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Can you help our RIAT loss campaign?

The team at a previous RIAT - perhaps the best show to expand our reach and give a massive boost to donations as well as healthy merchandise sales.

You will probably know that due to the crisis in the Middle-East, the Royal International Air Tattoo (RIAT) that usually takes place in the middle of July has been cancelled this year.

As **THE** biggest event on the aviation calendar and the biggest we attend with our merchandising team and core volunteers, it's a place to meet hundreds of supporters and the wider public over the three day event.

The cancellation will naturally have a large impact on our fundraising, so for the month of July, we are running our **AIRSHOW LOSS CAMPAIGN** - where we are asking supporters (and all those that would usually attend) to perhaps donate just a small proportion of what they would have spent.

We estimate the loss to be in the region of £15,000! (Ouch!)

It's not only tickets, but travel and accommodation costs together with the everyday expenses of food and drink. Those who have been before will know this can quickly add up to several hundred pounds!

All we ask is that you consider donating a fraction of that - a small consideration - directly to our cause. If a few thousand can do that - we will make up our shortfall.

We will keep this campaign going throughout July.

GIFT ANYTHING FROM £5 to £50 HERE

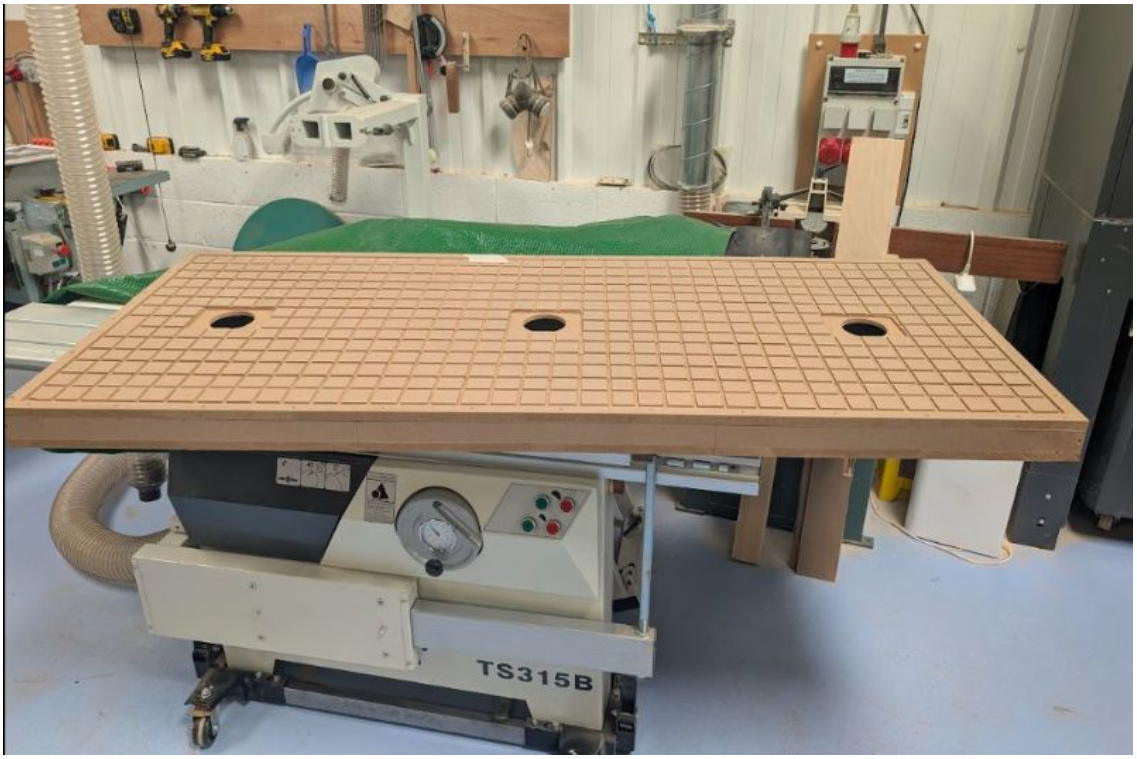
GIFT £100 OR MORE BY CLICKING HERE

Thank you for anything you can gift. It is very much appreciated.

Custom made Vacuum Table in Action!

Paul Cole with the specially built vacuum table jig. It runs on rails underneath a fixed-positiion rotating sanding machine that generates the angle used as a scarf joint when bringing two pieces of ply together.

A fine mesh sheet sits under the plywood, preventing the vacuum table becoming clogged with dust but leaving enough suction to hold the piece in place.



Here you can see the complex machine routering required to create the baseplate for the vacuum table. The three holes connect back to the vacumm machines providing suction via an extending PVC pipe system.

Above you can see the incredible work Paul Cole has done in creating a purpose-built vacuum table in order to get accurate joints on thin plywood sheeting.
The process was mentioned in our recent newsletter here.

Paul now has the jig all fixed up and is beginning to add a scarf joint angle to the appropriate panels. This work alone is expected to take at least another two weeks.

Mosquito Video Theatre

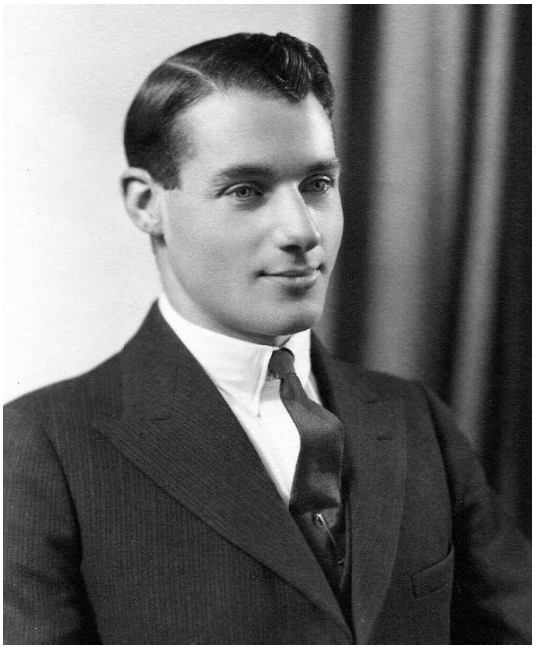
Did you know these Mosquitio facts?

Mosquito Masterpiece

A three-part serialisation of a story about a former Mosquito design team member, Ralph Hare.

An extract from an article originally published in **Pylon** - the in-house magazine of [the de Havilland Aeronautical Technical School Association.]

At Hatfield in 1990 the Royal Aeronautical Society's local branch published the proceedings of a symposium on Mosquito design, manufacture and operations to mark the 50th birthday of 'Man's greatest engineering achievement in timber'. Mike Ramsden (1946-1950) has dusted off this contribution to that inspiring little book. It is dedicated to Ralph Hare, senior structures designer on the Mosquito under R.E. Bishop and Bob Harper. Mike interviewed Ralph early in 1990. This article reappears with acknowledgements to Ralph (who died age 94 in 2009) and to the RAeS Hatfield Branch.



Ralph Hare, who died in May 2009, was one of the last surviving members of the de Havilland Mosquito design team at Salisbury Hall.

That remarkable team, free from the distractions of the wartime Hatfield factory, did the job in a year – from the outline drawing of November 1939 to the prototype's first flight in November 1940.

Mike Ramsden recently found the recording of an interview with Ralph Hare.

Ralph Hare was a De Havilland Aircraft structures engineer with many years of experience in wood, a material he once described as 'God's own composite, resin-reinforced material'. He loved to work with wood all his life.

As we know, the Mosquito was one of the fastest and most versatile combat aircraft of World War 2. It could carry the load of a B17 to Berlin with one fifth of the crew, having consumed 20% of the manufacturing manpower, at twice the speed. Seventy years on, the Mosquito's wooden structure is still an object of wonder, not least among those who are restoring a Mk VI fighter-bomber at the de Havilland museum, Salisbury Hall.

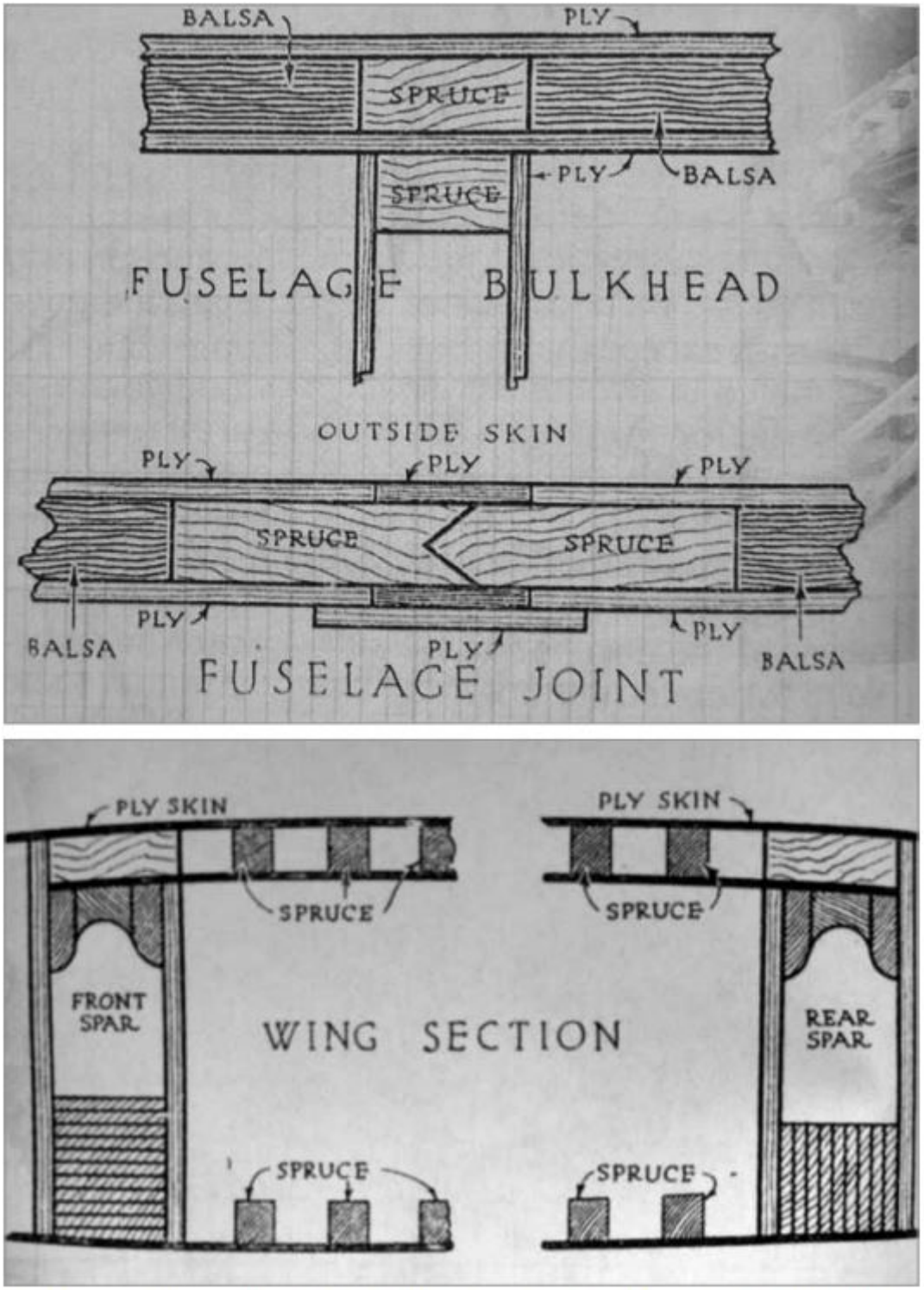
Ralph Hare completed his career designing the wings of Europe's Airbuses.

I particularly wanted to hear this modest genius talk about the Mosquito, perhaps history's greatest engineering masterpiece in wood, to which he made such an important contribution.

Site of the recording was The Comet Hotel, Hatfield, here seen just after being built. Our lower feature gives an update on this building.

We met for lunch at the Comet Hotel, Hatfield. The result, recorded with his approval, was heard in part at a Mosquito 50th Anniversary Symposium at Hatfield in 1990. Mosquito design team leader was R.E. Bishop. Ralph Hare recalled that the personal hours which Bishop put into the project were ‘staggering’. Bishop had been responsible for the Flamingo, de Havilland’s first metal airliner, but he had been brought up in the company’s tradition of wooden structures. Under A.E. Hagg, whom he had succeeded as chief designer in 1938, the young Bishop had seen how the brilliantly successful DH.88 Comet racer had innovated diagonal planking to achieve a thin wing of high aspect ratio without the drag of external wire bracing. Diagonal planking had also been adopted for the de Havilland DH.91 Albatross airliner, and it was seriously considered for the DH.98 Mosquito; but it became obvious that it would not take military loads, speeds and stresses.

Ralph Hare recalled many journeys in his Austin Seven carrying test pieces to the de Havilland materials laboratory at Stag Lane. Diagonal planking was tested but found wanting. He recalled taking hundreds of panels for testing before the final design decisions were made. The top wing skin would not take the compression loads without buckling. It was found that a double plywood sandwich with spanwise stringers – first of spruce, later of Douglas fir – was by far the most effective. The size of the square-section stringers was calculated by theory, varying with wing station and checked by testing. The top of the wing had three doubleskin panels.



Top: Diagrams showing the method used for the construction of Mosquito fuselage bulkheads and fuselage joints. Below: A cross section diagram of the core wing section's build.

Many panels were made for 'control tests' to measure the basic performance properties of the materials and the construction, to put numbers to the allowable stresses in tension, compression and shear, and to measure elastic moduli. Mean values were used to obtain stress distributions for design. Optimising these properties for the wing – the most heavily loaded part of the structure – was the ultimate test of de Havilland's extensive experience with wood.

Two spars with tip-to-tip top and bottom booms of laminated spruce, boxed

with plywood webs, were finally chosen. Spruce has always been the preferred wooden aircraft material. The tree grows very tall with few knots, and is blessed with the straight grain and low-density which give it a high strength-to-weight ratio. Even so, only one in ten Canadian spruce trees was selected for the Mosquito's spars. The choice of wood to meet the required standards became a great skill. Air Ministry DTD36B set out the requirements for aircraft spruce, defining moisture, density, brittleness, straightness of grain and other properties, how to test for them, and what the strengths and moduli should be.

The forward booms were made of single-piece spruce laminations; the aft booms, delineating the Mosquito's famous wing planform, needed forward sweep as well as dihedral, and were spliced. Theory and experience, backed by Stag Lane testing and DTD36B showed that the best taper for these splices was 1 in 15. For hardwoods 1 in 10 was best.

The front spar booms were originally made of three horizontal laminations and the aft spar of three vertical laminations to accommodate the forward sweep. In theory the booms could have been solid spruce beams, but laminations allowed easier manufacture and were the best use of spruce resources. Later, further down the production learning curve, the three laminations became ten to save wood. Sawing was accurate to within 0.01in, and was left rough for gluing.

The laminations and spar webs were glued in their jigs under pressure and, to speed up glue setting, were heated. Electric mats kept the temperature Page 24 Pylon 2011 of the whole production jig constant regardless of whether one end of the 50ft spar was near a draughty factory door and the other near a warm canteen. Accuracy of the spar over 50ft was 0.04in – remarkable precision for mass-production carpentry.

How remarkable to learn that a De Havilland engineer responsible for work on the Mosquito also worked on Airbus wings!

- Part Two of this series continues next week -

Our thanks to the members of The de Havilland Aeronautical Technical School Association for their support in using these articles.

The Comet Hotel today...

The building today, little changed from the original with a commemorative DH 'Comet Racer' mounted on a plinth.

First opening its doors in 1936, the original Comet Hotel was named for the locally built De Havilland Comet DH.88 racing aeroplane, which had been developed specifically for the 1934 England Australia MacRobertson Air Race. Having won this iconic race in a world record time, the Comet aeroplane was a true local hero, and an international legend.

It represented the cutting edge of modern technology at time when the world was opening up thanks to international high speed travel. The eponymous hotel was actually designed around the footprint of the aircraft, which gives the building its unusual and iconic shape.

The building's architectural style, known as Streamline Moderne, represents a late type of the Art Deco architecture and graphic design that emerged in the 1930s as response to the new optimism inspired by technology. The Comet Hotel reflects this concept in homage to the De Havilland Comet.

In recent years, the building has undergone refurbishment and extension - all based on the rich heritage and period glamour of the original Comet Hotel, hearkening back to this golden age of air travel, glamour and sleek design. Beautiful period architecture, classic design and future-facing technology combine to create a welcoming and exciting environment, a rebirth for one of Hatfield's most iconic buildings.

Interior artwork reflects the buildings' origins - with the restored Comet aircraft G-ACSS seen airborne below.

Official TPM Merchandise

Intruder Glass Whisky Tumbler with Slate Coaster

£19.99

View

Mission Patch Pint Glass with Bottle Opener

£19.99

View

TAMIYA De Havilland Mosquito FB MK.VI - 1/32 Scale

£219.99

View

TAMIYA De Havilland Mosquito B Mk.IV/PR Mk.IV - 1/48 Scale

£25.99

View

TAMIYA De Havilland Mosquito FB MK.VI/ NF MK.II - 1/72 Scale

£18.99

View

Intruder Bic Grip Smooth Roller Pen - Grey

£2.75

View

RL249 Mosquito Embroidered Keyring

£5.99

View

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