MACH 2

Concorde magazine

Alpha Golf has a re-paint

Important restoration work in Seattle

The cutting edge

Machining parts for Concorde

Concorde watch

News from Manchester, Brooklands and Duxford

Issue 31
August 2021

Introduction

In this issue we include our customary insight from Concorde's history, as former toolmaker Richard Froud *looks back at his involvement with the techniques for cutting parts for the airframe.*

Elsewhere, however, the focus is firmly on the present day. It is nearly 18 years since the Concorde fleets retired, but the aircraft still attracts attention and admiration from aviation enthusiasts and the wider public. We are very pleased to present a report from Ted Huetter of The Museum of Flight, Seattle, USA, on the re-painting work being carried out on Concorde G-BOAG.

Concorde G-BOAC was the "host" for the aviation fair held by The Aviation Society, Manchester, in July; we report on the event, which was attended by members of Heritage Concorde as well as Mach 2 editor Katie John.

We also bring news on the maintenance and re-activation projects ongoing at Manchester, Duxford, and Brooklands as the COVID restrictions lift and visitors start returning to the museums.

In this issue

Editor: Katie John

Cover: Concorde G-BOAG at the Museum of Flight, Seattle, USA, after her re-paint. Photo: The Museum of Flight

Re-painting Alpha Golf

Ted Huetter, Senior Public Relations and Communications Manager, The Museum of Flight

Keeping Concorde's paintwork in good repair is essential not just for aesthetic reasons but also to protect the airframe. Ted Huetter of The Museum of Flight in Seattle, USA, reports on the work recently undertaken to renew the paintwork on Concorde G-BOAG.

British Airways Concorde G-BOAG retired to The Museum of Flight, Seattle on November 5, 2003 after nearly 23 years of service with the carrier. "Alpha Golf" showed some well-earned wear from the experience, but its livery shone. Although forever grounded, it didn't become a hangar queen, and Seattle's soggy skies took their toll every year – despite the Museum's constant efforts to keep this precious Concorde well preserved.

A joint project

Alpha Golf spent 12 years outside, and another six partially exposed to the elements. Its supersonic paint was fading and peeling. As the Museum reopened to the public this spring after an 18-month pandemic pause, re-painting Concorde was a priority.

The Museum hired Global Jet Painting, LLC (https://globaljetpainting.com) for the job. Global Jet had previously painted the Museum's Boeing 727 and 747 prototypes, plus its B-52 Stratofortress. The company is based in California, and is well acquainted with the Northwest climate and its challenges.

"Being at The Museum of Flight is always fun," said Global Jet president Guy Amico, "and working on a historic supersonic plane – for an aircraft painter it doesn't get any better than this." Amico and his crew were highly motivated by the historical importance of the plane, and the fact that it will be displayed for generations to come.

The job used a crew of ten aircraft painters, plus support from the Museum's technical staff led by Evan Elliott, who has tended Alpha Golf since the plane arrived. Although none of the paint techs had ever worked on a Concorde, one of their consultants, Richard Giles of Sherwin-Williams Aerospace Coatings (https://industrial.sherwin-williams.com), had originally painted Alpha Golf and all of the other British Airways Concordes. Giles helped the team choose the proper red and blue trim for this project. The Seattle-based high-performance graphics company Color Craft (https://colorcraftinc.com) helped to provide the stencils to create the fade on the "speed ribbons" on the fuselage and the vertical. Amico said that correctly rendering the distinctive fade on the ribbons was one of the more challenging aspects of the livery. Also supporting the team was Mike Suhara of AkzoNobel Aerospace Coatings (https://aerospace.akzonobel.com).

Prepping and sanding

The crew began prepping Concorde in June. Instead of the cool, damp and sometimes

Heatwave conditions
Right: A worker sands Alpha Golf's tail in the summer heat.
Photo: Ted Huetter/The Museum of Flight

Preparatory work
Above: The fuselage and wings, after many days of sanding and priming work.
Photo: Ted Huetter/ The Museum of Flight

Minimising dust
Right: A worker sands the underside of the aircraft. The vacuum tube for collecting the dust can be seen attached to the sanding pad.
Photo: Ted Huetter/ The Museum of Flight

Painting in progress
The aircraft had to remain in situ and could not be sprayed, so both large areas (top) and small corners (above) had to be painted by roller.
Photos: Ted Huetter/The Museum of Flight

stormy weather they were used to during Museum of Flight jobs, they worked through a record-setting heatwave that was wilting the Northwest, but “we often work in the desert and hot climates,” said Amico, “so this was not out of line for us.”

The biggest consideration for the paint crew was that Alpha Golf had to be painted where it is in the Aviation Pavilion. Environmental concerns meant it couldn’t be sprayed. All of the preparatory sanding had to be contained in vacuum bags, and the paint had to be rolled on. “That is always a shock when people hear about it or witness it,” said Amico.

It took days of prepping and sanding to remove and smooth worn areas on the plane. The sandpaper was all “hook it”, with holes to accommodate the vacuum bags. It was sanded deep enough to provide a smooth solid surface for the paint, while bare and thinly covered areas were primed.

Painting and finishing

Samples of the British Airways paint were sent to the Museum so the new paint would match the original livery. Sterling Lacquer in St. Louis, Missouri (sterlinglacquer.com) donated the paint to the Museum. The company had previously supported repainting the Museum’s B-52 and wanted to be part of the Concorde project. Over the course of a couple

weeks the crew used about 50 gallons of paint and primer. Most of the white required three coats. Alpha Golf is looking new again.

"the crew used about 50 gallons of paint and primer"

Delays in paint shipments (another reminder of the pandemic's reach into so many fields) forced the crew to suspend operations because of prior job commitments in Arizona. However, all of the large areas on Alpha Golf were finished by early July. The Global crew will return soon to complete the intricate detail and finish work. Amico estimates that the crew will have invested 2,500 man-hours on the project when it is finished, and you can be sure that the crew and the Museum are proud of every second!

"We paint many large aircraft," said Amico, "and while we're always proud of our work, it's usually a relief to see them finished and move on to the next project. Not so with Concorde; this is special. It is a heartfelt privilege to be a part of its history. Finishing Concorde is bittersweet; we'll be sad to leave."

Painting the wing
Above: Several crew members work together on the wing.
Photo: Ted Huetter/The Museum of Flight

Applying the lettering
Left: The protective tape around the newly re-painted lettering is carefully removed. The Speedmarque is still to be done at this point.
Photo: Ted Huetter/The Museum of Flight

Adding the final touches
Below left and below: The British Airways livery and Alpha Golf's registration have now been added to the paintwork. The very last touches, notably the decals to give the "fade" effect on the livery and the Speedmarque, will be added over the next few weeks.
Photos: Sean Mobley/The Museum of Flight

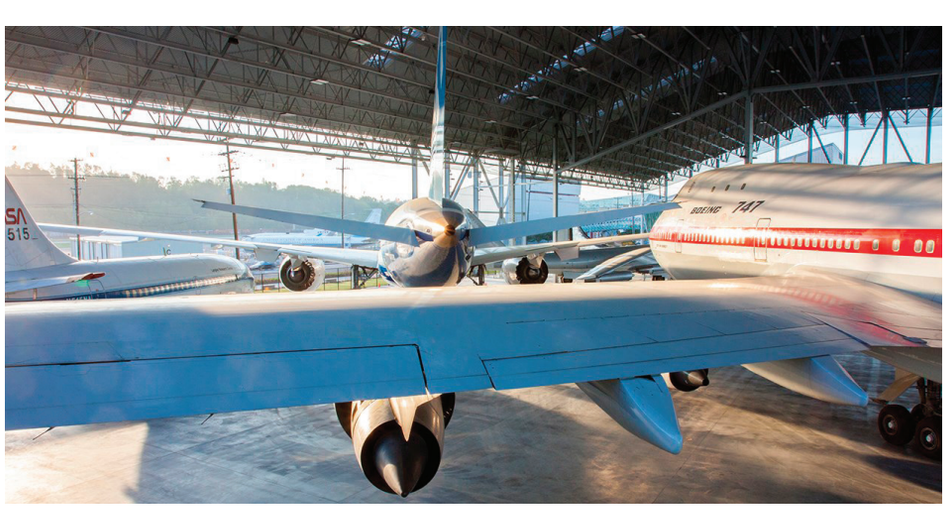
Preparation for display
Alpha Golf, almost ready for display again. Even at this stage the aircraft looks much better for her new coat of paint. *Photo: Layne Benofsky/The Museum of Flight*

The aviation pavilion

A fully-enclosed gallery to house The Museum of Flight's collection of large airliners and bombers, as well as Concorde, has always been on the wish list, but it was not until 2015 that the dream began to materialize. A pavilion nine stories high with a 3-acre roof became the new home to 19 aircraft including Alpha Golf. While it doesn't keep the weather completely out, the roof protects the collection from most of the rain and sun.

Solid walls for the Pavilion are next on the agenda – all it takes is funding! The Museum dreams big.

For further information or to make a donation, please visit the Aviation Pavilion's web page:
www.museumofflight.org/explore-the-museum/museum-galleries/Aviation-Pavilion



Cutting-edge technology

One of the many innovations in the Concorde project was the use of new machining techniques to cut parts for the airframe, to reduce the need for welding and riveting. Former toolmaker Richard Froud *recalls his involvement – and tells how technology sometimes needed a boost from simple human ingenuity.*

I was an apprentice at the Royal Aircraft Establishment (RAE), Farnborough, from September 1960 until the summer of 1966, when I finished my apprenticeship as a toolmaker/model maker.

The tool rooms/model shops were divided into three sections: 154, Q65 and free flight. I worked my 3-month slot in the free flight section and was really impressed with the TSR2 models. When TSR2 was cancelled I realised that the aircraft industry was on its way out and moved on. However, the skills learned at Farnborough put me in a good position for work until my retirement after 55 years.

The Concorde project

My only story about working with Concorde goes back to 1963/64 in Q65 building, when I was working on my 3-month slot in the grinding shop. I was working on machining a scale model wing that was being machined either for wind tunnel testing or free flight testing.

In the main workshop a Huron Mu6/Mu66 milling machine had been installed by Rudolph Carne of Isleworth, Middx. The machine was all new, NC (numerically controlled). In this process, very new at the time, the instructions for the machining process were typed on to punch tapes, which were fed into teletype machines. A special office was erected in the workshop where the teletype machines were installed and guys were punching in co-ordinates for the machine to cut profiles. The rolls of punch tapes were then loaded onto reels in the Huron's control box and the cutting of a Concorde profile was started.

Huron Mu6
The machine was operated by means of automated instructions typed on to a teletape and fed into the machine's control box.
Photo: Richard Froud

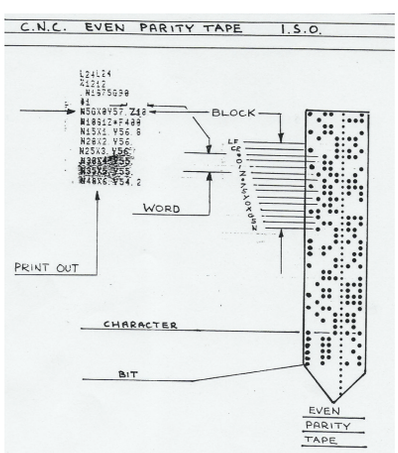
The other apprentices and I were not allowed too close to this process. However, when you think how many holes had to be punched into the teletape it was inevitable that some mistakes would happen. Of course, today CNC (Computer Numerical Control) machines enable the program to be run on screen and modified before cutting begins.

Running into problems

Back to 1963/1964 – the machine took off. However, problems arose as the HSS ball nose cutters were not coping with the feed rate (in inches per minute) at which the metal was being fed through the machine. In addition, waste material was flying around; swarf (material removed by the cutter) then became a problem.

Aluminium alloy is a comparatively easy material to cut. However, it does need a lot of coolant to wash away the swarf. This can lead to dry spots on the tool cutting edge, which in turn leads to material sticking to the cutter and over-heating. This heating causes the cutting edge of the ball nose cutter to become blunt.

To cut down the feed rate would have meant typing new tapes,



Teletape instructions
The tape is shown on the right. The instructions are given in binary code: a "bit" is the presence or absence of a hole in a row; a "character" is a group of bits in a row; a "word" is a group of characters; and a "block" is a group of words for one complete instruction.
Image: Richard Froud

because the feed rate was typed on each code line. Therefore, the cutters would have to be modified.

Me being in the grinding shop at that time, I was also in charge of the cutter grinding (to keep the cutting edges sharp). So a bucket of 1½" ball nose cutters appeared by the cutter grinder, along with a fixture. Well,

I studied the fixture and could not make head or tail of it. No one else seemed to know either.

Because our work was covered by the Official Secrets Act, we were not allowed to take photographs, so I sketched the fixture and took the sketch home to show my dad.

A clever solution

My dad was a self-taught multi-spindle automatic tool setter, who during WW2 had worked nights making parts for aircraft. He was a master of offhand tool grinding and had an eye for the different approaches to solve a problem. I learned so much from him: 25% from work, 25% from college and 50% from him.

The auto's, as he called them, were very complex bits of machinery. But Dad studied the sketch and was soon on the case. The answer to the problem is shown on the right.

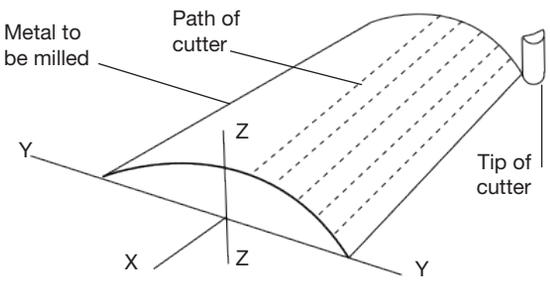
- Once the cutter was secured in the fixture, the cutter was indexed across point "Q".
- The cup grinding wheel was set as shown.
- The fixture was turned 90° between Y2 and X2.
- The cutter was then turned through 180° and the same operation was repeated.
- Also, I lowered the cup grinding wheel to give an 8-degree clearance to the cutting edge.
- In addition, I used free hand grinding behind the cutting edge to help in releasing swarf.

It was Dad who pointed out the need for the cutter to be passed over point Q. Also, his knowledge of materials and cutter clearances during mass production solved the over-heating of the cutting edge.

As a result, to everybody's surprise, the cutter worked really well and I was offered overtime to grind all the cutters I could. The top man in Q65, Chopper Johnson, invited me into his office to say thanks.

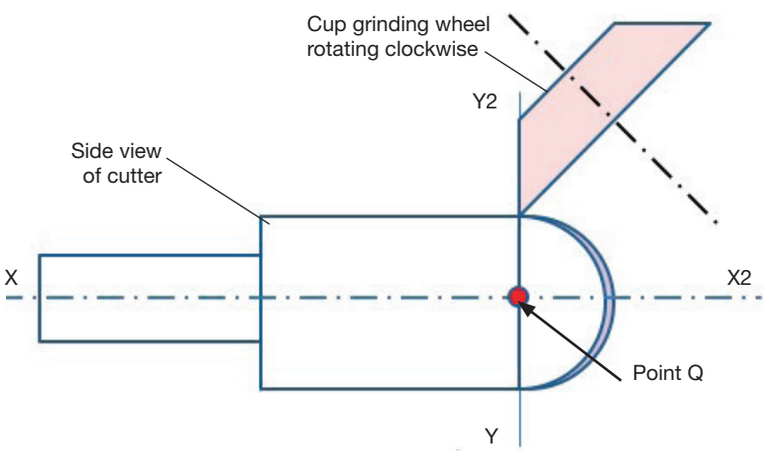
Unfortunately, we were not allowed cameras, so no pictures survive. However, in 1987/88 I went back to Rudolph Carne to order a CNC Huron for Culham Laboratory, and they had all the records of every Huron they had sold. These included pictures of the machine from Farnborough that had also produced – as well as the Concorde model wing – a rose bowl for HM the Queen on a tour of the RAE.

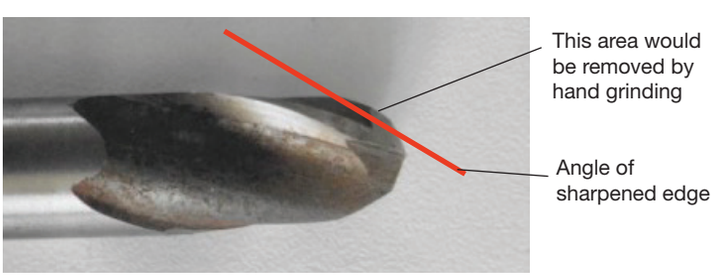
The re-grinding process



Ball-nose cutters
The tips of the cutters (bottom of image) had to be re-ground repeatedly to keep them sharp.
Photo: Richard Froud

Cutting path
The diagram above shows the path that the cutters would follow as they shaped the metal.
Image: Richard Froud/Katie John





Details of the process
Top: Side view of cutter, with the position of the cup grinding wheel shown. The grey area is the area that the grinding wheel will remove.
Above: Detail of the cutter end, showing area to be ground away.
Images: Richard Froud/Katie John

TAS Aviation Fair 2021

Katie John, Editor, Mach 2

Setting up
The stallholders prepare their displays under Alpha Charlie's wings – surely the most stunning location for an aviation fair.
Photo: Graham Cahill

On the weekend of 24–25 July, The Aviation Society (TAS) Manchester held their annual Memorabilia Fair at the Runway Visitor Park, under the wings of Concorde G-BOAC. I was attending to support Heritage Concorde in raising funds for their preservation work, and to sell some of my own artwork from my Concorde Gallery.

Heritage Concorde offered a range of merchandise, from "Concorde" mugs to books, models and prints of Concorde and souvenirs from the aircraft themselves – a rudder plate from one aircraft, framed circuit boards from G-AXDN's air intakes, lightbulbs from Alpha Charlie and used tins of M2V hydraulic oil.

The oil tins had recently been used for replenishing the hydraulic systems on Alpha Charlie and on G-AXDN at Duxford. The aircraft models had kindly been donated by a young boy who wanted to do his bit for Heritage Concorde's preservation work – and two of them were bought by another small boy who was glad to help. The light bulbs from G-BOAC were astonishingly popular – Heritage Concorde member John Hepple did a brisk trade.

I was offering the framed original of my painting *The Flagship*, featuring Alpha Charlie in Landor livery, for sale, with all proceeds going to raise money for Heritage Concorde's restoration work. I also offered art prints of my paintings and drawings.

A successful day out

The event, opened by TAS Chairman Peter Hampson, was apparently quieter than in previous years, but even so it seemed very well attended. There was a fascinating range of items, with plenty of souvenirs from civil aviation as well as militaria, and good representation from charities.

There was a lot of interest in our stall; Heritage Concorde raised almost £300, which will be going towards upgrading the hydraulic system on G-AXDN and upgrading the electrical systems on G-BOAC (see Concorde Watch, pp.10–13). I had some enthusiastic responses to my artwork. Graham and I also made some very useful contacts, notably a lady from *Aviation News* (www.key.aero/aviationnews), who was keen to interview both of us.

The day was a great success for both Heritage Concorde and Concorde Gallery. Many thanks to TAS Manchester for their support during this event, and to Alison Blacow, Retail Manager at the Runway Visitor Park, for the help she gave us.

Further information

For information about TAS, see: www.tasmanchester.com

For further details about Heritage Concorde and their work, see: https://www.heritageconcorde.com

The Flagship is still for sale, with proceeds going to Heritage Concorde; for information, see: https://concorde-gallery.co.uk

A joint endeavour
The stall with Concorde Gallery prints and Heritage Concorde merchandise, under G-BOAC's starboard wing.
Photo: Graham Cahill

Concorde watch

Concorde G-BOAC — British production aircraft

Location: Runway Visitor Park (RVP), Manchester, UK
Reporter: Graham Cahill **Date:** 3 August 2021

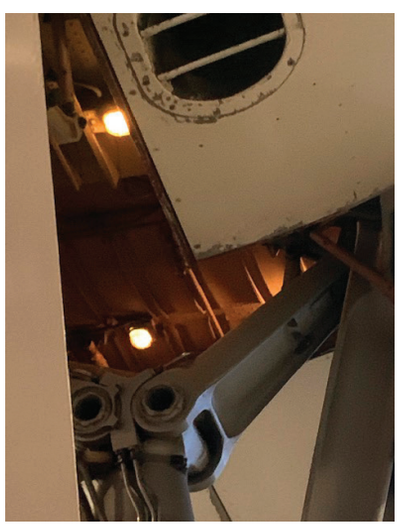
The Heritage Concorde team for this work on G-BOAC was John Dunlevy and Graham Cahill.

The following work has been carried out since the last issue of Mach 2 (May 2021).

1. Completion of the service lights

We had wanted to add a little life back into the aircraft for technical tour visitors so, as outlined in the previous issue of Mach 2, we had started to activate some of the ground service lights on the aircraft.

We replaced all the 28v dual filament lamps with similar glass LED lamps; in order to preserve authenticity the original colour temperature of the replacements was the same as in the originals. This work has now been completed and visitors will now see the service lights in open panels and landing gear bays active for all tours.



Lights in service area
A view of the service area in the nose leg bay, now lit by LEDs.
Photo: John Hepple

2. Application of 115v power for selected systems

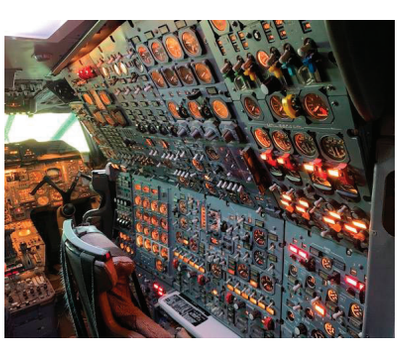
We have been saving up for this project for almost two years now, and it has cost a fair amount to get started. Anyone who donated money to us or bought from our eBay shop has contributed to this work, and we would like to thank all of them for the support.

We purchased a small 115v power supply, which will be used to power the cockpit lighting, navigation lighting (excluding strobes), and landing lights. Other items may be added in the future; these will be selected by John Dunlevy.

Cockpit instrument lighting makes a huge difference to the cockpit and the offering at Manchester for technical tours. The best way to complete this work was with the application of 115v to existing circuits and using the aircraft's own systems to power the lights rather than removing transformers and applying 5v direct to the instruments (as done on Concordes at other locations). The wiring was tested, and we applied 115v to the individual circuits; the instrument lights work really well and look fantastic.

We have started work on activation of the landing lights. This will use all of the original systems; however, the lamps will be replaced by LEDs, which will produce less heat and last much longer. (The original lamps will be retained in case they ever need to be put back.) This project is very much ongoing, and as

Work in progress
Connecting the 115v power supply. The team connected the supply to the existing circuits so that the lights can be run from the aircraft's own systems.
Photo: Heritage Concorde



The finished result
Instrument lighting now operational. The team were very pleased with the results and hope that this work will add to the impact of the aircraft tours.
Photo: John Hepple

Landing lights lowered
Work is being done to reactivate the lights but with LEDs, which will save energy and produce less heat than the original lamps.
Photo: Heritage Concorde

each step is taken we are testing the systems fully before completing. We are also keen to retain the originality of all systems on G-BOAC, and if required the work can easily be reversed.

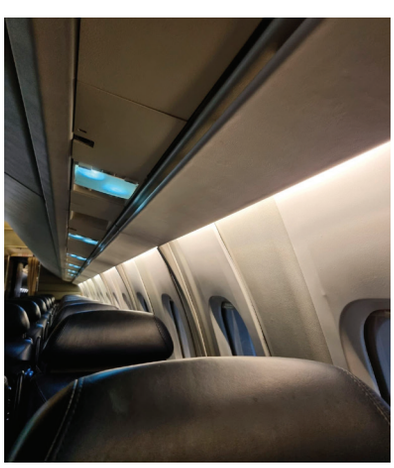
3. Reading lights in cabin

The lights in the forward cabin are now working and active for tours, which has added extra life (and light) to the cabin for visitors; we are most pleased with the result.

4. Cabin lighting

On G-BOAC, the cabin lighting consisted of 240v fluorescent tubes, which were installed in 2003. From almost day one these started to fail and were regularly replaced by the RVP; however, as time has progressed the RVP has found it much harder to obtain the tubes to fit, and where they could find them they are extremely expensive. In addition to this, the fluorescent tubes and associated ballast generated a lot of heat in the already hot cabin during the summer months.

We are in the process of replacing the tubes with a low-voltage LED replacement. Currently we have completed the port side forward cabin and are working on the starboard side forward cabin; because tours are constantly running currently, we have a mix of LED and original tube lighting. Once the project is complete, the whole forward cabin will be lit by LEDs with a colour temperature correct for the period. The benefits of this change will be less maintenance for the RVP, less heat generated, and more light, as all the lighting will work. We can't wait to see the finished result in the forward cabin, which should be complete by the next issue of Mach 2. The project so far has been funded by Heritage Concorde.



Cabin lighting
The new LED lighting in place on the port side of the cabin.
Photo: Heritage Concorde

5. Cooling the cabin

You would not believe how hot it gets in the cabin of G-BOAC in the summer months. As you walk up the stairs to the aircraft you can feel a significant increase in heat, due to the hot air being trapped in the hangar. We are looking at a cooling solution that will move air from the lower, cooler part of the hangar to inside the aircraft using the original air conditioning ducts within the aircraft. Although this work is in its early stages so far, things have been positive and we will report further on this in the next issue.

Air conditioning ducts
The team are looking at using G-BOAC's own system to provide cooling on board the aircraft.
Photo: Heritage Concorde

We feel it is important to retain the lines of the aircraft for tours, so are trying to avoid using the same method used at Seattle, with equipment on the ground and large pipes running into the aircraft. Again, this will be done in a way that does not damage the aircraft or is reversible so we can retain originality.

I would like to thank the managers at the RVP for their continued support in these projects. The work will definitely add a further dimension to the tour offering at Manchester, and we hope people will visit again and again to see the changes made.

Also on the list for thanks are TAS (The Aviation Society) at Manchester, who have supported us by allowing us a stall at the aviation fair (see p.9). This has allowed us to raise much needed funds. TAS have always been most supportive of our work, particularly when we activated the nose at Manchester, so a big thanks to them.

For details on visiting G-BOAC, see the Runway Visitor Park site: www.runwayvisitorpark.co.uk
For further information on Heritage Concorde's work on G-BOAC, see the website: www.heritageconcorde.com/current-projects
To donate to Heritage Concorde by PayPal, visit the link here: https://paypal.me/Heritageconcorde?locale.x=en_GB

Concorde G-AXDN

British pre-production aircraft

Location: Imperial War Museum, Duxford, UK
Reporters: Graham Cahill, James Cullingham **Date:** May–August 2021

The team from Heritage Concorde who have been working on G-AXDN for the past few months are James Cullingham, Peter Ugle, John Dunlevy and Graham Cahill. They made three recent visits – on 17 May, 9 June, and 7 August.

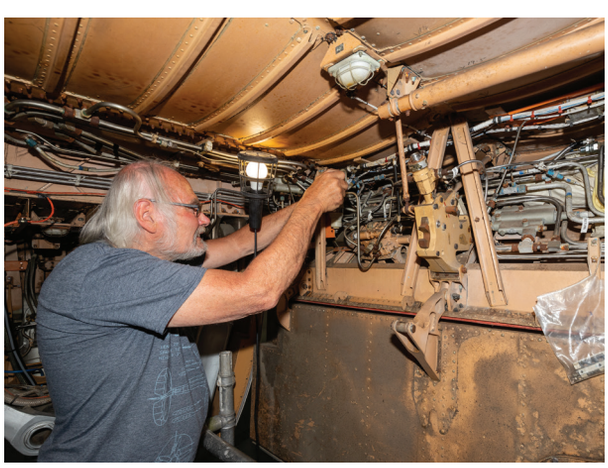
On 17 May, a panel on the rear trailing edge on which work was started last time was finally removed. The structure was inspected and was found to be in very good condition. The panel has now been replaced.

The main focus of the visits, however, was to relocate the hydraulic pump for the nose so that it can be controlled from the cockpit.

Moving the hydraulic pump

On 17 May and 9 June, progress was made with a project to install the hydraulics pump in the nose gear bay – a set-up effectively identical to that used for G-BOAF – to remove the need to have pipes running underneath the aircraft. Work involved fixing the ground door opening system, which was eventually (after some head scratching) traced to the cut wires on the tail skid. The wiring has now been corrected and the solenoids work as expected. Pipework was also identified and work started to find the correct fittings.

The next task was to find a method of pump control from the cockpit (sadly not as easy as on G-BOAF), as well as preparing the hydraulic pipework. On 9 June, various Green hydraulic systems were disconnected/



Working in the nose landing gear bay
Former Concorde engineer Peter Ugle disconnects Green hydraulic system connections for the nose wheel steering.
Photo: James Cullingham

Pipework identified
The nose gear door valve, with the pipework clearly labelled for future reference.
Photo: Heritage Concorde

capped off (nose landing gear (NLG) downlock, NLG retraction jack, nose wheel steering, etc.) to make safe. Pipework between the NLG bay and the current pump connection point was blown through to clear.

Intended benefits of the project

The work to extend the active portion of the aircraft's Green hydraulic system back to the NLG doors has been a lengthy project so far. However, it will have the following benefits:

1. No more unsightly pipes trailing from the nose of G-AXDN down to the power pack on the floor.
2. Reduction of flexible pipe length from 30 metres down to 8 metres.
3. Increase in automation of the hydraulic power pack, meaning that DAS will be able to move the nose entirely from the cockpit if required.
4. If all goes well, an attempt at actuating the NLG bay doors may be attempted – TBC. The addition of moving NLG doors will give further scope for technical tours.
5. The power pack will be working less because it will be located higher up inside the NLG door bay with less flexible pipe; we hope this will increase performance.

Looking to the future

G-AXDN was the test aircraft during development and was also the test aircraft for museum nose moves in the UK. Since we started to activate the nose in 2012, we have improved methods, and it was about time we

Planning routes for cabling
Former Concorde engineer John Dunlevy assesses possible routes for the power cables to the pump.
Photo: Heritage Concorde

updated the Duxford offering and incorporated the improvements that we have achieved with other aircraft on to G-AXDN.

The person in charge of this project is James Cullingham from Brooklands Museum (see following article), but the project will be financed by Heritage Concorde for the most part. Our friends at Hydraulics Online (https://hydraulicsonline.com) are updating the power pack for G-AXDN for us in the coming months.

Since the last issue of Mach 2 we have completed detailed inspection of the hydraulic system to enable the doors to be moved, electrical systems have been activated, and we plan to test the system soon. We have deactivated the NLG retraction system and flushed out the system ready for connection. We are installing the electrical controls on our next visit very soon. Because this is an ongoing project and it's taking some time to complete, we will update you when we have more to report; we estimate that by the next issue of Mach 2, we should have a result.

Thanks to supporters

As usual we have saved up long and hard for this work to be done on G-AXDN, and those who have bought from our eBay shop or donated by other means have helped to do this – so a very big thanks to you all; you are difference makers.

As always, a big thank you to our friends at DAS (Duxford Aviation Society) who are always supportive of the work. These guys are brilliant at the work they do to preserve their collection of 13 British airliners – one of the most important collections of airliners in the UK today.

For information on the work of the Duxford Aviation Society, see: www.duxfordaviationsociety.org
For details of Heritage Concorde's work on G-AXDN, see: www.heritageconcorde.com/current-projects
To donate to Heritage Concorde by PayPal, visit: https://paypal.me/Heritageconcorde?locale.x=en_GB

Concorde G-BBDG

British development aircraft

Location: Brooklands Museum, Weybridge, UK
Reporter: James Cullingham **Date:** May–August 2021

Despite the bad weather in the last few weeks, progress has been made with prepping and painting the aircraft, as well as with some other maintenance.

17 May

First set of panels on the tail (and associated aircraft structure) prepped, treated and undercoated.

9 June

- Further progress was made on repainting the tail.
- A number of panels were sanded back, treated and repainted.
- A number of sections on the airframe had the same treatment.
- Panels completed the previous week were re-fitted and sealed.

- The tail fin, up to the kink in the leading edge, was sanded ready for treating and painting the following weekend.

Work on the tail fin
Panels removed and upper rudder held independently of lower rudder (note different angle of lower rudder).
Photo: James Cullingham

● The upper rudder restraint bracket had its first test fit. This fitting would be removed and have a final fix in the coming weeks; we can now remove the joint plate to make it look a little neater/better.

18 June

Over the weekend of 12–14th June 2021, we prepped, treated and undercoated the bare metal on the left-hand side of the fin as well as the majority of panels, which are currently off-aircraft.

The weather wasn't great, so progress was limited to replacing items that were ready to be re-fitted.

1 July

Because of the bad weather over the last few weeks, we were limited to re-fitting panels that were ready as well as doing a final fit of the new upper rudder restraint bracket.

Some of the rudder seal strips are going back on, but as DG didn't have a full set when she arrived at Brooklands we are looking to get the missing strips re-made; for the moment there will, sadly, be gaps.

In addition, we took out the rear-most four windows to be inspected, cleaned and re-sealed prior to painting.

21 July

We finally had a decent set of weather to enable progress. Over the last few weeks we have:

● Carried out a final fit of the new upper rudder bracket.

Upper rudder, bottom hinge
Hinge cover and seal strip seating areas prepped ready for painting.
Photo: James Cullingham

Upper rudder restraint bracket
Newly manufactured bracket allows either rudder to be independently held for painting and enables the use of a smaller upper–lower joint plate.
Photo: James Cullingham

● Adjusted the lower rudder to bring it into alignment with the aircraft's centre line.

● Prepped and painted almost all the remaining panels.

● Re-fitted and sealed all the painted panels.

● Prepped and undercoated 60% of the right-hand side, and almost completed prepping of the rest of that side.

● Started work on manufacturing the missing rudder seal strips, working to the original drawings.

The next step would be to complete all the prep work from frame 66 backwards, and undercoat as well as fit the final few panels. This will enable us to start applying the top coat, starting with the white from the leading edge, followed by the cheat line and rudder blue.

3 August

Over the weekend, between the showers, we managed to complete the preparation of the right-hand side of the fin as well as apply the undercoat. This job was followed by the preparation of the rear-most portion of the fuselage, from the cheat-line upwards, which was undercoated on Tuesday.

We also fitted and sealed the rear-most fairings for the lower rudder PFCUs.

Another good weekend should see the left-hand fuselage and fin and the fuselage aft of the cargo door prepared and undercoated as well as all the panels re-fitted, sealed and watertight.

For information on Concorde at Brooklands Museum, see: www.brooklandsmuseum.com/concorde

Latest work
Below left: Right-hand tail fin with panels refitted and sealed and bare metal treated, ready for undercoating. Below: Undercoat done on right-hand fin and upper fuselage from mid-way along the rudders to the rear tail light.
Photos: James Cullingham