter the CTR.

The MATZ and the Danger Area are very much military issues, but we can't ignore them. We need to check to confirm the status of both the Danger Area and MATZ – look on the legend around your chart and you will find information about Danger Area Crossing and Danger Area Activity Information Services. If we cannot contact one of these controlling agencies, both London and Scottish Information keep track of all danger area activity and we will be able to get accurate information on their status whilst in flight.

Many people are keen to highlight that a MATZ doesn't apply to civilian pilots (the ATZ still does) but I would offer that it is highlighted on the CAA chart for a reason and it is always a pilot's responsibility to ensure he doesn't do anything to endanger either his or another aircraft. Finally, we need to check NOTAMs to ensure that there are no short-term changes to the airspace environment that may affect us. NOTAMs can be accessed through the AIS website (*nats-uk.ead-it.com/public/index.php.html*) once pilots have set up a free user account.

TECHNOLOGY AND SMART FLIGHT PLANNING

Many of us recognise that working through the environment element of our pre-flight preparation process can be difficult, time-consuming and somewhat frustrating if we have to access information from lots of different sources.

Fortunately, there are some excellent third-party software applications which combine many of the necessary functions into a clear, one-stop-shop format. Many will have heard of SkyDemon, which combines flight planning functions with a VFR GPS capability. Less well known is SkyDemon Light, which is an application available on the web, iPad (*web.skydemon.aero/*) and other tablet devices.

Here pilots can quickly plot routes, enter basic aircraft data and then download relevant weather and NOTAM information in real time. From the image at the bottom of this page it is clear that pilots can easily visualise their route, identifying potential issues such as airspace and NOTAMs.

'Hovering' the mouse over any particular feature or graphic provides more information such that a pilot can instantaneously assess its relevance. Importantly, there is a vertical profile (called virtual radar) which assists in planning vertical profiles especially when operating beneath CAS with variable base levels.

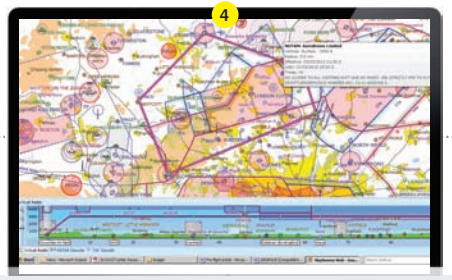
There can be no doubt that such software enhances situational awareness and makes a significant contribution towards flight safety, not least in reducing the risk of airspace infringements. While the fundamental tools are still available through AIS and the Met Office, a visual representation of all necessary elements makes the planning task more efficient and less susceptible to error.

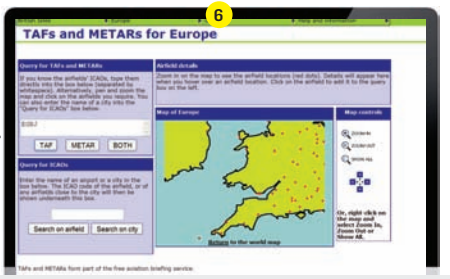
In conclusion, I think it is clear that pre-flight preparation is not something that can be taken lightly or rushed. Advances in software have undoubtedly made the process easier but it is important for pilots to develop their own structured routine and, when using aids such as SkyDemon, understand the strengths of the software as well as some of the vagaries. CU

DAVID PHILIPS

David Phillips has spent his entire career working in various areas of aviation embracing air traffic control, airfield management and flying. A flying instructor and examiner, he is currently the managing director of a busy Approved Training Organisation delivering a wide spectrum of private and commercial flying training.

1: NATS website to get Notams
2: EASA is insisting on weight and balance checks
3: Raintoday (raintoday.co.uk) gives excellent rain radar
4: SkyDemon light (web.skydemon.aero) is an invaluable planning and flying aid **5:** Weather online (weatheronline.co.uk) is another useful quick met guide **6:** TAFs and METARs can be collected easily from the Met Office website





prepare2go

Fly Further!

Guided Flying Safaris to:

Cape Town and back – on our Trans-Africa Flying Safari

The North Pole Expedition

France, "Châteaux & Courchevel"

Norway, the Discovery Safari

Lebanon, Jordan and Israel Flying Safari

Algeria and Niger Flying Expedition

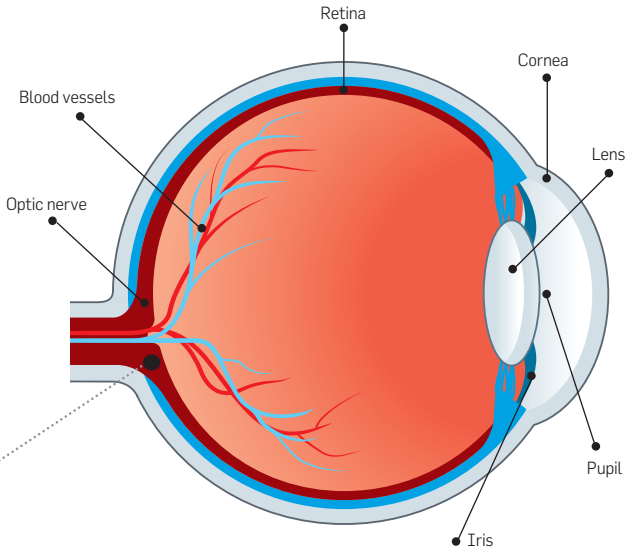
Helicopter Expedition Sweden

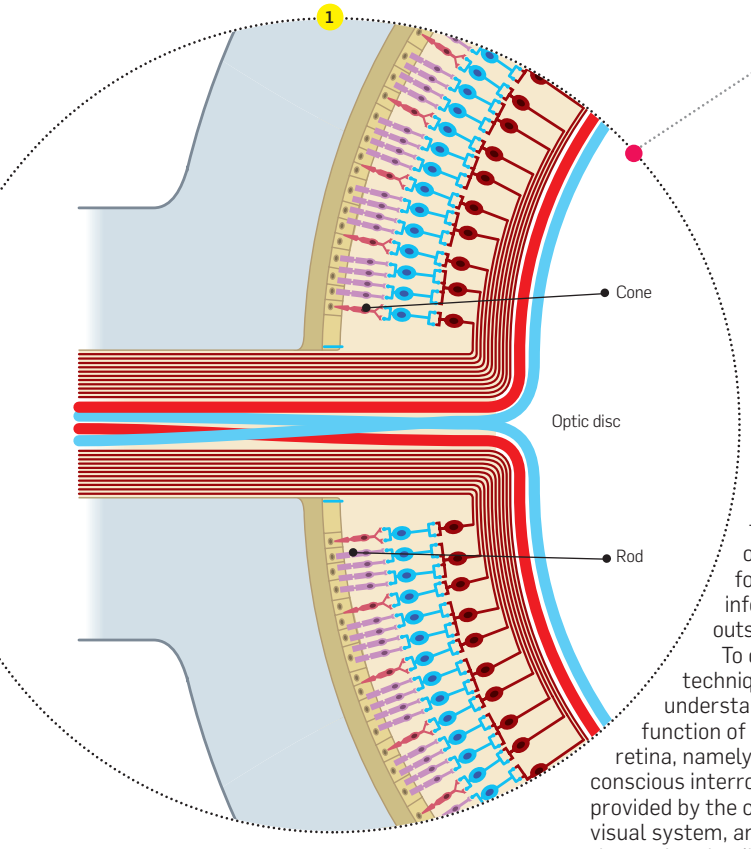
Turkey and Georgia Flying Safari

Or anywhere else, both aeroplanes and helicopters
– we make it happen.

www.Prepare2go.com

SEEING IS **BELIEVING**





'It's not what you look at that matters, it's what you see'

Henry David Thoreau

We all take vision for granted sometimes, yet there can be few other areas of flying where an understanding of normal human physiology – in this case of the eye – can have such profound implications for flight safety. But while 'lookout' is crucial to the 'see-and-avoid' principle, it's not the only tool in the collision avoidance toolbox.

What we need to do, though, is examine the limitations of vision, some of the perceptual pitfalls that predispose to mid-air collisions, and the ways in which aviators, novice and experienced, can mitigate these by effective 'lookout'.

LIMITATIONS OF VISION

Most of us know that the human eye is like a TV camera – light enters and is focused by the lens to form an image on the retina (the back wall), a layer made up of over 100 million light sensitive cells. This is converted to electrical impulses that are sent to the brain along the optic nerve; making the eye the principal organ of orientation and responsible for some 80 per cent of the information received about the outside world.

To develop an effective 'lookout' technique, it's important to understand the distribution and function of the two types of cells of the retina, namely rods and cones. Detailed and conscious interrogation of the world is provided by the central, or focal, part of the visual system, amounting to an area no larger than a thumbnail held at arm's length.

Not only is this area small compared with the whole visual field, but an image falling on this portion of the retina has to be stable and the pilot's attention directed towards it for its active interpretation. Meanwhile, the light-sensitive cells in the periphery of the retina are responsible for the ambient visual system that relies on an object's motion in the outside world to attract the focal system's attention. Movement is therefore a very important attention-getter for the ambient system.

In the absence of visual cues to attract the eye's attention, there's a tendency for its focus to rest at a point in space one to two metres away, making the pilot functionally short-sighted. It's important, therefore, for pilots to periodically look at objects, such as wing tips, at visual infinity, to prevent this 'empty field myopia' from happening.

Quite apart from these physiological limitations, the eyes are vulnerable to other visual distractions, not all of them confined to flight; such as lighting, foreign objects, illness, fatigue, emotion, the effect of alcohol, certain medications and age. If glasses are needed to correct vision, always wear them and ensure that a spare pair is to hand. In flight, additional challenges are present, for example: atmospheric conditions, glare, deterioration of transparencies, aircraft design and cabin temperature.

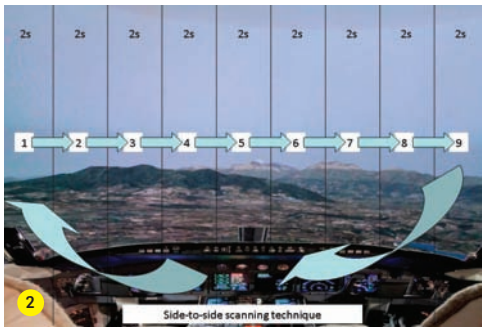
MID-AIR COLLISION

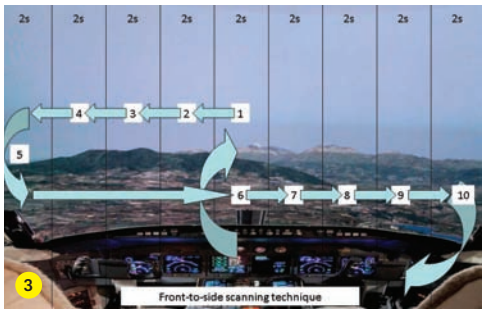
There are a number of perceptual pitfalls making the identification of a collision threat difficult for even the most conscientious pilot. Let's have a look at two of them.

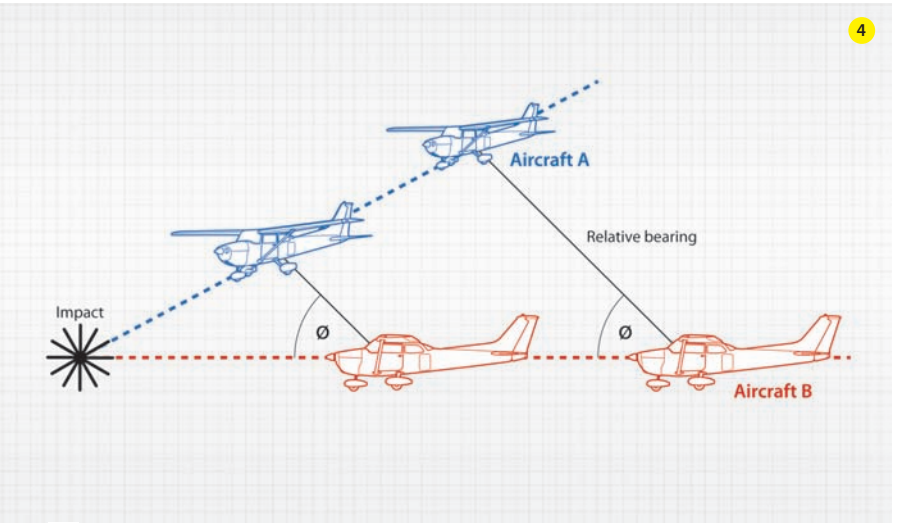
The problem of 'constant relative bearing' is one in which colliding aircraft maintain a relative bearing that is constant to each other until the moment of impact. The subjective effect of this is that the collision threat remains in the same place on the pilot's canopy unless head movements are made to stimulate the ambient visual system. An unfortunate consequence of 'constant relative bearing' is that no other aircraft that the pilot has ever seen will have possessed the same characteristic as that of a colliding one. So head movement, relative to the canopy, is an important aid to detection.

In fostering an effective 'lookout' technique, it's also helpful for pilots to have an understanding that as a collision threat approaches, its size on the retina roughly doubles with each halving of the separation distance; meaning that colliding aircraft stay relatively small until shortly before impact. This presents a challenge, even when performing a diligent 'lookout', but serves to emphasise the importance of apportioning the correct amount of time for a systematic and repetitious scan pattern.

1: Rods and cones in the retina cover just a small area, changing the image to electrical impulses in the optic nerve to be sent to the brain







2: Side-to-side scanning starts on the far left and moves across to the far right
3: Front-to-side scan starts in the centre and moves to the left, back to the centre then to the right
4: The relative bearing of a potentially colliding aircraft remains constant

Even with good 'lookout', it can take between five to ten seconds for an outside object to be focused by the central visual system, a decision made, an action performed and the aircraft to change course.

VISUAL SCANNING TECHNIQUE

'Lookout' starts from the moment the aircraft moves until it comes to a stop. From what's gone before, it can be seen that glancing out and conducting a scan using smooth and continuous eye movements is incorrect; because for the pilot to perceive another aircraft, time is needed for a stable image of it to fall on the centre of the retina and the pilot's attention directed towards it. 'Lookout' should only be performed using a series of small eye and head movements with intervening rests, the latter being the only time when the outside world is really being interrogated.

That said, there's no one technique that suits all pilots, although horizontal back-and-forth eye movements seem preferred by most. It's important that each pilot develops a comfortable and workable scan. Firstly: know where and how to concentrate 'lookout' on the most critical areas at any given time. In normal flight, most of the risk of a mid-air collision can generally be avoided by scanning an area at least 60° left and right of the intended flight path. This does not mean the rest of the area to be scanned should be forgotten! At least 10° above and below the projected flight path of the aircraft should also be searched.

The more time spent on 'lookout', the less chance of mid-air collision. To reiterate: effective scanning is accomplished by a series of short, regularly-spaced eye movements that bring successive parts of the sky into the central visual field. Each movement should be no more than 10°; and each area observed for about one to two seconds. Peripheral vision can also be useful in spotting collision threats, bearing in mind that if another aircraft appears to have no relative motion it is likely to be on a collision course. In other words, if an aircraft shows no horizontal or vertical motion on the windshield, but is increasing in size, take immediate evasive action.

Two 'lookout' patterns are generally regarded as being effective for pilots, using the 'block' system of scanning. Practically speaking, the windshield is divided into segments, with the pilot systematically scanning each block in sequential order.

SIDE-TO-SIDE SCANNING METHOD

Starting at the far left of the visual area, make a methodical sweep to the right, pausing very briefly in each 10° block of the windshield for the eyes to focus. At the end of the scan, return to and scan the instrument panel and then repeat the external scan.

FRONT-TO-SIDE SCANNING METHOD

Starting in the centre block of the visual field (centre of front windshield); move to the left, focusing very briefly in each 10° block, then swing quickly back to the centre block and repeat the action to the right. Then, after scanning the instrument panel, repeat the external scan.

Some other methods may be effective; but unless some series of fixations is made, there is little likelihood that other aircraft will be seen in time. Remember: when the head is moving, vision is blurred and the brain will not perceive potential collision threats.

'Lookout' is just part of the pilot's total visual work. To achieve maximum efficiency, the pilot also has to establish a good internal scan and learn to give each scan its proper share of time; depending on the work-load inside the cockpit and the density of traffic outside. Generally, the external scan should take considerably longer than the look at the instruments; such that 75-80 per cent of a pilot's time should be spent looking out. An efficient instrument scan is good practice, permitting more time for 'lookout' and thereby reducing the likelihood of mid-air collision. Nevertheless, pilots often find it difficult to maintain good 'lookout' for long periods: so pre-flight planning can be used to identify areas where the threat of collision is greatest.

CONCLUSION

No pilot is immune to mid-air collision. While a working understanding of the limitations of vision, collision geometry and visual scanning technique will enhance collision avoidance, other factors are equally important. These include planning ahead, following procedures, avoiding crowded airspace if possible, compensating for aircraft blind spots, talking and listening, making use of information and utilising all available eyes in the cockpit. CU

THE AUTHOR

Dr Oliver Bird graduated in medicine from the University of Sheffield in 1988 and joined the RAF the following year. He gained membership of the Royal College of General Practitioners in 1995, and completed diplomas in aviation and occupational medicine. Since 2002 he has worked as a medical officer instructor at the RAF Centre of Aviation Medicine, providing physiological training to flight personnel.

The new Rallye Pilot watch from Davosa

DAVOSA
SWISS

Limited to only 330 pieces.
Every watch comes with a model Alfa Romeo Sport from the 1971 "Targa Florio".

Price £1,395

www.classic-time.co.uk

Tel: 01189 482674

WOULD YOU LIKE ICE WITH THAT, SIR?

*Carb icing still catches people out, but why? **Irv Lee** offers a few thoughts*

We piston-engined pilots using 'legacy technology' with carburettors know that we have 'carb-ice' as a potential threat every time we fly. We understand the problem reasonably well, and have a 'carburettor heat' control in conjunction with training that instils its use prior to take off, during 'en-route' checks in the cruise, and in any reduced power descent or approach to land.

As for the general threat of carburettor icing, the theory is based on the physics of fuel vaporising and mixing with air in the venturi-based carburettor before entering the engine cylinders. The lower pressure in the venturi (remember the Gas Laws?) plus the natural cooling from a liquid vaporising (remember 'Latent Heat' energy transfers?) contribute to a significant temperature drop often to freezing values. If there is one thing even the clear air in our UK atmosphere is rarely short of in significant quantities, it's water vapour, ready to solidify as ice should carburettor temperatures drop below zero.

This icing is a natural process to be expected in the carburettor and, if allowed to build up, will choke the fuel-air mixture flow, and/or restrict the throttle valve, perhaps sealing it in a shut or barely open position. Judging by the enormous number of successful flights in the UK using engines with carburettors, the way we deal with this general threat to our engines, (application of hot air at either periodic times or prior to specific events), we have demonstrated that we can cope.

However, we all know from accident reports that our general methods of dealing with carb icing are good, but not perfect; engine failures still happen due to it in the cruise, or a reduced power descent, often through a more rapid build up of carb ice than normal.

This may come about due to local or widespread atmospheric conditions combined with the engine handling by the pilot. A recent GASCo study showed that fatal accidents can come about due to pilot overload after an initial mechanical or engine problem leading to loss of control with a resulting stall and spin, so carburettor icing is best detected and dealt with early.

Perhaps more dangerous than a total engine failure, is the insidious problem of reduced power, especially while still at low level on the climb-out.

The key to reducing the small number of carburettor icing incidents which break through our normal preventative procedures is to make improvements on weaker areas of engine handling, perhaps through discussions with instructors either during initial or biennial training sessions on improved engine handling.

EARLY DETECTION

Ice can be detected (and dealt with) by efficient checks long before late symptoms such as a rough-running engine. By all means apply the carburettor heat and watch the RPM drop (assuming a fixed pitch propeller), but far too many pilots believe the RPM drop itself combined with a rough running engine is what they are looking for to detect ice. Such a situation indicates ice has been allowed to develop for far too long already.

The key to detecting ice early is to look for any subsequent rise in RPM after an initial drop, either dynamically during warm air application, or by comparing values before and after the process. Even a small rise in RPM indicates the ice build up has started, and that's the time to apply more heat to remove it all. Many pilots never look for the RPM rise, and miss the opportunity to recognise high risk icing conditions early and the need to reduce the time interval between checks significantly.

1: The amount of ice that could potentially form in a carburettor of a normal light aircraft, such as a Beagle Pup, on a typical UK summer's day, descending from 3000ft down to 2000ft **2:** A delay in carb heat application during descent from near cloudbase caused this field landing **3:** Time to increase the frequency of the carb heat checks – moist air rising over Alderney forms a cloudbase close to our crossing altitude.

2

EXPECTATION OF RAPID CARBURETTOR ICING

With the amount of potential water vapour held in clear air being related directly to temperature, and carburettors being capable of reducing temperatures internally by well over 20°C, the most likely days for rapid carburettor icing in clear air are the warmer ones, because in the UK climate there will often be more water mass available to freeze out from any given volume of clear air.

The closer the outside air temperature is to its dewpoint, (and therefore the closer the relative humidity is to 100%), the easier it is for a carburettor to form ice rapidly, so care needs to be taken for example near the cloudbase itself, where by definition, temperature must equal dewpoint.

Although cold air cannot hold as much water vapour as warm air per given volume, a rapid ice build up can still happen, for example, after taxiing across grass on cool mornings, the dew being stirred up as minute droplets into the atmosphere near ground level, perhaps more easily thought of as a form of super saturation. After crossing wet or damp grass to line up, further ice removal should be attempted before take off, and the attitude, speed, and power monitored carefully during the climb out for any differences from normal.

ACTIONS IN CASE OF ENGINE FAILURE

Asked what actions are taken after unexpected engine failure, many pilots will say they would control the aircraft, adjust the attitude for 'best glide', then 'trim' and sometime later include 'restart checks'.

3

Observing many pilots in practice engine failures, one hand adjusts the attitude, the other moves immediately to the trim control. Trimming can take a reasonable time, as it requires the aircraft to be stable at the required speed, yet it takes less than a second to apply carburettor heat, so it would make sense for the carburettor heat to be applied before the hand moves to the trimmer. It is probably the only 'restart check' that has a time dependency for it to work. CJ

FURTHER INFORMATION

For more on the subject there is a CAA Safety Sense Leaflet on Piston Engine Icing (No. 14), revised as recently as this year

see www.caa.co.uk/safetysense

Flying with EASA

In April 2012 private pilots across the UK were affected by the introduction of the new EASA licensing law. Before it's too late, we explain the issues a private pilot now needs to take

One of the most significant changes to pilot licensing of recent times took place in April 2012, when we were introduced to the new European Aviation Safety Agency (EASA) Flight Crew Licensing (FCL) EU law, which was then implemented in the UK during September.

Many pilots flying commercially are already fully integrated into the new EASA licensing world, and many of them have had company support to help ensure their understanding of, and compliance with the new requirements. What support is there for the private pilot, perhaps flying for fun a couple of times per month, weather permitting? A clock started ticking in April 2012, and many private pilots, perhaps flying without the support of a formal club or national organisation, may be confused about their flying legality, and what they need to do, if anything, over the next 24 months as the clock ticks on. It's not an alarm clock where you sleep on and wake up when the bell rings: it's best to understand the issues and take any required action personally before it's too late.

One major problem for private pilots trying to understand the EASA world is a fundamental shift in privileges for existing licences that may make no immediate sense in their world: that is, the concept that some licences will no longer be valid for aircraft that they have previously covered. Under the new European Law, known as 'the Aircrew Regulation' introduced by the European Commission, we are in a transition period for private flying over the next two years. The 'Aircrew Regulation' includes the Part-FCL licensing requirements, and the Civil Aviation Authority (CAA) is now issuing 'Part FCL Licences in accordance with these rules. Known by the colloquial term 'EASA licences', one important message is that pilots who have not obtained the EASA licence they need by the end of the transition period will have to look at an aircraft – perhaps even one they fly today – and establish whether or not their existing licence will still allow them to fly it.

Pilots currently flying certain aircraft on NPPL ratings, older (pre-JAA) issued PPLs, or foreign (ICAO standard) licences will soon no longer have the privilege to fly aircraft that come within the scope of the new rules. They will need to apply for a new EASA licence (or perhaps an EASA validation for a foreign licence), should they wish in future to fly what are called 'EASA aircraft'. So, with that in mind, it's important to know the answer to the question: 'what is an EASA aircraft?'

WHAT IS AN EASA AIRCRAFT?

This is not something you decide for yourself, even if you own the aircraft. Europe's new licensing rules apply to pilots flying any aircraft registered in an EU country which is subject to EASA airworthiness certification – meaning that it has an EASA Certificate of Airworthiness or EASA Permit to Fly. Other aircraft, which are not regulated by EASA and therefore do not need pilots to hold new EASA licences, are those that come within the definitions detailed in 'Annex II' (pronounced 'Annex Two') to Regulation 216/2008. These are often referred to as 'Annex II aircraft' or 'non-EASA aircraft'. For easy reading here, let's call the two groups 'EASA aircraft' – those for which pilots will eventually need the new EASA licences – and 'non-EASA aircraft' – those which are not affected by the new rules.

At the light aeroplane level, EASA aircraft, that is, the ones which reasonably soon will only be available to pilots with EASA licences tend to be all the types you see around flying schools, rental organisations, and some syndicates – the Cessna 150 to 182 range, the Piper 28s and 38s, the Grummans and the Cirrus to name some of many. Most sailplanes, Touring Motor Gliders (TMG), balloons and helicopters are 'EASA aircraft' too, and their pilots will also be subject to the Part-FCL licensing rules.

'Non-EASA aircraft' include: all kit-built aircraft; ex-military, aircraft such as the Bulldog, a few vintage types (e.g. the Piper PA-22) which have national Certificates of Airworthiness or Permits to Fly (issued under the Air Navigation Order), and all microlights and light gyroplanes.

Non-EASA aircraft can continue to be flown under the current UK licensing scheme without the pilot needing to obtain an EASA licence. However, UK legislation has been changed so that EASA licences are also valid for 'non-EASA aircraft' that are within the aeroplane class ratings – i.e. Single Engine Piston (SEP), Multi-Engine Piston (MEP) and Microlight (subject to differences training). Pilots will only need a UK national licence to fly non-EASA aircraft that require type ratings – which means non-EASA helicopters and a (very) few specific aeroplane types – such as the Catalina. So once the transition period is over, an EASA licence will be required to fly an EASA aircraft, but all EASA licence holders can fly non-EASA aircraft, providing of course the aircraft are within the licence's privileges and class ratings.

So, soon, it will be fundamental to pilots without EASA licences to know whether an aircraft is categorised as 'EASA' or 'non-EASA' in order to stay legal, as they will not be allowed to fly the 'EASA' ones. How can anyone distinguish between them?

HOW CAN A PILOT TELL IF AN AIRCRAFT IS 'EASA' OR 'NON-EASA'?

One easy way to check whether it is an EASA aircraft is to check the aircraft paper documents. If the certification is through an EASA 'ARC' (Airworthiness Review Certificate) or an EASA 'Permit to Fly', then it is an EASA aircraft (EASA Certificates of Airworthiness ➔

and Permits to Fly have EASA form numbers). Easier still is to go online and check via the CAA's 'G-INFO' database *caa.co.uk/ginfo*. Searching by a specific aircraft registration or a manufacturer's type will produce the information you need in the field entitled 'CofA / Permit'. If EASA is mentioned in that field, an EASA licence will be required to fly it soon.

How soon will an EASA licence be required by UK private pilots?
There are two categories of pilots who do not need to take specific action:

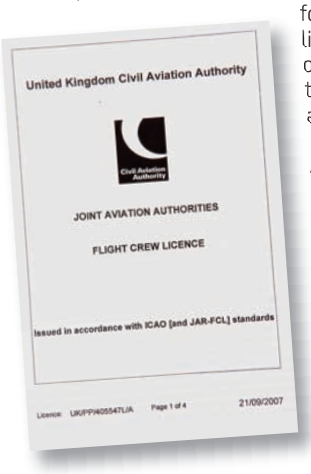
i. If you are a pilot with a JAA licence, that licence is recognised now as a Part-FCL licence automatically, except that it will still expire. When you apply to renew your JAA licence before its 5th anniversary, or, if you send it to the CAA to add a rating or make any other change in the meantime, it will undergo conversion and be replaced with a non-expiring EASA equivalent licence.

ii. If you will only ever fly non-EASA aircraft, then you will not need an EASA licence. You can continue to use your current national licence and ratings to national rules, as you do today.

If you don't fall into either of the two categories above, then the last day that your non-EASA licence and its ratings will be valid to fly any EASA aircraft is April 7, 2015. Also, from April 8, 2014, the use of a national licence to fly EASA aircraft is restricted to private flights in day, visual meteorological conditions in aircraft not exceeding 2,000kg and with no more than four persons on board.

Holders of full UK PPLs, who wish to continue to fly EASA aircraft, should aim to have an EASA licence before April 8, 2014 to retain full privileges from that date. Holders of UK NPPLs with SSEA or SLMG ratings should plan to be in possession of an EASA licence well before April 7, 2015, as that is the last day that an NPPL will be valid to fly an EASA aeroplane.

Pilots should note that the new European licences will allow them to do more than is permitted by their UK national licences. A Part-FCL licence allows the holder to fly an EASA aircraft registered in any EASA State and throughout EASA countries. LAPL holders flying non-EASA aircraft outside the UK need to check with other countries if that combination is acceptable in local airspace. These Europe-wide privileges apply to the new Light Aircraft Pilot's Licence (LAPL), which is similar to the UK NPPL – the NPPL is restricted to UK- registered aircraft only, and to UK airspace unless the country to be visited has agreed it may be used. This means that a pilot who holds a LAPL Medical Certificate (which is a lower standard than the Class 2 medical required for a full PPL) will be able to fly aircraft registered in Europe throughout Europe. It is also significant that the European rules include a LAPL for helicopters. This means that, for the first time, pilots at the LAPL medical standard (below Class 2) can be licensed to fly helicopters.


United Kingdom Civil Aviation Authority

JOINT AVIATION AUTHORITIES

FLIGHT CREW LICENCE

Issued in accordance with ICAO [and JAR-FCL] standards

21/09/2007

EASA licences are subject to the same 'differences training' and '90-day passenger rules' that we have become accustomed to under JAR-FCL since the turn of this century. Certain types of flying using EASA aircraft will require specific ratings in the licence. These include aerobatics and towing (of gliders or banners). The CAA has produced 'conversion reports' in accordance with the new legislation that will enable pilots who already do these things to obtain the new ratings as part of their licence conversion. If the specified evidence of the past activities is included with the application for licence conversion, all of the privileges will be included at no extra charge.

How soon will an EASA licence be required for pilots with 'foreign' (ICAO) licence?
For many years UK legislation has allowed 'foreign' ICAO licence holders (from countries outside the JAA or EASA area such as the USA, South Africa, etc) to fly 'G' registered aircraft covered by their licences for private purposes only without having to apply for any certificate, licence or approval. This is not permitted by the EU legislation. The UK privilege for foreign licence holders to fly G registered aircraft will remain in place for non-EASA aircraft only; it will cease with effect from April 8, 2014 for EASA aircraft. To fly an EASA aircraft from that date, the foreign-licensed pilot must obtain an EASA licence – credits will be given for the foreign licence. Pilots licensed outside the EU may also obtain a temporary validation of their licence under EU legislation for a period of one year.

Applying for an EASA Part-FCL licence
The CAA is already issuing Part-FCL licences for new applicants and existing licence holders. For conversions pilots can in general apply for the directly equivalent Part-FCL licence or one of a lower level. (The EASA equivalent of the NPPL is the LAPL). Full details of the conversion terms are given in CAP 804 (which can be found at *caa.co.uk/cap804*). However, there are a few specific aspects to draw attention to here:

- Under EU rules, a pilot must obtain all of his Part-FCL licences from one country, which must be the country where his medical records are held.
- Pilots will hold one European (Part-MED) medical certificate for all of their Part-FCL licences. UK pilots may obtain a LAPL medical certificate from their own doctor (GP), or an Authorised Medical Examiner.
- While JAR-FCL provided PPLs, CPLs and ATPLs for aeroplanes and helicopters, Part-FCL offers all of these plus pilot licences for sailplanes, balloons and airships. And Part-FCL provides the LAPL – similar to the NPPL, but valid throughout Europe – for all of these categories of aircraft.
- Applicants for a Part-FCL licence must hold the appropriate medical certificate at the time of application. Depending upon the licence(s) applied for, this will be a LAPL Medical Certificate or a Class 1 or 2 certificate issued in accordance with the new Part-MED rules (existing JAR-FCL Medical Certificates are deemed to be Part-MED certificates).
- Part-FCL specifies that all pilots who will use radio must be certified as language proficient to level 4, 5 or 6 and this certification has to be in place before the CAA can issue the Part-FCL licence (level 6 is the highest, fluent, level and does not expire; those at levels 4 and 5 have to re-qualify at specified intervals).

Unfortunately, language proficiency in English cannot be assumed, even for pilots born in the UK. To enable pilots to achieve/renew language proficiency the CAA has authorised all UK examiners to assess and certify pilots who are at Level 6 during any flying test, radio test, or through a structured aviation-related conversation.

For further information on all of the above, please see the publication CAP 804, which may be accessed via the CAA website at *www.caa.co.uk/cap804*

hill aviation insurance services ltd

The natural choice

01765 690777

hillaviation@btconnect.com
www.hillaviation.com

Unit 1a, Sycamore Business Park,
Copt Hewick, Ripon, HG4 5DF

Est.1991

AA and AA – rated security

Private and Club risks quoted

Solid reputation and experience

Cover for UK-based fixed wing aircraft

Security Ratings from Standard & Poor's

LICENCE/RATING/MEDICAL VALIDITY

Here is a summary of the common combinations of aeroplane licences, ratings and medicals that can be used in the UK to fly both EASA and non-EASA aircraft in the transition period which ends on April 7, 2015. After that date, with the minor exception of a foreign ICAO licence holder with a formal EASA one-year validation, an EASA aircraft can only be flown by a pilot with an EASA (or current JAA) licence (i.e. EASA LAPL, EASA/JAA PPL, EASA/JAA CPL, EASA/JAA MPL, or EASA/JAA ATPL) with the relevant rating or privilege and an EASA Medical Certificate that is appropriate for the licence.

Licence	Rating	Medical	Validity in EASA/Non-EASA Aircraft
NPPL	SSEA, SLMG, M'light	NPPL GP Declaration, or EASA LAPL Medical, or EASA/JAA Class 1 or 2 Medical	Valid as an NPPL to April 2015 in all UK-registered aircraft in the UK covered by the rating involved, and then continues to be valid in non-EASA aircraft only. NB: This combination has no EASA privileges at all from April 8, 2015, whichever medical is used. To fly EASA aircraft from April 8, 2015, you must apply hold an EASA licence, such as the LAPL.
Any PPL(A)	SEP, SSEA, SLMG, M'light	NPPL GP Declaration	Valid with UK NPPL SSEA and/or SLMG privileges until September 30, 2013. The exemptions to allow this combination will not be renewed after that date. See IN-2012/100.
Any PPL(A)	SEP or SSEA	LAPL Medical	This combination is NOT VALID – there is no exemption or regulation that allows a LAPL medical to be combined with any PPL for any purpose, whatever rating you have in your PPL. The LAPL Medical Certificate is valid for LAPLs, NPPLs, UK PPL(G), UK PPL(BA) and the Restricted UK CPL(B).
UK PPL(A) (Not a JAR or EASA PPL)	SEP	JAA/EASA Class 1 or 2	In EASA aircraft, this combination gives full PPL privileges up to and including April 7, 2014, and then LAPL privileges for a further 12 months. From April 8, 2015, it cannot be used in EASA aircraft at all. However, as it is ICAO compliant, this combination will be valid in UK-registered non-EASA aircraft for flight worldwide into the future. (An EASA Part-FCL PPL(A) is also valid for UK-registered non-EASA SEP aeroplanes for flight worldwide).
EASA Part-FCL or JAA PPL	SEP	JAA/EASA Class 1 or 2	This is a full ICAO-compliant licence, valid in both EASA and UK-registered non-EASA aircraft with no time limits except the JAA licence calendar expiry (at which time the licence must be converted to an EASA Part-FCL PPL. Conversion will also be triggered by any change to the JAA licence that has to be applied by the CAA (e.g. a new rating added or change of address).
EASA LAPL	SEP	LAPL Medical or JAA/EASA Class 1 or 2	This is the standard combination for an EASA LAPL(A). It is valid for single-engine piston EASA and UK non-EASA aeroplanes up to two metric tonnes, with up to four persons on board, day VFR etc, for use EU-wide (plus Switzerland, Iceland, Norway and Liechtenstein). Touring Motor Gliders privileges can be included. Unlike other licences, the LAPL does not have an expiring aircraft class rating. Instead the pilot must follow a 'rolling validity' scheme and self-check their own validity on any day they wish to fly. They must have 13 hours (specifically 12 hours 'pilot in command' including 12 take-offs and landings plus a one-hour flight training with an instructor) in the two years before any flight they intend to make. UK microlights can be flown with the LAPL(A) subject to completion of signed-off differences training.
Foreign PPL (ICAO)	Any	Foreign Medical	Usable for private purposes in G registered aircraft that it covers until April 7, 2014, but after that date cannot be used in EASA-aircraft, but continues to be valid flying G registered non-EASA aircraft. To fly EASA aircraft from April 8, 2014, either an EASA licence or a one-year EASA validation of the foreign licence is required.

IMPORTANT INFORMATION FOR PILOTS WITH NPPL MEDICAL DECLARATIONS

The NPPL medical declaration cannot continue to be used with any PPL, CPL or ATPL after September 30, 2013. Advance warning of this change was given in June 2012 with the publication of Information Notice IN-2012/100, which provides a full explanation of this change and the reasons for it. IN-2012/100 may be found on the CAA website at *caa.co.uk*

Any pilot holding a PPL(A), CPL(A) or ATPL(A) and a Medical Declaration who cannot, or does not wish to, regain a Part-MED/JAR-FCL Class 1 or Class 2 Medical Certificate has two options available to them. Either:

1. Obtain a LAPL Medical Certificate (from their GP) and convert the existing licence to a LAPL(A); or
2. Keep the medical declaration current and obtain a UK NPPL(A).

The UK medical declaration remains an acceptable medical standard for the UK NPPL, the UK PPL(Gyroplanes), the UK PPL(Balloons & Airships) and the Restricted CPL(Balloons).

However, the LAPL Medical Certificate is acceptable for all of these UK licences, as well as being the appropriate medical certificate for the Part-FCL LAPL for any category of aircraft; (aeroplane, helicopter, sailplane and powered sailplane, and balloon). CU

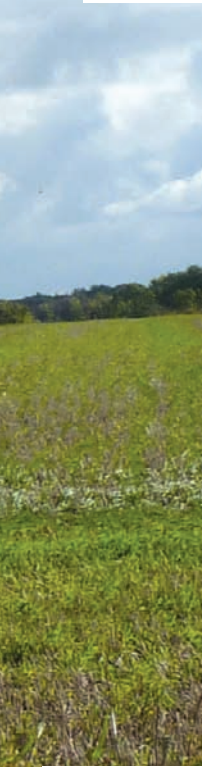
WHEN THE — ODDS — STACK UP

We delve deeper into the reasons behind the rotary accidents of helicopter flying and how the problem can begin before take-off

Few helicopter accidents are the result of only one factor. Many are said afterwards to have happened due to human error, pilot error, or whatever term you prefer, but they actually tend to occur because a number of things go awry at the same time. Poor weather, navigation problems, fatigue, stress, distraction – all of these are contributory factors in many rotary accidents.

Yet many helicopter pilots, if they are honest, will admit to having flown when tired or stressed, and have been distracted by something or had the weather start to close in on them. Normally, it's not a major problem, and indeed such things can often be converted into learning experiences.

However, it is different when more than one problem occurs at the same time. For example, perhaps the weather worsens, you decide to divert, and then you realise the GPS is playing up. Maybe a long flight has tired you; then you suddenly have to cope with



1: In a helicopter it can be too easy to leave a precautionary landing until too late **2:** Distraction, from passengers for example, can be a real problem when the workload gets high **3:** Flying under, rather than on top of, bad weather can force helicopters into CFIT, wire strikes or hitting obstacles

THE AUTHOR

After gaining a CPL(H) and rotary flight instructor rating, Helen Krasner worked as a helicopter instructor for many years; she also flew fixed-wing aircraft for pleasure. These days most of her working life is spent writing about aviation, mainly helicopter flying. She has regular columns in several publications, and has also had two books published: "The Helicopter Pilot's Companion" (Crowood Press 2008) and "Flying Helicopters, a Companion to the PPL(H)" (Crowood Press 2011). She also maintains her own aviation website and has published several aviation ebooks.

complicated ATC instructions in crowded airspace. It is the odds stacking up like this which can lead to disaster.

Some years ago, I wrote about a flight in which, as a low hours helicopter pilot, I attempted a long trip over unfamiliar territory, through the airspace of a major airport. On the flight home, with a low sun in my eyes and complicated departure instructions to follow, I missed an instrument warning light and was lucky to avoid an accident. I called my article 'The Holes in the Cheese', a reference to the well-known analogy of flying disasters being like gruyere cheese in which each hole represents a possible problem; and it is when the holes line up that an accident occurs.

Another way of putting this is to say that disasters happen when you become mentally overloaded. Overload when flying is difficult to deal with since, by definition, there is no part of your brain available to sit back and realise that you simply can't take in any more. If you can manage to see it coming it is sometimes possible to take off the pressure – perhaps by diverting, or giving control to a co-pilot, or even landing... it depends on the circumstances. But if you don't or can't do any of those things, your mind can simply cease to take something new on board – perhaps an obstacle, or a radio call, or a warning light as in the example mentioned above. Indeed, someone speaking to you in such a situation can simply be enough to push you over the edge – and this is when accidents take place.

Of course, all these points apply to any pilot of any flying machine. So why mention helicopters in particular? Well, I believe that this kind of accident is more likely to affect helicopter pilots, simply because of the nature of the aircraft we fly and the prevailing rotary aviation culture.
Let me explain...

First, let's look at where accidents happen. A large proportion are caused when flying low – by CFIT, wire strikes, or colliding with obstacles. Indeed, short of losing control of the aircraft or having some mechanical failure, there's not really much which can go catastrophically wrong at altitude – and if it does, you have far more time to sort it out.

So low flying might well be seen as a contributory factor, and, as a general rule, helicopters fly lower than fixed-wing aircraft. This is often simply because they can. Helicopters are easier to manoeuvre at low level than their fixed-wing counterparts, so we tend to use that facility frequently – we avoid bad weather by flying around or underneath it rather than 'on top'. Perhaps we do this to the extent that pilots even think it's a necessary part of helicopter flying.

In a recent piece from another aviation magazine concerning a group flight, the author recounted how "with a cloud base of only 1,300ft and rising ground ahead, the helicopters were soon struggling to find a clear route, while the fixed-wings were able to climb." What... the helicopters couldn't climb? Since when are rotary machines limited to staying below 3,000ft? Yet it must be admitted that this is often an assumption, or a habit, in rotary flying circles, and many helicopter pilots will stay low in difficult circumstances. And at low level you have

FROM *GUIDE TO VISUAL FLIGHT RULES IN THE UK* (CAA PUBLICATION)

Weather minima for VFR flight outside Controlled Airspace

Below FL 100
5km flight visibility
1500m horizontally from cloud
1000ft vertically from cloud.

At or below 3000ft
for fixed-wing aircraft
5km flight visibility
Clear of cloud and in sight of the surface.

For fixed-wing aircraft operating at 140kt or less
1500m flight visibility
Clear of cloud and in sight of the surface.

For helicopters operating at a speed which, having regard to the visibility, is reasonable.
Clear of cloud and in sight of the surface.

obstacles, wires, less time to take action... in fact you could be unwittingly setting yourself up for an overload situation.

Secondly, the legal weather minima for helicopters are slightly different in that outside controlled airspace at low levels there is no fixed visibility limit (see box). Now I think this is reasonable, and I certainly wouldn't want to change the rules. Yet, does it maybe cause some pilots to think they can fly in exceedingly poor weather? When working as an instructor, I recall a low hours helicopter owner setting off in his own aircraft in very limited visibility, when three instructors told him it would be a good idea to stay on the ground. He flew, and he reached his destination safely. But he easily might not have done, particularly if something else had gone wrong. Again, it's almost setting up an overload situation, and I think we'd all have liked to be able to point to a rule which said he couldn't fly.

Next, most helicopters require more hands-on flying than fixed-wing aircraft. This isn't true of the more sophisticated ones, but many rotary aircraft need to be constantly flown; they cannot be trimmed and left to themselves, as can aeroplanes. Indeed, this is their attraction, and those who like hands-on flying are often attracted to helicopters. But it means that helicopter pilots cannot reduce their workload by trimming the aircraft and leaving it alone. In effect, we have a larger workload from the start, and while that doesn't matter in normal circumstances, if there is any other problem it could make a difference.

Finally, helicopters can land almost anywhere. This fact is a massive advantage. But maybe it can also be a cause of accidents, if it tempts a pilot to just push on a bit further, to leave things a little too late. After all, unless you are in the middle of the countryside with no obstacles and flying into wind, you can't just plonk your helicopter down anywhere. Usually a little preparation is needed, a bit of a 'recce' if not a proper circuit. It is easy to leave everything a little too long, and that sensible precautionary landing becomes an accident site.

So what can be done about all of the above? Well, after an accident, those sitting safely on the ground frequently conclude that the flight should never have been attempted in the first place. Certainly that was the case with my 'Holes in the cheese' incident – too many challenges at the same time for someone with limited flying experience. So perhaps it comes down primarily to the quality of our 'go/no-go' decisions. Maybe we all, as helicopter pilots, need to look more closely at what every flight involves.

For example... perhaps the weather is marginal, but you know you have the experience to cope with that. But... are you also flying an unfamiliar aircraft? How well do you know the route? Do you have passengers who aren't used to flying? Have you programmed the GPS correctly? Are you likely to get distracted in any other way? None of these alone may matter, but together, are the odds stacking up?

Perhaps it would help if all these factors were rated on some kind of points system, in the same way that stressful life events sometimes are. Then we could add up the points, and know instantly if a particular flight would be over the limit. But somehow I don't really think that this issue is that simple. It is very much an individual thing, for we all have different capabilities and limitations. But perhaps we do need to be much more aware of what we can safely do rather than what we'd like to be capable of when it comes to our flying 'go/no-go' decisions. We need to look at the whole picture, and be honest with ourselves.

And maybe we all need to be a whole lot braver when it comes to making a decision *not* to fly! CU

4: Distraction, from passengers for example, can be a real problem when the workload gets high

Learn to fly a helicopter at

Heli Air

OPEN
7 DAYS
A WEEK

- Trial Lessons
- Introductory Days
- Pilot Training
- PPL and CPL
- Helicopter Charter
- Weddings
- Self Fly Hire

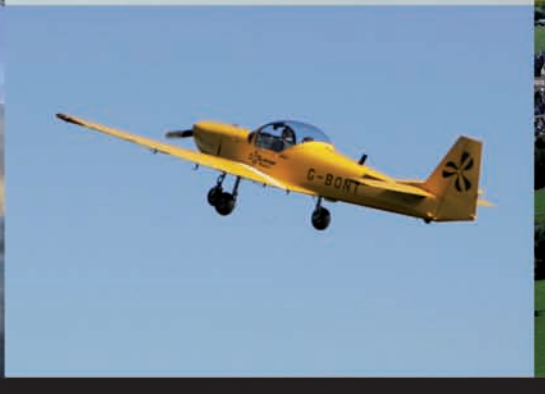
Visit HeliAir.com

for further details

London/Denham	London/Fairoaks	Wycombe	Silverstone	Wellesbourne	Thruxton	Gloucester
01895 835899	01276 855000	01494 769976	01327 857752	01789 470476	01264 773373	01452 855500

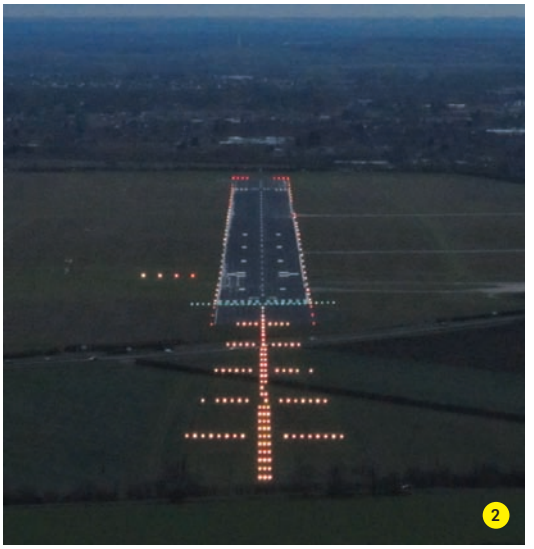
the exclusive club
at a very inclusive price…

with 24/7 access to a fleet of aircraft from 152s and PA28s to aerobatic and complex singles to use as if they were your own, it's no wonder we say the sky's no longer the limit.



Ask us for a membership pack e: admin@takeflightaviation.com
Loxley Lane I Wellesbourne Airfield I Warwickshire CV35 9EU
t: 01789 470424

Take Flight
AVIATION.com



POINTS OF **APPROACH**

Sometimes 'final' extends much further than pilots are expecting...

Numerous conflicts on the final approach path to Cambridge Airport's runway 05 were reported to the CAA in 2012. Each has been investigated to determine the causal factors, and some of the conclusions are discussed here for those who fly regularly, or are considering flying, in the Cambridge and Duxford area.

In May 2012 a single-piston aircraft was operating on a VFR flight approximately eight miles south-west of Cambridge. The airport was operating on runway 05 and there was a business jet performing an NDB/DME approach to the runway. As the jet manoeuvred on to final the pilot observed the smaller aircraft performing aerobatics ahead of it and took action to manoeuvre off the final approach track to avoid the other aircraft.

In October 2012 two incidents occurred in roughly the same position on the approach to runway 05. Again, on each occasion, a single-piston powered aircraft was operating south-west of Cambridge. On the first occasion, another jet being vectored by Cambridge ATC for final approach aborted its approach to runway 05 and repositioned to land on runway 23 with a tailwind to avoid the other aircraft. On the second occasion, a medium-sized jet executed a go-around on the final approach as the single-piston aircraft came within 0.8 miles of it.

Finally, in February 2013, another jet in the visual circuit and positioning for Cambridge runway 05 came into proximity with a fast-jet routing southbound for an arrival at Duxford.

Although the incidents involved different aircraft and pilots, there were common factors associated with each one. The aircraft executing the arrival procedures or flying in the visual circuit were in receipt of an air traffic service from Cambridge ATC. Where possible, this allowed traffic information to be passed to assist the pilots in spotting and avoiding the other aircraft. The single-piston powered aircraft and the fast jet were radio-equipped but the pilots had elected not to be in communication with Cambridge ATC as they flew by or operated in the vicinity. The latter was in communication with Duxford Flight Information Service unit, a non-radar equipped unit, who could not warn the pilot about the busy traffic picture north of their aerodrome.

The airspace around Cambridge and Duxford is predominantly Class G, where the responsibility for the avoidance of collision rests with the pilot. The 'see and avoid' principle is key to assisting pilots achieve this. However, around the Cambridge area, Cambridge ATC is able to offer a range of services to aircraft operating in uncontrolled airspace, which can ultimately enhance the safe operation of flights in the area.

1: Cambridge has suffered a number of conflicts on 05
2: Well lit up for a night approach

3: 'Feathers' on the chart indicate that an instrument route exists
4: Instrument approaches can be much longer than standard circuits

There are plenty of land-based features in this area, such as the M11, wind farms, disused cement works and large radio telescopes, all of which act as ideal visual reference points for pilots. However, these often lead pilots to operate in specific areas, some of which may be in proximity to other aircraft manoeuvring to land at Cambridge.

This is shared airspace where pilots can encounter a range of aircraft of differing sizes, speeds and operating characteristics. In each of the incidents the pilots of the aircraft not in receipt of an air traffic service could have sought information and assistance from an air traffic service capable of informing them about other traffic as necessary and improving the overall safety for all pilots.

Pilots planning to operate in this area should consider, as part of their planning, whether or not taking part in a radar-based Air Traffic Service could enhance not only their own flying experience but also that of other pilots operating in the area. CU

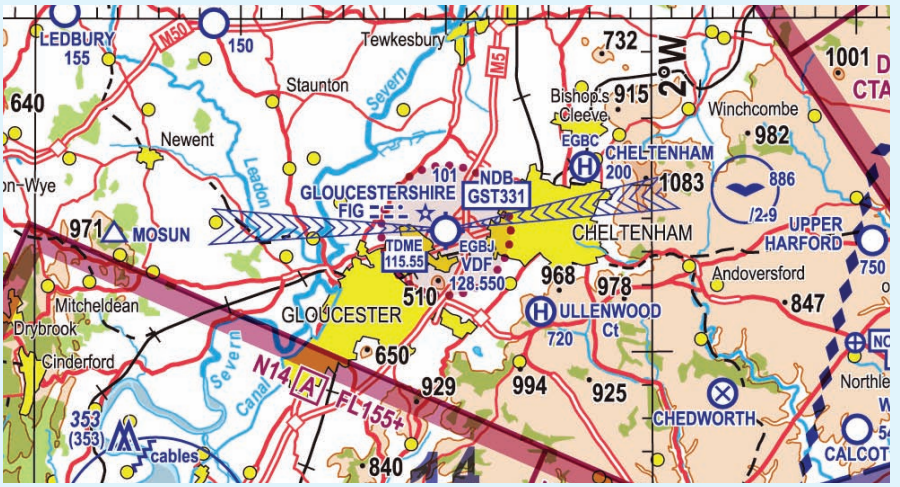
AVOIDING CONFLICTS

Let's face it, flying across the approach when aircraft are trying to land is a bad idea by anyone's standards, which is why most pilots naturally avoid flying on the extended centreline of a runway or through the circuit pattern unless they can be sure there is no other traffic.

But what's often not so obvious to some is the fact that many UK airports provide instrument procedures that start several miles away from the airport. Aircraft using these procedures follow certain pre-defined routes, usually aligned with nearby radio beacons, that lead them down to the runway.

It's clearly not practical to avoid every instrument procedure at every airport all of the time, but it pays to know where the routes are and what to look for. One simple indicator that instrument routes exist is the marking of Instrument Approach Procedures (IAP) or 'feathers' on the chart (right). The relevant aerodrome page of the AIP (*ais.org.uk*) will show the full route of the procedure and should ideally be reviewed during pre-flight planning.

The best action pilots can take is tune their radio to the aerodrome frequency and listen in to transmissions of aircraft in the vicinity. Better still, call the aerodrome and let them know your intentions. Doing so ensures that everyone flying in the area is aware of the traffic picture and dramatically reduces the chance of a mid-air collision.



LX Avionics Ltd

Fast, efficient and friendly advice and service

Ten Years of Service to the Recreational Aviation Community

DITTEL AVIONIK · funkwerk avionics · TRIG Approved Dealer · BECKER AVIONICS we bring you home

8.33 TRANSCEIVERS

lx nav

LX navigation

GLIDING FLIGHT COMPUTERS

POWER flarm flarm

COLLISION WARNING SYSTEMS

FLIGHT RECORDERS

PRIMARY FLIGHT DISPLAY (KANARDIA)

BALLOON 8.33 TRANSCEIVER & TRANSPONDER PORTABLES

For advice and service call John Delafield on 07850 950349

email: johnd@lxavionics.co.uk

www.lxavionics.co.uk

TRANSAIR FLIGHT EQUIPMENT

Transair TA-200 *Pilot Headset*

- Foam earseals
- Volume control
- Light weight
- Electret mic
- 22dB noise reduction

ONLY! £129.95

NOMEX *Flightsuit*

ONLY! £199.00

Pilots Black Leather *Flight Jacket*

ONLY! £159.95

Pilots Kneeboards

Uniform Clothing

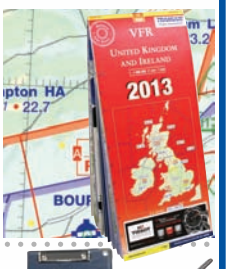
Viper *Tactical Boots*

£79.95 VIPER

Transair TPS-1 & 2 *Flight Computers*

FROM £53.95

Transair Chart



Transair Professional *Leather Flight Case*

Includes FREE 'CREW' luggage tag

ONLY! £119.95

Transair Traveller *Flight Bag*

£44.95

Transair Professional *Flight Bag*

£69.95

www.transair.co.uk

Tel: +44 (0)1273 466000

SPECIAL INTRODUCTORY OFFER

Subscribe to Pilot and receive a FREE Pooleys FC-8 Flight Bag

Keep up to date with the latest coverage of what's new in GA, flight tests, travel articles & technique features by subscribing to *Pilot* magazine from **£31.99** – that's just **£2.46** per issue!

PLUS – receive a **FREE** Pooleys Pilot Bag worth **£26.95** to keep all your gear together on your flights

Great reasons to subscribe:

- **FREE** Pooleys FC-8 Pilot bag – worth **£26.95**
- **SAVE** up to **40%** on the full cover price
- **JUST £2.46** per issue (usual price £4.10)
- **FREE** UK delivery direct to your door!

Pilot is also available in digital for just £17.99* Enjoy reading each issue on your laptop & tablet whilst you are on the move!

T&Cs: Digital subscription does not include free gift and is only available to order online.

Secure your FREE Pilot Bag & subscribe today!

www.subscriptionsave.co.uk/clued

☎ 0844 848 8049 quoting code **NPICLDU1**

T&Cs: This is a UK offer only. Details on Direct Debit Guarantee available on request. Gift is available whilst stocks last. One free gift per household. Savings are based on the cover price of £4.10 per issue. £31.99 (saving 40%) is a Direct Debit only offer, alternatively, subscribe by credit/debit card for £34.99 (saving 34%) on a year's subscription. Free gift only available with UK print subscription. For overseas subscription rates, please call +44 (0)1858 438840. *By purchasing a digital subscription, you will also receive access to the app through you apple store or, Google play. Offer ends 31/07/13.

01

Shuttleworth tragedy

The Shuttleworth Collection pilot planned to make a re-familiarisation flight and practice prior to an afternoon display at Old Warden Aerodrome. In the past, the Humming Bird's 34hp ABC Scorpion II engine had suffered a number of power losses during ground runs and also in flight, which had resulted in significant damage to the aircraft. As a result, the Collection's policy was to operate the aircraft only within gliding range of the aerodrome, so the pilot planned first to remain within the airfield boundary, then position to the north for the display practice. Total planned flight time was about 10 minutes. He had a brief discussion with the Collection's Chief Pilot, who considered that, while weather conditions were unsuitable for some of the flying planned for the day, they were acceptable for his flight.

The Humming Bird flew to the southern end of the airfield and performed a series of level turns at 600-800ft. The Chief Pilot and another pilot qualified on-type watched the take-off and initial turns and saw nothing amiss. After a few minutes the aircraft flew downwind to the north before descending to 150-200ft as it turned back towards the airfield. Witnesses commented that the effect of the wind made the aircraft appear to be travelling unusually fast downwind and "almost stationary" upwind.

The aircraft continued to fly along the Rwy 21 centreline before making a level turn to the left, taking it close to, and downwind of, a copse of tall trees. It is possible that the aircraft completed this turn before starting a second turn, when eyewitnesses saw the port wing drop sharply. It then recovered to level flight, after which the port wing dropped again, with the aircraft rolling to a steep angle before the nose dropped. It then entered a very steeply descending left turn from which it did not recover, striking the ground nose-down beyond the vertical. Witnesses estimated the total time from the initial wing drop to striking the ground at two to three seconds. The aerodrome fire and rescue service arrived at the crash site within one minute, but the pilot had been fatally injured.

From examination of the wreckage and ground marks it was concluded that the aircraft had struck the ground at a pitch attitude that was slightly beyond vertically nose-down and with its wings approximately level, with no appreciable lateral speed. The engine compartment had separated from the fuselage and the engine was partially buried in the impact crater. Both propeller blades had fractured chordwise close to the hub. The cockpit structure was severely disrupted. The remainder of the aircraft came to rest some five metres from the initial impact point. There was nothing to suggest that the aircraft had not been structurally intact prior to the accident.

A post-mortem revealed that the pilot had sustained a very severe head injury that would probably have been instantaneously fatal. Although his cloth flying helmet afforded little protection from impact, due to the nature of the head injury it was unlikely that more-protective headgear would have altered the outcome.

INCIDENT DETAILS

- **Aircraft Type**
  De Havilland DH53 Humming Bird
- **Date & Time**
  1 July 2012 at 0842
- **Location:** Old Warden Aerodrome, Bedfordshire
- **Damage** Substantial
- **Crew** – 1, Passengers – 0
- **Commander's Flying Experience**
  ATPL, 14,780 hours,
  55 minutes on type
  Last 90 days: 151 hours
  Last 28 days: 56 hours

The pilot had joined The Shuttleworth Collection as a volunteer in 1997 and had been its Chief Pilot between 2009-2010. He was qualified to fly almost all the aircraft in the fleet, and for a large number of types, only he and the current Chief Pilot were qualified on them. He had previously been a military test pilot, was a graduate of the Empire Test Pilots' School, and at the time of the accident was an airline pilot.

The Collection operates a group of aircraft, including the Humming Bird, which have low power margins and no systems such as brakes or hydraulics, and are unsuitable for regular display use, but which need to be displayed from time to time to fulfil its charitable objective of public education. This pilot was qualified on all the aircraft within this group and was one of four qualified on the Humming Bird. However, he had not flown it since 2010, when he completed a 10-minute air test. Prior to that his last flight in the DH53 had been in 2004. Nonetheless, his limited total time on type was not unusual.

In the aircraft was a set of flight reference cards, and the pilot had with him typed notes which cautioned of the need to be prepared for an engine failure at any time; that vibration made the instruments hard to see; and that the pilot should firmly hold the ailerons central as the aircraft had a tendency for 'aileron tramping' near the stall giving symptoms of catastrophic wing drop. The flight reference cards noted the relevant operating speeds for the aircraft as Takeoff 45mph, Cruise/Climb/Approach 55mph, Stall 42mph. During his April 2010 flight test the accident pilot's report on stalling noted a wing drop of 10° in calm conditions using a 1mph/sec deceleration. He also noted: "Altimeter u/s...altimeter is of small scale type which is of little practical use to the pilot at low levels."

The 1920s era airspeed indicator fitted to the Humming Bird had a speed scale ranging from 40-160mph. The scale was compacted at lower speeds, with a 10mph range represented by a 13° arc, and expanded at the higher speed ranges, where a 10mph range occupied a 38° arc. The weather at the time of the flight was changing from a moderate constant wind to significant gusts of 22-25kt. The aircraft's normal operating speed was 55mph and its stalling speed was 42mph, so in normal conditions there would have been a 13mph margin above stalling speed.

With a steady wind of 15kt and gusts of 22-25kt, the gust would comprise between 62-88% of the available speed margin, which occupied a very small portion on the available speed scale on the ASI, represented by an arc of approximately 15°. With the known vibration of the aircraft, the small display range of the ASI would have made accurate reading of airspeed difficult. A lack of clear, usable airspeed indications in gusty conditions would have made the aircraft more challenging to operate.

The AAIB report notes: "The turn at point 'A' (see graphic) took the Humming Bird downwind of the tree line at a height at which it might encounter turbulent airflow in the strong winds, particularly given the developing

gusts. The aircraft had, by modern standards, low stability and power margins and poor flight instrumentation. It was known to be prone to aileron tramping close to the stall.

"Eyewitness accounts described a departure from controlled flight consistent with a stall followed by a significant wing drop. It seems likely that the loss of control was the result of a combination of the DH53's challenging operating/handling characteristics, the turbulent effect of the trees and the gusty wind conditions.

"All damage to the airframe and flight controls was consistent with the impact with the ground... It was not possible to determine conclusively if the engine was operating normally at the point of impact, but neither was there sufficient evidence to suggest that it was not. The engine note was distinctive and noisy; none of the witnesses reported being aware of a change in engine note during the flight. The shallow propeller strike on the ground (indicated) that the propeller was rotating at the time of impact but no assessment could be made of the engine power being delivered.

"Given the low power rating of the engine, the wooden construction of the propeller, the hardness of the ground and the predominantly vertical trajectory of the aircraft at impact, it is uncertain whether the propeller would have made a more substantial propeller strike even if the engine was operating at full power.

"The aircraft departed from controlled flight for reasons that could not be fully determined. Technical failure of the aircraft and pilot incapacitation were considered, but ruled out as causal factors. Given the prevailing weather conditions and the challenging operating/handling characteristics of the aircraft, it is considered that the most probable cause of the accident was handling related."

Following this accident The Shuttleworth Collection conducted a comprehensive internal safety review. It highlighted matters to be actioned or considered further:

- Analysing the effect of wind over the trees on the east side of the airfield and whether those trees could be reduced in height.
- Provision of on-site Aerodrome Fire and Rescue Services and medical services during all flying activity, not just during displays.
- A review of the safety equipment worn by its pilots.
- A review of the current provision of meteorological information and consideration of installing a certificated anemometer at the airfield.
- Consideration of the imposition of total wind and gust limits for individual aircraft.
- Addition of modern flight instruments, particularly airspeed indicators and slip balls to all aircraft capable of mounting them.
- Fitting and use of radios in the Collection's aircraft. CU

FOR FURTHER INFORMATION ON INCIDENT REPORTS, VISIT *AAIB.GOV.UK*

02

Schleicher spun in

INCIDENT DETAILS

- **Aircraft type** Schleicher ASW 24
- **Date & Time** 30 April 2012 at 1342
- **Commander's Flying Experience** BGA Gliding Certificate, 274 hours, 10 on type
  Last 90 days: 17 hours
  Last 28 days: 8 hours

WEATHER CONDITIONS were good at the gliding site near Dunstable, but there was a blustery wind from the south-east, estimated at 10-15kt, with some stronger gusts. Visibility was more than 10km, with scattered cumulus, base 4,500ft. A red windsock was being flown at the site, indicating that in these weather conditions it was recommended that only instructors and those with a Silver standard gliding qualification should fly.

The ASW 24's pilot was not an instructor, nor did he hold a Silver qualification, but he had recently returned from a club trip to the Pyrénées where he had flown in more challenging conditions. He considered taking an aerotow for his first launch, but given the wind direction, he decided to launch off a winch, and flew a circuit before returning to the field. On his second launch he released at 900ft and made a right turn, flying along the Dunstable Downs ridge. He then made a gentle continuous turn to the right through approximately 180°, followed by a single orbit to the right, rolling out on to a northerly heading. The glider was then seen by a witness to pull up steeply, level off, then bank to the left and enter a spiral dive. Other witnesses saw the glider in a steep nose-down attitude before it struck the ground in a field of crops, fatally injuring the pilot. Examination of the wreckage showed that the glider was structurally complete prior to impact, with the landing gear retracted and airbrakes closed. No evidence of any pre-impact failure was found in the structure or controls.

The AAIB report concludes: "The pilot had completed a previous flight... which appears to have been conducted safely, [but] he did not execute any pull-up manoeuvre on the first flight. On the accident flight, for a reason that was not determined, the pilot elected to execute a pull-up. A possible explanation is that he was exploiting an area of lift, in order to gain height. Onboard GPS data shows that the glider's groundspeed reduced to 47kt as it reached the top of the pull-up, at which point it banked to the left. The wind direction and strength was such that it would have produced a tailwind component of 10kt or possibly greater, given the gusty conditions. This, in combination with the low groundspeed, indicates that the glider's airspeed would have been close to, or possibly even below, the 1g stall speed of 37kt for the given weight. It is not known if the bank to the left was the pilot's intention or the result of a wing drop, but witness evidence suggests that the glider then stalled and entered a spiral dive to the right, from which there was insufficient height to recover."

The ASW 24's operating manual notes: "Spiral Dive Recovery. Depending on the aileron position during spinning with forward centre of gravity positions – that is the CofG range when the glider will no more sustain a steady spin – it will immediately or after a few turns develop a spiral dive, or slipping turn similar to a spiral dive. These conditions will both be terminated by applying opposite rudder, or applying aileron opposite to direction of turn." CU

03

Power surge

The Skyranger Swift was being flown for the first time after replacement of rubber fuel hoses and fuel filters. In the climb, at about 500ft, the engine produced what the pilot described as a "surge" in power. He stopped the climb and positioned for an immediate return to the airfield.

The engine surged again as the aircraft was on final approach for a precautionary forced landing so the pilot turned off the magneto switches to avoid complications should there be a further surge in power. The aircraft touched down heavily, bounced a few times before the nosewheel dug into the grass surface, then flipped over. The passenger suffered minor injuries, but both occupants were able to get out of the aircraft without assistance. Ground witness marks indicated that it had been pitching fore and aft during the landing run, and had possibly been travelling on its nosewheel only at some point.

At the time of reporting the reason for the abnormal engine running had not been established, although the pilot thought carburettor icing was unlikely given that the aircraft was equipped with a water jacket carburettor heating system. CU

INCIDENT DETAILS

- **Aircraft Type** Skyranger Swift
- **Date & Time** 14 November 2012 at 1530
- **Location** Sackville Farm Airfield, Bedfordshire
- **Damage** Damage to engine mounts and firewall, propeller and spinner, nose landing gear
- **Crew** – 1, Passengers – 1
- **Commander's Flying Experience** NPPL 235 hours, 141 on type
  Last 90 days: 7 hours
  Last 28 days: 2 hours

/ INCIDENT REPORTS IN BRIEF

SUNSTRUCK
A Focke-Wulf (Piaggio) FWP-149D was en route back to its base airfield, with a planned stop at Stretton. On arrival the weather conditions were as forecast and the pilot carried out an approach to Rwy 27, whose surface is variable, with only an 18m strip on the north (or right) side, viewed from the approach that is maintained in a suitable condition. The approach was made into a low sun. Just before touchdown, the pilot applied rudder to remove drift and align with the runway, but it continued just above the surface and drifted right. The starboard wing struck a large bush, which yawed the aircraft to the right and into a hedge. The pilot attributed the accident to his continuing with the approach when the low sun and stroboscopic effect from the propeller made judgement of height difficult.

NOT SO EZ
A Rutan LongEZ's pilot was given traffic information on a Bell JetRanger helicopter inbound to Duxford from the east. The LongEZ reported downwind for Rwy 24 LH. The JetRanger was on 3nm final and was not visual with the LongEZ, which subsequently reported final with no contact with the helicopter. ATC requested a position report from the LongEZ pilot, who stated he was over the threshold. He was actually on final for Rwy 06 with the JetRanger on final for Rwy 24 grass. The LongEZ landed and was instructed to hold position at the far end of 06 due to departing traffic joining 24R/W24 via the taxiway. Its pilot has been de-briefed by Duxford's Airfield Safety Manager, and the airfield "has taken comprehensive remedial action' as a result of the incident.

GLARING ERROR
A Piper Seneca was positioned high during the initial stages of a flapless approach to Coventry. A correction then placed it below the correct approach path, with the IAS falling. The instructor asked the student to go around, but he was slow to respond and the lower surface of the aircraft passed through the tops of high bushes. No damage was found. The crew believed a major factor in this incident was sun glare on a damp runway making approach assessment difficult. The student and instructor were debriefed regarding optical illusions and the need to maintain a normal 3º glidepath.

UNWANTED EXTRA
A jet fuel bowser driver found FOD on Kemble's runway, identified as a black rubber de-icing boot and two plastic cable ties. Airfield Ops checked the movement database for likely aircraft types and identified an Extra EA400, and it was subsequently confirmed that the item had come from this aircraft on its departure.

C310-VS-B777
A Boeing 777 B777 on the ILS at 9nm from Edinburgh's Rwy 06 was given avoiding action by ATC and broke off its approach due to conflict with an inbound Cessna 310 operating VFR that became IMC at 2,000ft. The C310 turned through the final approach track, climbing back to 3,000ft. It had been cleared to enter the Edinburgh CTR (Class D) VFR, not above 3,000ft and had been passed weather information, which consisted of good visibility but low cloud between 1,000-2,000ft. The C310's pilot had elected to continue VFR having been offered IFR, reported at West Linton inbound at 3,000ft and was transferred from Radar to Tower frequency. Tower subsequently informed Radar that the aircraft was in IMC at 2,000ft and was being transferred back to Radar, who in turn issued the avoiding action to the B777. Both aircraft were re-vectored and landed safely.

04

Stricken Squirrels

IN THE FIRST OF TWO INCIDENTS a squirrel helicopter was nearing the end of a transit to a pick-up site in the Cairngorms National Park. Suspended below it was an empty chain lifting sling. The pilot reported that he encountered localised severe turbulence while flying at 80kt, the maximum allowed airspeed for the configuration. This caused the helicopter to sink rapidly through some 60-80ft. The pilot heard a bang and immediately realised that the chain had struck the aircraft, probably in the region of the tailboom. The sling, which was normally visible in the cargo mirrors, had disappeared from view.

There were no uncommanded yawing movements, no vibration and the helicopter was responding normally to control inputs, so the pilot made a normal approach to land. However, when the ground crew reported that the chain was wrapped around the tailboom, he reduced speed to slower than normal and landed safely. The tail rotor system had sustained considerable damage.

Eight days later a similar incident occurred to another of the operator's Squirrels. This one was moving powerline poles from a field site in Yorkshire to a construction area. After completing several uneventful return flights, it was returning to the site when, as the helicopter was descending at 75-80kt, the pilot heard a loud bang and felt a high frequency vibration.

Cockpit indications remained normal. As the landing site came into view, the pilot warned the groundcrew by radio of the situation, jettisoned the empty lifting sling just before touchdown and carried out a minimum power landing. The empty chain lifting sling had made contact with both tail rotor blades, the tail rotor driveshaft cover and the port horizontal stabiliser. The pilot reported that the weather at the time was generally fine, although there was a westerly wind of 25kt, gusting to 35kt, with some turbulence near the hills, but not so much as to cause him major concern.

The helicopters' operator conducted an internal investigation, which concluded that the slings had entered the tail rotors due to high airspeed, probably coupled with a descent and associated nose-up attitude, and turbulence being a contributory factor. The chain-lifting sling was seven metres long and covered in a cloth sheath. A flight trial established that this sling angled further back in flight than a sling without a sheath, which was the type of sling originally tested. The operator subsequently removed the cloth sheaths from the majority of the sling length, which was increased to ten metres. A safety bulletin was issued to all affected pilots and ground crew, highlighting the changes and stressing the need to adhere to the 80kt speed limit, whilst being prepared to reduce speed further in unfavourable flight conditions. CU

Heavyweight light jet

THE CESSNA CITATION Mustang had been overfuelled at its departure airfield, putting it 84lb over MTOW. An overweight landing was made at Blackbushe, but instead of the intended landing on Rwy 07 it touched down on Rwy 25. The aircraft's performance limiting weight with a 5kt tailwind is 6,911lb, so it landed 1,220lb above this weight.

05

Shedding light

At a height of 400ft after takeoff from Dunkeswell the pilot heard a thud, and saw that the landing light cover on the port wing leading-edge had split along its centreline, with the upper half deflected upwards and the lower half downwards. This had the effect of funnelling the airflow into the wing structure and, because there was a gap underneath the front spar which allowed air into the rest of the structure, the fabric covering was bulging under the pressure.

He levelled out, intending to fly a right-hand circuit to land but found that despite full control deflection he was unable to prevent the aircraft from yawing and rolling to the left. Approaching 90° of bank and with altitude decreasing, he throttled back and the controls started to respond, although somewhat sluggishly. After getting the wings nearly level at about 50ft he still felt that he had almost no directional control and attempts to apply power other than in short bursts made the aircraft very unstable.

The aircraft was now heading back towards Dunkeswell and the pilot felt he might be able to reach Rwy 17, albeit downwind. However, as he lowered the nose, and despite full opposite control application, the Jodel started to turn left towards some taxiing aircraft on Rwy 23/05. He pulled the nose up to clear the aircraft on the ground and then lowered it again to regain airspeed. This had the effect of yawing the aircraft to the left again and the port wing struck the ground, slewing the Jodel around on the grass at the end of Rwy 17. Overall, the incident had lasted about four minutes.

The landing light cover had been made of polycarbonate material bent around the leading-edge profile. This induced residual stresses in the material and probably led to cracking and failure. When this occurred the material reverted to its natural, flat shape. The correct component uses Perspex moulded to the shape of the leading-edge. The Light Aircraft Association has since drawn attention the potential pitfalls of making the light cover using an incorrect method, and the possible effects on controllability should such a failure occur. The French Bureau d'Enquêtes d'Analyses (BEA) is not aware of any other accidents caused by such a failure. CU

INCIDENT DETAILS

- **Aircraft Type** Jodel D150 Mascaret
- **Date & Time** 27 October 2012 at 1323
- **Location** Dunkeswell Airfield, Devon
- **Damage** Damage to left wing spar, undercarriage, fuel tank and propeller
- **Crew** – 1, Passengers – 0
- **Commander's Flying Experience** PPL, 721 hours, 470 on type Last 90 days: 7 hours Last 28 days: Nil

06

Tomahawk tripped up

INCIDENT DETAILS

- **Aircraft Type** Piper Tomahawk
- **Date & Time** 3 November 2012 at 1630
- **Commander's Flying Experience** 223 hours, 75 on type Last 90 days: 7 hours Last 28 days: 4 hours

The pilot took off from Inverness and flew to Dornoch to carry out practice forced landings there. The weather was fine, with a light surface wind. Overhead Dornoch, there appeared to be negligible surface wind, so the pilot started a PFL to Rwy 28. When it became apparent that the wind actually favoured the opposite runway he discontinued the approach and flew a satisfactory PFL to Rwy 10, using two stages of flap. He took off again and climbed for a further PFL, with the windsock still indicating a light easterly wind favouring Rwy 10.

The next approach was slightly lower than the first, so he did not use flap. The Tomahawk arrived at the runway at 70kt. This was reduced to 65kt in the flare, when the starboard wing lifted abruptly. He attempted to level the wings and applied full power to go around, but the aircraft pitched violently nose down and yawed left. It had nearly come to a stop on long grass adjacent to the runway when it pitched slowly forward and overturned. CU

07

Tiger downed

The Tiger Moth was en route from Lashenden (Headcorn) to Spanhoe Aerodrome when its engine started to run roughly. The pilot throttled back and checked each magneto but to no avail. Shortly afterwards, a large amount of smoke appeared on the left side of the cowling and the oil pressure dropped to zero. The pilot selected a field for a forced landing, his choice limited by power and telephone lines, as well as crops and trees. The aircraft touched down and rolled into a hedge and fence at the end of the field at an estimated 5-10mph. The pilot was unhurt and telephoned Headcorn to advise of his safe landing, having previously transmitted a MAYDAY. The cause of the engine power loss is unknown, but the DH Gipsy Major engine's No 3 cylinder showed no compression and a quantity of oil remained in the oil tank. CU

08

Stuck gear 1

Inbound to Cranfield the Piper Turbo Arrow descended from 4,500ft to 2,500ft. The pilot lowered the landing gear and later reported that he saw a red 'gear unsafe' indication, but did not say if there were any green 'down and locked' lights. He recycled the gear but to no avail, then saw smoke coming from under the seats.

Intending to reduce power, "in panic" he pulled the propeller RPM lever instead. This meant that engine RPM would not exceed 2,000 even with full power, so he made a forced landing in a field, during which the aircraft was severely damaged.

It is possible the smoke had come from the electro-hydraulic landing gear motor, but this has not been confirmed. The pilot did not try to use the emergency extension system, which would have released hydraulic pressure and allowed the gear to lock down under gravity. CU

INCIDENT DETAILS

- **Aircraft Type** Piper PA-28RT-201T Turbo Cherokee Arrow IV
- **Date & Time** 3 November 2012 at 1445
- **Location** Near Sherburn Airfield, Yorkshire
- **Damage** Aircraft damaged beyond economic repair
- **Crew** – 1, Passengers – 1
- **Commander's Flying Experience** PPL 129 hours (7 on type) **Last 90 days 23 hours** **Last 28 days 8 hours**

09

INCIDENT DETAILS

- **Aircraft Type** Cessna R182 Skylane
- **Date & Time** 18 December 2012 at 1214
- **Location** Dundee Airport
- **Damage** Damage to propeller and forward lower cowlings, engine shock-loaded
- **Crew** – 1, Passengers – 0
- **Commander's Flying Experience** CPL, 1,430 hours (of which 21 were on type) Last 90 days: 50 hours Last 28 days: 20 hours

Stuck gear 2

The Cessna Skylane RG's pilot rejoined the circuit at Dundee after an engineering test flight. He selected landing gear down and saw the main gear lower as normal, but he did not see a green 'gear down' light until he cupped his hand around the indicator.

He heard the 'landing gear unsafe' warning horn but ignored it, assuming it to be the stall warner. After touchdown the aircraft pitched nose-down and the propeller struck the ground. It slid to a stop on the runway without the need for braking.

The nosewheel was still retracted with its doors closed, but no reason has been found for its failure to lower. CU

To find out further information please visit aaib.gov.uk

10

Proctor prang

The aircraft was landing at a private airstrip in Kent after a flight from Le Touquet. The weather was fine, with no wind. The pilot, who had flown from the strip for a number of years, allowed the aircraft to become slightly slow just before touchdown and applied power to correct. The Proctor bounced and he applied full power to fly a go-around, but it did not climb, staying in ground effect at low airspeed, with full flaps lowered, and started to veer right. The pilot was unable to raise the flaps because of the airspeed, so he decided to reduce power and land, and then perform a groundloop before the aircraft reached a substantial hedge and ditch ahead. However, before he could do so, the Proctor's port wing struck a small oak tree, swinging it into the hedge. The pilot, who was wearing a lap strap harness, sustained serious injuries and had to be freed from the wreckage by fire and rescue services. He attributed the accident to a combination of his handling of the aircraft and the hot, calm conditions. CU

INCIDENT DETAILS

- **Aircraft type** Percival Proctor 3
- **Date & Time** 24 July 2012 at 1630
- **Commander's Flying Experience** PPL, 3,200 hours, 1,067 on type Last 90 days: 2 hours Last 28 days: 1 hour

PROPILOT

ATPL Ground School

for tomorrow's airline pilots

The training approach that's changing the industry

Full Time or Distance Learning

Find out more 02476 511447

www.propilot.eu facebook.com/propilot.eu twitter.com/propilottweet

WRONG MIX...

Fatigue, workload, type reversion – would it catch you?

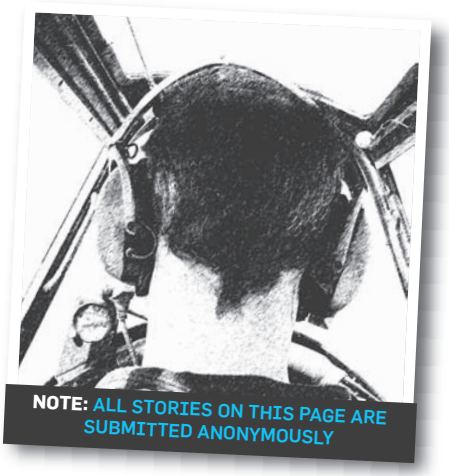
We mere mortals are creatures of habit. Just think... How many times have you set off to drive to wherever and found yourself taking the route to the office instead? A trip which you drive out of habit, maybe five days a week, on autopilot. The more ingrained the habit, the higher the chance of making this sort of mistake. Throw in a bad night's sleep and the distraction of the kids asking 'Are we nearly there yet?' and you're set up. Get the idea?

For pilots we know that habit can be a 'bad thing' and over several decades flying and instructing in all sorts of flying machines I have watched and witnessed some quite alarming incidents and one accident attributable to this one factor. I think my saving grace is that I, fortunately, have spent my career piloting a wide variety of flying machines and so have had little time to stagnate in any particular groove. Those who predominantly fly the same type in all its various marks with small changes introduced year after year are probably the most at risk of falling into this 'gotcha'.

In my early career I experienced a real eye-opener which has held me in good stead to this day. Read on.

At the time of the incident I had about 3,500 hours in my logbooks and was currently on pressurised turbo-props, light aircraft and gliders; of this 1,500 hours was instructing and examining.

The company of which I was Chief Pilot and Aviation Director purchased a Harvard IIB and as 'boss' it fell to me to collect it, check my guys out and put it into service as a PR and marketing. tool. I had hundreds of hours on tail-draggers, and had taught on Tiger Moths, Stampes, Austers and the like, so I wasn't exactly a novice, but one look at the Harvard was sufficient to convince me that I needed a thorough check flight on this particular beastie before I would let myself loose, not to mention checking others out on the type.



NOTE: ALL STORIES ON THIS PAGE ARE SUBMITTED ANONYMOUSLY

The aircraft was awaiting collection at A so we had to accept and deliver it to our base at B. After making appropriate enquiries I was put in touch with an experienced and respected Harvard owner and display pilot to fly it, with me as shotgun, to B. Once at B he would check me out. A cunning plan and so far so good.

We flew up to A in the company hack, an Aztec E, checked the Harvard over, fired her up and flew back to B in formation. I had a ferry radio in the back which was just about good enough to talk to our shepherd and any aerodrome within 10 miles.

The approach to our destination's westerly runway was over a large city and, still in formation, our man completed the initial approach checks as we turned on to a four-mile final over the city. As we rolled wings level the engine spluttered and quit, the prop wind-milling. The Harvard took up the flying qualities of a well-shaped brick and the silence was truly deafening. P1 up front quickly ran out of ideas and lined us up to crash in the only area possible. A line of back gardens complete with walls, sheds and, probably, people. Not good. My mind went into survival mode.

Putting my instructor's hat on I went through the engine failure checks I had taught for many years. FMS – Flippin' Motor Stopped – well something like that anyway.

F - Fuel on and sufficient. Electric fuel pump on (not fitted to the Harvard). Change tanks.
M - Mixture rich.
S - Switches – Check the magnetos.

Being totally unfamiliar with the type I had to look for each item; not feel but look. On reaching 'Mixture' I looked down, located the red knob and was greeted by the sight of the word 'Lean' at the selected position. Re-selecting it to 'Rich' had the desired effect. The propeller which was still wind-milling, readily roared into life and we climbed away. Very, very relieved.

After landing without further excitement we were asked to call Air Traffic on the telephone and I explained what had happened. In turn they related a call from a lady in the city who said she thought an aeroplane was going to crash in her back garden. Their reply? "So did we, ma'am?" Apparently they had almost lost sight of us. We were that low.

So why would a highly experienced pilot make such a basic mistake? Habit exacerbated by high workload and further fuelled by fatigue. His checks were done by touch, and one small but vital difference, the only difference, in this cockpit from the one he had spent hundreds of hours flying, almost caused a serious if not fatal accident. Add to that the fact that we had flown for a total of five hours prior to the incident and it was an accident waiting to happen.

So what caused the problem? Our Harvard had the mixture control configured so that lean was fully forward and rich fully aft. Most unusual and in the UK non-standard. To this day it is the only aircraft I have flown with this feature. Also, maybe because of the configuration, it had a little spring-loaded lever on the throttle so that when the lever was retarded it automatically put the mixture into rich.

We had discussed the difference before departing A and also noted that the spring was broken, rendering the defence mechanism ineffective. In a high workload situation, possibly fuelled by fatigue, our man had reverted to type, forgetting this vital difference. Our saviour, apart from neither of us panicking, was that I was new to type and had to look to check my actions. The rest of the day went fine. I was checked out and we operated the Harvard for three years without hitch.

The lessons are, hopefully, obvious. Know your cockpit and check your actions. Make sure you are moving the switch/lever in the correct direction.

Finally, fatigue must never be taken lightly and in retrospect was one of the links in the chain.

The entry in the 'Remarks' column of my log book reads: 'Noisy but nice – delivery flight'. No mention of the drama. I think I was very fortunate to write that entry. CU

BOSE
Better sound through research®

I like to stay ahead of my airplane. So if I'm 40 miles out with weather rolling in, I'm listening to what's happening in front of me. ATIS. Pilot chatter. A quick check with flight service. Sometimes, there's a lot to decipher. But I need to hear it clearly. Because when I do, I feel confident. Prepared. In the moment. And that allows me to just

focus on what matters, flying.

Bose® A20®
Aviation Headset

Visit us at www.bose.eu/A20 for more information or contact one of our authorised sales partners for a demonstration:

Mendelssohn Pilot Supplies
www.gps.co.uk

Heli Air Ltd.
www.heliair.com

HSL Headset Services Ltd.
www.headsetservices.com

Global Aviation + Piper Parts Ltd.
www.globalaviationparts.co.uk

Pooleys Flight Equipment Ltd.
www.pooleys.com

Transair Pilot Shop
www.transair.co.uk

MORE NOISE REDUCTION. LESS DISTRACTION.

Better sound can make all the difference, especially where you go. Which is why, with 30% greater noise reduction than conventional noise reducing aviation headsets, the A20® headset lets you hear more of what you need to hear. While proprietary cushions and minimal clamping force let you fly comfortably for hours. Meets or exceeds TSO standards.

LIGHTSPEED

Comfort. Quiet. Clarity.

Lightspeed Aviation ranked #1 in 2012 Headset Preference Survey by *Professional Pilot*

Lightspeed was founded with the goal of providing the aviation community with extraordinary noise canceling headsets combined with a remarkable customer experience. This heritage has guided us in developing the industry firsts that have come to define the category of premium aviation headsets—such as Bluetooth® integration and Auto Shutoff™—and made Lightspeed the choice of professional and private pilots around the globe.

The quest to produce the best aviation headset continues with Zulu.2, a headset with the ultimate performance profile.

- Greater ANR performance achieved through superior electronics and magnesium ear cups
- Patent-pending Dual Aperture Disc™ microphone delivers unparalleled clarity and noise cancellation
- Bluetooth integration for high-quality phone and music streaming
- Headband and ear seal designed for maximum comfort on long flights
- Integrated with FlightLink, the first in-flight cockpit recording app for iPad and iPhone
- Low-profile, stainless steel headband for added durability and cabin clearance
- 5-year warranty

Visit **LightspeedAviation.com** to learn more.

The free FlightLink app works seamlessly with newer Lightspeed Zulu.2 headsets to capture and retrieve incoming and outgoing communications for instant playback and later retrieval.

Available on the App Store

For more information contact one of these Authorized Lightspeed Dealers:

Harry Mendelssohn Sales: www.gps.co.uk, 0131 4477777
Flightstore: www.flightstore.co.uk, 01924 509273
Pooley's: www.pooleys.com, 44 (0) 20 8207 3749
Transair Pilot Shop: www.transair.co.uk, 01273 466000
Airplan Flight Equipment Ltd: www.afeonline.com, 0161 4990023