Pixel perfect

If you've ever wondered how Hitler's Luftwaffe would have evolved, the answers are plain to see...

English lessons

The future of fighters without German innovation, the Gloster Meteor was Britain's first operational jet. Built with unswept wings and centrifugal flow Rolls Royce Derwent engines, the unsophisticated Meteor still enjoyed a long and successful career.

Here, Daniel Uhr has portrayed RA381, an F.4 serving with No. 600 (City of London) Squadron, RAuxAF, in 1951.

© Daniel Uhr

TITLE IMAGE

Future jets

A pair of Blohm & Voxx P.208 interceptors, shown high over the European Alps. The advanced P.208 was designed as a jet and would have evolved into the turbine powered P.212.

© Daniel Uhr

BE SURE TO TAP THE IMAGE FOR THE FULL SCREEN, FULL COLOUR VIEW.

It's easy to say digital art isn't 'serious' or even 'true art'…but it's a lot harder to find arguments that actually back up that purist point of view.

Creating digital aircraft takes as much research into dimensions, perspective, weathering and detail – even performance – as any other school of rendering that we've covered for *Inside Loupe*.

Daniel Uhr is a case in point. He's a highly talented digital aviation artist based in Rio de Janeiro, Brazil.

You don't need us to tell you his art is truly amazing. The images speak for themselves.

Can't see the brushwork?

What these images don't show quite so clearly is that Daniel that is equally at home with a range of more traditional painting techniques – including oils,

OPPOSITE TOP

Blown away

Daniel's incredible rendition of B-17G 43-37756 'Milk Wagon' (708th BS, 447th BG) in action highlights his artistic skills as well as his appreciation of actual operations. However, his book reminds us that Germany wasn't defeated by 1930s bomber design, so much as America's overwhelming productivity and logistics.

OPPOSITE BELOW

Cover story

The cover of Caudio and Daniel's Luftwaffe Confidential. The subtitle outlines the book's subject matter perfectly.

gouache, india ink and airbrush.

Those fine art skills underpin his digital creations, helping his work deliver the same satisfying accuracy and energy that all aviation artists aim for. (They also qualify him to teach electronic art, and run his own design business in Rio.)

Daniel sells high quality prints of his art and takes on commissions. So if there's an aircraft you'd like to see every morning when you wake up, you'll find a link at the end of the article...

His works have also adorned box covers for a number of plastic kit manufacturers (including Hobby Boss, Trumpeter, High Planes Models/HPM Hobbies, etc), the pages of numerous magazines, and the fabulous Luft46 website.

A new reality.

And that leads us nicely to Danial's *magnum opus* – the remarkable ***Luftwaffe Confidential***, which he created with author Claudio Lama de Farias.

Daniel worked closely with author Claudio Lama de Farias to create a book that would give fresh relevance to the work of Germany's aerodynamicists and aircraft builders. Many would bring their talent to post-war aircraft and spacecraft development on both sides of the Iron Curtain. We still watch, fly in, and benefit from, the legacy of their aerodynamic research.

ABOVE

Control of the air

Among the many developments pioneered by the Luftwaffe, covered in the book, and taken for granted today, are wing fences.

Here, an Me 109-G is shown with an experimental fence installation, based on plans by their developer Dr. Liebe.

OPPOSITE

...y in the sky

...esigned as a high-altitude reconnaissance platform with a Walter rocket motor, the DFS 228 made extensive use of glider technology. The design was futher developed by the Soviets after the fall of the Third Reich, but the concept reached its ultimate development in the Lockheed U2.

TAP THE IMAGES TO SEE FULL SPREADS

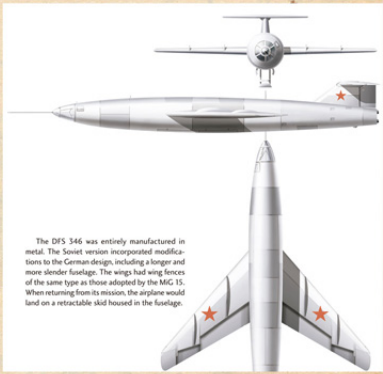
So this 166-page hardcover masterpiece is more than just a look at a possible future for Hitler's Luftwaffe, or even the rich array of designs that were aready on the RLM's submissions desks and test-fields as the Allies fought World War Two to its conclusion.

It's actually a far more thought-provoking analysis of the enduring aerodynamic breakthroughs that came out from Germany's design innovations.

The Cold War and beyond

Let's not forget, this was research that was eagerly pounced upon by Western and Russian scientists and carried back to their respective aircraft industries at the end of the war.

That included, notably, the swept-wing science that would prove critical to a generation of post-war fighters like the F-86 Sabre – which NAA President Dutch Kindleberger delayed for around a year, so



The DFS 346 was entirely manufactured in metal. The Soviet version incorporated modifications to the German design, including a longer and more slender fuselage. The wings had wing fences of the same type as those adopted by the MiG 15. When returning from its mission, the airplane would land on a retractable skid housed in the fuselage.

LEFT TOP

Sweeping the skies

As aircraft performance increased, German aerodynamicists made extensive use of wing sweep to improve performance and control transonic compressibility. Swept, forward swept, M, and W planforms were all explored in the drive to manage speed, drag and centre of gravity.

LEFT BELOW

The shape of things to come

Swept wings are now so widespread we hardly give them a second thought, but the original German research has found its way into numerous aircraft in the years since World War II – as this spread from *Luftwaffe Confidential* illustrates.

Two prototypes were ordered in 1948 but its mission was changed to that of a fast medium bomber (XB-53). It would be powered by three General Electric J35 turbojets, would be able to carry twelve 1000 lb bombs, and fly at 938 km/h, a very impressive performance at the time. The project was cancelled so no prototypes were completed. Had it been built, the Convair bomber would surely have been a remarkable sight.

During the 1960's, engineer Hans Wocke, one of the Ju 287's designers, designed the 320 HFB *Hansa Jet* for the Hamburger *Flugzeugbau* (Formerly Blohm und Voss.).

The *Hansa Jet* was an executive aircraft in the same class as the *Learjet*, carrying up to twelve passengers. Its most evident characteristic was the swept forward wing.

More recently, with the advent of revolutionary composite materials such as carbon fiber and the increasing use of titanium in aircraft construction, it has been possible to create very light wings with extreme structural strength and stiffness. The concept of forward sweep therefore returned to the drawing board as a way to create aircraft of extreme agility. Developed by Grumman in the United States, the experimental prototype X-29A went through a series of successful tests, beginning in 1984.

This nice photo shows the unique design of the HFB 320 *Hansa Jet*, the only corporate jet that employed forward swept wings. Photo: HFB. Rainer Niedrée's archive.

The experimental aircraft Grumman X-29 employed forward swept wings and also canards. Photo: courtesy NASA.

In Russia the OKB Sukhoi created the impressive Su-47 *Berkut*, an advanced experimental fighter. Although to the layperson its futuristic form may recall something from George Lucas' "Star Wars" saga, scholars of aviation history can surely identify a certain Germanic flair in this design.

Photomontage showing a model of the extremely advanced Convair XA-44/XB-53. Photo: courtesy USAF.

CRESCENT WINGS

Another form of wing sweep explored by German designers was the so-called crescent wing. In this arrangement the wing possess different degrees of sweep along its length, increasing from the tip towards the root at the fuselage. The crescent wing was invented by engineers Rüdiger Kosin and Walter Lehmann of the Arado company and was patented in 1942 under number 844723. Kosin decided to test the idea in a series of prototypes for the Arado Ar 234.

RIGHT

Shaking the tail-feathers

The 'flying wing' work of Reimar Horten receives particular attention in the book – including details of his post-war work in Argentina.

His 1942 Horten VIII (left) and 1949 jet fighter (far right) are both short-lived but far-sighted projects from one of Germany's most gifted designers.

FOLLOWING PAGE

Shadow dancer

Daniel's unique view of an Aero L-29 Delfin, skimming clouds high over a snow-bound Warsaw Pact landscape.

airscape is deeply indebted to **Daniel Uhr** for sharing his artworks and *Luftwaffe Confidential* with us.

To see more, order high quality prints, or commission art, TAP HERE to visit Daniel's website.

And whether you're interested in aerodynamics, aviation history, or the Luftwaffe's legacy, *Luftwaffe Confidential* is well worth tracking down.

TAP HERE for a list of stockists

his design team could analyse and incorporate the German data.

In other words, *Luftwaffe Confidential* goes far beyond exploring the future aircraft of a would-be Luftwaffe. It's as much about the future aircraft of the Cold War and beyond.

Be ready to learn something new.

The subject is covered by grouping the German innovations in four main areas – Aerodynamics, Configurations, VTOL and Special Missions.

Given the bellicose character of the Reich, military aircraft predominate, including a detailed (and surprising) history of the Horten Flying Wing. However there are also biographies of the significant designers and even some eye-opening developments from the civilian sphere.

Back to the art.

'Imagineering' the aircraft images for the book really was a labour of love. While Claudio researched the text, Daniel researched the aircraft that epitomised the key aerodynamic advances being covered.

This involved finding drawings and specifications, of course, as well as tracking down performance data and/or projections, and then creating a real-world scenario that accurately portrayed possible camouflage, weathering effects, mission profiles, weapons, battle damage and more.

Fortunately, some archive photos and even a few museum examples were available to help in the process. But as the samples for this article show, the final artworks go far beyond anything the historical record could provide.

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