

**THE  
DE HAVILLAND  
AERONAUTICAL  
TECHNICAL SCHOOL**



*Inside front cover*

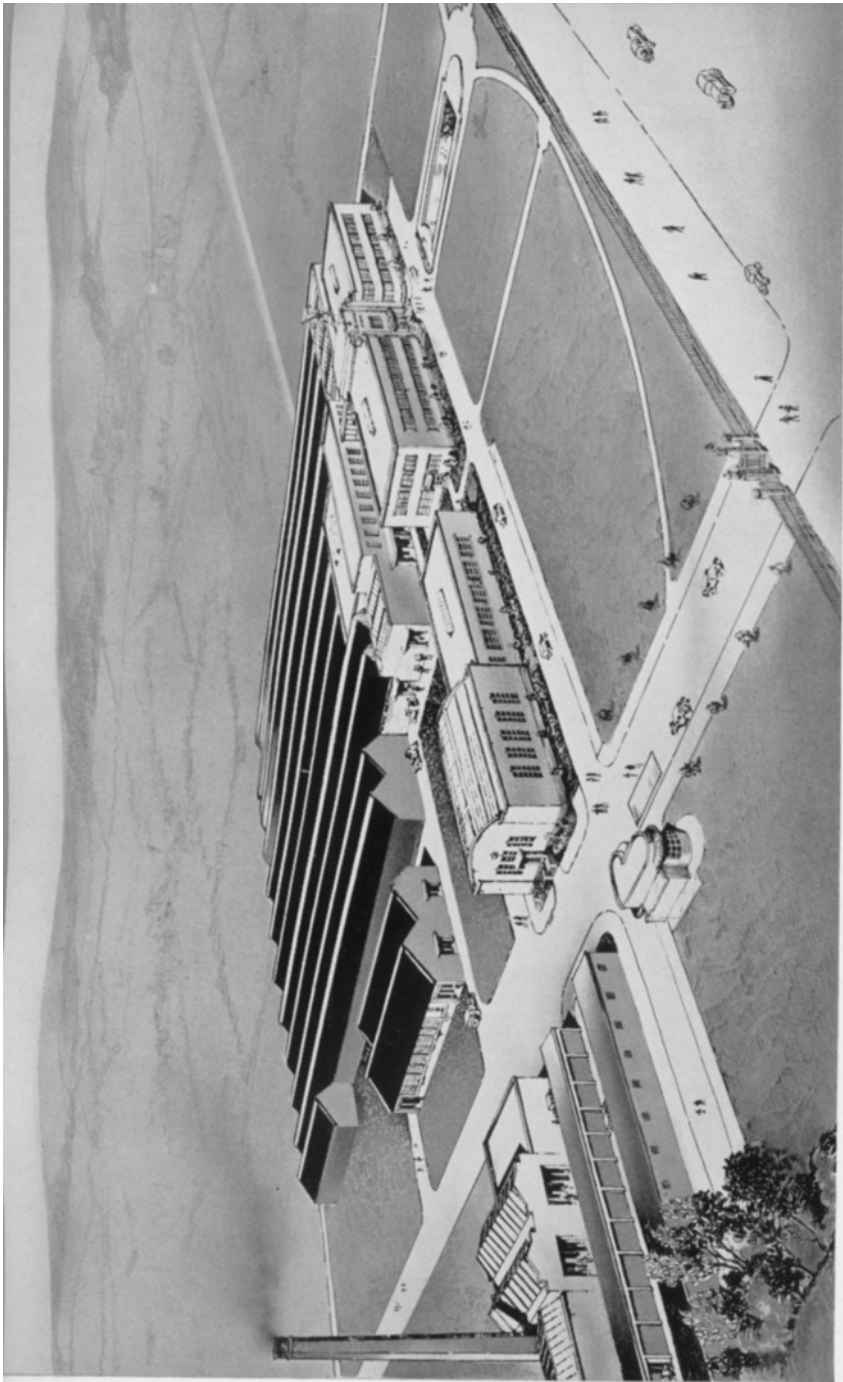


The  
de Havilland Aeronautical  
**TECHNICAL SCHOOL**

**SYLLABUS**

Engine Factory  
**Stag Lane**  
**Edgware, Middx.**

Aircraft Works & Flying Ground  
**Hatfield Aerodrome**  
**Hatfield, Herts.**



*Prospective view of the new de Havilland  
Factory at Hatfield, Herts.*



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# The de Havilland Aeronautical TECHNICAL SCHOOL

## THE STUDENT SCHEME

### TUITION

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The de Havilland Aircraft Co., Ltd., offers technical tuition in Aircraft and Aero Engine Construction, Maintenance and Repair, to Students who are entering the Industry as a permanent occupation in life, and exceptional facilities are included in the Scheme for acquiring experience in the Theory of Flight and Aircraft Design.

Students will receive tuition for the Air Ministry's Ground Engineers' Licences in Categories "A," "B," "C" and "D," in accordance with the regulations contained in Air Ministry Pamphlet No. 34, for which a candidate must be twenty-one years of age, and have had at least *two years'* practical experience on the Construction, Maintenance and Repair of Aircraft and Aero Engines, before his application for examination can be considered.

Students are engaged upon the work which is actually being utilized on Production, and in consequence will pass through Inspection. They are, therefore, trained to a high degree of efficiency and accuracy.



(Flight)

*A group of students with three Moth aeroplanes which were built by the students themselves as part of their normal training.*

## LECTURES

A Winter Session of Evening Classes, commencing in September and ending in the following March, is held under the supervision of the Board of Education and County Education Committee.

Lectures are given on the following subjects :—

Aero Mathematics and Mechanics.

Aerodynamics and Aircraft Performance calculations.

Aircraft Materials.

Aircraft Drawing and Detail Design.

Aircraft and Aero Engine Construction, Maintenance and Repair.

Air Navigation and Meteorology.

These Lectures are held in the School Lecture Rooms from 6 p.m. to 8 p.m., and Students will be in attendance on four nights per week, according to their Class grading. The Advanced Class is up to post graduate standard, and offers facilities for a Student to take the examination for the Associate Fellowship of the Royal Aeronautical Society.

On account of the Evening Classes specializing in Aeronautics only, superfluous theoretical tuition in other branches of engineering is eliminated, and the Student can therefore advance far more rapidly and obtain a higher degree of efficiency in a shorter space of time than is usual at most technical schools. A short lecture and discussion takes place every

Saturday morning at 11 o'clock in one of the Technical School Lecture Rooms, when Students are invited to ask questions on any difficulties that may have arisen during their week's work. At this lecture a special record of attendance is kept, and if required, Note Books will be inspected.

## ATTENDANCE AT LECTURES

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Students must be seated in Lecture Rooms at 6 p.m., when the register is called. Registers are closed at 6.10 p.m., and after that time later arrivals are regarded as absentees. This is the ruling of the Board of Education and cannot be modified. Lectures are held on five evenings per week ; the fifth evening is optional to the Student. Illness is the only reason that can be accepted for absence from these Classes. During the summer months Classes are held once weekly to help backward Students and to act as a refresher to the others. The Annual Examination, which is held at the end of the Winter Session, must be taken by all Students, and the results, together with a progress report of the year's work and attendance, are posted to parents or guardians.

## FEES

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In order to save the expense to candidates of embarking upon a complete course from which they are unlikely to gain full benefit, a probationary period of six months is necessary for those undertaking two or three year courses. The fee for this probationary period is 60 guineas, which therefore should be deducted from the fees shown below.

Two years Course for Students aged 19 or over, who have had some previous engineering experience. Fee, 200 guineas.

Three years Course for Students aged 18 or over. Fee, 250 guineas.

The fees for Short Courses are laid down in the special paragraph dealing with the subject.

All fees are payable in advance. In special cases, to suit the convenience of Students, these fees may, by special arrangement with the Company, be paid in four or six instalments at six-monthly intervals. Where, however, this method of payment is agreed upon, an increase of 10% on the fees mentioned is charged.



(Aeroplane)

*A corner of the Woodworking Shop of the School, showing wings under construction.*

## QUALIFICATIONS FOR ADMISSION

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Candidates must be at least 18 years of age for the three years Course and 19 years old for the two years Course, in order that they shall be at least 21 years of age when eligible to take the Ground Engineers Examinations conducted by the Air Ministry. A good standard of general education is required, such as the School Certificate with several Credits, or the London Matriculation Examination. This standard is highly desirable, but in cases where the candidates can give evidence of satisfactory technical instruction, together with sound common sense and an irreproachable character, the School Committee is prepared to consider each case on its merits.

## COMPENSATION

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As Students do not receive pay or other remuneration, they are not insurable under the National Health and Unemployment Schemes. They are, however, covered by a policy under the Workmen's Compensation Act, 1925, in accordance with



the Form of Agreement. In the event of accident or injury, however trivial, Students must report to the First Aid Post. This procedure is necessary to comply with the Home Office Regulations and the conditions of the Workmen's Compensation Act.

## DISCIPLINE

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In all instructional undertakings it is soon realised that if the discipline is good the pupils learn very much more readily, and the instruction can proceed more rapidly in consequence. It is appreciated that a young man on leaving school may find that the exacting requirements of Works routine may seem somewhat more strict than his previous school training. This must necessarily be so in an Aircraft Works, since the product is a carefully designed, highly stressed machine, and the utmost care and attention are necessary to ensure its safety. Any slackness is at once brought home to the Student, and by precept and example he is encouraged to produce his best work. Discipline is definitely a strong point in a Student's training, and one which—next to character—is ultimately reflected in his future career. The Company reserve the right, in the case of any serious breach of discipline and/or incompetency on the part of the Student, to terminate his training at any time, and in the event of the training being terminated for such cause, the Company shall be under no obligation to refund any portion of the fee for the unexpired period of his Course.

## WORKING HOURS

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At first the Student is accommodated in the Technical School buildings, when the hours are as follows :—

MONDAY TO FRIDAY : 9 a.m. to 12.30 p.m.  
1.30 p.m. to 5 p.m.  
SATURDAYS : 9 a.m. to 12 noon.

After preliminary instruction in the Technical School proper, he is posted to the various Workshops of the Company, and must strictly conform to the hours of working laid down for the particular Department or Shop, which are normally :—

MONDAY TO FRIDAY : 7.30 a.m. to 12.30 p.m.  
1.30 p.m. to 5 p.m.  
SATURDAYS 7.30 a.m. to 12 noon.



*(Hugh Wootten)*

*(Aeroplane)*



*Students employed on practical tests in the Laboratory.*

*Part of the Technical School Engine Section.*

*Part of the School Fitting Section.*



*(Aeroplane)*





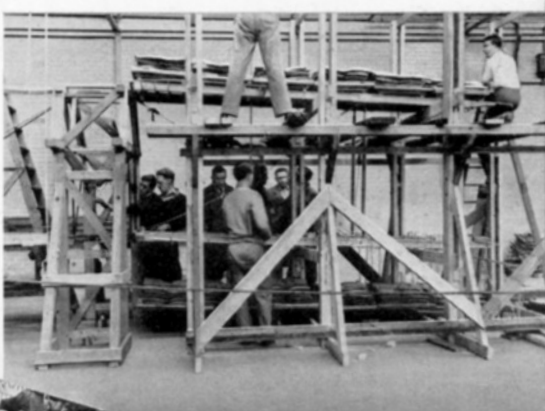
(Flight)

*Students' Design and Drawing Office.*

*Full scale test on the wings of the student designed machine.*

*Full scale test on the wings of the student designed machine.*

(Flight)



(Flight)



(Aerofilms Ltd.)

*Squash courts and bathing pool at the Company's Aerodrome at Hatfield, available for the use of students.*

## HOLIDAYS

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Annual vacational leave is granted in August (14 days), and at Christmas and Easter (7 days each), in addition to the Statutory holiday when the Works are closed at Whitsun. Leave of absence cannot be granted at times other than the routine holiday

periods, but any case of extreme hardship in this matter should be brought to the notice of the Principal through the School Instructor concerned.

## TOOLS

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The Student's first exercise on arrival is to make a tool box of an approved pattern, and he is then supplied with a comprehensive tool equipment, which becomes his own property on the satisfactory completion of a long course. All tools will be checked periodically, and deficiencies must be made good by purchase to complete the kit to standard. Students are advised to mark the tools for easy recognition. Special tools are issued on temporary loan from the Tools Stores on signature, and must be returned on completion of the job, or on Friday afternoons before 2 p.m., whichever is the sooner. Losses and breakages will be charged to the Student.

Tools must not be left lying about in Workshops or in aircraft, as serious damage or possible accident may result if tools become entangled or jammed in controls. A good workman always looks after his tools, for they are indispensable to his work. Well kept tools and a tidy tool box indicate a well-ordered mind.

## OVERALLS

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Whilst engaged in the Workshops, Students must wear overall coats or overalls, which they must themselves supply. Sleeves should button close to the wrists to avoid loose flapping cuffs catching in moving machinery. An overall coat is generally preferred to the ordinary mechanic's suit, and Students may defer the purchase of this article of dress until their actual arrival, when a suitable pattern can be inspected.

## NOTE BOOKS

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Every Student must provide himself with a rough notebook for workshop notes and a fair notebook for reference. The loose leaf type is recommended, since it may be divided into sections corresponding to the various subjects covered by the curriculum. Further, such a notebook is capable of unlimited expansion, as the Student gains knowledge of the subject. Fair notebooks must be written up and ready for inspection by the Educational Staff on Saturday mornings. The Workshop rough notebook is as essential as the tool kit, and must be shown when the tools are inspected.

## BOOKSHOP

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Books, stationery, slide rules, drawing instruments, etc., may be obtained through the School facilities at the discount rates allowed to the Company.

## BOARDING ACCOMMODATION

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Students are advised to obtain suitable accommodation in the vicinity of the Works. The addresses of several persons who are desirous of accommodating Students at moderate inclusive terms may be obtained on application to the Principal.

## SUBSEQUENT EMPLOYMENT

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The Company does not accept responsibility for finding employment upon the completion of the training, but it endeavours to place those who have passed through the Course

*(Aerial Photographic Co.)*

*Part of Stag Lane Aero-drome giving a bird's-eye view of the Factory.*





(Aeroplane)

*Three of the machines used for flying training of students.*

with credit into positions both at home and abroad. An Appointments Section, which deals with the finding of employment for Students, has been set up and has, up to date, succeeded in placing the majority of Students into suitable posts. De Havilland trained men are to be found in all parts of the world, many holding well paid positions of responsibility in the aircraft industry. Pending suitable opportunities occurring elsewhere, Students have, in many instances, been found employment in the Company's Works.

## FLYING

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Flying is not essential to an Aeronautical Engineer but is a very useful asset. The fees for this service are very moderate and the flying facilities formerly enjoyed by the Students at Stag Lane Aerodrome are now embodied in the London Aeroplane Club, at the Company's Aerodrome at Hatfield, Herts. The majority of flying students have qualified for the "A" Pilot's licence, and many of these for the Commercial licence "B"; this latter, it should be noted, qualifies the holder to undertake flying as a profession, if he so desires. The requisite engineering knowledge for holders of this licence is a part of the ordinary Technical Course.

Students who are members of the London Aeroplane Club may enjoy the amenities of the Club, its open-air swimming bath, restaurant, social and rest rooms.

## PRACTICAL EXPERIENCE

Students during their Course of Instruction will pass through such Workshops of the Company as may be considered necessary in order that they may assimilate the knowledge of the Manufacture, Testing, Maintenance and Repair of Aircraft and Aero Engines, required for their Ground Engineers Licences.

The following is a brief outline of the information which they are expected to gain ; notes must be taken by the Students, and notebooks will be open to inspection by the Technical School Staff.

### Technical School Workshops

A Student on admission is given an initial period of training in the Woodwork Section, where he makes for himself a tool box to an approved pattern. He is then issued with a comprehensive kit of tools, which becomes his own property on the satisfactory completion of the long Course of Training. He is then employed in making various wooden parts for aircraft, each of advancing difficulty, until he has reached a satisfactory standard in this class of work. He is then posted to the Fitting Section, where he makes additional tools for his kit, such as spanners, punches, fitter's square, etc. Starting with the more simple fittings, he progresses to the more complex and highly stressed parts, which are subjected to the closest scrutiny before being accepted for use.

He then proceeds to the Engine Section of the School, receiving initial instruction on more elementary types and gradually advancing to the higher powered engines. Engines are built up by the Students, tested on the Company's test benches, stripped, cleaned and examined. This procedure is repeated with each type of engine and, running concurrently with the practical work, instruction is given in theory. When the Student has reached a degree of proficiency which, in the opinion of the Technical School Staff, would justify his posting into the Aircraft and Engine Factory, he begins to extend the scope of his experience by actual employment on the Firm's production, and his work is controlled and inspected in accordance with the special requirements of Aircraft production.

### Fitters Department. A

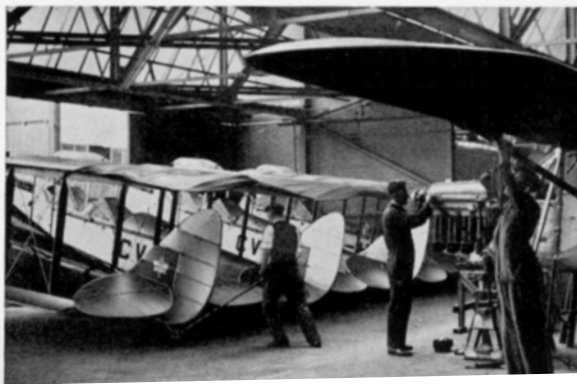
Manufacture of detail fittings and components, including preparation of material, marking off, bending, drilling, reaming, etc. Particulars of construction by means of oxy-acetylene welding and jigs.

### Fitters Department. B

Heat treatment of duralumin, steel, etc. Press tool work. Sand and shot blasting. Anodic and cadmium treatments. Stove enamelling.

*A top overhaul in progress in the Assembly Shop.*

*(Photo Press Ltd.)*





(Pacific & Atlantic Photos Ltd.)

*A steel fuselage in welding jig.*

### **Panel Shop**

Manufacture of cowling, tanks, induction and exhaust pipes, general pipe work (with testing), including tinning, hard and soft soldering and welding, materials and fluxes used and precautions to be observed.

### **Erecting Shop**

General assembly of components and machines. Checking for truth, alignment, rigging, engine installation, etc. Wire splicing and testing. Electrical installation, bonding and screening.

### **Fabric Shop**

Preparation of material and precautions to be observed in seaming, stitching, etc. Taping, covering and stringing of aircraft components. The characteristic defects, inspection and testing of fabric will be given in the lectures.

### **Dope and Paint Shops**

Points to be observed in varnishing dope resisting painting, doping, including temperatures of Workshop, ventilation and waiting periods. Painting and finishing of aircraft prior to delivery.

### **Wood Detail**

The manufacture of ribs, box spars, cowling, flooring, struts, etc. Wood bending and splicing. Glueing, including hot and cold glues, and precautions to be observed regarding temperature and waiting periods.

### **Wood Mill and Wood Inspection**

Visual inspection and detection of the characteristic defects of aircraft timbers, in growth, seasoning and conversion. Wood machining of solid spars and other components.

### **Aeroplane Assembly Shops**

Assembly of components, including the construction of fuselages, wings, rudders, elevators, ailerons, tail planes, etc. Use of jigs in manufacture, alignment and rigging of machines. Engine installation and preparation of the aircraft for flight.





*Part of Engine Erecting Shop.*

*(Pacific & Atlantic Photos Ltd.)*

### **Engine Department (A). First Assembly**

Machining operations on all detail components and first assembly of Gipsy Engines, paying particular attention to clearances, tolerances and timing. Preparation of engines for endurance test.

### **Engine Department (B)**

Students will be given a permit to enter this Workshop to take notes on all machining operations, and to obtain information regarding the special processes for the prevention of corrosion in steel, duralumin and electron.

### **Engine Stripping and Testing Shop**

Method of stripping, cleaning, inspection, repair and re-assembly of Gipsy Aero Engines. Method of testing by means of calibrated propeller and water brake, including the calculations for B.H.P. for both power and throttle curves. Precautions to be observed in checking the brake, temperatures, cooling and general running faults of engines undergoing tests. Checking of flow meters.

### **Jig and Tool Room.**

The design and construction of jigs and tools used in the manufacture of aircraft and aero engine components.

### **Case Hardening and Heat Treatments**

The various processes employed for case hardening and heat treatment of aero engine components. Use and checking of recording pyrometers, provision of test pieces, temperatures and methods to be adopted for normalizing, annealing and tempering.

### **Inspection Department**

The inspection of Gipsy Engine components by means of micrometers, depth, plug, ring, screw, taper, feeler, vernier and clock gauges.

### **Laboratory**

Properties and testing of aircraft and aero engine materials by means of tensile, Izod, scleroscope, Brinnell, and Vickers' diamond machines, etc.

Methods of ascertaining moisture content and suitability of aircraft timbers and plies. The method of testing aircraft propellers and pressure testing of engine details. The inspection and testing of aircraft instruments.

### **Aircraft Fitting Inspection**

Visual inspection of welded and other aircraft parts. Methods of checking welded fuselages and aerofoils for correct assembly, truth and alignment.

### **Repair and Service Department**

The dismantling of aircraft, inspection for damage and deterioration caused either by accident or in service. The repair and replacement of fabric and timber members, worn fittings, streamline wires, cables and tie rods. Re-assembly of machine and inspection preparatory to flight after overhaul, in accordance with the requirements for the renewal of the Certificate of Airworthiness. The daily inspection and routine maintenance of machines and engines in service. The top overhaul of engines and the methods of testing to ensure the correct functioning of the engine, controls, etc.

### **Aerodrome Experience**

Arrangements are made with the de Havilland Flying School, Hatfield Aerodrome, for Students to obtain experience of aircraft in service.

### **Routine**

The Course also includes experience in the Cost, Wages and Buying Offices, and the Service and Despatch Departments, in order that Students can obtain a knowledge of general business routine.

### **Drawing Office**

In the case of Students wishing to develop on Design, an opportunity will be given to them, providing that their qualifications and work are satisfactory, for entering the Company's Drawing Office, after preliminary instruction in the Technical School Design Office.

### **Further Instruction**

The School also arranges for Students to visit other works with a view to obtaining knowledge of various other details in connection with Aviation, Aircraft and Aero Engine Construction.

### **Appointments Section**

Each Student will be specially studied regarding temperament and suitability for the various spheres embraced in the Aircraft Industry, and the Appointments Section of the School will endeavour to obtain a suitable berth for every Student who has passed through the School with credit and efficiency.

## **SHORT AND REFRESHER COURSES**

Courses of short duration are available for engineers who have had previous aircraft experience, and who require their knowledge to be brought up-to-date in order to qualify or re-qualify for Air Ministry licences. In addition, private aircraft owners who are desirous of undergoing training for their Pilot's Licences, or otherwise, are similarly accommodated. The actual length and extent of the training necessary can be decided after consultation with the Principal.

<b>Fees.</b>	Six months	...	...	...	60 guineas.
	Three months	...	...	...	35 ..
	One month	...	...	...	15 ..

*Inside back cover*

*Back cover*