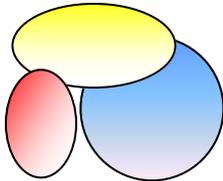




www.bristol-wing.co.uk



Bristol Wings



Newsletter of the LAA Bristol Wing

December 2012

NEXT MEETING— Annual Quiz

Our next meeting is the Annual Quiz led, for the last time, by our retiring Question Master Trevor Wilcock. This will start at 2000 hrs on **Wednesday 5th December** and we traditionally bring and share around some nibbles to keep the grey cells working.

Please also bring your pencils and wits for this year's compilation. iPads, smartphones and other means of going on-line are strictly reserved for the Question Master! As a hint, here are the titles of the sections, which may or may not be helpful:

- A bad day at the office
- Cleared to land
- What the "L"?
- Motor Sport
- Where are we now?
- Airfield designators
- In theory, it should fly
- Can you tell your EASA from your...?
- Tailpiece

plus the Caption Competition and marks for a good team name.

Trevor says this website may be of use in aircraft identification:

www.aviastar.org/index2.html



LAST MEETING— FROM ARIZONA TO ALLIGATORS

Graham Clark gave us an account of his trip this year to Arizona. We saw his pictures of the stunning geology of the area - Monument Valley, the Grand Canyon, Meteor Crater, etc - which only an aerial view can do justice to - together with interesting rough strips. Moving from hot and dry to hot and humid, Graham described the Lake Agnes "Splash-in" associated with the Sun 'N Fun event at Lakeland, Florida.

Waterborne aviation is arguably the most attractive form of flight - so long as the alligators are given a wide berth!



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Where to go...

Free landing vouchers for **December 2012**

Flyer: , Blackpool, Haverfordwest, Holmbeck, Retford (Gamston), Sleaf, Wick

Pilot: .Andrewsfield, Sleaf, Tibenham, Turweston

**Flying is not dangerous -
crashing is dangerous.**

As there may not be much flying going on because of the weather you may be interested in the following free talk taking place in Cheltenham:

Vulcan Bomber from the cockpit—5th December 1900 to 2100 hrs

The Vulcan veterans will give insight into the history of the Vulcan, their experiences of the Cold War and the Falklands conflict as well as the return to flight of Vulcan XH558 through the Vulcan to the Sky Trust

Speakers: Barry Masefield and Andy Marson

Programme: 19:00 Registration and refreshments -19:30 Lecture starts

This is a joint event between the IET Gloucestershire Network and the Vulcan to the Sky Club.

Venue: Room TC014, Elwes Building, Park Campus, University of Gloucestershire, Cheltenham GL50 2RH

Bristol Wing Members' details

Our membership Secretary, Gordon Pritt, would be very grateful if you could remember to update him whenever your details change ie Address, Home or Mobile Phone No, e-mail address, LAA membership etc so that he can keep the Wing membership details up to date. Thank you.

Picture Quiz

Last month's Picture Quiz sent in by Graham....

His clue: *A cliff Hanger?*

The Answer:..It is an FVA-17 motor glider built at Aachen.

Our Quiz Master Trevor Wilcock was the only person to offer any information and the came up with the following:

Projekt "A" Aachen, built by Ulrich Schäfer of the Fachhochschule Aachen

This time it's Trevor who has set an aircraft for you to identify.

Is this a taster for the quiz on Wednesday?



Sopwith Camel and Spitfire Flying together

The two historic fighters were flown side by side to showcase the advance in technology in only 20 years! The Sopwith Camel and the Supermarine Spitfire are icons of their respective eras, both efficient designs . The Sopwith Camel was first flown in 1916. The Supermarine Spitfire made its maiden flight Mar. 6, '36.

This historic video was shot in New Zealand.

[Click](#) for the link.

CAA News

The CAA frequently issues documents affecting us. Below are links to some which may be relevant to some of our members/readers:

The latest **GASIL** has been issued and can be read [here](#) and the occurrences can be read [here](#).

The **Distress and Diversion (D&D)** Cells located at Swanwick and Prestwick currently provide emergency coverage throughout the London and Scottish Flight Information Regions (FIRs) respectively. However, as of **12 December 2012, the Scottish/Prestwick D&D Cell will close**, with the London/Swanwick D&D Cell taking responsibility for both the London and Scottish FIRs. Click [here](#) for more information.

There is a supplement to CAA **Radiotelephony Guide CAP 413**, aimed at General Aviation Pilots, in the form of an interactive quick reference to the UK phraseology most commonly used in General Aviation operations. The supplement covers arriving at and departing from aerodromes, cross country flight, operating at unattended aerodromes, instrument approaches and emergency messages.

PLEASE NOTE: This document is not available in paper format as it contains audio technology which is only available on-line so click [here](#) to access the relevant CAA page to download the document.

Note: Users of this supplement may experience difficulties with the audio elements if opening this document in Adobe Acrobat 9. If you have problems with the audio content of this document upon opening, please save the file to your computer, which should resolve the issue.

Noise considerations as GA Aerodromes: [Here's](#) the link for this document which affects us....

GA PILOTS ASKED TO RENEW LANGUAGE REQUIREMENTS

The UK CAA is advising private pilots to check the currency of the English language proficiency endorsement on their licences, as pilots applying for any of the new EASA licences must have a valid English language endorsement.

All UK pilots were automatically given an endorsement by the CAA in 2008 following a global ruling by the International Civil Aviation Organisation (ICAO) requiring all pilots to formally demonstrate their knowledge of English –the international language of aviation. However, this blanket 'Level 4' endorsement was only valid for four years, and, unless renewed, expired in March 2012.

Most commercial pilots have now been upgraded by flight test examiners to a Level 6 endorsement, which is valid for life. However, the majority of GA pilots, unless they have undertaken a flight test in the last four years, will not have been similarly upgraded. PPL and NPPL holders may therefore be unable to acquire an EASA licence until they renew their language proficiency endorsement.

Pilots can renew their endorsement –upgraded to a Level 6 (native English speaker) – through a simple ground-based assessment with any Radiotelephony Examiner, Flight Examiner, Type Rating or Class Rating Examiner. Unless a licence specifically states the holder has a Level 6 language proficiency endorsement, pilots should assume they need to obtain one.

Ray Elgy, Head of Licensing and Training Standards at the CAA, said, "Obtaining a Level 6 endorsement is relatively straightforward. Any Flight Examiner can give a pilot a non-expiring Level 6 endorsement on the basis of a simple conversation on the ground. Pilots whose licences have, or are due to expire, should therefore contact their local Flight Examiner as soon as possible."



SKYWATCH SEEKING PILOT VOLUNTEERS

The South Gloucs/Bristol/Somerset emergency planning authorities have formally asked Skywatch-Civil Air Patrol to try to start an Operational Unit covering their area(s). This would be of pilots with access to light aircraft, based reasonably locally, who have agreed that they might be willing to fly to assist authorities with aerial observation or search in event of incidents or emergencies. For details of what SWCAP already does and where, see here:

<http://www.ukcivilairpatrol.co.uk/>

If you would or might be prepared to volunteer, or ask any questions, please get in touch with Mike Fortescue on mikeCAP@fortescues.freemove.co.uk, putting 'SWCAP' in the Subject line. Note that pilots do not need a CPL - the CAA has agreed that such flights are not Aerial Work under the ANO.

The Wiltshire coordinator of SWCAP supporters is organising a training day at one of their airstrips for local interested pilots and others on **8th December 2012**. This will be with the local Police Rural Crimes unit. Although SWCAP Operational Units do not, as policy, accept requests to fly in support of Law Enforcement as such, both SWCAP and the Police have an interest in low-level (but legal!) air observation; and there are other police support functions (eg, missing persons) which SWCAP OUs do support on request. Pilots interested in taking part can contact me (on the e-mail address above for more details (although I myself will be unable to take part). There would be no commitment on visiting pilots either to join SWCAP (only £15/year!) nor, thereafter, to join an OU if a local one is formed.

Mike Fortescue



WHO ARE WE?

A column dedicated to finding out more about who belongs to the Bristol Wing.

This month we branch out to invite a guest subject: **Nick Klaus**

Current Day Job/Past Career

For the whole of my career I have been a leading figure in the parcel delivery industry; my competition is ParcelForce, UPS and the like. It's very seasonal - an awful lot of admin, followed by an intense flying period.

Why Aviation?

It's really the only way to get the job done.

Current aeroplane?

A SLA, initially with 32 HP (Hoof Power) propulsion; however it was only certified for VFR operation which, in view of my need to operate at night and in severe weather conditions, was not acceptable. I therefore invested in the IFR (I Fly Rudolph) upgrade, which provided a beacon system as well as 4 HP additional power.

What licence do you hold?

A CPL - entitling me to Chimney Pot Landings

Number of hours per year?

I manage a very consistent 24 hours annually - but cover one heck of a distance! I also exceed the 12 landings and take-offs by a very wide margin! I manage to squeeze in the biennial check by taking along an instructor from the Elf and Safety department of my organisation. I really have lost count of the total of my hours, probably about 300,000

First Flight – in What, Where and When?

Around 1820

Favourite and Worst Type Flown :

I did invent a sleigh with rocket assisted take-off but it all went wrong one year, when the Jato pack came loose and Rudolf got something up where it hurts. It put him right off his food for a fortnight, it was touch and go if he led the team that year.

Best Aviation Moment and Flight :

Flying over Disney Land is always special. They all think it's a trick every year when they put fireworks on and think it's a model, but it's me really.

Any 'Hairy' Aviation Moments - if so – any lessons learnt :

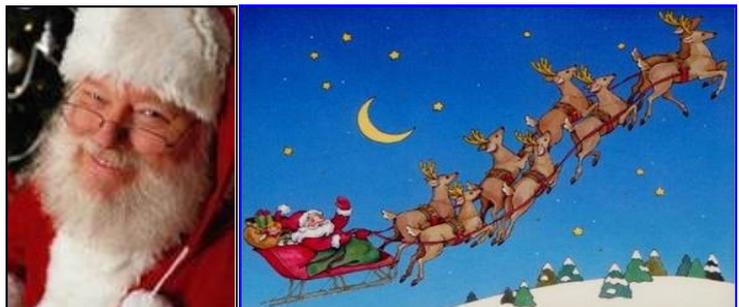
Oh yes loads. Trying to glide down chimneys is very tricky, and making sure the kids are a sleep of course. I also had a huge problem going backwards across the International date line, just as those U.S. Air Force chaps did in their F-22's. I did write to the Pentagon, pointing out the problem, but they must have thought I was a nut case or a mythical figure, because I never got a reply !

Any Advice For All Pilots :

Plan and plan again. You think you have got problems, try fitting in millions and millions of kids, in hundreds of different countries in a 24 hour flight schedule.

And make sure your power source is always properly fed and watered.

Many thanks to Trevor Wilcock and Neil Wilson, Wessex Strut Newsletter Editor, for their combined transcriptions of their interviews with Nick Klaus. Very much appreciated chaps....Ed



WHO ARE WE?

We are treated to two profiles this month:

*We asked Record Breaking **Edwin Shackleton** and he has given us a detailed insight into his life*

Current Day Job/Past Career

I have the best job in the world which is retirement, yes! and I escaped at the age of 60. After a poor start at University I had a wonderful spell in National Service as Engine Fitter at RAF Syerston working on Tiger Moth, Harvard then Prentice, even- ing being responsible for the C.O's aircraft. After my 2 year service I wrote around the aircraft industry, aged 22, and was offered a job in the Engineering Development Lab at a salary of £7/4/6 per week at the Bristol Aeroplane Co. I was respon- sible for setting up a 'cold test' facility even doing the building drawings! We did a lot of work in proving the Britannia glaz- ings and sorting out flying control gearbox problems. I was then closely involved in BAC1-11 and BAe146 structural test- ing (including tanks testing) then on Concorde, particularly 'fail safe' testing of structure design.

Why Aviation?

I was born in Ipswich (1927) and have vague memories of the early days but with the start of WW2 the scene changed. Plen- ty of air raid sirens then; one day I was on the back lawn with my Dad and I said "That's a Dornier" and we saw the bomb salvo opening. Immediately we dashed into the house and under the stairs!! The first bomb destroyed a bungalow about 150 yds away—and a line of bombs damaged property (luckily no injuries). Then some months later I was in my bedroom and heard gunfire. Foolishly I ran to the window and a Hein- kle 111 flew low overhead. It dropped a 4000 lb bomb in a nearby park but it did not explode. It was eventually extracted and I think that it did a national tour.

First Flight—in what, where and when?

My first flight was as an ATC cadet from Ipswich Airport in a DH Dominie (19/3/43), then a Bristol Beaufort (N1019) at an ATC camp at Cranfield—and it was the first time (and last) to be airsick. It was the last time that I ever ate sardines—quite silly!! Another camp was at RAF Bircham Newton and I flew in 2 Hudsons and an Ventura. I did well at aircraft recognition and was awarded with trips from Ipswich Airport in a Martinet Target tug Waterbeach and Church Fenton for local contests. Also I 'did' an unofficial flight in a USAF B-17G Fortress from Debach. My final ATC flight was in an Airspeed Oxford from the long runway at Woodbridge.

A short vacation job at Miles Aircraft was a chance to fly in a Miles Messenger (Pilot: Hugh Kendall) also the lovely Aerovan prototype plus one other (G-AHTX). Also flew in the Miles Nighthawk then at Southend in the Airspeed Courier—the last 3 now extinct types.

Now in Filton Bristol, I met a lovely lady. We married in 1952 and I soon had her airborne in a DH Fox Moth from Southport Sands. The pilot was Norman Giroux who had owned G-ACEJ since 1936. Next year Irene and I had our first helicopter flight (Bristol 171 MK3A) from Southampton to Northolt. I flew in an Anson 12 in late 1954 as an Observer Corps member—but gave up the ROC— didn't suit me!

Back at Filton, I flew in a Britannia 102 G-ANBB and then on a Britannia 312 production machine in 1957. Another helicop- ter flight was in a Brantly B2 at the Shackleton Sales Weekend in June 1993. Next day I flew to my first Paris Air Show. I de- cided to travel in different airliners—this time in an Air France



Edwin enjoying his momentous flight in Concorde!

Caravelle returning by British United Viscount. Later shows I added a BAE Trident, Breguet 763 (which took the Concorde Olympus engines on the lower deck, passenger were top deck), then a Skyways HS 748 from Beauvais to Lympe. Final Paris trip was an Air France Boeing 727, back in a Japan Air- lines Douglas DC-8.

In this period I went on a Mitsubishi MU2 sales demonstration flight from Leavesden, then in a Pilatus Porter from White Wal- tham to Booker (piloted by Ladi Marmol). A sales demonstra- tion at Balckbushe in 1996 gave me a chance to fly in the first Jet Ranger in the UK and an Italian Augusta Bell 204.

My Friends in Filton flight operations fixed me a ride on a new East African Super VC10 for a series of training circuits. In ear- ly 1967 South Cerney said farewell to the Primary Flying School and I had a Chipmunk flypast then, in contrast, had my first flight in an HS125, return flight Filton to Chester and back.

A really contrasting experience was a press invitation—flying from Portland in a Royal Navy Wessex to HMS Hermes in Lyme Bay (the carrier was later sold to the Indian Navy). Colin Newnes flew a Britten Norman Islander from Bembridge and landed on the 700ft deck. He did a circuit with a touch and go—then I was lucky to experience a fixed wing take off and landing from the carrier—then returning to Portland in the Wessex.

I had read about airships but never thought that I would see one in the UK. The Goodyear Airship N2A was visiting Leaves- den and I went there on **4th July** 1972 and was able to have an 18 minute trip! Then I went with Peter March to the naval helicopter gathering and was extremely lucky to arrange a flight for us in a French Navy Super Frelon which was 44 minutes of joy!

Shortly after I had won a company magazine competition prize resulting in an HS125 trip to Toulouse, a factory tour and return flight. To complete the year, 1972, a Laker DC-10 visited Bristol Airport and I enjoyed a 50 minute (free) local flight.

In 1974 I started a 14 year association with the International Air Tattoo at Greenham Common/Fairford with duties ranging from Ground Exhibition Manager to initiating the Photobus Operation and 'Friends of the Tattoo' manager. My first flight

was the display of the Boeing KC-97L Stratofreighter, holding initially then a fly-past with the deployed flight refuelling probe scraping the runway! Later in the year I helped Jim Buckingham and Eddie King set up the Avon Air Day at Weston-super-Mare and enjoyed flights in the Messengers RG333 and RH378 then later in the Gemini.

In mid 1975 I made an approach to Harry Pollitt, RR Chief Pilot to fly in the bizarre VFW 614 (spent a short while at Filton) which resulted in a 150 minute sortie—but very bizarre to look out on the top wing-mounted engines.

Thanks to the Avon Air Day I met up with Tony Liddiard who had acquired a Piper J-3C Cub (G-BDHK, 329417) to which he had applied a US Military colour scheme. I was a regular visitor to English Bicknor, flew many times in the Cub. He flew me in the Cub, Rallye, Topsy B and Belfair, Vagabond.

An outstanding trip in August 1976, was in the Shorts Sandringham, owned and flown by Charles Blair from Studland Bay. It was the first of two visits to the UK and it now resides in a Southampton Air Museum. His wife, Maureen O'Hara had disembarked in Ireland on the flight from the Virgin Islands.

My first and only flight in a hot air airship was in a Cameron D-96 (Zanussi) from a snowy field at Marsh Benham, near Newbury on 6th January 1979. With four inflated fins and a small open cabin it was an exciting 15 minute experience. My 100th aircraft type was a Beagle Pup from Swansea just after I flew with Tony Liddiard in the Topsy Belfair on its delivery from English Bicknor.

I took the opportunity to fly on a charter of a Dan Air DH Comet 4C (25th November 1979) from Gatwick. Just visible on the wing was the painted-out RAF roundel—some highlight!

An extra special privilege was to fly in the Royal Navy Historic flight Swordfish from Yeovilton in September 1980 in formation with the Sea Fury and Firefly along with the BBMF Spitfire and Hurricane. But the Spitfire was U/S and the session was cancelled—but the Swordfish pilot did me proud and we had a local flight....

Next trip was in the Tiger Moth seaplane from Scotney Court, Camber with David Shepherd. We did a couple of take-off and landings to give me another super experience.

Tony Young, founder of the Wessex Strut, took me for a flight in a Hughes 269 and 500 from Henstridge in February 1981 coincident with his formation of the Wessex Strut. Later in the month I was able to scrounge a flight from Filton in a US Army Beech U-21A Ute, a turbine engine military version of the Beech King Air. The 45 minute flight to Liverpool was followed by rail trip back to Bristol!

A 9 day visit to Paris with Irene started with my first trip in an A300 Airbus of Air France. In Paris I had a short flight in an AS350 Ecureuil (squirrel) helicopter (single engine). In May 1981 I assisted in the commentary of the first Colt helicopter fair at Cheltenham racecourse and managed to get rides in a Robinson R22 and a Rotorway Scorpion homebuilt helicopter.

At the 1981 Greenham Common Air Tattoo I was fortunate to fly in a Sea Search Contest as a photographer. The task was to find (in 4 areas around the Cornish Coast) various targets which was a vessel in distress, a prominent structure, a yacht and a snorting submarine all of which had to be photographed. Our aircraft was a BAe 748 Coastguarder. The crew were brilliant and found/photographed the sail training ship "Winston Churchill", a fishing boat with attendant lifeboat, Bishop's Rock Lighthouse and a snorting Submarine. I managed

some super photos which were used in "Aircraft Illustrated" with my article—and the team won the contest.

Later in the year I flew in my first microlight—A Mistral Trainer—from Warren Farm, Charterhouse and has a 2 page coverage (15 photos) in "Aircraft Illustrated".

In absolute contrast on 10th April I flew in Concorde (G-BOAF) from London to Cairo—subsonic over Europe then cleared from Venice to fly supersonic down the Adriatic and across the Mediterranean to Cairo. A full day there with visit to the Pyramids, camel ride, lunch by a hotel swimming pool and back home—25 hours door to door. It must be my best ever flying experience. From Middle Wallop, on a press trip, I flew in a Skeeter helicopter to Netheravon then back in an Auster AOP9—11 days after the Concorde trip! A couple of days later I flew in a Fokker F28 Fellowship to Rotterdam for a bulb trip with Irene—back 2 days later.

In 1982 I went on my first trip to the USA. My late friend, Reg Bloomfield, agreed that I planned the trip (to get different aircraft types) - so we flew to New York (British Airways TriStar), SA Dauphin helicopter flight locally then to La Guardia, TWA Boeing 727 to Dayton, 737 (not new) and DC-9 to Oshkosh. Return flights were by Republic Airline Convair 580 to Chicago and Boeing 747 (BA) to Heathrow. I was able to fix 6 flights at Oshkosh—Stinson SM6000 tri-motor, the famous RLU Breezy, Waco EQC-6 Air and Space 18c gyro, the rare 1926 Swallow bi-plane and PT-26 Cornell—9 new types. Back home, Peter Turner fixed me 2 flights Beech King Air 90 to Luton and return to Staverton in a new Mitsubishi Diamond executive jet. Then I went on a route-proving flight (Filton—Toulouse—Filton) in a BAe 146 (G-OBAF) just over 3 hours in total—Dec 1982.

Michael and Julie bought me a birthday flight (Lulsgate—Cardiff) in a Dan Air Bandierante—my 151st type (not my age!) then in contrast I flew with Tony Bullen in his Jodel 150 G-BPAM on a Wessex Strut Fly out to Calais in 1983—eleven light planes and another experience. Next month I flew with John Jordan from Badminton—sat in a smelly hopper on the floor—my 155th aircraft type! Later in the year I flew with Mike Crymble in his Percival Provost for an air to air photo session with Peter March in the Cessna 172.

My late wife used to worry about my ventures. My son Michael and Daughter Julie are keen supporters. I have had wonderful help from Peter March since 1952, Peter Turner in more recent times, the late Tony Liddiard from English Bicknor and also many Air Britain and local PFA Strut members.

This is just a part of the story as my total is now 862 aircraft types and I have been accepted in the Guinness of Records in 10 issues, first of which was in 1990.

I am, at the age of 85, still hoping to add to my flying list so if you can help directly or indirectly the following are on my 'hope list' - Rutan VariEze, DH Moth Major G-BAZB, SAAB 2000, Miles Whitney Straight, Morane Alcyon, Cessna 162 and 185, Piel CP1320 Saphir G-CFIH, Robinson R66, Airospatial/ Eurocopter AS355 (twin) and am waiting for the Boeing 787 to be financially available!!

Canopy Repair Notes Thanks to Graham Clarke for making this information available from the Jodel Website

For anyone with a permit aircraft with cracks in the canopy—here's a do-it-yourself solution:

Materials and Tools Required:

- *Canopy Cleaning Agent: Turps Substitute, followed by water with a drop of Fairy Liquid*.*
- *Cutting tool: Dremel or similar, with V-shaped Carbide cutter, with depth regulator.*
- *Chemical cleaning agent for crack only, Methylene Chloride*
- *Narrow belt sander, with depth regulator.*
- *IR Heater*
- *Temperature control unit e.g. Eurotherm 2116 with a relay regulator; source: by RS components or Farnell.*
- *Blanket*
- *Dental Tool with 'spade' tip*
- *Narrow Masking Tape*
- *Cotton-based sealing tape.*
- *Blue Tack*
- *Tensol A & B (Bostik)*
- *West & Dry abrasive paper* grades listed below*
- *Velcro (3m system 'hookit')*
- *Cotton-based adhesive tape*

STAGE 1

The first job is to remove the damaged Plexiglass panel from the aeroplane and take it to the workshop for careful inspection. To effect the repair, the panel must be set upon a jig and held securely so that material either side of the crack cannot shift during the repair process. Short cracks close to the edge are difficult to repair; they can be stop 'drilled' with a hot wire (not soldering iron).



This side window on Graham's Sicile Record was damaged by his elbow when he slipped and fell from the wet wing walk. The crack was about 30 cm long. Prior to removal, the crack was closed on both sides with wide transparent tape with which Graham continued to fly for several weeks while arranging a replacement.

STAGE 2

The Plexiglass panel is probably curved. Choose two pieces of scrap wood and, using the Plexiglass concave edge, pencil mark the curve either side of the crack on the scrap wood. Using a jigsaw or band saw, cut the scrap to profile and sand smooth. Repeat this procedure for the other non-cracked end of the panel. Cut sufficient square plywood washers and then secure the curved scrap pieces to the Plexiglass. Secure the curved wood scrap to the Plexiglass with flathead wood screws, then screw a wood bridge between the two curved scrap pieces. Do this at to both ends of the Plexiglass panel.



Illustration shows the cracked Plexiglass panel ready for clamping on bench.



STAGE 3

Place Plexiglass panel on clamping jig, with convex side facing upwards. Clamp the resulting frame and Plexiglass panel to the bench, convex side upwards. Remove temporary repair transparent tape from convex surface and clean to remove adhesive residue from the crack zone using turps substitute, followed immediately by water with a drop of washing up liquid e.g. Fairy Liquid.

STAGE 4

Position the workpiece so that the repairman can have convenient and controlled access to the cracked convex surface with a Dremel tool and V-shaped cutter.



Cut away the crack to a depth of about 2.5 mm. Cut the groove in progressive stages, using depth adjustment gauge.

Clean the area with Fairy Liquid and water.



Dremel cutter with V-shaped Carbide cutter and home-made adjustable depth regulator.



STAGE 5

The cutting action has introduced stress formations into the Plexiglass area which, if not removed, will be a source of future crack propagation. The material is now annealed and de-stressed using an IR heater.

The crack zone temperature is now raised slowly (to prevent swelling) and in steps to 75°C, at which temperature it is then maintained for an hour. The heating process is monitored using a thermocouple temperature gauge.



IR heater placed below the cracked zone, with blanket on top to retain and spread heat over stressed area. Thermocouple held against material by Blue Tack

Temperature control unit e.g. Eurotherm 2116 with home-made relay time-step regulator

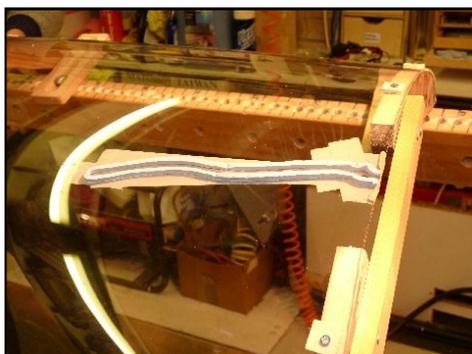


After annealing and subsequent cooling to room temperature, the cut V-shaped groove is cleaned with methylene chloride (do not inhale).

The Blue Tack barrier must form an enclosed pool whose dykes are about 2 mm from the edge of the V-shaped cut groove.

STAGE 6

Cut thin strips of Blue Tack and use these to form a low barrier around the groove, about 2 mm away from the edge.



STAGE 7

Using e.g. a dental tool with a flat spade, bed down Blue Tack edges to prevent leak of Tensol repair agent from groove. The groove must be completely sealed underneath, and around the exposed edges. Close the crack concave surface with a strip of strong polythene foil under a strip of cotton-based adhesive tape to prevent migration of Tensol from the crack to the concave surface.

STAGE 8

The repair agent is Tensol, a two-part chemical, whose accelerator component is stored in the fridge at 0-5°C. The Tensol repair mixture is introduced to the V-shaped groove at room temperature (16-23°C).

Tensol (Part A) is Methyl Methacrylate, and is stored warm in the airing cupboard. Tensol (Part B) accelerator is stored in the fridge. Makers: Bostik Findlay.

The Tensol is conveniently mixed in a little pot made of minced pie aluminium cups compressed to convenient size using e.g. a cork with calibration marks for the inner face of the aluminium cup.

It is important to achieve an accurate ratio of the Tensol Agents A & B.

When mixing in the accelerator, use a wooden stick and insert into the mixture once only: to prevent introduction of air bubbles, do not lift the stick from the mixing cup during the mixing process. During the mixing process, the mixture at first goes cloudy, but then clears again. It is then ready, and the curing process has been activated.

Ratio: 1 drop accelerator per CC Tensol minimum.

Using a spirit level, place the Plexiglass panel in a perfectly horizontal position to minimise migration of the treacle-like Tensol fluid. The Tensol is poured very carefully into the groove, sufficient to form a slight convex meniscus surface standing proud of the V-groove. (During the curing process, the Tensol will shrink. After curing, it will be abraded and polished down to the correct thickness, level with the surrounding material.) When raising the cup pouring lip from the groove, be careful not to allow any residues to fall outside the groove.

The crack zone is then heated again with the temperature raised in steps to 75°C, at which it is held for 90 minutes. It is then allowed to cool to room temperature and cure overnight.

The Blue Tack is removed using a Plexiglass blade made from scrap (will not scratch!).

CONCAVE PLEXIGLASS SURFACE

The Concave Plexiglas surface is then treated in the same way as the convex surface. The crack margins are cut away with the Dremel tool, whose cutting depth is calibrated to just reach the surface of the solidified Tensol along the crack line.

FINISHING

At this stage, the crack has been filled with Plexiglass, and forms a ridge standing proud of the Plexiglass surfaces. This ridge is then progressively removed using a narrow belt powered sanding tool with depth regulator.



Narrow Belt sanding tool with depth regulator

When the ridge is nearly flush with the remainder of the Plexiglass, a zone is marked around the repair area with narrow masking tape (narrow masking tape can tackle curves and bends better than wide masking tape). There is a margin of at least a quarter of an inch between tape and the damaged/repair surface. The margin between the end of the crack and the masking tape (transverse leg) is much longer (0.5 inch). The area is then polished with the wet and dry process:

(a) Wet rotary tool action. The tool is tilted so that residual marks are at right angles (transverse) to the crack. After each polishing stage, clean and dry, looking under lamp for missed areas.

(b) Next stage: hand use of wet abrasive paper at the next finer gauge, used with longitudinal (parallel to crack) action.

Grit stages:

(a) P150 rotary

(a) P500 Rotary

(a) P1000 Rotary

(b) P400 linear

(b) P800 Linear

(b) P3200 Linear

The rotary abrasive papers can be secured to the tool with Velcro 3m 'hookit' system.

Finally: G3 and G10 polishing paste

Following each stage, the masking tape is removed, the residue wiped off and the Plexiglass dried. Then a new application of masking tape around the repair, leaving at least a quarter of an inch between the treated zone, and the masking tape.

Possible Source of Perspex finishing kit: Severn Valley Sailplanes, UK.

So now you know: Get Cracking!

BRISTOL WING BOOK LIBRARY

The books in Bristol Wing Library are available on request. Just call/text Alan George on 07968 347831 or email him at alan.george@trussler.co.uk and he will bring your requested book to the next Wing meeting. Alan says that last month he received a few requests. The list was published in the last couple of newsletters and is therefore still available on the corresponding issues on our website www.bristol-wing.co.uk so do make use of this facility. Something to read over Christmas.....



Best wishes for Christmas and the New Year to all our readers

