



# The de Havilland Aeronautical Technical School Association

## Apprentice Display at the de Havilland Aircraft Museum

### and

## Catalogue of Training Exercises



This document describes the creation of the Display, explains the sort of craft exercises undertaken by apprentices and illustrates some of their work.

*Roger de Mercado (DHA Hatfield 1957-62) Secretary DHAeTSA*

INDEX	PAGE
The Apprentice Display	2
Apprentice training exercises – drawings	4
Apprentice training exercises – toolboxes 1	5
Apprentice training exercises – toolboxes 2	6
Apprentice training exercises – fitting, sheet metal and machining	7
Apprentice training exercises – fitting, sheet metal and machining: Part 1, “Illustrated Parts Catalogue”	8
Apprentice training exercises – fitting, sheet metal and machining: Part 2, “The Ultimate Apprentice Exercise?”	10
Apprentice training exercises – fitting, sheet metal and machining: Part 3, more exercises	12
Workpieces retained by proud owners	13
Larger images of specimens	17
Model milling machine at BAE Systems Heritage Archive	29
Version history	30



*Entrance to the display*

## The Apprentice Display

In 2013 Ralph Steiner of the de Havilland Museum at Colney Heath told the committee of the de Havilland Aeronautical Technical School Association that he was keen to have a display about apprentices. A request was made in the Spring 2014 newsletter of DHAeTSA for items such as brochures, ties, badges, workpieces and a toolbox. The late Ken Pye, a member of the team restoring a DH89A Rapide at the Museum, agreed to be the recipient of artefacts. Almost at once Ken received a pristine example of the 'square in the square' exercise, all the way from Bill Rogers on the US west coast. Other items rolled in, including, extraordinarily, one of the work benches from Astwick Manor! At about this time the Museum opened their new shop, which had been in the 'Foreman's Office', which thus became available. The Office has been furnished as a meeting room with a Technical School display around the sides. This is a good dual-purpose arrangement, although it has precluded installation of the bench! Terry Pankhurst, former apprentice, then woodwork instructor at Astwick Manor and now Rapide team leader, made display units wherein a selection of the over 50 artefacts received are on display. The surplus is stored in the Rapide hangar. Terry and Ken created story boards about various aspects of the School, which the Museum had printed and framed professionally. The rudder, sole surviving piece of the TK2 designed by apprentices, is hung alongside.

The Apprentice Display was formally opened on Tuesday 9th August 2016 by the late Mike Ramsden, seen on the left in the photo below. Due to the limited capacity of the Foreman's Office, the guests were few in number, but included the Mayor of Hertsmere Borough Council, Councillor Peter Rutledge and his lady, and Councillor

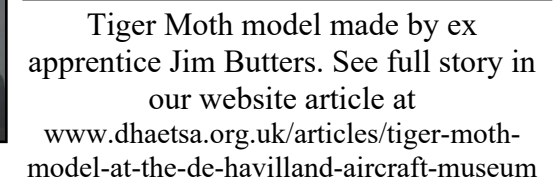
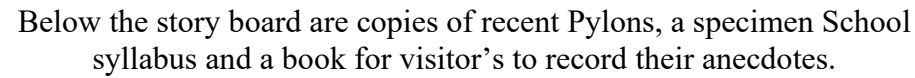


Maurice Bright. Also present was Dr Julie Moore, of the University of Hertfordshire's History Department, who had generously donated £800 towards the Display. Our Association was represented by Philip Birtles, who is President of the Museum, John Ball, John Bellam, Phil Catton, Roger Earland, Sonja Fillingham, John & Jackie Johnston, Terry & Margaret Pankhurst, Ken & Sandra Pye and, of course, Mike & Angela Ramsden. Ken represented our Committee, other members being unable to attend.

Mike gave a short speech and declared the Display officially open. He then presented a cheque for £300 as a donation from our Association to the Chairman of the Museum Trust, Alan Brackley, as a contribution towards the Museum's expenditure on the Display.

In the following years, many items and features have been added, as the photos on the next page show and as listed on following pages.





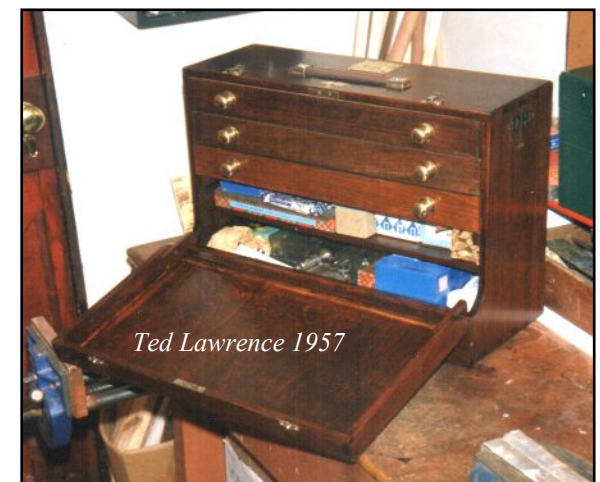
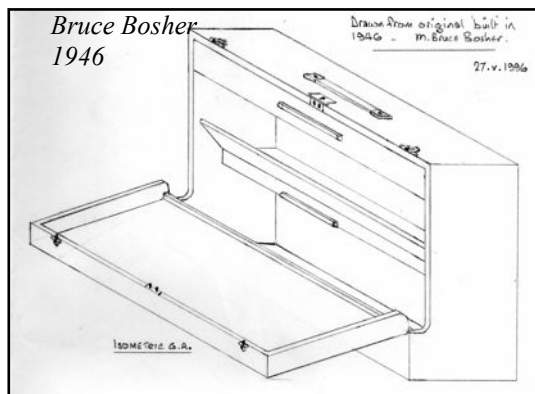




## Apprentice Training Exercises - Toolboxes 1

Toolboxes were always made by DH apprentices. The earliest known example was made by Bill Grace at Stag Lane in 1920, from aircraft spruce, ply, brass screws and alloy aircraft penny washers, shown on the right. It remains in the possession of his son Ian Grace, Chairman of the de Havilland Moth Club of North America.

The standard post-war design at Salisbury Hall in 1946 was drawn by Bruce Boshier in 1996 (complete plans available on request to DHAeTSA). A well-used and stocked example of 1946 is Ken Watkins' and a pristine example is Jim Prettyman's of 1948. In the 1950s the design was similar, but there were now two full drawers, as exemplified by Roger de Mercado's somewhat battered box (1957), still in use as are so many. A variation is Ted Lawrence's three-drawer toolbox.







## Apprentice Training Exercises - Fitting, Sheet Metal and Machining

About three months were spent in each of the three Sections. The upper and middle photos were taken at Astwick Manor in 1967. A bench salvaged from Astwick was given to us in 2015 by Geoff Morriss (1965-70) and is in use at the DH Aircraft Museum.





## Apprentice Training Exercises - Fitting, Sheet Metal and Machining

### Part 1 "Illustrated Parts Catalogue!"

Click on an image to jump to a full page copy

**Donations by Geoff Morriss**



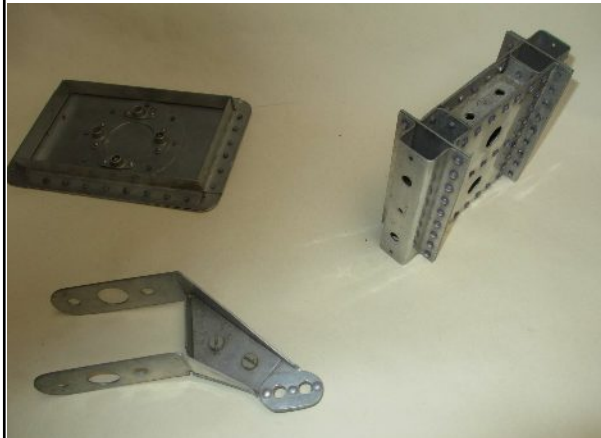
1/2 scale Moth instrument panel  
Flanged folding with lightening hole  
Tube and flange assy.



Straight and curved box structures with  
lightening holes



Pyramid flange  
Straight sided flange  
Three stepped angles plus centre holes  
and 1/16 rivet holes  
Tube and tube support



Access door and anchor nuts  
Top hat rivetting  
45° flange



Two handled die holder plus die  
Spanner - 11/16 A/F  
Fitting exercise - block within two blocks



Tube in "v" plate with threaded studs  
Steel turning bored with tapered end  
Go -no go plug, end knurled





Turning with five diameters  
Steel angle gauge



Tool makers clamp



Sheet strip and hinged tubular end  
Rivet exercise - 39 rivets and 5 anchor nuts  
Small folded bracket

**Donations by Roy Branson (1957-63), Nick Ruston (1952-57) and Bill Rogers (1958-63).**



Clamp made by Roy Branson in 1957.



Die holder made by Nick Ruston in 1952/3



The first exercise given was usually to make a rectangular hole in a block into which another rectangle would fit perfectly. If this was done well the apprentice was allowed to drill and tap holes for threaded studs. This example was made by Bill Rogers in 1959.

### Oil can made by Hugh Langrishe (1946-49)



The oil can is of the plunger force-feed design and perhaps based on the widely-used Braime oil cans. The components were given to apprentices who then had to solder them together.



## Part 2 - Donation by Robin Webb (1951-56), 18th October 2017.

### THE ULTIMATE APPRENTICE EXERCISE?

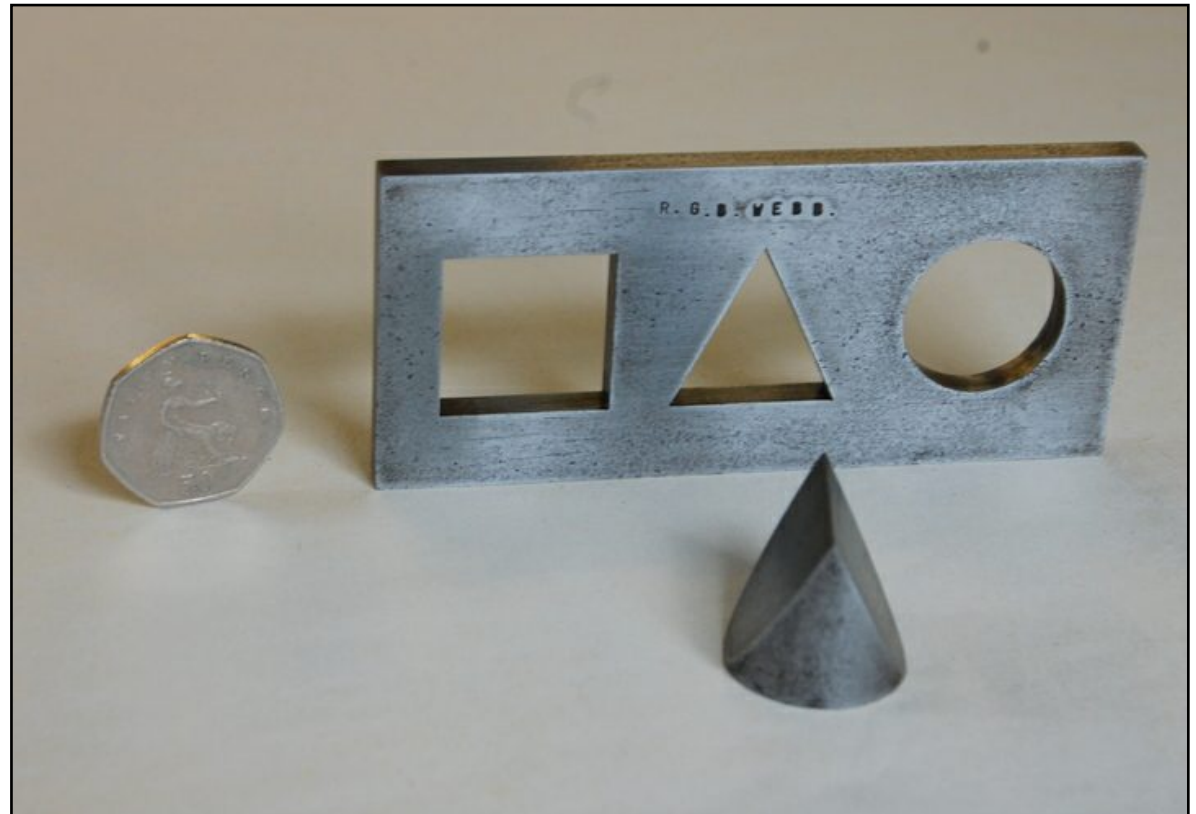
This was Bert Oliver's piece-de-resistance, which he inflicted on me as my last exercise for him before I moved on to Dicky Whiddon's sheet metal bench, and I don't know of anyone else who made one.

The first problem was to work out what it was that I had to make, because Bert just gave me a sketch of a piece of 1/4" steel plate with three holes – one 1" diameter; one 1" square, and one triangular with base and height of 1" – and said "Go away and make that, *and the one piece which will exactly fit the three holes*". Needless to say the plate itself had to be accurate to size and with all edges truly square, and the fit of the plug had to be to the usual cigarette paper criterion, and to fit all possible ways round.

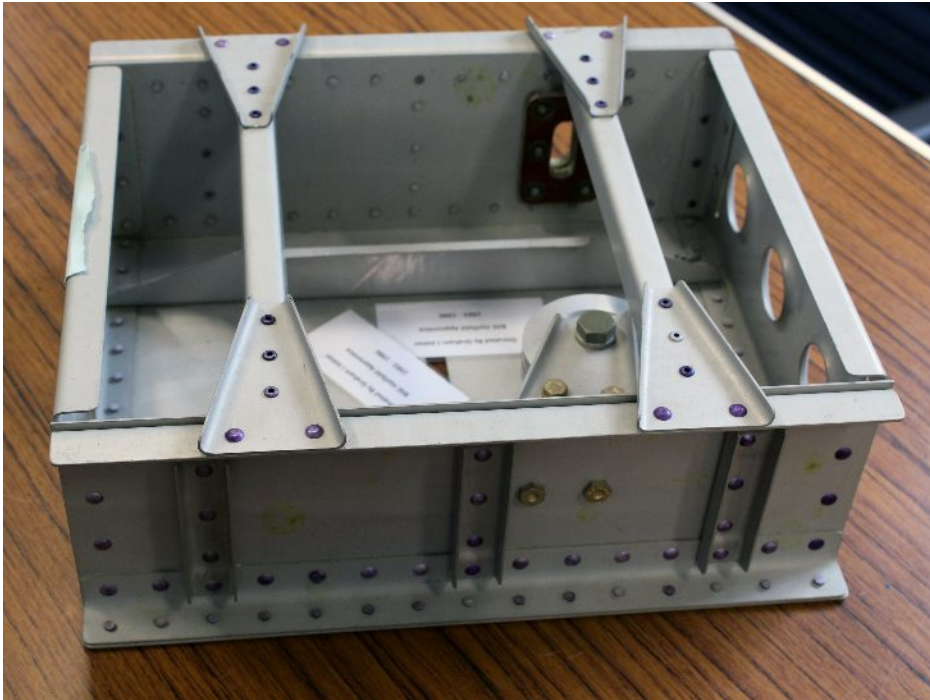
Robin Webb



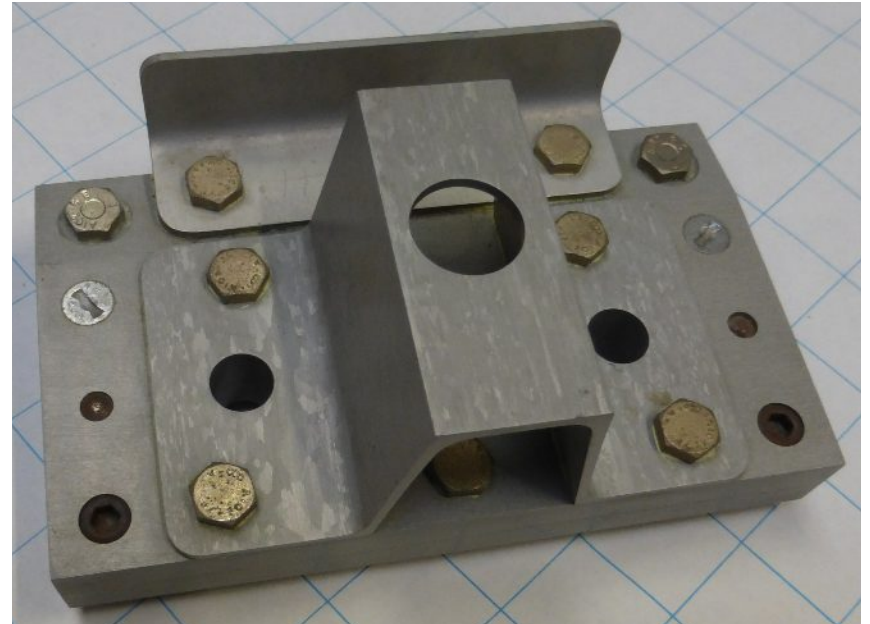
*Terry Pankhurst, left, accepting Robin's donation in the Display Room, aka the Foreman's Office..*



### Part 3 - Donations by Graham Joiner (1983-86) and Ed Martin (1949-53).



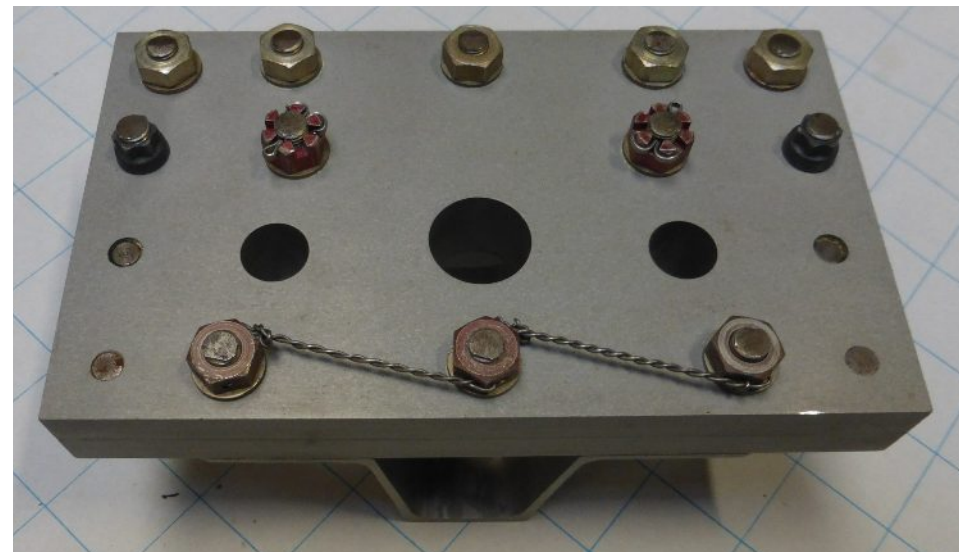
Above: Graham Joiner's box section and pulley exercise



Above and below: Graham Joiner's bolt locking demonstration piece.



Left: Ed Martin's tap holder





#### Part 4 - Photographs of workpieces retained by proud owners

**From Martyn Ames (1964-69):** Model of Football Association Cup. The overall height is 225mm.



**From Ted Lawrence (1957-62):** While having a bit of a sort out in my workshop, I thought I would see what I still had from days at Astwick of the various exercises one had to undertake. There is an aluminium fruit bowl, a plain steel can with a lid, which has got surface rust on it (still has some ex Hatfield Imperial socket head screws in it), a three way aluminium line connector, a tin plate funnel and a turning exercise of various threads.

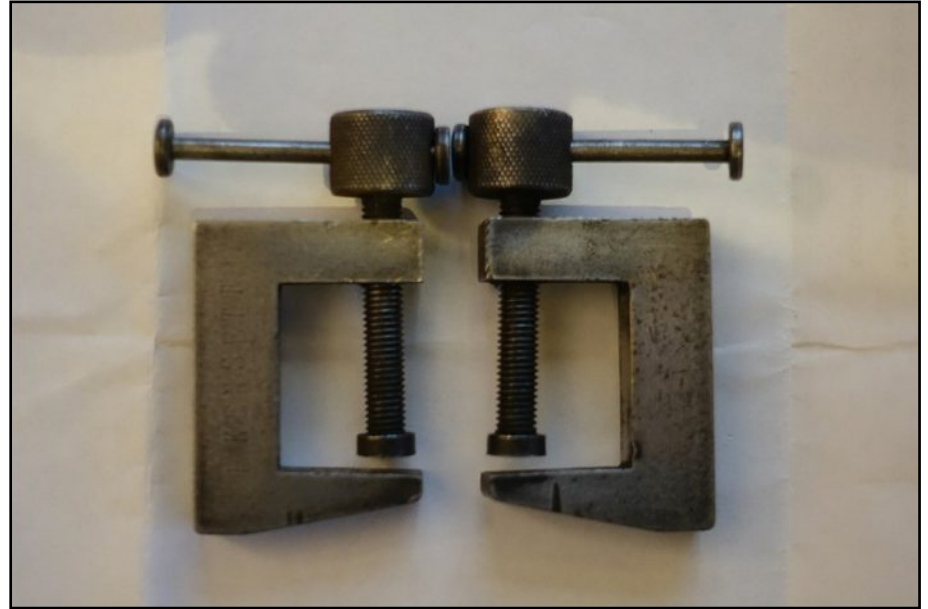




**From Barry Kensett (1954-59):** I did not have to do Robin Webb's 'ultimate fitting challenge' as described in the Autumn 2017 newsletter (and on page 8 of this Catalogue), but my very first exercise with Mr Goode was the square in the square which I guess we all did. However after all that sweat and tears did everyone then have to saw it up to make a pair of "G" cramps? I still have mine ready for instant use in my original Astwick toolbox.

I have the stainless steel fruit bowl which Mr Whiddon had us beat out over the stake. It was very hard, very thick and very painful on the fingers. It took about a week of hammering. We scalloped the edges and brazed on feet.

When we went through the foundry there were a number of patterns for apprentices to use. I made a sand casting of the Comet 3, G-ANLO.



**From Stuart McKay, Secretary of the de Havilland Moth Club:**

It was not until a couple of days ago that I learned that my friend Mike Vaisey spent a week at Astwick Manor just before he left school, when he was considering becoming a DH Apprentice - 1960s at a guess. During that time he made a matchbox holder - pic attached.

At the end of the week he was offered an apprenticeship but chose instead to go into the building industry as a quantity surveyor. His metalwork 'training' helped him when he built himself a Luton Minor.

*Tiger Moth owner Mike Vaisey founded Vintage Aviation Technology Ltd.*



**END OF PART 4.**

**THE FOLLOWING PAGES ARE LARGER IMAGES OF SOME OF THE ITEMS IN PART 1**





1/2 scale Moth instrument panel  
Flanged folding with lightening hole  
Tube and flange assy.

GEOFF MORRISS

[Click anywhere on image to go back](#)



Straight and curved box structures with  
lightening holes

GEOFF MORRISS

[Click anywhere on image to go back](#)

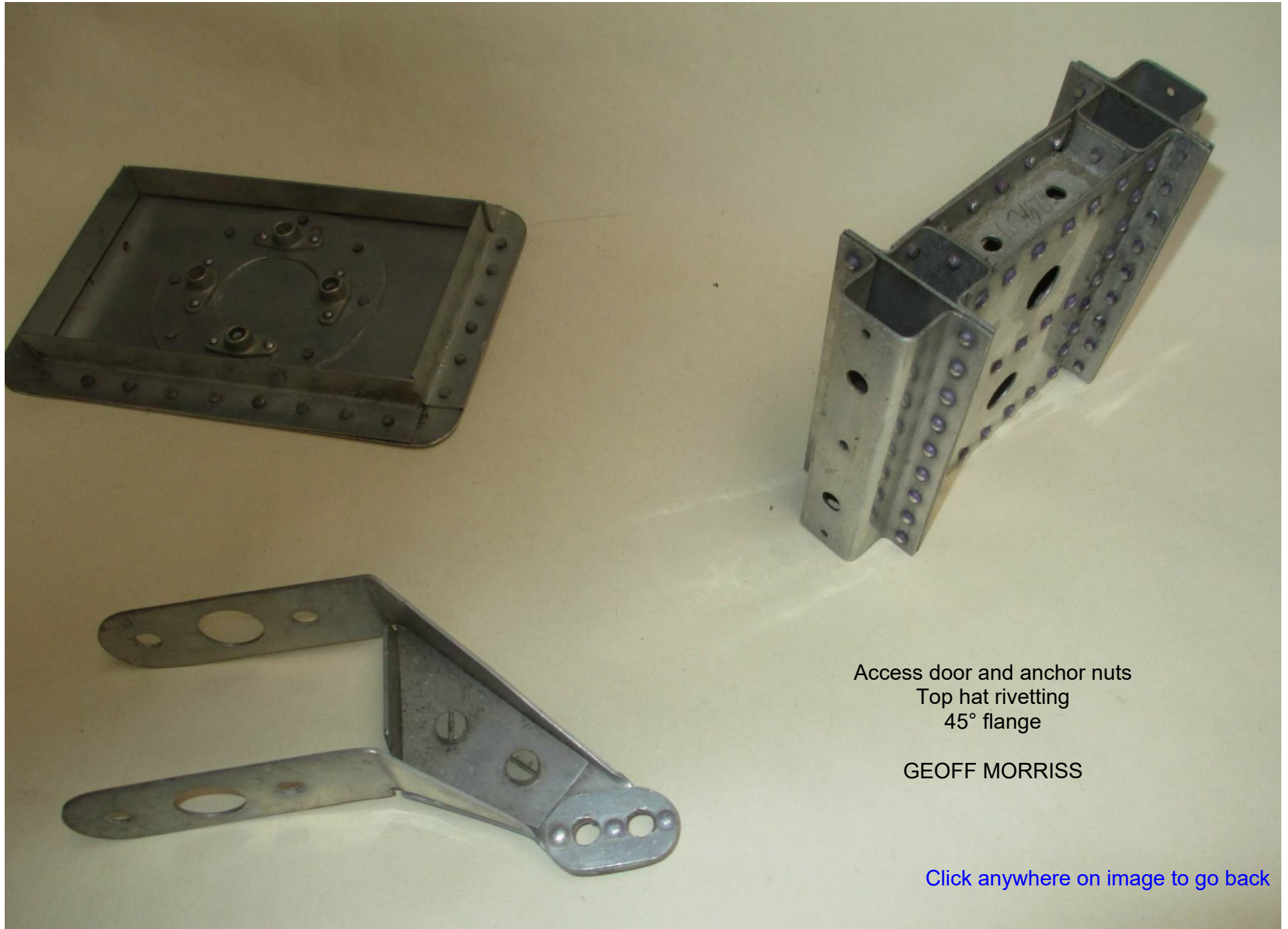




Pyramid flange  
Straight sided flange  
Three stepped angles plus centre holes  
and 1/16 rivet holes  
Tube and tube support

GEOFF MORRISS

[Click anywhere on image to go back](#)



Access door and anchor nuts  
Top hat rivetting  
45° flange

GEOFF MORRISS

[Click anywhere on image to go back](#)





Two handled die holder plus die  
Spanner -11/16 A/F  
Fitting exercise - block within two blocks

GEOFF MORRISS

[Click anywhere on image to go back](#)







Turning with five diameters  
Steel angle gauge

GEOFF MORRISS

[Click anywhere on image to go back](#)



Sheet strip and hinged tubular end  
Rivet exercise - 39 rivets and 5 anchor nuts  
Small folded bracket

GEOFF MORRISS

[Click anywhere on image to go back](#)





Tool makers clamp

GEOFF MORRISS

[Click anywhere on image to go back](#)



Clamp made by Roy Branson in 1957.



[Click anywhere on image to go back](#)





Die holder made by Nick Ruston in 1952/3

[Click anywhere on image to go back](#)



The first exercise given was usually to make a rectangular hole in a block into which another rectangle would fit perfectly. If this was done well the apprentice was allowed to drill and tap holes for threaded studs.

[Click anywhere on image to go back](#)





MILLING MACHINE MODEL

made by students of

The de Havilland Aeronautical  
Technical School

early 1950s

Version 1 (Unpublished.)

Version 2 Published October 2016.

Version 3 Published October 2017. Change of layout (now all landscape). Additions:  
Robin Webb's 'Ultimate Apprentice Exercise', donated to the Display 18th October 2017.  
Martyn Ames' 'World Cup'. Ted Lawrence's workpieces and toolbox.

Version 4 Published November 2017. Additions of Barry Kensett's cramps and fruit bowl.

Version 5 Published January 2018. Addition of Barry Kensett's Comet 3 casting.

Version 6 Published March 2018. Addition of more toolboxes; now two pages of toolboxes.

Version 7 Published April 2018. Addition of Ken Watkins' toolbox.

Version 8 Published April 2019. Addition of donations from Ed Martin and Graham Joiner; addition of matchbox holder.

Version 9 Published October 2021. Addition of oil can made by Hugh Langrishe.

Version 10 Published May 2024. Addition of model milling machine. Index added to front page.

Version 11 Published July 2024. Addition of new pages 2 & 3 of photographs of the display.