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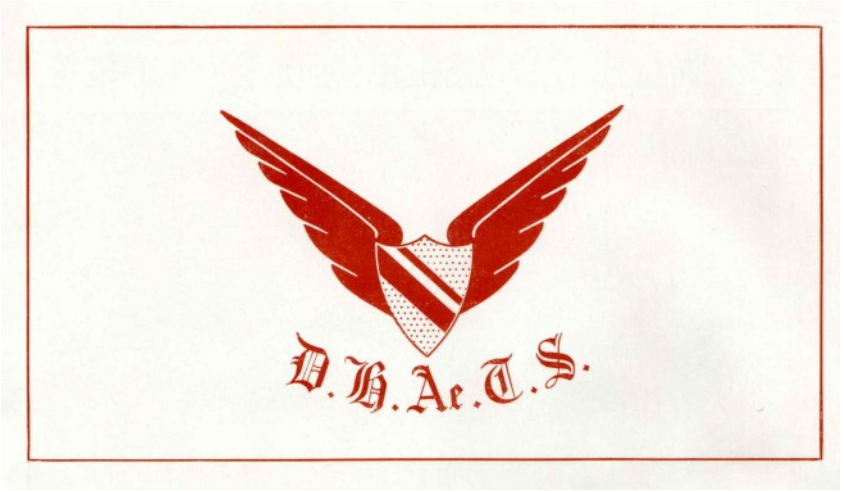
Roger de Mercado
Secretary, de Havilland Aeronautical Technical School Association
9 Kitts Moss Lane
Bramhall
Stockport
SK7 2BG

Email r.demercado@ntlworld.com
Tel. 0161 439 2635



A Brief History

of the

de Havilland Aeronautical Technical School

Established 1928

The first of its kind in the aeronautical world

Roger de Mercado

October 2018

Introduction

The de Havilland Aircraft Company was registered on September 25th 1920. Operations were set up at Stag Lane Aerodrome at Edgware, a wartime training airfield occupying 76 acres. At this time there was just one small house near the aerodrome. Leased initially, the site was bought the following year with the substantial help of Alan Butler, who became chairman of the company in 1924.

By 1928 the Company was well established, employing some 1,500 people. It was foreseen, primarily by Frank Hearle, that a training scheme was needed to ensure a supply of skilled engineers. The existing facilities for premium and trade apprentices gave limited experience and did not provide training leading to qualifications. A series of lectures was organised for those wanting to obtain Air Ministry licences. The Company decided to establish an evening school in which instruction would be provided. The Middlesex Education Committee supported the undertaking. This was the foundation of the de Havilland Aeronautical Technical School.

Flight magazine recorded on 8th January 1932 that "It is the pioneer civil aeronautical technical school in the world, and its activities have been officially recognised by the Air Council, Board of Education and Middlesex Education Committee."

Initially the course length depended on age at entry, varying from three to five years. Many of the early students were from overseas. In 1932 design studies were added to the curriculum, to enable students to sit Royal Aeronautical Society examinations. By 1935 a production engineering course had been added to cover the requirements of the Institute of Production Engineers.

Although overall management of the School and the training of aircraft students was transferred to Hatfield in 1934, engine and propeller students continued to be trained at Stag Lane. During World War 2 the Stag Lane training workshops were moved to Kingsbury Works, where Vanden Plas were engaged in building Tiger Moths and Mosquito wings.

Major expansion in the decade from the late 1930s to the late 1940s resulted in de Havilland acquiring sites at Lostock, Leavesden and Chester. Schools were set up at all these sites, providing at least workshop training. After the take-over of Airspeed in 1951 the schools at Christchurch and Portsmouth became part of DHAeTS.

The Company became the de Havilland Division of Hawker Siddeley Aviation in early 1960. In April 1965 Hawker Siddeley Aviation and Hawker Siddeley Dynamics absorbed the Aircraft and Propeller Companies. The Engine Company had been acquired by Bristol Siddeley Engines in late 1961, that company being acquired by Rolls-Royce in 1966.

The School at Hatfield continued to operate with the name de Havilland until 1965, but by the end of that year it had become the Hawker Siddeley Aviation (Hatfield) Apprentice Training School.

This booklet reproduces contemporary accounts of the early days and relates some post-war activities of the School. It is inevitably incomplete and is likely to contain errors and to have made omissions! Please advise amendments to me; contact details are on the back page.

Roger de Mercado

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From DH Gazette 1929, by Captain Alan Eadon

Just over a year ago, the de Havilland Aircraft Company Limited clearly foresaw that the general development of aircraft warranted the establishment of a separate department to deal with the problem of education. At this time the Company was offering facilities for premium and trade apprentices, but both of these schemes gave rather limited experience and did not provide to the full the training necessary to conform with the requirements both of the Air Ministry and of the industry. A series of lectures was organised for apprentices and ground engineers who were considering taking their licences at the Air Ministry, and considerable success was obtained in the number of licences granted in this initial period.

Theoretical training facilities exist, of course, at certain Institutes in London, but it was found, in most cases, to be impracticable for apprentices in the Stag Lane works, on account of distance and consequent late hours, the latter impairing the benefit of workshop knowledge gained during the day. The Company therefore decided to form students, apprentices and any employee desiring training into an evening school in which theoretical and technical instruction of all kinds should be provided. During the working out of the scheme a happy idea occurred that perhaps government support could be obtained; the Middlesex Education Committee, approached through the Board of Education, at once responded by giving the necessary support to this undertaking. With the knowledge that the Technical School, the first of its kind in the aeronautical world, is viewed with favour by the Government, the Company will have no hesitation in expanding its efforts on the educational side of the industry, as opportunity and necessity dictate.

From a full-page report in Flight magazine, December 1929, about the de Havilland Annual Works Dinner

Mr. Butler then recalled some of the outstanding "Moth" successes during the past year.

Captain Geoffrey de Havilland, who was greeted with deafening applause, said the success of the company was due to the enthusiasm of the staff. He fully appreciated the very good show they had put up and thanked them all very sincerely.

Mr. Hearle said that he perhaps more than anyone else of the board appreciated in detail the excellent work which everyone had done during the year. Civil aviation was growing quickly, and what worried him was the thought that shortly there would not be enough skilled engineers. With the experience of the de Havilland Aircraft Co. it was natural that operating firms should come to them for good engineers. They had started an educational section, and already this had done very well. Many students had gone for their ground engineer certificate, and thanks to Mr. Eden they had got good results. He asked them to do their best to extend help and courtesy to every visitor to the works, so that visitors would want to come again.

The reference to "Mr. Eden" is to Captain Alan Eden-Eadon, the Principal.

Great Oaks… by Wing Commander O. W. Clapp, Pylon Spring 1946

The de Havilland Aeronautical Technical School dates from the year 1928 and was the logical outcome of the existing apprenticeship scheme of training, which was of course too limited in scope to deal with the training of Aeronautical Engineers.

The School at its inception was directed by Captain A. T. Eadon, F.R.Ae.S., who continued as the Principal until the middle of 1932. It was the first school to undertake the training of ground engineers, and as the G.E. licence had become an essential requirement for the repair and maintenance of civil aircraft, it follows that the Company was faced with the problem of how to give instruction and maintenance experience to the many eager applicants for Ground Engineers' Licences.

In those early days the country was undergoing the slump in trade which was part of the aftermath and legacy of the 1914-18 war. The aircraft industry was at a low ebb and it was a hand-to-mouth struggle to keep going. By 1933, however, the industrial tide had turned, and during this particular year the de Havilland Aircraft Co. Ltd turned out more aircraft than the whole U.S.A. production – an inspiring record!

With the growth of the aircraft industry the School had to be expanded to meet the increased demand. By 1930 the School was well established and perhaps a hundred ground engineers, draughtsmen and aircraft executives had passed through the school and were beginning to spread themselves around the earth, wherever the ubiquitous "Moth" was to be found. Naturally, the de Havilland Company was quick to offer posts to these young men, who, although they lacked experience, were white-hot with enthusiasm and enterprise. The school as primarily envisaged was meant to supply the Company with trained staff, but so great was the enthusiasm of its ex-students in spreading the news that a successful school was in being that hundreds of young men applied for admission. Unless the school was expanded beyond its original conception it could not accept these applicants. However, a new and progressive policy was laid down. The school premises were enlarged, more instructors were engaged, and the new policy was launched by Captain Eadon, the first Principal of the school.

Epoch II 1932-1939

By the middle of 1932 the school had 80 full-time students, most of whom were training to be ground engineers, under their Chief Instructor, Mr A. W. Seeley. A small but active Drawing Office was started by Mr Marcus Langley, under whose subsequent guidance the first two student-built aircraft were designed. At this time, June 1932, Captain Eadon accepted the post of Director of Civil Aviation (India), and the school was taken over by Squadron Leader O. W. Clapp, M.I.Mech.E., A.F.R.Ae.S.

This is really the beginning of the second epoch. The Company's business was now expanding rapidly, new designs were produced, and so great was the volume of business that it was foreseen that the Stag Lane premises would be inadequate to handle it. Further, the general building programme of the London County Council had surrounded the aerodrome with building estates, and flying from the aerodrome with faster and heavier aircraft was incurring a risk that decided the Directors to enlarge the Hatfield site.

The new aircraft factory was built at Hatfield and the Technical School was transferred there in January 1934. The engine factory still remained at Stag Lane, as did

Books:

'From Vampire Trainer to Twist Mill', (A Hawker Siddeley Aviation Apprenticeship *[at Chester]* Recalled), Anthony J Robinson. Available via Roger de Mercado.

'An Aviation Life - Reminiscences From Another Age', Mike Benoy. Includes Chester apprenticeship. Available via Roger de Mercado.

Pylons old and new contain many accounts of apprenticeship.

The T.K. Series:

'Apprentice Planemakers', by Ken Pye. Available from the DH Museum.

'de Havilland Aircraft Since 1909', by A J Jackson.

'Magnificent Enterprise - Moths, Majors and Minors, by Janic Geelen.

The Company

The only definitive history of the Company is 'D.H.', by C Martin Sharp. Second hand copies are fairly easy to find (look for the second edition, 1982).

Sir Geoffrey de Havilland's autobiography 'Sky Fever', 1961, is also fairly easy to find.

Mike Ramsden's 'Sir Geoffrey de Havilland' is a profile privately published in 2015, available from the DH Aircraft Museum.

Philip J Birtles' 'Hatfield Aerodrome: A History' was published by BAe in 1993 and has limited availability.

Maurice Allward & John Taylor published 'The de Havilland Aircraft Company' in 1996. Copies can be found.

John Clifford's 'de Havilland and Hatfield', published in 2015, is available in various formats including Kindle.

There are a great many books about de Havilland products, mostly about the aircraft. Search the internet by aircraft (or other product), or visit the bookshop of the DH Aircraft Museum in person or at www.dehavillandmuseum.co.uk. Popular authors are Philip J Birtles and Martin Bowman, among others.

Pylon resurrection

Pylon was resurrected in August 1998 to coincide with the reunion to celebrate the 70th anniversary of the school's founding. It was a compilation of extracts from many previous issues, the earliest being from the very first printed issue of July 1933. This become known as Pylon 70. Another reunion was held in August 2003 for the school's 75th birthday. For this a completely new edition was compiled: Pylon 75. For a while, it was felt that the next issue would mark the school's 80th birthday. An awareness arose that some of the more mature members might not be completely happy to wait that long, so an interim edition was produced, issued for Christmas 2005. Pylon 80 appeared for the 80th anniversary in 2008. Pylon 2011 filled in the gap before Pylon 85 in 2013 for the 85th anniversary. Pylon 2015 appeared in that year and Pylon 90 was published in June 2018.

School Records

Regrettably, none of the individual records kept at Hatfield survive. Those not destroyed by the bombing of 1940 were destroyed by the carnage when the site was closed. The album of named group photographs disappeared. However, all the photographs taken by the Hatfield site photographer were relocated to the BAE Systems Heritage Archive at Farnborough. All the group photograph negatives that could be found have been scanned and are included in the digital album available on the Association website. Also on the website is a separate album of informal photographs.

Other sites' records similarly appear in general to have not survived, although by chance a set of Lostock apprentice intake photographs, with names, was acquired in June 2018 and is now on the Association website.

Some issues of Pylon recorded examination successes, also reported on sporting and social activities, so references to students can sometimes be found.

DHAeTSA membership records and newsletters contain a great deal of material, of course.

Further reading

Apprenticeship

On the website www.dhaetsa.org.uk:

DHAeTS Prospectuses 1937, 1945, 1949 and 1955

DHAeTS Stag Lane and Kingsbury

DHAeTS Portsmouth

DHAeTS Christchurch

DHAeTS Chester

DHAeTS Lostock

Apprentice Display at the DH Museum

Squadron Leader R W Reeve

…and many other articles.

the propeller factory which had been started in a small way in 1935. So it can be seen that the training of students would suffer a division, part of the training at Hatfield and part at Stag Lane.

The curriculum was by this time considerably enlarged and the student was undertaking a much more arduous and comprehensive programme. At the same time a demand for a shorter course - three years instead of five - was experienced and an effort was made to condense what is normally a five-years apprenticeship plus relative technical instruction into the brief period of three years. It was necessary for the student to do vocational training for at least forty hours per week and to take a minimum of ten hours technical instruction. It was found that the older students could carry this out without undue hardship. but it was thought rather too strenuous for youths just leaving school. However, a four-year course was instituted to embrace students of seventeen years, and technical instruction was reduced to a compulsory six hours per week. It is fair to say that the majority of the younger students accepted the ten-hour programme. This was a good thing, since the added year at such an intensive rate permitted the introduction of extra subjects for the students to attempt.

First Class Instructors

The subjects included Aircraft Design, Heat Engines, Structures, Jig and Tool Design, Factory Organization and Materials. All these were in addition to Mathematics, Mechanics, Ground Engineering, Navigation and Aerodynamics. The school was fortunate in having for its instructors the cream of the Company's Design Staff, who were years ahead of the textbooks and actively engaged in designing aircraft at the time. It will be appreciated that the student was thus actively in touch with current design problems, right at the start.

By 1936 the school had 200 regular day-time students and the evening classes had to cater for 180 apprentices as well. Three new drawing offices were built and were used in the day-time for Elementary Drawing Instruction under Mr Scott-Lindsley, Aero-Engine Design under Mr Marshall and Aircraft Design under Mr E.W. Dodds. In the evening they functioned as lecture rooms for Jig and Tool Design, Structures. and Heat Engines respectively. In addition. two upstairs lecture rooms and two downstairs were necessary to meet the demand for evening classes.

Real Aircraft

The school workshops occupied about 7,200 sq ft of floor area. They were equipped with gas-heated muffle and salt-bath furnaces, and special testing machines for timber and metal specimens. A test bench with Heenan & Froude brake was built and equipped by the students for testing the Gipsy engines overhauled by them in the Engine Section under Mr Honeywood. The School machine-shop under Mr Collingwood was considerably enlarged in the main factory after the move from Stag Lane. The woodwork section was divided between Messrs Picken, Michell and Wright, and Mr Cobb took charge of the advanced construction and building of aircraft. The metal side was represented by Messrs Glennie, Blackburn, Wakelin and Oaten. Students under the guidance of these instructors constructed twelve aircraft, three of which were designed by the students themselves.

Instead of the students doing exercises which had no ultimate useful value, the policy of building real aircraft parts, which were of course subjected to the same rigid inspection as the parts made by the factory proper, was instituted very early in the training. Although loss by scrap was inevitable, it was surprising how much *did* pass inspection. The psychological value of making parts that were incorporated into the real aircraft was of course enormous, and the sense of responsibility inculcated did much to confirm in the student's mind that he had become an integral part of the Aircraft Industry. Another vital factor that did much to enhance the value of the training was the experience gained by designing aircraft that received a Certificate of Airworthiness in each instance and competed with conspicuous success in the King's Cup Races, Isle of Man Race, Cardiff Race, etc.

"Tekniese Kollege"

The history that led up to this concession has been published in the Pylon on a former occasion, but will bear repetition at least in part. It was never intended to permit students to build and design full-scale aircraft, but it was readily conceded to permit the design of a rudder or complete tail unit, the students carrying out all the stress calculations exactly as for a serious commercial design inaugurated by the Company itself. The Directors were duly persuaded to sanction full-scale design, after much discussion with the Principal. It was pointed out, on behalf of the students, that Architectural students were encouraged to make designs of such structures as cathedrals, art galleries, and other noble works, but the Aeronautical student was restricted to doing very minor parts. Of course it was logical, since the young ex-student would not be called upon in either profession to do more than minor routine work at first and would gradually mount the ladder of experience, accepting responsibility with the advance of years.

However, the undoubted success of the first design justified the welcome concession and inspired a better and faster machine for a second design. The Technical School aircraft were known as the T.K. series. T.K.1 was so called because a Dutch student was prominent in the initial stages of its design and labeled his drawings "Tekniese Kollege". This amused his fellow students and caused some good-natured banter, but the name stuck and subsequent machines have been called T.K. It is also true that T.K.1 had TK as the final letters of its Registration (G-ABTK), but this was due to the fact that the Air Ministry Register had arrived in the vicinity of ABTG or ABTH, and as a special favour the School got on the waiting list and secured ABTK. Naturally most people think that it was because of this registration that the series was called T.K., but this is not so. AETK was T.K.4 and the application was made at just the right time to secure the TK termination.

A Winner

The aircraft T.K.4 was a world-beater; its speed per horse-power put it into the world-record category and the machine had in fact been entered for a world record attempt. Unfortunately, two or three days before this was due to take place it crashed. T.K.4 went round the King's Cup course during the race at 236 mph, and to beat the record it had to do better than 190 mph, so unofficially this had already been done by a handsome margin. There were several important features about the T.K.4 that wartime students may not already know, but which may now arouse their interest. First, the machine was designed,

The Old Boys' Association

The de Havilland Aeronautical Technical School Old Boys Association was inaugurated in March 1951. By 1953 the Association had some 450 members, including 35 in Canada. It was largely Hatfield orientated, although for a time there was a Northern Branch, and membership was primarily for ex-students. Dances and reunions were held at Hatfield and dinners in London at Simpsons-in-the-Strand.

It survived the take-overs and mergers, but by the end of the 1970s it was somewhat moribund, with even suggestions that it should be wound up. However, the decision was made to revitalise the Association by contacting as many former students as possible. The then Secretary, the late Mike Rogers, sent notices all the world's aviation journals, resulting in many renewed contacts. A successful 30th anniversary reunion, attended by 300 people, was held at Hatfield in May 1981. Another reunion was held in 1984. From then on the mainstay of the Association was the late Bruce Bosher. The membership was widened to include all ex-apprentices from all former de Havilland sites with but one stipulation: that they must have joined the School while it bore the name 'de Havilland'. Thus the last eligible intake was that of 1965. The name was shortened by dropping the 'Old Boys' part of the title (inappropriate anyway as there had always been occasional girls.)

> The committee of the de Havilland Aeronautical Technical School Old Boys' Association is again organising events and a reunion at Hatfield in May 1981 is being planned. The association wants to contact members and find out what they are doing now, and if any retired members are willing to help with administration. Contact secretary Mike Rogers, Drumnessie, Ivy House Lane, Berkhamsted, Herts HP4 2PP; telephone 04427 4127.

'Flight International' 10 January 1981

Until the closure of Hatfield in 1993 there were occasional reunions there, the last being in 1994. The main annual event became the enduring association with the de Havilland Moth Club's annual Rally. Coincident with the Rallies of 1998, 2003 and 2008 there were reunion dinners at Aspley Guise, near Woburn, to celebrate the 70th, 75th and 80th anniversaries of the founding of the School. The 85th anniversary event was a lunch at Old Warden, home of the Shuttleworth Trust. The de Havilland Museum at Salisbury Hall, a fitting venue, was chosen for the 90th anniversary celebration lunch, attended by 85 people including 43 members.

The original OBA published occasional newsletters called The Stag (after the Hertfordshire symbol). The North American Branch, primarily Canadian, published a series of newsletters called Chinook (a Canadian tribe). Chinook was of a high standard, better than the Stag, and lasted longer. DHAeTSA recommenced newsletters in 1982 with, after a very long gap, the last issue of The Stag. The first under the DHAeTSA masthead appeared in Spring 1985 and at present is published three times a year. Originally typed and photocopied using Company facilities, in later years it was created on home computers and printed at first on a laser copier, then on inkjet printers. The advent of email enabled distribution by that means, the number of recipients increasing slowly from a few to the present 60%.

Membership of DHAeTSA remains strong, with nearly 500 members worldwide. Even now, former apprentices appear "out of the woodwork" to mitigate the inevitable toll of years. There is a website at www.dhaetsa.org.uk.

The Pylon

No history of the School would be complete without mention of The Pylon, the magazine of the students. The first issue was dated October 1932, typewritten as was the next issue in January 1933. At least 15 issues had been published by Christmas 1939. It contained a mixture of learned articles, humorous pieces and news of School activities, The volume and issue numbering suggests there may have been up to three more issues, of which no copies are known. Production had to cease during the war and resumed in Spring 1946. Issues appeared sporadically until Winter 1954, after when there were none until the final run from Winter 1963 to Summer 1970.

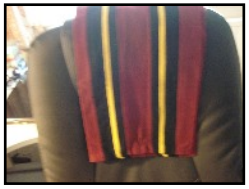
Blazer Badges, Ties and other apparel

It was recorded in Pylon Jan – March 1934 that "The School now subscribes to the College of Heralds and has a badge of its own". The 1937 School Brochure stated that "A winged shield in gold, maroon and black is the School badge, and ties and badges in School colours can be obtained at the School office."

There are no known images of the pre-war design, but in the 1950s it was as shown below left. At that time it was available from a shop in St Albans. From the 1980s onwards several recreations of the badge have been organised by the Association from various suppliers, the most recent shown below right.

The earliest design of tie is not known. Various designs were commissioned by the Association, the most common being as shown far left. There are also some with the wings motif, mostly on a blue background although some have a brown background, as shown near left.

There was also a scarf and a lapel badge.



built and stressed by the students. It was fitted with a standard Gipsy Major engine, but a special airscrew was designed by an ex-student. It was the smallest V.P. airscrew in the world, and it functioned perfectly.

Mr Dowty Helps

The retracting undercarriage was likewise the smallest in the world. It was of Dowty design and was a conspicuous success. Its history is itself interesting. Mr Dowty, on being approached to undertake the design, only consented under pressure, owing to the fact that he was otherwise heavily engaged and suffered from an acute shortage of draughtsmen. He also lacked the necessary space. All this was true, but the Technical School intended to have a retractable undercarriage by hook or by crook and finally Mr Dowty consented to allow two of the students to work under his Chief Designer, Mr Bounds (a former D.H. man by the way), who was most sympathetic.

So energetic were the students that within the first week they made forty-three drawings of the undercarriage. Each evening they posted the prints of the day's work to the school, and the school in turn got down to the manufacture of the parts indicated on the drawings so that when the last of the 140 drawings arrived, only a day or two elapsed before the complete undercarriage was assembled and ready for test. The school made a third leg for "Type-test" purposes and these tests actually took longer to make than did the design and building of the undercarriage itself. Several of the students subsequently became members of Mr Dowty's staff.

T.K.4 was fitted with Handley Page slots. These must also have been the smallest in the world. Flaps of the same diminutive scale added to the novelties compressed into the dynamic little craft. There are still two more historic features. The fuselage was made of the plywood and balsa construction now so familiar, and the Perspex cupola is worthy of special mention as it was the first moulded "glassware" to be made.

A Canard

The next design to be built, T.K.5, was a Canard, or tail-first machine, which was not quite ready for flight test at the outbreak of war. T.K.6 was on the drawing-board, and was to have been a serious attempt to construct a small aircraft with a reasonable top speed, and to bring the landing speed within the trolley-bus range.

Mention must also be made of the Engine Design Section of the school. The drawings of a four-cylinder inline type air-cooled aero-engine were almost complete, and crank-case patterns were being made in the school, when the war interrupted the project. This effort was perhaps the most progressive and ambitious yet attempted by the school up to this time, and it is certain the engine would have been built but for the war.

Tradition and Example

This brief summary of the history of the D.H.Ae.T.S. does not do the school full justice, as many of its activities have not been mentioned, but when the whole facts are known, the present-day students will realise that a tradition has been built up of which they can be proud. A considerable number of these devoted and loyal lads have sacrificed their lives to the common cause to save England from slavery, humiliation, Belsen, and perhaps something worse; whilst others, more fortunate, have survived the struggle and have been rewarded for acts of gallantry and devotion to duty. The standard set by these

students and ex-students is an example that the present students will do well to emulate, and it is to be hoped that they will be inspired to work, and play, with a seriousness that they owe to the traditions so laudable and hard-won.

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Aircraft built by students

Stag Lane
1931 D.H.9J G-ABPG built as a full scale exercise.
1932 D.H.60G Gipsy Moth G-ABTS; engine made up from reject parts.
1932 D.H.60G Gipsy Moth G-ABXT.
1933 D.H.60G Gipsy Moth G-ACAM; sold to two graduates, who flew it to Delhi.

Hatfield
1934 D.H.82A Tiger Moth G-ACPS for the London Aeroplane Club.
1935 D.H.82A Tiger Moth G-ADGO also for the London Aeroplane Club.
1935 D.H.60G111Moth Major G-ADIO (Hatfield's last wooden biplane).
1937 D.H.82A Tiger Moth G-AEVB for the de Havilland School of Flying.

Aircraft designed by students; some built
1933 T.K.1 G-ACTK (see **NOTE** below).
1935 T.K.2 G-ADNO.
T.K.3 Not built.
1937 T.K.4 G-AETK.
1939 T.K.5 G-AFTK. Flight attempted, but failed to become airborne.
T.K.6 and T.K.7. Design studies abandoned on outbreak of war.

For more about these aeroplanes see **Further reading** at the end of this booklet.

NOTE:
A single example of the D.H.81 Swallow Moth monoplane was flown in 1931, in two versions (with and without a canopy) and eventually parked in a corner of Stag Lane airfield in early 1932. It is believed that students had seen the abandoned aeroplane, were encouraged by tutor Marcus Langley to think of ways of improving it and used the basic fuselage as a starting point for the biplane T.K.1 design. The T.K.1 fuselage was used later to build the first D.H.94 Moth Minor.

carry children on Sports Days and other special occasions. It was given to the Bournemouth Engineering Society.

In 1955 a group of Engine Company apprentices at Stag Lane designed and built a working Fenland Beam Engine, which eventually was donated to the Kew Bridge Steam Museum at Brentford.

A Druine Turbi, for which the registration G-AOTK was obtained, was built by a group of apprentices, with company encouragement and mostly in their own time. They began in 1955 with Roger Druine's sketchy outline plans, amplified by a visit to the original Turbi in France. Major components were assembled at Hatfield Technical College and some small items were made at Astwick Manor. The engine, twenty years old but new and unused, was overhauled by Stag Lane apprentices as a supervised workshop exercise. The building of Turbi was very much in the spirit of the original TK series. It took three years to the point of final assembly and pre-flight checks. Pat Fillingham (a former student) made the first flight on 9th August 1958. It was the first amateur post-war ultra-light project to be initiated in the UK and the aeroplane is still airworthy.

In 1958 a four-man bobsleigh, designed by former student Mike Costin of Lotus fame, was made at Astwick Manor for Henry Taylor of the British Olympics team.

The D.H.53 Humming Bird G-EBHX was restored in 1960 for the Shuttleworth Trust, with Chris Capper, a Company test pilot, making the post restoration flight. It was flown by The Shuttleworth Collection until it crashed in 2012, killing the pilot.

Apprentices at Leavesden built a functional replica of Geoffrey de Havilland's Iris engine, which was started by Sir Geoffrey on 13 November, 1961. It is displayed by the Rolls-Royce Heritage Trust at Patchway, Bristol.

The Hatfield Man-powered Aircraft Club was set up in 1960 to compete for the Henry Kremer prize. Senior staff of all necessary disciplines, many of them former students, were involved, including John Wimpenny who designed and flew the first machine. Apprentices and a few retired craftsmen made the aircraft at Astwick Manor. Puffin I flew in 1961 and Puffin II in 1965.

The apprentices of what was by then Hawker Siddeley Aviation at Hatfield and Rolls-Royce at Leavesden combined their talents and restored for static display the Science Museum-owned unique C.24 Autogiro. The task of restoration was started by Dr Moult in the early 1960s with the rebuilding of the original Gipsy engine, and the overall restoration was completed in February 1974. It is now displayed at the DH Museum, Salisbury Hall.

The chief designer of the D.H.125, Joe Goodwin, designed his J.G.3 racer for a Rollason competition. Manufacture of the airframe was started at Astwick Manor, but not completed. Pylon for Summer 1965 reported work on this aeroplane, on a replica D.H.1 (to which no other reference has been found), a hovercraft, repairs to the D.H.53 after an accident in 1964 and lastly a computer tape punch machine.

In 1967 Chester apprentices maintained tradition by building a hovercraft that did fly, albeit not for very long. The project was summarily halted due to catastrophic engine failure.

The list above is bound to be incomplete!

places. Some students rented rooms sublet by owners in the four Courts, south to north named Haddon, Cumberland, Rodney and Altham, built in the 1930s on the then-called Barnet Bypass opposite de Havilland's.

A hostel was built at Astwick Manor, adjoining the old building, where students could reside for their first year at a modest cost. As built the hostel rooms were very small, but later were halved in number and doubled in size to make decent study-bedrooms. By then no other Company accommodation was made available and the majority of students lived in digs unless their homes were nearby. Some lived in just for weekdays, going home at weekends, whereas others were seven-day lodgers.

It is not known if any hostel-type accommodation was provided at other sites.

Projects

In addition to the pre-war aircraft projects listed on page 7 and the 'official' projects listed below, there were many 'unofficial' ones, the majority being in connection with students' vehicles of two or more wheels.

In February 1948 the fuselage of Hornet Moth G-ADMT, of the London Aeroplane Club, was stripped down for a major overhaul and rebuild at Salisbury Hall.

Also in 1948 a full scale replica of the original Wright Flyer was built at Salisbury Hall for display in the Science Museum, to replace the original which was returned to the USA. It was assembled at the Science Museum and handed over in October 1948. The aircraft was initially fitted with a wooden dummy engine, but a working replica engine built by the Engine Company apprentices was installed in 1951.

The T.K. series of aircraft was not continued after the war. In 1946 the design of a single blade helicopter with an athodyd ram-jet engine at the blade tip and a counter-balanced rotor was begun. The concept originated with staff engineers in the Design Offices. Designated T.S.1, construction began at Salisbury Hall and some testing was made of the engine. A start was made on the fuselage at Astwick Manor, but the project was eventually terminated by the management.

In 1951, Hatfield apprentices rebuilt at Panshanger the Company-owned Cirrus Moth G-EBLV, flown after the rebuild by Clem Pike, Chief Instructor at the London Aeroplane Club. It is now owned by BAE Systems, kept at The Shuttleworth Trust and flown regularly.

Also in 1951 another team built replacement control surfaces for the airship Bournemouth G-AMJH plus some minor fittings and equipment.

In the same year Chester apprentices restored D.H.88 Comet G-ACSS from a very derelict state to exhibition standard for display at the Festival of Britain.

The Comet Sailing Club's fast Hornet racing dinghy, 'Shearwater', was built at Hatfield and completed in 1952. It was restored by its last owner, Derek Brown, who presented it to the Broads boat museum at Stalham Staithe, Norfolk where it is now on display.

In 1953 a Hucks Starter, once belonging to Airco at Hendon and later used at Stag Lane, was reconditioned at Hatfield. It is now at the Shuttleworth museum.

Also in 1953 the School at Lostock accepted an invitation to repair a sailing dinghy from Cheshire.

In 1955 a 2ft diameter, 15ft wind tunnel was made of wood at Christchurch for Hatfield, probably one of those in the Aero Lab at Hatfield College. Also at Christchurch a model steam locomotive was manufactured capable of pulling a train to

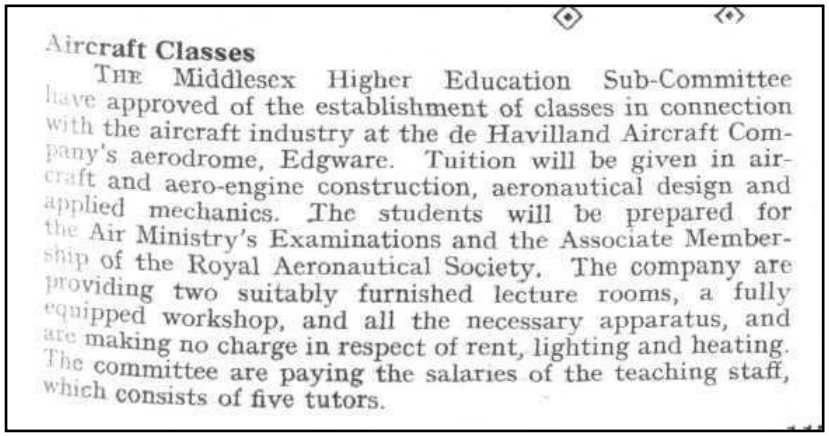
In The Beginning, "By One Who Was There", Pylon June 1949

It was in the early months of the year 1928, when the de Havilland Company was buzzing with the commercial success of the Moth, and at last beginning to feel its feet as a business concern, that the Directors came to the decision that the existing apprenticeship scheme must be radically developed in order that a comprehensive course of theoretical studies in aeronautical subjects could be taken in addition to the practical training. This is how the de Havilland Aeronautical Technical School came into being. Some lectures had been initiated, and to good effect, but they were restricted to the mechanical and maintenance aspects. It was necessary now to create a school in the true sense. About this time, the apprentice supervisor was promoted to a position in the de Havilland School of Flying, which also was expanding. On the factory notice boards appeared an announcement inviting applications for the position of apprentice supervisor and lecturer on aircraft technical subjects in general. I was interested in this notice; I had had experience of most of the practical aspects of airframe and engine manufacture and maintenance, and of lecturing and instructing on several subjects during the first world war and subsequently. I applied in writing for the post. So enthusiastic was I that I almost took it for granted that the job was mine. When it went to somebody else however, I did not lose heart but promptly offered my services as a lecturer in an honorary capacity after working hours. This offer was accepted, and I found myself busily occupied with the new principal in organizing the school and preparing for its future development. After a few weeks even my working hours became partly absorbed in the new task, and it was not long before I was released to the School altogether, to my great satisfaction.

Organizing the theoretical training was not an easy matter. Hitherto the only technical instruction available to the apprentices was in the form of lectures at the Board of Education's evening institutes between 7.30 p.m. and 9.30 p.m. This meant a long day for apprentices who started work at 7.30 a.m. at Stag Lane, finished at 5 p.m., and then had to have a scrambled tea and make a tedious journey in rattling tramcars to the nearest institute about seven miles away, study for two hours, and then make the long trek home again, getting in at 10.30 or 11 at night. And the type of engineering instruction given at these institutes did not at that time have much of an aeronautical bias. Designing and stressing roof trusses, bridges, locomotives, steam and oil engines, and even automobiles, although good basic engineering, did not help too well with the finer aeronautical problems. The difficulty was one of creating a complete evening school of our own without incurring prohibitive expense, and with the recognition of the Board of Education, for whose National Certificates in engineering most of our apprentices were training. There were many discussions with the central and local authorities, and eventually we were permitted to organize a technical evening institute on the Company's premises under the auspices and control of the Middlesex Education Committee, and they approved our classes and the instructors, who were drawn from the Company's senior executives in the design, aerodynamics and stressing departments, and the works. We ran these classes, and practical classes as well, from 6 p.m. to 8 p.m. five days a week, with a strong aeronautical bias, and with the advantage of full recognition by the Board of Education and the county authority. We trained up to the standard of the Royal Aeronautical Society's Associate Fellowship examinations.

The next problem which faced us was the fact that if the industry continued to expand at the same rate as had been apparent during the previous two or three years, some difficulty might be experienced in finding not only sufficient skilled personnel for the construction and maintenance of aircraft and engines, but also competent executives to take charge in the various branches which appeared to be growing from this lusty tree.

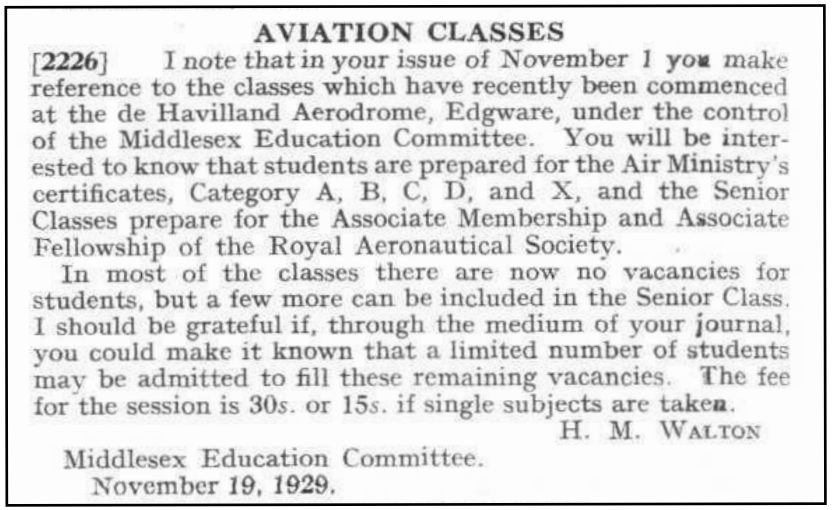
From Flight 1 November 1929



Aircraft Classes

THE Middlesex Higher Education Sub-Committee have approved of the establishment of classes in connection with the aircraft industry at the de Havilland Aircraft Company's aerodrome, Edgware. Tuition will be given in aircraft and aero-engine construction, aeronautical design and applied mechanics. The students will be prepared for the Air Ministry's Examinations and the Associate Membership of the Royal Aeronautical Society. The company are providing two suitably furnished lecture rooms, a fully equipped workshop, and all the necessary apparatus, and are making no charge in respect of rent, lighting and heating. The committee are paying the salaries of the teaching staff, which consists of five tutors.

From Flight 20 December 1929



AVIATION CLASSES

[2226] I note that in your issue of November 1 you make reference to the classes which have recently been commenced at the de Havilland Aerodrome, Edgware, under the control of the Middlesex Education Committee. You will be interested to know that students are prepared for the Air Ministry's certificates, Category A, B, C, D, and X, and the Senior Classes prepare for the Associate Membership and Associate Fellowship of the Royal Aeronautical Society.

In most of the classes there are now no vacancies for students, but a few more can be included in the Senior Class. I should be grateful if, through the medium of your journal, you could make it known that a limited number of students may be admitted to fill these remaining vacancies. The fee for the session is 30*s*. or 15*s*. if single subjects are taken.

H. M. WALTON

Middlesex Education Committee.
November 19, 1929.

Skilled operators for most other branches of engineering had hitherto been provided by means of the ordinary apprenticeship schemes which in most instances required from five to seven years for training in the various trades, and then at the end of these periods the apprentice was usually regarded as an improver for one or two years. We could not

After the Comet disasters of 1954, the subsidy had of necessity to be withdrawn and flying by apprentices became rare.

In the immediate post war years there was a Students' Committee. One section liaised with S/L Reeve about training issues and another arranged social functions. It seems to have faded and an Apprentices' Association was formed in 1957. It was allowed to arrange visits to other factories or places of technical interest, for which time off was allowed, and arranged occasional social functions.

There were Parents' Days at Panshanger and at Stag Lane in 1950, and one at Astwick Manor in 1953. There may have been others, also similar occasions at other sites.

By the 1960s exchange postings to other companies, including some in Europe, took place albeit on a very limited basis.

The Company became the de Havilland Division of Hawker Siddeley Aviation in early 1960. Despite a gentleman's agreement with Sir Geoffrey that the de Havilland name would always be retained, it was expunged in April 1965 by a new HSA managing director. Hawker Siddeley Aviation and Hawker Siddeley Dynamics absorbed the Aircraft and Propeller Companies. The Engine Company had been acquired by Bristol Siddeley Engines in late 1961, that company being acquired by Rolls-Royce in 1966.

The School continued to operate with the name de Havilland until 1965, but by the end of that year it had become the Hawker Siddeley Aviation (Hatfield) Apprentice Training School.

Astwick Manor continued to be used for the training of company apprentices until 1984, following which it was used by St Albans College for practical aeronautical training. It is now a gated site of private apartments.

Awards

All the Schools had their own site awards schemes, but the major award in post war years was the August 23rd Memorial Prize. It was created to commemorate those who lost their lives in a Mosquito collision on August 23rd 1943. A Mosquito piloted by John de Havilland with John Scrope, of the Aerodynamics Dept., as observer collided near St Albans with another Mosquito, piloted by George Gibbins with Godfrey Carter, flight shed supervisor, as observer. All four were former apprentices or students of DHAeTS.

The award was for the best apprentice of the year throughout the Company and was first awarded in 1944. The Prize was a certificate and a small sum of cash (ten pounds in 1952). It was last recorded as being awarded in 1969, but may have continued for a time thereafter. In 1986 it was revived when Hatfield was managed by Charles Masefield, but lapsed again after 1990. See 'de Havilland Memorials' at www.dhaetsa.org.uk for the names of winners and photos of the award noticeboards.

Accommodation

Many students lived in digs. In the Hatfield area, from 1941 there was some accommodation at Sherrards on Digswell Hill, near Welwyn. It had been used previously as the woodwork training centre. Longfield House in Hatfield, not far from the main gate of the factory, was also used for accommodation. Ex RAF Nissen huts at Ellenbrook Camp, south of the post-war Service School, were used for a short time, with the Spartan conditions and periodic flooding remembered still by former occupants. Anecdotes have emerged over the years of various escapades and adventures at these

Astwick Manor

In 1948 the Hatfield School moved to Astwick Manor on the northern boundary of Hatfield Aerodrome. The administration and drawing offices were there, with Nissen huts outside used at first for lectures. Later the Airspeed Horsa hangar (not the Mosquito hangar as recorded in some places) from Salisbury Hall was moved to Astwick Manor where it was equipped as workshops and the junior drawing office.

It was formally opened on 18th June 1949 by Lord Salisbury. The occasion was a grand affair, celebrating also the twenty-first anniversary of the School. There were exhibitions of work, tours of the factory and a flying display.

Astwick Manor continued to be the training headquarters where the curriculum was expanded to include design, production and maintenance engineering courses, backed up by practical experience in the aircraft, propeller and engine factories. Theoretical instruction was given by Company staff, some of whom were qualified to set examinations for the Royal Aeronautical Society. In 1952 Hatfield Technical College was opened, built on land donated some years previously by Alan Butler, and classroom instruction transferred there. For a time there was a machine shop annexe in the old Public Hall, Hatfield.

In the first year all apprentices undertook training in the School's workshops. This started with work on the metal fitting bench, the first exercise teaching the use of files, drills, taps and dies. The task of making a perfect rectangle of mild steel, then cutting a hole in it into which a smaller rectangle fitted perfectly, was a challenge, particularly for those without previous training! This was followed by exercises in making tools such as spanners and G-clamps. Next was the sheet metal section, where the trainee leaned to fashion cans, air-scoops and other shapes in aluminium and other metals. Every apprentice had to make his or her own wooden toolbox, where skill had to be gained in dovetail joints, the fitting of drawers and french polishing. One was given a list of basic tools that had to be bought (usually at Tingey's of Hatfield) before going to the factory proper. Many toolboxes - and their contents - have lasted through the years, often still in regular use. The apprentice learned the use of machine tools, including lathes and milling machines, and was often encouraged to make components which could be of future use, or be part of an ongoing project allocated to apprentice training. Engineering apprentices also had a few weeks' instruction in draughting. DHAeTS provided workshop training to apprentices of British European Airways and of British Overseas Airways Corporation.

The very best apprentice workpieces were displayed at a cabinet in the vestibule and were regarded as unattainably perfect by the majority of trainees. Regrettably, the fate of these items is unknown.

In 1947 ownership and management of the London Aeroplane Club (LAC) was taken over by the School. The LAC, formed at Stag Lane in 1925, was one of the first flying clubs in the world. It was one of the first occupants of Hatfield Aerodrome. Activity ceased during WW2, but was resumed at Panshanger after the war. The Club was open to the public as well as to company employees and students. Students undergoing training for Aircraft Engineers' Licences got practical training on Club aircraft. Flying instruction was on three Tiger Moths and two Hornet Moths. School students accounted for 60% of the flying, the cost being subsidised by the Company.

afford to wait so long for the results desired, so we hit upon a plan of offering highly concentrated courses of training to University graduates, public school boys, and others who had attained sufficiently high standard of education required for entrance as students of the Technical School. The courses were of two, three and later four years' duration according to the age of entrance, namely nineteen, eighteen and seventeen years respectively, so that the student would attain his majority on completion of the course in each case. To meet the cost of the scheme, the idea was that the student, or his guardians, would pay a sufficient premium, and in return the student would receive highly concentrated training of both a practical and a theoretical nature for the whole of the period, in order to fit him for an executive post in whichever branch of the industry he desired or was most suitable. However, we cautiously proceeded to sell the idea before putting it before the Company, and it was well received. In fact we received inquiries for about ten or twelve bookings before we were able to acquaint the managing director with the full facts. From then on, although we limited the number of applications accepted, we very soon had quite a respectably long waiting list. Student No. 1 came from South Africa, stayed in this country for a while for further experience on completion of his course, went to India for a time, obtained a commission in the R.A.F. during World War II, and is now in East Africa with a charter company formed by himself and two other ex-students who had joined the school a year or two later than he did.

We had already acquired a corner of the works plant maintenance workshop and had equipped it in some measure with our own personal tools and such aircraft and engine material as could be spared without interfering with works production, but this room proved totally inadequate for our needs. This very soon became obvious to the Managing Director who arranged for a complete re-arrangement of some of the works departments in order to supply us with a suitable building. The next job was to equip our new premises. We had already acquired a few woodwork and metal work benches complete with vices, but we needed more material for instructional purposes. I well remember starting out one morning with a pocketful of "Bradburys" *[the first pound notes were signed by John Bradbury]*, and after persuading the firm's transport manager to loan to me for the day his largest lorry complete with driver, proceeding to the Aircraft Disposals Company at Croydon Airport and purchasing for spot cash a complete Avro 504K aeroplane in skeleton, a R.R. Eagle VIII, a Napier Lion, a Monosoupape Gnome engine, a quantity of spare parts, and returning in triumph to grace the new workshop with them in addition to a B.R.II Radial Engine which a mutual friend of ours had so kindly presented to us. We also acquired a couple of Gipsy One engines and a Cirrus I Engine in addition to the remains of a crashed D.H. 60 Moth. At this stage we had an addition to our stall in the person of our first engine instructor who incidentally is still with the school. I would here like to pay tribute to his untiring efforts to make his part of the school a success. Nothing was too much trouble for him to undertake, no task too menial, if it was for the benefit of the school. He would work both early and late to tidy up the workshop before the students arrived in the mornings and after they had left in the mornings to make ready for the day's instruction In these days the staff had so much to do and so little time in which to do it that it was often that the gatekeeper enquired whether we belonged to the day or the night shift when we were proceeding homewards much after hours.

The early students were equally enthusiastic and worked with a will not often equalled in these later days. Some of them from abroad, particularly from the East, found our ways, hours of work and climate a little too exacting until they became used to what to them must have been a radical change. I well remember one of the senior Directors of the Company flying a Moth and on coming in to land he flew over the school workshops. On landing he immediately telephoned us to say that he was rather perturbed to have seen from his machine what appeared to be a body spread-eagled on its back on our roof. He wondered whether he (the body) had fallen out of another machine on to the roof as he appeared to be badly bruised about the face. On investigation we discovered that it was one of our students from the East enjoying his midday siesta in the sun as was his wonted custom in his own country.

The remains of the crashed D.H. 60 Moth previously mentioned we proceeded to rebuild as an instructional exercise. It first became a test bed for running the Gipsy and Cirrus instructional engines built in the school, and later, when we had repaired and rebuilt the wings a rigging exercise. We then conceived the bright idea of removing the top wings and attaching the bottom ones only by means of long struts to the fuselage and to use it as a monoplane for taxying instruction; the idea being that by removing the top wings the machine would be safer as it could not then take off if the engine was opened up while the stick was not held correctly for taxying by an inexperienced student. This, however, did not meet the case, for thanks to the original excellent design of what was left of the machine, it was really difficult to prevent it from flying. We overcame the difficulty by removing the entire leading edge section of both the lower main planes thus presenting the full depth of the front spars to wind. Having made progress with the reconstruction of the taxying machine the students were anxious to build an aircraft, but the time was not yet ripe, due to lack of facilities. About this time we constructed a quarter-scale working model of a Gipsy Moth, including such details as differential aileron control.

The building up of our technical library was expensive and, therefore, gradual. It began, I remember, with our own personal books. Through a friend of mine who was connected with the Carnegie Trust libraries controlled by the Middlesex County Council, and after interviews with the Chief County Librarian at Hounslow, I obtained permission to draw practically all the stock of technical books from the main County library and to establish a centre at Stag Lane. To this we added a fiction library for leisure hours - should the students happen to have any. About this time we formed a social and sports club for the students. Many attempts had been made by the directors previously to establish a sports club for the works, but without any outstanding success. The fact that the students were keen on sport, however, awakened an interest among the works personnel which hitherto had not been stirred. All this movement had the most agreeable outcome, and the two clubs were later combined to the advantage of both.

As an extension to the social amenities of the School we promoted the idea of an annual students' ball, the first one of which was held at the Portman Rooms in Baker Street, London, WI, and was an outstanding success far beyond our expectations. We did not anticipate at the first that all the students would be really interested so as an added attraction we took the risk of inviting the directors of the company as well as the senior executive staff and all the important people in aviation circles to come along to meet the students there. To our surprise most of them turned up, and the whole show

More examples of **Certificate of Due Service**

CERTIFICATE

This is to certify that KEITH RATCLIFFE has completed his Apprenticeship with this Company in the course of which he has trained in the following departments.

SCHOOL	FROM	TO
Machine Section	23. 8.54.	18.12.54.
Fitting Section	18.12.54.	16. 4.55.
Machine Section	16. 4.55.	3. 9.55.
Drawing 1 day per week throughout this period.		
WORKS		
Tool Room	3. 9.55.	4. 8.56.
* Inspection Department	4. 8.56.	24.11.56.
Machine Shop Lathes & Drills,& Milling	24.11.56.	7. 9.57.
London Drawing Office	7. 9.57.	31. 3.58.
Missile Development	31. 3.58.	14. 7.58.
Missile Guidance Mechanism	14. 7.58.	9. 2.59.
Thermodynamics	9. 2.59.	6. 4.59.
Missile Test Site	6. 4.59.	23. 8.59.

* Propeller & Guided Weapon Manufacture & Repair.

Regraded to Engineering Apprentice, 9. 9.57.

Gained Ordinary National Certificate, 1958.

Propeller Company courses

CERTIFICATE

This is to certify that Michael O'Brien has completed his apprenticeship with this Company, in the course of which he has trained in the following departments

School	From	To
Fitting Section	31. 8.53.	5.10.53.
Drawing Office	5.10.53.	9.11.53.
Sheet Metal Section	9.11.53.	22.2. 54.
Machine Section	22. 2.54.	24. 5.54.
Fitting Section	24. 5.54.	19. 7.54.
Wood Detail	19. 7.54.	23. 8.54.
Works		
PROPELLERS		
Overhaul Department Propellers	23. 8.54.	24. 1.55.
Assembly Shop Propellers	24. 1.55.	14. 1.57.
Development Propellers	14. 1.57.	6. 1.58.
Drawing Office Guided Weapons	6. 1.58.	31. 3.58.
Development Propellers, Stevenage	31. 3.58.	31. 8.58.

Regraded to Engineering, 9. 9.1957.

Gained Ordinary National Certificate, June, 1957.

Examples of **Certificate of Due Service**

SCHOOL	FROM	TO
Drawing Office Section	7. 1.57	4. 2.57
Sandwich Course - Hatfield Technical College	4. 2.57	28. 6.57
Fitting Section	28. 6.57	16. 9.57
Woodwork Section	16. 9.57	14.10.57
Sheetmetal Section	14.10.57	9.12.57
Machines Section	9.12.57	3. 2.58
Sandwich Course - Hatfield Technical College	3. 2.58	1. 7.58
WORKS		
Fuselage Shop - Assembly fitting on aircraft fuselage	1. 7.58	10.10.58
Fitting Shop - Aircraft detail fitting	10.10.58	30. 1.59
Block Release - Hatfield Technical College	30. 1.59	3. 7.59
Shop Supervision - Assisting Erecting Shop Superintendent	3. 7.59	2.10.59
Wind Tunnels - High speed and Low speed, Drawing Office work	2.10.59	29. 1.60
Block Release - Hatfield Technical College	29. 1.60	24. 6.60
Stress Office - Detail stressing	24. 6.60	16. 9.60
Block Release - Hatfield Technical College	16. 9.60	13. 2.61
Cambridge University - Flight Test Laboratory	13. 2.61	10. 7.61
Aerodynamics Office	10. 7.61	23.10.61
Instrument Test - All types of measuring instrumentation	23.10.61	18.12.61
Flight Development	18.12.61	7. 1.62

Aircraft Company Design course (above)

CERTIFICATE

This is to certify that John Michael Greenaway has completed his Apprenticeship with this Company, in the course of which he has trained in the following departm

School	From	To
Fitting Section	30. 8.48.	23. 5.49.
Senior Drawing Office	23. 5.49.	22. 8.49.
Machines Section	22. 8.49.	31.10.49.
Works.		
Aircraft Fitting Shop	31.10.49.	15. 5.50.
Venom Aircraft Wing Assembly	15. 5.50.	1.12.50.
Perspex and Plastics	1.12.50.	21. 8.51.
Foundry and Press Shop	21. 8.51.	22.10.51.
Servicing and Maintenance of De Havilland type Aircraft	22.10.51.	23. 2.53.
Instruction Course on Dove Aircraft	23. 2.53.	9. 3.53.
Servicing and Maintenance of De Havilland type Aircraft	9. 3.53	13. 4.53.
General Course of Instruction on Propellers	13. 4.53.	24. 4.53.
Servicing and Maintenance of De Havilland type Aircraft	24. 4.53.	18. 5.53.
Instruction Course on Gipsy Engines -	18. 5.53.	5. 6.53.
Jet Engines -	5. 6.53.	14. 6.53.
Servicing and Maintenance of De Havilland type Aircraft	14. 6.53.	26.11.53.

Aircraft Company Maintenance course (right)

was such a success that in after years we were always inundated with enquiries from the V.I.P.s long before the appointed date for invitations to this important event with strong hints as to what might happen to us if we inadvertently left them out.

From Flight 16 May 1930

A De Havilland Occasion

THE de Havilland Technical School held a dance at the Portman Rooms, in Baker Street, on Friday, May 9. A large number of guests thoroughly enjoyed themselves, and the arrangements, in the capable hands of Mr. Eadon, were well appreciated. Some of the dances were "Spot" dances, and the very acceptable prizes were presented by Lady Bailey to the lucky ones. Capt. de Havilland himself was present as were many other important members of his staff.

As the numbers of students increased so did their enthusiasm in direct proportion, and we found that we had to expand our staff by the addition of both a woodwork and a metal-work instructor on aircraft fittings and components, and with the acquisition of a lathe and a couple of drilling machines, a soldering and brazing hearth as well as a welding plant, we were in a position to expand our capacity for practical instruction. The problem, however, was to obtain sufficient material as well as work of a useful nature to cope with the almost insatiable appetites of the students for work. Our policy was not to make samples which would eventually have to be thrown away, but to make real parts which could be used to do a job of work. At the same time we could not go into production of the Company's products, so after having made all the equipment we could to fit our workshop, we eventually obtained permission to meet the students' keen desire to build an aircraft that would fly. Accordingly we commenced with a Gipsy One Moth, the whole of which with the exception of the machining of the main-plane spars was made by hand, in every case by the students themselves, even to the extent of making the necessary jigs. When the job was about to take shape we had to make plans to obtain an engine. We could not buy a new one as the demand for Gipsy engines was such that one could not be spared. Neither did we want a second-hand one, so we formed the idea of using machined parts from the works which were slightly above or below the tolerances permitted by the high standard of inspection set for inclusion in the Company's production engines for sale. By careful selection from a large number of these parts, we found that by coupling together high- and low-limit parts so that the correct working clearances were obtained between them we could build a perfectly good engine which would perform quite satisfactorily but which had no interchangeability-of-parts standard whatever. I would not, however, advise or recommend any one to attempt this plan, as without an enormous stock of out-of-limit parts to draw upon (and naturally we didn't have that), it is positively a real headache to find a suitable spare part when one is required. Nothing succeeds like success, and by dint of much sheer hard work we produced a non-standard engine which earned full marks on the test bed and provided the motive power for our first aeroplane. The whole machine including the engine during its construction was submitted to the works inspection and, with a few concessions, obtained a Certificate of Airworthiness and Certificate of Registration G-EBTS. We then obtained permission from the Technical School Flying Club and our first machine, maintained by the students and inspected and certified by our own staff, did real yeoman service in teaching the young to fly. I believe that in its second year of existence this machine put up nearly 1,000 hours of flying, most of which consisted of

take-offs and landings. A most gruelling test and creditable performance for a student-built aeroplane. In later years we built many other machines of a similar nature with the exception that all of them had standard engines, the parts being obtained from the works and assembled in the school. One of these aircraft, G-ACAM, we sold at cost price to two of the students who on completion of their courses flew back in it to their homes in South Africa.

The students' course was arranged with an initial period of about twelve months in the School workshop (varied in individual cases), and the remainder of the time, so far as practical work was concerned, was divided among the appropriate departments of the works. The theoretical training occupied three of four evenings a week during the winter session. Placing students in works departments was not at first as easy as we had imagined. The skilled craftsmen in the factory were always ready to accept the ordinary trade apprentice, but we discovered a marked antipathy towards the student who they realized would be in their care only for a short time and who was not necessarily going through in their particular trade. Even the foremen and charge-hands felt that the students would be something of a brake on the production of their particular section. Considerable persuasion was, therefore, required in some instances to induce them to appreciate that the students would be useful to them whilst learning themselves, as they had already had concentrated initial training. I am not at any time in favour of any form of bribery and corruption, or of recommending others to this pernicious practice, but at the same time it is remarkable what an odd beer after hours and a packet or two of cigarettes will do (they were twenty for a shilling in those days). I must, however, confess to being guilty of hinting to the students I placed in the works that a few cigarettes from them to the workmen to whom they were posted would be a good lubricant to promote friendly relations. Incidentally, I had to instruct one student how and where to obtain a particular brand of shag and some cigarette papers for his sponsor who did not favour the standard brands. The remarkable thing was that this oiling of the works so to speak pertained for only a very short time, for after a week or so the boot was on the other foot, the workmen were buying cigarettes for the students, who were in such demand that we hardly had enough to go round. The craftsmen in the works had discovered that the students' efforts earned them extra bonus on their jobs which they were only too pleased to share in the form of the pleasures of My Lady Nicotine with their helpers. One student particularly was anxious to see, do, and learn all he could in the time available to him, even to acquiring a knowledge of the running of the factory. He was consequently posted to the works plant maintenance department. He was introduced to the works foreman who being a very busy man instructed one of his charge hands to accommodate the student with all he required. The student was perhaps a little unfortunate in so much as the first job he was given to do was the repair of a lavatory seat. Proof of his initial training and discipline in the school is that he did the job first and complained to the plant foreman afterwards. The foreman being a resourceful man, while apologizing to the student for the mistake in the selection of the job, observed that the student did say in the morning that he wished to start at the bottom, and added that he would see to it that the student would be provided with work of a higher order on the morrow.

For some inexplicable reason the word student always seems to conjure up in the lay mind visions of much ragging in the shape of flour and soot throwing and "beating the place up". In consequence I was often asked how we managed to maintain discipline

5. The Guarantor and the Engineering Apprentice hereby jointly and severally agree with the De Havilland Companies as follows:

(i) That the Engineering Apprentice shall faithfully and diligently serve the De Havilland Companies during the Engineering Apprenticeship in the said trade at the said Technical School or at any branch of the business of the De Havilland Companies at which the Engineering Apprentice may for the time being be under instruction that he shall keep the secrets of the De Havilland Companies and shall obey the lawful commands of their Officers and Servants and not absent himself from or neglect their Service.

(ii) That the Engineering Apprentice will not wilfully waste or spoil any of the goods of the De Havilland Companies or dispose of the same without their consent or injure them in their said trade or behave himself otherwise than as a diligent and faithful Engineering Apprentice.

(iii) That the Engineering Apprentice shall not take part in any labour dispute which may arise between the De Havilland Companies and any of their employees or in which the De Havilland Companies and any of their employees may be involved, nor during the continuance thereof refuse to do any work which he may lawfully be required to perform.

(iv) That the Engineering Apprentice on being required to do so shall during the period of his Apprenticeship devote such times as the De Havilland Companies shall reasonably require to attending day and evening classes at any institution from time to time nominated by them.

6. In case the Engineering Apprentice shall at any time during the said term be wilfully disobedient to the lawful reasonable commands of the De Havilland Companies their Officers and Servants or shall otherwise misconduct himself either on or outside their premises in such a manner as may be detrimental to their interest or be unable to maintain a satisfactory rate of progress or shall persistently neglect refuse or fail to comply with any of the provisions of this Agreement or shall habitually absent himself from work without the permission or consent of the De Havilland Companies except in the event of sickness duly certified by a qualified medical practitioner it shall be lawful for the De Havilland Companies to discharge the Engineering Apprentice without notice from their service in which event this Agreement shall forthwith be terminated.

7. If the Engineering Apprentice shall duly and faithfully serve the De Havilland Companies throughout the said term the De Havilland Companies shall deliver to the Engineering Apprentice a certificate of such service duly signed by one of their Directors.

8. The Company committing any breach of any obligation on the part of the De Havilland Companies hereinbefore contained alone (and not any other Company or Director or other Manager or Officer of any Company) shall be liable for any such breach.

The foregoing example is of a bespoke Company form. Sometimes a generic form provided by the Engineering and Allied Employers National Federation was used.

Wages were given in pounds, shillings and pence or simply in shillings and pence, as below.

WAGES

7. (1) The Apprentice will be paid in respect of each ordinary or shortened working week for each hour he works in such ordinary or shortened working week respectively at the following rates according to his year of service.

During the 1st year of service at the rate of 49/11d per week
" " 2nd " " " " 58/1d per hr. worked
" " 3rd " " " " 78/- " "
" " 4th " " " " 89/10d " "
" " 5th " " " " 101/6d " "

This Apprenticeship Agreement is made the twenty-fifth day of September one thousand nine hundred and fifty-seven BETWEEN DE HAVILLAND HOLDINGS LIMITED whose registered office is situate at Hatfield in the County of Hertford in their own right and on behalf of their subsidiary companies incorporated in the United Kingdom of the first part and xxxxxx (hereinafter called "the Guarantor") of the second part and xxxxxx (hereinafter called "the Engineering Apprentice") of the third part.

WHEREAS the Engineering Apprentice has undergone a probationary training for the period of six months from the 7th day of January 1957 to the satisfaction of all the parties hereto and in consideration of the execution of these presents De Havilland Holdings Limited have agreed to include such probationary period in the terms hereinafter mentioned.

THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement the expression "the De Havilland Companies" shall mean De Havilland Holdings Limited or any of the said subsidiary companies from time to time nominated for the purposes of this Agreement by De Havilland Holdings Limited.

2. The Engineering Apprentice of his own free will and with the consent of the Guarantor hereby binds himself as an Engineering Apprentice to the De Havilland Companies to learn the trade or business of Design of Aircraft and to serve the De Havilland Companies for a term of five years from the said day of January 1957

3. The De Havilland Companies hereby agree with the Guarantor and the Engineering Apprentice as follows :

(i) To take the Engineering Apprentice as their Apprentice and throughout the said term (excepting and subject as hereinafter mentioned) to teach and instruct the Engineering Apprentice to the best of the power skill and knowledge of the De Havilland Companies acting by their Officers and Servants to cause him to receive the necessary instruction both theoretical and practical leading to the Examination for Higher National Certificate (Aeronautical) as carried on by the De Havilland Companies and in all things appertaining thereto in accordance with the Prospectus of The De Havilland Aeronautical Technical School or any subsequent modification or addition thereto PROVIDED THAT the Engineering Apprentice shall obey all lawful commands of the De Havilland Companies their Officers and Servants and commit no breach of any obligation on the part of the Engineering Apprentice herein contained.

(ii) To allow the normal works holidays as notified on De Havilland Official Notice Boards.

(iii) To pay the Engineering Apprentice the following weekly payments throughout the period of Apprenticeship including the normal works holidays but subject to his working the full normal or shortened working week of his place of work or instruction.

From the 16th birthday to the 17th birthday the sum of £2.14.0 per week worked.
From the 17th birthday to the 18th birthday the sum of £3.3.7 per week worked.
From the 18th birthday to the 19th birthday the sum of £4.6.1 per week worked.
From the 19th birthday to the 20th birthday the sum of £5.0.11 per week worked.
From the 20th birthday to the 21st birthday the sum of £5.19.1 per week worked.
From the 21st birthday and over £7.13.3 per week worked.

4. THE GUARANTOR hereby agrees with the De Havilland Companies as follows:
To provide the Engineering Apprentice during the Apprenticeship with good and sufficient board and lodgings and medical attendance and medicines and all other necessaries.

among such a diversified number of young people of so many different nationalities. The answer is difficult to find, for although I would not suggest that all our students were perfectly white chickens (they were every bit as human as the rest of us who have long since passed the student stage) we found an excellent code of honour and amenability to the conventions among them. In fact they used to look after each other and maintain discipline themselves and woe betide any one of them who broke any of the unwritten laws.

An instance of this did occur on one occasion when one of them did fall short in one particular. The category of the "crime" does not matter here, but to us the punishment appeared to fit it (shades of the Mikado). One day in the tea-time period between work in the school and the commencement of the evening classes at six p.m. we were astonished to see a long object wrapped in a large dust sheet being borne on the shoulders of six of the most muscular of the students and being conveyed to the far end of the aerodrome. Being somewhat curious, we followed the cortege at a very discreet distance. On arrival at the works pool, the object was unwrapped and proved to be an offender who was made to strip then and there and was dumped into the pool. Needless to say, he scrambled out a most pitiable object, a sadder and much wiser student.

One student, however, gave us at times moments of perturbation in that we never knew what form his next escapade was likely to take. He was a very likeable fellow but had a most unfortunate capacity for doing the unconventional things at the most inappropriate moments. He arrived one day on a penny-farthing bicycle and someone dared him to ride it through the work- shops. He immediately took up the challenge, to the amusement of many and to the consternation of ourselves and those in charge of works departments whose duty it is to maintain discipline and production at one and the same time. On another occasion we received a frantic telephone call from the Officer Commanding Hendon Aerodrome to say that one of our machines had flown into and scattered a squadron of his fighter aircraft and would we see to it. Fortunately no one was hurt and no damage was done, but on investigation we discovered that the culprit was our No. 1 trouble student. On being interrogated he excused his action by saying that he was only practising blind flying on his own account by keeping his eyes shut for a few minutes and that it was not his fault if the R.A.F. decided to use the same patch of sky just when he wanted to occupy it. Many other escapades of this student would make interesting mention but we cannot spare him all the space that he merits.

The training of most of the early students was directed to the maintenance and construction of aircraft and engines, with a view to their obtaining the Aircraft Ground Engineers' Licences. The Aeronautical Inspection Directorate of the Air Ministry. on which devolved the responsibility of the examinations for these licences, became somewhat overwhelmed at the number of applications for examination made by de Havilland students. The outcome of this was that we were permitted to conduct the examinations, at first with an A.I.D. inspector as chairman of our examination board. After a short time we demonstrated that our standard was at least as high as that which had hitherto obtained, and two of us were granted letters of authority by the chief inspector, A.I.D., to conduct the examinations. We regarded this as quite an achievement, and an honour to the School.

Shortly after this we decided to turn our attention to fresh fields and pastures new to the existing capacity of the School. We proceeded to equip and establish a drawing and design office of our own and engaged an instructor to take charge of it. A few weeks of designing and drawing detail parts only did not seem to us or to the students to be getting anywhere, so it was decided to attempt the design of a complete aeroplane. It is still not much use doing this unless one can make it and try to fly it to find out and prove that the idea is right. When the design had reached a fairly advanced stage we sought and obtained permission to build it, provided that the whole structure was checked and stressed by the Company's design and stressing staff. They must have been satisfied with it for before too many more moons had passed we had built the first of the T.K. series of aircraft, obtained a Certificate of Airworthiness for it and entered it for the Kings Cup Race in which it earned fourth place. In all modesty, I think that this was a notable achievement on the part of the students who, assisted by the staff, worked with such a vigour to achieve it, rarely experienced in the ordinary way. T.K.2 followed as an almost natural consequence and its successes are already too well known for me to make any reiteration of them here.

The third in the series was designed but not built, but two of the students who were engaged on the design, on completion of their respective courses, started up a small concern of their own account. They modified the design of what would have been T.K.3 considerably, and built it. Powered by a Ford-Carden engine it has proved to be a successful ultra-light aeroplane. *[This was the Chilton D.W.1 monoplane; the connection with T.K.3 has been disputed - Ed.]* T.K.4, which was also designed and built by the School and entered for the Kings Cup Race, was probably the smallest and yet the most advanced aeroplane of its day. The commencement of World War II came a little too soon to permit the flight trials of T.K.5 (a tricycle canard pusher) which was almost completed, it having reached the taxying stage at the time. An observation of a well-known aircraft pioneer designer not unconnected with the Company is worth recording here, "That if only one worthwhile practical fact of aircraft design emerges from any design exercise taken up by the students the whole exercise, however extensive, is definitely worthwhile."

The progress of the school in all its branches was steady and continuous right up to and through the first year of the recent war, when it suffered a temporary set-back through being a victim of enemy action. We were fortunate in this action in that we only lost one student killed and he was not actually in the school workshop at the time, and none was injured. I would here like to dispel a rumour current at the time that we were bombed by a former student of the school. Such was not the case. The student referred to in the rumour was shot down and captured a considerable distance away several months prior to the incident. Like the Phoenix of ancient mythology, the School has risen from the ashes, preened its feathers, and is now on its way to many more and greater achievements.

In this little story of the early days of the School I have mentioned no names, because it is a story of progress from small beginnings to notable achievements, in which all the personalities without exception have played their respective parts with a will, and to the utmost of their several abilities in order to attain the success desired. It would be indeed unfair to single out any one of them in particular and to mention them

The de Havilland Enterprise for August 1950 stated that of the 1,025 apprentices on the strength of the School at 31st May 1950 less than half were in the Aircraft departments and School workshops, some were in the Chester aircraft factory, more than a third were divided between the Engine establishments in Edgware and Leavesden, and about a sixth were in the Propeller school workshop and main works at Lostock and Hatfield. About two thirds of the total were trade apprentices. Gazette for August 1952 noted 1,372 apprentices, of whom 1,025 were trade apprentices.

Gazette for February 1955 reported that at the end of September 1954 the pupil population of the School had reached the record figure of 2,401, of whom 484 were engineering apprentices and 1,917 were trade apprentices. If post-graduate students, BEA and BOAC apprentices and those whose apprenticeships were interrupted by National Service were taken into account the figure rose to 2,500. The distribution of trade and engineering apprentices within the Enterprise was as shown opposite:

	Engineering	Trade
Hatfield & Stevenage (Aircraft Company)	212	482
Stag Lane & Stonegrove	72	190
Leavesden	43	410
Lostock	41	231
Chester	33	262
Hatfield (Propeller Company)	37	33
Portsmouth	9	146
Christchurch	37	163

Indentures and Training Records

Although it probably would not have applied to fee-paying students before WW2, all trade apprentices in the 1920s and 1930s, and all students/apprentices after WW2 would have been indentured in the traditional manner. The trainee, his or her parent and a senior member of the Company would sign a formal Agreement. It was not as legally binding as those of previous centuries, when apprentices were bound by law to remain with their employer until the full term, often seven years or, for children, until they were 21. (Agreements of apprenticeship, land and financial transactions were usually written as duplicates in sequence on a single sheet, the halves being parted by a jagged series of indented cuts such that forgery was impossible - hence 'indenture'. This had ceased by the time of aviation!)

The Agreement drew on traditional wording and covered several pages. An example of the body of one dated 1957 is shown on pages 24 and 25. The Guarantor was a parent or guardian. A record of all the training received, a 'Certificate of Due Service', was entered on to the apprentice's copy of the Agreement on completion of his or her time – see pages 26 and 27 for examples.

No Company records survive; see page 34.

Thereafter it depended on the site. At sites such as Hatfield where there was a large design organisation the final years would be spent in departments such as Aerodynamics, Stress and Design, including sub sections such as the Wind Tunnels (part of Aerodynamics). Production apprentices at sites such as Chester and Hatfield spent more time on practical work as well as the office side of the operation. Many Lostock engineering apprentices spent their final years at Hatfield in the Propeller Company. Some Stag Lane apprentices ended their time on engine work at Leavesden.

Trade (later known as craft) apprentices chose their future specialisation, in agreement with the School, after their six months' probation. Apprentices could become, for example, a fitter, machinist or electrician.

Academic training at all sites was by attendance at a local college except at Hatfield before 1952. The more fortunate students were put on 'block release', sometimes called a sandwich course, for full time attendance of five or six months. Others had 'day release', usually involving one long day (9am to 9pm) a week. In the main Stag Lane students attended Willesden or Hendon Technical Colleges, Leavesden students attended Watford Technical College, Christchurch students went to Bournemouth Municipal College, Portsmouth students to Portsmouth College of Technology or University College in Southampton, Chester students to Wrexham Technical College and Lostock students to Worsley Technical School or Bolton Technical College.

The general pattern was that engineering apprentices progressed through the Ordinary National Certificate (ONC) to the Higher National Certificate (HNC). The ONC was a three year course, but those with suitable school leaving qualifications skipped the first year. The HNC was a two year course which, if properly planned, contributed towards graduate membership of one of the learned societies - Aeronautical, Mechanical or Production. It was, though, recognised as a senior engineering qualification in its own right. Trade apprentices were expected to attain the ONC; those showing aptitude wre eligible for upgrading to an engineering apprenticeship and would continue to HNC. An alternative for trade apprentices was the courses administered by the City and Guilds of London Institute. These provided a greater bias towards practical training than did the ONC.

In the late 1950s the Diploma of Technology was introduced, intended to be closer to a University degree than the HNC. The aims and the syllabus took some time to evolve; for some people the course lasted up to seven years and even then some ended up with a Higher National Diploma and/or a Diploma of Hatfield College.

A small number of apprentices were placed on external degree courses with the University of London. Some attended Cranfield College of Aeronautics. A few worked abroad for short periods at places such as Sud Aviation in France and Dornier in Germany. It was also possible for university graduates to be given a short post-graduate course in order to obtain some practical experience.

Apprentices were encouraged to take part in Company sporting activities, as all sites had sports clubs on or near the premises. Most Schools fielded soccer, rugby and cricket teams that played inter-departmental matches and against teams from other local employers. Social activities such as dances took place at some sites.

Flying training was supported where practical, notably at Hatfield, also at Portsmouth where in 1953, for example, four apprentices were flying solo.

all would require much space. For the same reason I am writing this under a pseudonym, which I would ask the reader to accept and not to be too curious to discover to whom it refers. The future success of the School is in the hands not so much of the staff but of the students to whom in all sincerity I would presume to proffer some advice. Remember that "rate of climb" without range and capacity to remain and cruise at altitude is by no means sufficient. It is of no use achieving your objective without sufficient knowledge and experience of how to stay there with, in addition to fuel for the journey, a reserve to enable you to orbit around to seek for a suitable landing ground in case of emergency. In other words, do not make the mistake of being in too much of a hurry to make progress. Whatever task is given you both during and after your course of instruction, do it at least once more than is necessary in order to enable you to satisfy yourself that you have attained perfection before moving on to the next stage. Do this and you will in all good time achieve your objective and, what is more, become a worthy product of the de Havilland Aeronautical Technical School, my son.

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School Principals

The first Principal was Alan Theodore Eden-Eadon, always known as Captain Eadon although in reality he had been a lieutenant in the Army before transferring to the Royal Flying Corps and left the Royal Air Force as a flying officer. When he left to become the Deputy Director of Civil Aviation in India, the post was filled by Owen Wilson Clapp, then holding the rank of Flight Lieutenant in the RAF Reserve. A former RFC/RAF Engineering Officer, since 1922 he had been an Officer Instructor at No. 1 School of Technical Training, RAF Halton, lecturing on engines and metallurgy; in 1936 he wrote 'Some metallurgical notes for the aeronautical student' (copies can still be found!). Promoted in 1934 to Squadron Leader, he was posted in 1941 to RAF Kidbrooke, a stores and maintenance unit, including barrage balloons. In 1942 he was promoted to Wing Commander.

He was replaced by Robert William Reeve, MM, DFC, AFC, then a Squadron Leader in the RAF Reserve. From 1935 he had been in charge of No. 13 Elementary Training School at White Waltham, prior to which he had a varied career in the Army, RFC, RAF and in civilian aviation. (see 'Further reading'). On his retirement the post of Principal lapsed and each school had its own Supervisor.

World War Two

At the outbreak of WW2 the School was located in the D.H.94 Moth Minor production building, known as the 94 Shop. It was just east of where the Comet Hangar, now a Leisure Centre, was later erected. The School was reduced to a low ebb in the first months of war by the rush of apprentices and instructors to join the Forces, particularly the RAF and the Fleet Air Arm. Some overseas students were stranded and inevitably had to spend the war away from their own countries. Many of them subsequently served in the British Forces. The 'Flight' article opposite, dated 28 December 1939, reported on the School's wartime operation.

Early in 1940 the Moth Minor drawings, jigs and tools, finished and unfinished airframes were shipped to DH Bankstown, Australia to make way for the manufacture of Mosquito parts. The 94 shop was destroyed on 3rd October 1940 by bombs dropped from a Ju.88 which had failed to find its first target at Reading. It was shot down by the aerodrome defences, the crew surviving. An aerial photograph of Hatfield was found in the aeroplane, so it had been a designated target. Twenty-one employees, mostly skilled tradesmen, were killed. The number included a student, Anthony J Scott aged 19 and an apprentice sheet metal worker, Ernest F Pretty aged 18. A senior instructor (Bill Seeley) and several apprentices were among the many injured. The Mosquito work in progress was largely destroyed and Tech School records were lost.

The School was located temporarily at 8 Woodfield Road, Welwyn Garden City (in what is now the Peartree Farm Industrial Estate) and moved to Salisbury Hall in 1941. The Mosquito design team was established there in late 1939 and the site is now the home of the de Havilland Aircraft Museum. The student workshop at Salisbury Hall was located in the hangar built for the construction of the first two Airspeed Horsa Gliders in 1941. Students could volunteer to stay on the premises overnight and at weekends for fire-watching duty, for which they were paid 1/6 an hour. They had to be available to help the duty fireman to man the fire pump and carry out any other duties. Nights were spent in a room beneath the office of one of the instructors. It had no windows, six stretchers with blankets and a few chairs, but otherwise was devoid of any home comforts.

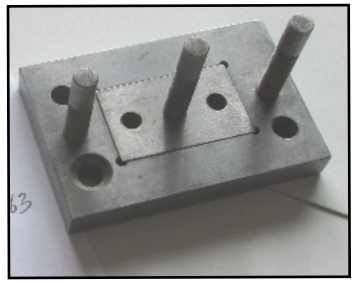
Before the war it was customary for students to live at home or in lodgings. There was a demand for accommodation near the factory and Sherrards, a country house at Digswell, Welwyn, was taken over in 1941 as a hostel for a small number of students. A Home Guard unit there was formed of students, under the leadership of an older officer. When on guard duty, a single 0.303 round per rifle was issued!

Indentured apprentices were exempted from military service until the age of twenty and it was necessary to condense the training course into about three years ending at that age. Many students had their training interrupted by entry to the Armed Forces. Some returned after the war to resume their training. Some 140 students and apprentices served in the Forces, of whom seventeen lost their lives. The close of the war saw the school with nearly 700 engineering and trade apprentices and probationers.

Entrance to DHAeTS Christchurch

Chester workshop, January 1954

Toolbox made by Jim Prettyman



Bill Rogers' fitting exercise

Astwick Manor workshop, December 1963. Woodwork section on balcony at right.

Salisbury Hall and workshops, 23rd July 1945

Astwick Manor, hostel and workshop, 21st August 1957

DE HAVILLAND TECHNICAL SCHOOL

THE de Havilland Aeronautical Technical School is now in full swing on an active wartime basis. Young men, who may have to join the forces later on, are these days faced with a difficulty in embarking upon any career, but it is obvious that in aviation—even more than most other vocations—facilities for obtaining essential technical training must be maintained in time of war as in peace. The de Havilland school's curriculum of theoretical instruction in the several subjects of aeronautical engineering is therefore being maintained, the winter programme having been framed as in previous years. The only significant change in the routine is on the practical side.

A natural desire soon became evident among the students to take some useful part in productive work at a time when the whole resources of the industry are mobilised, and after careful investigation this has become possible. Students spend long enough in the Technical School workshops to fit them for working in the production shops applicable to their particular courses of study; they are then transferred to the production shops in the de Havilland factories, passing from one department to another to gain the breadth of experience necessary for the courses they are individually taking. Design students, for example, as well as passing through the production shops, spend a period in the drawing offices where the ordinary design work of the company is in progress. The programme of design work in the School itself—which in past years has produced the widely known T.K. aircraft types, is being remoulded into more immediately useful channels without detracting from the value of the work from the students' point of view. Those specialising on airscrew and engine courses spend a proportionately longer time in the airscrew and engine factories, and research and experimental departments.

While students are working in the productive departments of the de Havilland Company they adhere to the standard working conditions of the shops they are in and receive remuneration according to a fixed scale, with overtime and bonus payments on a strictly pro rata basis. Overtime is not allowed to interfere with lecture engagements, and the full pre-war lecture programme is followed, care being taken to prevent any student from overworking no matter how zealous he is.

The acceptance age at the de Havilland School, as hitherto, is seventeen years, and of course the educational standard for admittance is as before. Students thus have a good opportunity of completing three-year courses before becoming of military age.

The outbreak of war found nearly a quarter of the students—the older ones—in one or other branch of the Royal Air Force Reserve and many were called up. Of the remainder who were of military age, most went into the R.A.F. and Fleet Air Arm, but the Navy and Army took a considerable number, and several are completing their courses before joining up. There are still about a hundred students in the School, and it may be hoped that most of these will find a commercial rather than a military demand for their qualified services by the time they have completed their training.

More than 1,100 students have passed through the de Havilland Aeronautical Technical School and nearly as many Air Ministry licences in various categories have been secured.

Flight 28 December 1939

Post War

Schools

Although the headquarters were at Hatfield from 1934, a school remained at Stag Lane (located at Kingsbury during and after the war, also at Stonegrove). Schools were set up at Lostock (DH Propellers) in 1946, Leavesden (DH Aircraft & Engines) in 1951 and Chester (DH Aircraft) in 1949. Lostock was a shadow factory set up in 1937, Leavesden was established by de Havilland at the request of the Air Ministry in 1940 and Chester, set up as a Vickers shadow factory, was acquired in 1948.

The Airspeed Aeronautical School (later College) was founded in 1935 at Portsmouth Airport, championed by Nevil Shute Norway who had worked briefly for de Havilland in the early 1920s (he was not an apprentice, as has been stated in some places). Airspeed was bought by de Havilland in 1940, soon after the Christchurch factory was built, and merged completely in 1951. A branch of DHAeTS was set up at Christchurch in that year; the last entry was in 1958. Christchurch (with Portsmouth) provided the full five year apprenticeship, whereas sites such as Lostock provided workshop training and experience for some two years, after which most apprentices went to Hatfield. DH Canada and DH Australia ran their own schools.

A detailed Prospectus was available to aspiring apprentices and their parents, updated every few years. The opportunities and the sequence of training were explained, there were many photographs of apprentices at work and a brief history of the Company was given. There are examples on the DHAeTSA website - see 'Further Reading' at the end of this booklet.

The system of fees being required of all students was gradually replaced by a scholarship scheme, whereby those with adequate school-leaving qualifications were given free training. 'Adequate' meant appropriate subjects at the Higher School Certificate or the later GCE A Level standard. As examples, in 1950 the annual fee was 100 guineas (£105), which had reduced to 80 guineas (£84) by 1956. (In 1937 the quoted total fees for two, three and four year courses had been 200, 300 and 400 guineas.) In all cases a small weekly wage was paid, usually based on the factory hourly rate.

The Society of British Aircraft Constructors (SBAC) instituted in 1937 a scholarship scheme, administered by the Royal Aeronautical Society, to enable trade apprentices who had the potential, but not the means, to be trained as professional engineers. Less than ten were awarded each year. In later years one scholarship, not necessarily for training at DHAeTS, was named in memory of John de Havilland. The scheme continued into the 1950s and some de Havilland apprentices won scholarships.

Trade apprentices paid no fees. They could not begin an apprenticeship until they were 16, but the school leaving age was only 14 until 1947, when it was raised to 15. A school leaver could be employed in the factory before 16 on unskilled or semi skilled work and taken into apprenticeship at 16 if showing promise.

Although it narrowed after WW2, there was still a significant distinction between the status of trade and engineering apprentices, similar to the distinction between factory and office workers. Only engineering apprentices could wear a DHAeTS blazer badge (bought from a bespoke supplier in St Albans), a hangover from the pre-war gulf between 'students' and trade apprentices.

Training

The School was established in 1928 to train licensed maintenance engineers. In the 1930s there were two quite separate types of trainee. The School provided training for "Students", who were well educated people, many from overseas. Fairly substantial fees were charged. The training generally lasted for three years, with some variation over time. The Company had taken on traditional indentured craft or trade apprentices almost right from the start, also "Premium Apprentices" in small numbers. The latter, as the term implies, paid the Company for their training, which was largely on-the-job training intended to fit the person for a future professional position. These two separate schemes mirrored those long established in railway companies and the like.

During the next twenty years the training system matured, turning out qualified design, production and maintenance engineers. There was a range of entry routes and career paths. Many students remained within what had become the de Havilland World Enterprise, a global organisation embracing research, design and large scale production of civil and military aircraft as well as piston engines and gas turbines, propellers, components and accessories.

In 1943 the de Havilland Education Board was set up with about twenty representatives from around the Company. By 1950 there were about sixty, essentially the departmental managers who were the potential employers of young engineers. The Board was overseen by a Council of four executives chaired by the Managing Director, W E Nixon, who had always taken a close interest in training within the Company.

By 1948 the indentured time was five years. The age at which apprentices were taken on varied slightly over the years. From 1947 the school leaving age was 15 and aspiring trade apprentices could be taken on as pre-apprentices, working in the factory, until they reached 16 and began proper training. Engineering apprentices were usually not taken on until the age of 17 or 18. Workshop practice in fitting, sheet metal and machine tools was taught, also woodwork in some cases. Practical training and experience took place within the factories, typically with three months in each department, design, production or maintenance as appropriate. Specific maintenance courses had largely been abandoned by the mid 1950s. A later innovation was a commercial apprenticeship covering business rather than technical studies.

In addition to providing initial technical training for students, the School also assumed responsibility for the training of all trade apprentices. 'Students', much to their disgust, became known as engineering apprentices. Trade apprentices showing particular ability could be upgraded to engineering.

The initial training was much the same in all the Schools. Typically about three months was spent being taught fitting, sheet metal work and machine tool operation. Woodwork continued to be taught at most schools. There is a display of apprentices' workpieces and School information at the DH Museum.

All apprentices were required to wear overalls when in training workshops and in factory areas. Practices varied from time to time and from one site to another. Sometimes overalls were provided and sometimes they had to be bought. Sometimes they were indistinguishable from those of employees and at others they were of a distinctive colour, often maroon, perhaps with 'Apprentice' embroidered on.

Engineering apprentices spent at least their second year in factory areas. This was to give them basic experience of manufacturing work rather than to hone their skills.