
# GENERAL INFORMATION

Produced and Published
by Christchurch Factory
August 1961

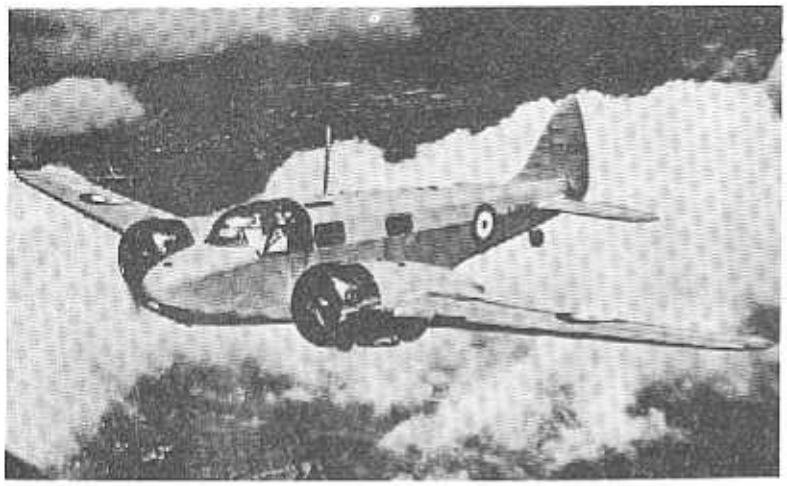
DE HAVILLAND AIRCRAFT COMPANY LIMITED
AIRSPEED DIVISION
CHRISTCHURCH, HAMPSHIRE

TELEPHONE
Christchurch 1800

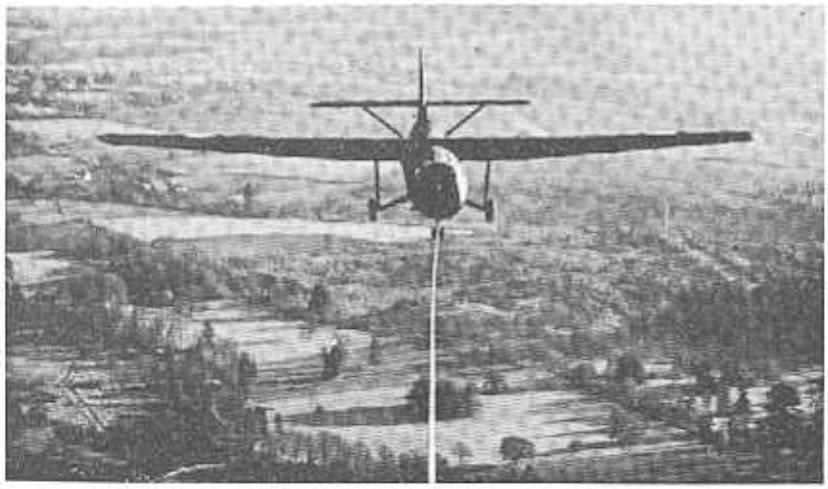
CABLES
Havilland Telex
Christchurch

TELEX
4185

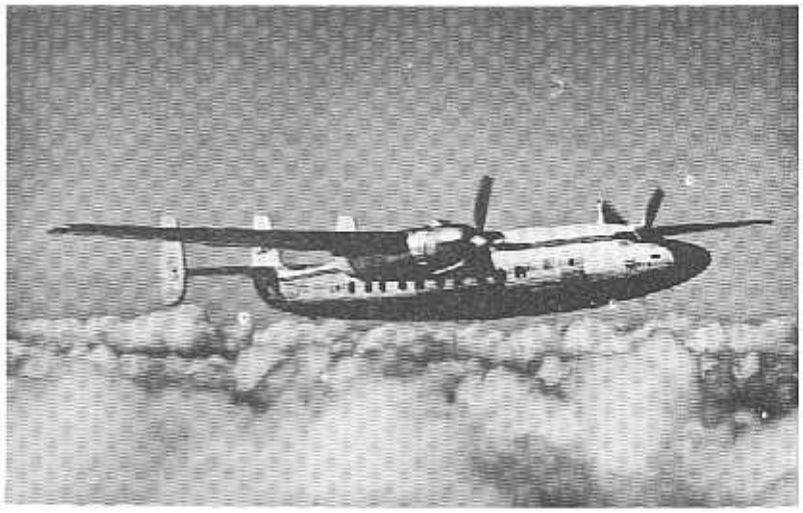
Aerial view of the Factory



Airspeed Oxford



Airspeed Horsa



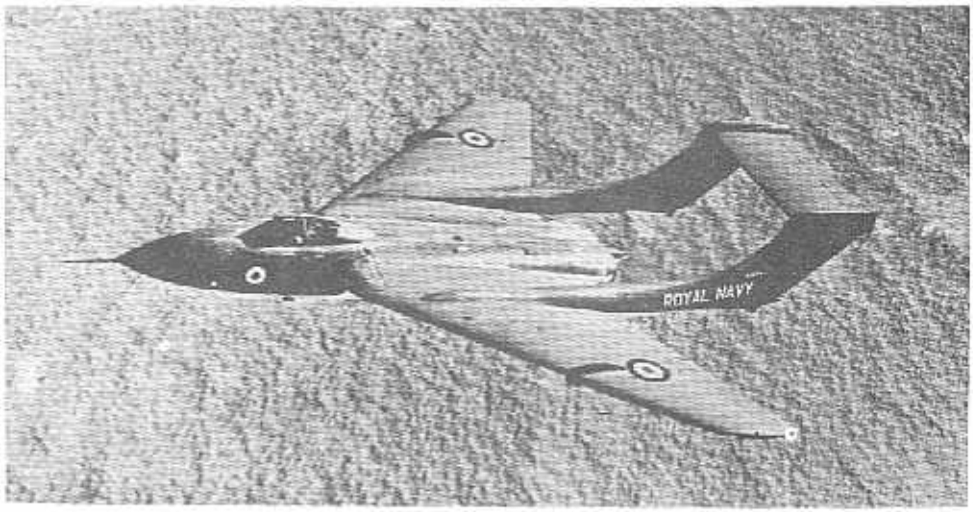
Airspeed Ambassador

# CONTENTS

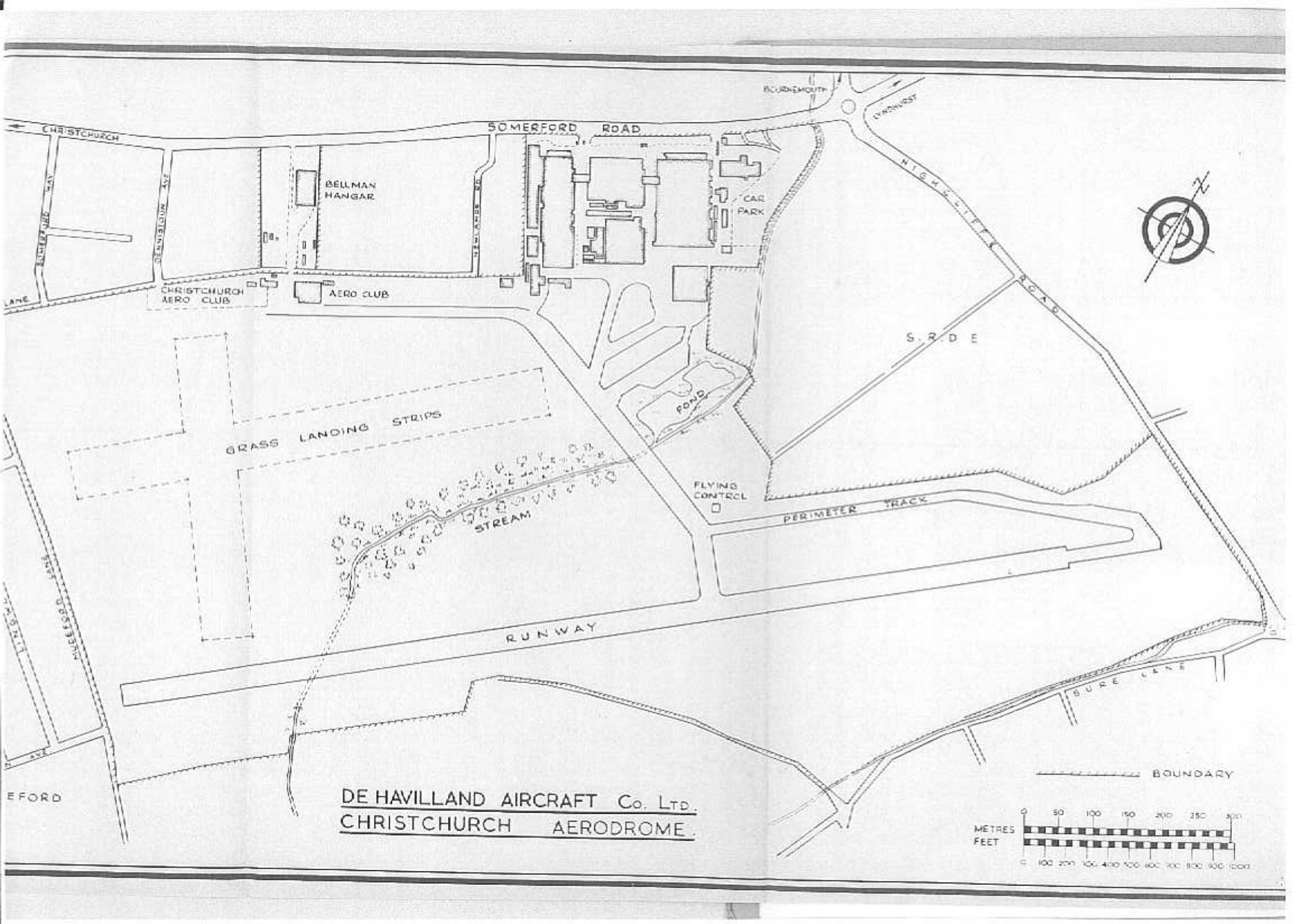
De Havilland Mosquito

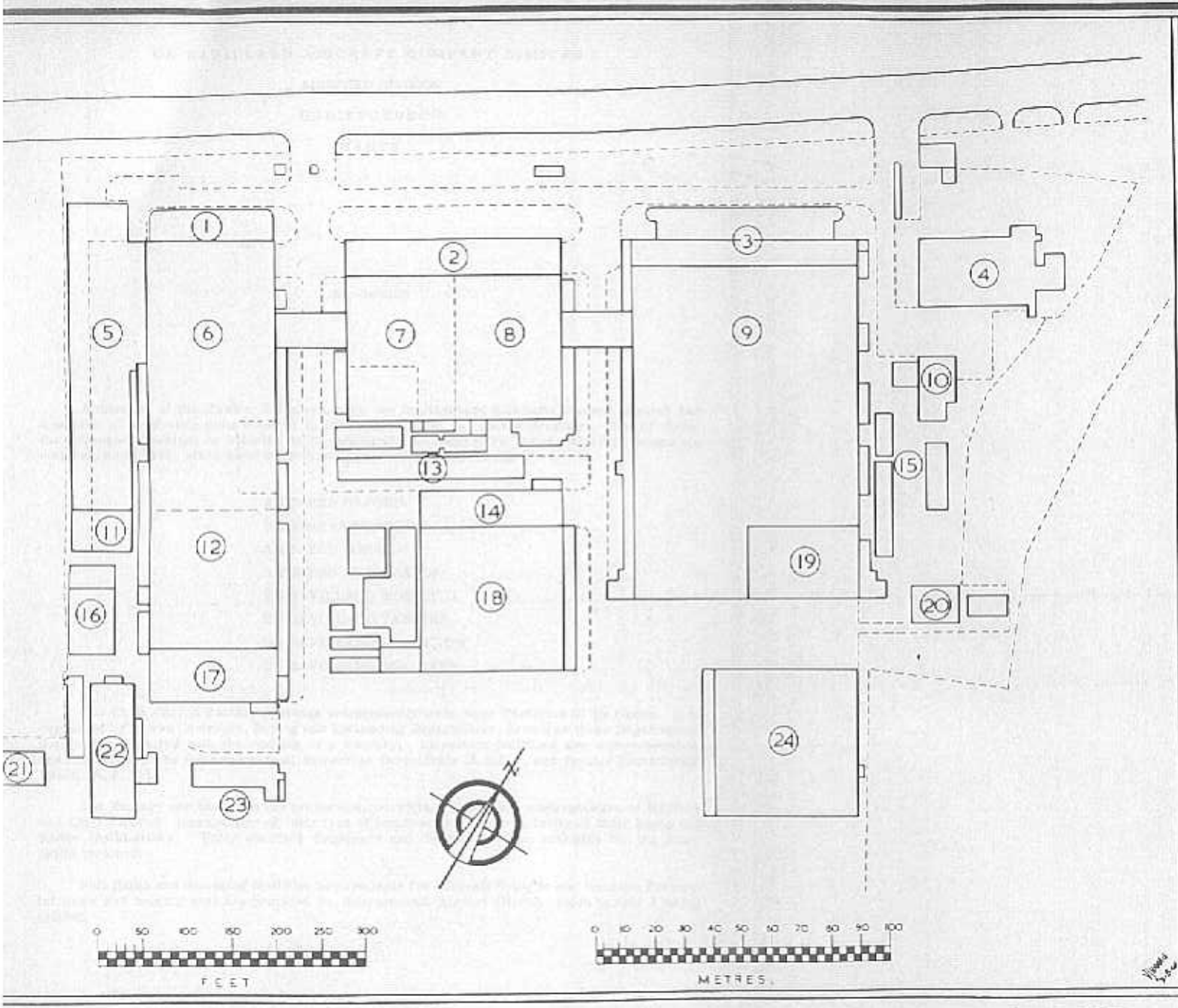
De Havilland Vampire

De Havilland Venom




De Havilland Sea Vixen


CHRISTCHURCH
SOMERFORD ROAD
BOURNEMOUTH
CYNDHURST
BELLMAN HANGAR
CAR PARK
HIGHCLIFFE ROAD
CHRISTCHURCH AERO CLUB
AERO CLUB
S.R.D.E
POND
GRASS LANDING STRIPS
FLYING CONTROL
PERIMETER TRACK
STREAM
RUNWAY
BOUNDARY
METRES
FEET
DE HAVILLAND AIRCRAFT Co. LTD.
CHRISTCHURCH AERODROME.




| CODE. | DESCRIPTION. | AREA SQ. FT. | HEADROOM FT. | HEADROOM INS. |
|---|---|---|---|---|
| 1 | JIG & TOOL DESIGN | 4,900 | | |
| 2 | UNLOADING BAY | 9,400 | 20 | 0 |
| 3 | ADMINISTRATION OFFICES | 15,300 | | |
| 4 | CANTEEN | 11,600 | | |
| 5 | PLASTICS | 27,400 | 10 | 6 |
| 6 | SUB ASSEMBLIES | 37,000 | 23 | 6 |
| 7 | STORES | 25,800 | | |
| 8 | DETAIL FITTING | 24,600 | 20 | 0 |
| 9 | MAIN ASSEMBLY | 82,000 | 25 | 0 |
| 10 | BOILERS | 2,300 | | |
| 11 | TEST HOUSE | 3,200 | 20 | 0 |
| 12 | MACHINE SHOP | 23,000 | | |
| 13 | WOOD TOOLS | 5,040 | 10 | 0 |
| 14 | WOODMILL & ROUTERS | 6,240 | 25 | 0 |
| 15 | INSTRUMENT TEST | 2,260 | 8 | 0 |
| 16 | MAINTENANCE STORES | 3,750 | | |
| 17 | MAINTENANCE WORKSHOP | 8,400 | 12 | 6 |
| 18 | AIRCRAFT SERVICING HANGAR | 25,600 | 25 | 0 |
| 19 | PAINT SHOP | 10,000 | 25 | 0 |
| 20 | PAINT STORES | 2,080 | | |
| 21 | FUEL FLOW TEST | 2,400 | 14 | 0 |
| 22 | ELECTRICAL DETAIL | 5,040 | 10 | 0 |
| 23 | RADIO & RADAR | 2,850 | 8 | 6 |
| 24 | FLIGHT TEST HANGAR | 25,600 | 25 | 0 |

| | | |
|---|---|---|
| AERODROME AREA | 246 | ACRES |
| FACTORY SITE | 20 | ACRES |
| FLOOR AREA TOTAL | 437,794 | SQ. FT |

# FACTORY LAYOUT & FLOOR AREA.

DE HAVILLAND AIRCRAFT COMPANY LIMITED

AIRSPEED DIVISION

CHRISTCHURCH

HANTS

## Introduction

A member of the Hawker Siddeley Group, the De Havilland Aircraft Company Limited has a number of production units situated in different parts of the United Kingdom. One of these, the Airspeed Division, is situated at Christchurch, in Hampshire, where aircraft production commenced in 1940, since when the following Aircraft have been built :-

AIRSPEED OXFORD
SEAFIRE CONVERSION
AIRSPEED HORSA
AIRSPEED AMBASSADOR
DE HAVILLAND MOSQUITO
DE HAVILLAND VAMPIRE
DE HAVILLAND SEA VENOM
DE HAVILLAND SEA VIXEN

The Christchurch Factory operates independently from other Factories in the Group. It is supported by its own Contracts, Buying and Estimating Departments, as well as those Departments normally associated with the running of a Factory. Inspection facilities are comprehensive, and are approved by the Aeronautical Inspection Directorate (A.I.D.), and the Air Registration Board (A.R.B.).

The Factory can carry out the production, servicing, repair and modernisation of Military and Civil Aircraft, irrespective of their type of construction, and complexity of their Radio and Radar Installations. Fully qualified Engineers and Technicians are available for the many skills involved.

Full Radio and Servicing facilities are available for Aircraft flying to and from the Factory; let down and homing aids are provided by Bournemouth Airport (Hurn), which is only 4 miles distant.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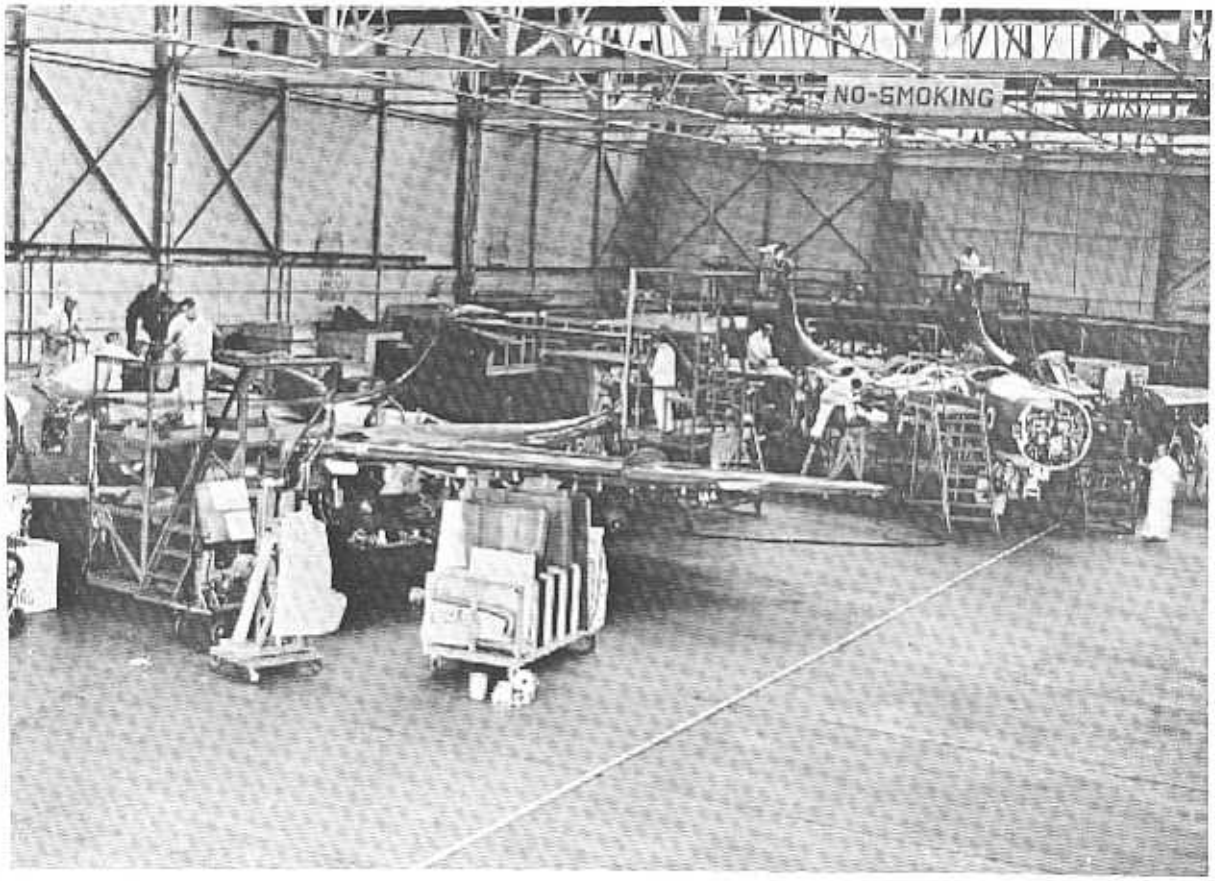
# FLIGHT TEST HANGAR

At present fitted with servicing docks for Sea Vixen Aircraft. These can be readily adapted to handle machines of any size up to the capacity of the hangar.

Aircraft are pre-flight checked to servicing schedules :-

| | |
|---|---|
| FUEL SYSTEM | Pressure checks |
| | Flows, calibrations and transfers |
| | Venting |
| | Pressure Refuelling |
| | Flight Refuelling - Tanker and Receiver |
| ARMAMENT | Alignments |
| AUTO-PILOT | Check operations |
| HYDRAULIC & PNEUMATIC SYSTEMS | Check operations |
| INSTRUMENT CHECKS | |
| ENGINE RUNS | |

The photograph opposite shews three Sea Vixens in their servicing docks.



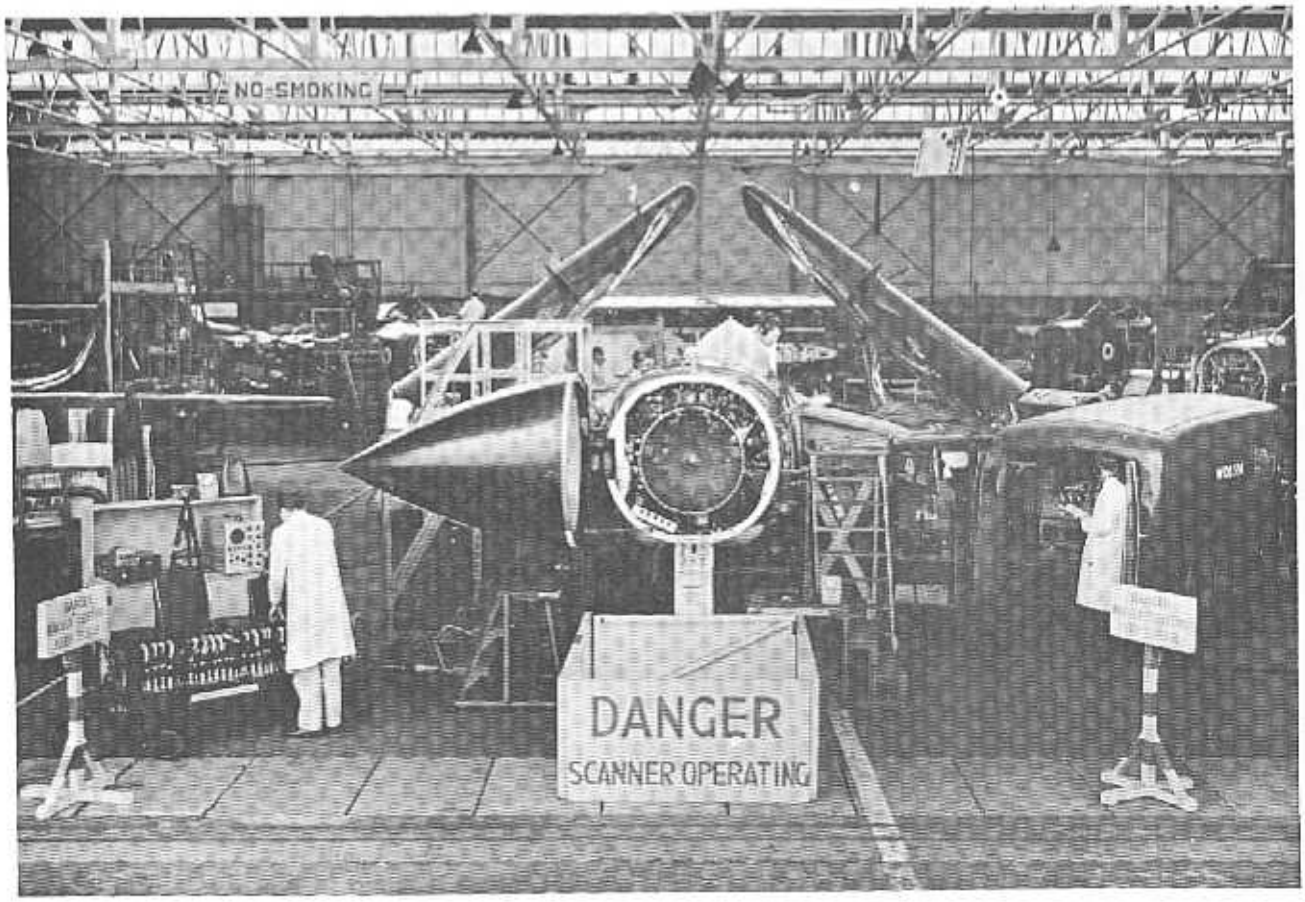

A corner of the Aircraft Servicing Hangar shewing
aircraft on repair and overhaul

# AIRCRAFT SERVICING HANGAR

Any type of aircraft can be serviced in this hangar. Aircraft conversions, modernisation, repair, overhaul and servicing checks are carried out by a fully qualified technical team, having many years' experience in this work.

Full Radar and Armament checks are completed and aircraft signed off for flight.

The illustration below shews an aircraft on Radar checks.



# AIRFIELD FACILITIES

| | |
|---|---|
| CONCRETE RUNWAY | 1650 yards long |
| Direction Magnetic | $060^{o}$ - $240^{o}$ |
| Load Classification Number | 40 |
| Grass Runways | N.E. - S.W. 760 yards |
| | S.E. - N.W. 475 yards |

The Air Traffic Control have available the following radio frequencies :-

| VHF | UHF |
|---|---|
| 122.5 | 256.1 |
| 135.54 | |
| 123.3 | |
| 117.9 | |

Let down and homing aid is provided by Bournemouth (Hurn) Airport.

The Aerodrome is within the Southampton Control Zone - a free lane is available for aircraft approaching and leaving the aerodrome, and which are not equipped with radio.

Supplies of the following fuels are maintained :-

| | | |
|---|---|---|
| D. Eng. R.D. 2488 | AVCAT | Aviation Turbine Fuel |
| D. Eng. R.D. 2482 | AVTUR | Aviation Turbine Fuel |
| D. Eng. R.D. 2486 | AVTAG | Aviation Turbine Fuel |
| D. Eng. R.D. 2485 | 100/130 | Octane Aviation Fuel |
| D. Eng. R.D. 2485 | 73 | Octane Aviation Fuel |

# LABORATORIES

The Laboratories are a self-contained unit providing a comprehensive service to the Production Factory and the Inspection Department.

The Works Control Laboratory is responsible for the mechanical testing of all aircraft materials from fibreglass to high tensile steels.

The factory plating and processing baths are controlled by the Chemical Laboratory which is also equipped for general chemical analysis and testing of the majority of the non-metallic materials used in the manufacture of aircraft.

As well as providing a service to the Production Department, the Metallurgical Laboratory undertakes research and development problems. This department is authorised by the Ministry of Aviation to undertake investigation into service failures.

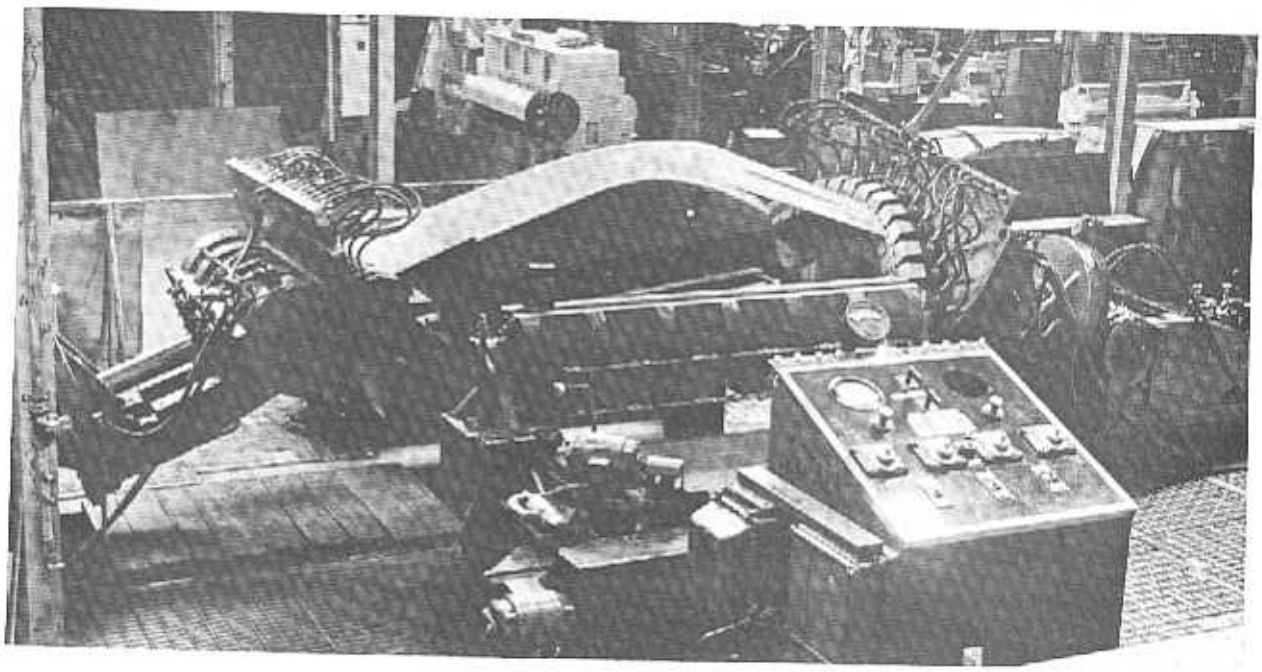
The Laboratories also have their own Workshop, Photographic Section and X-Ray Department with a portable 160 KV X-Ray set.

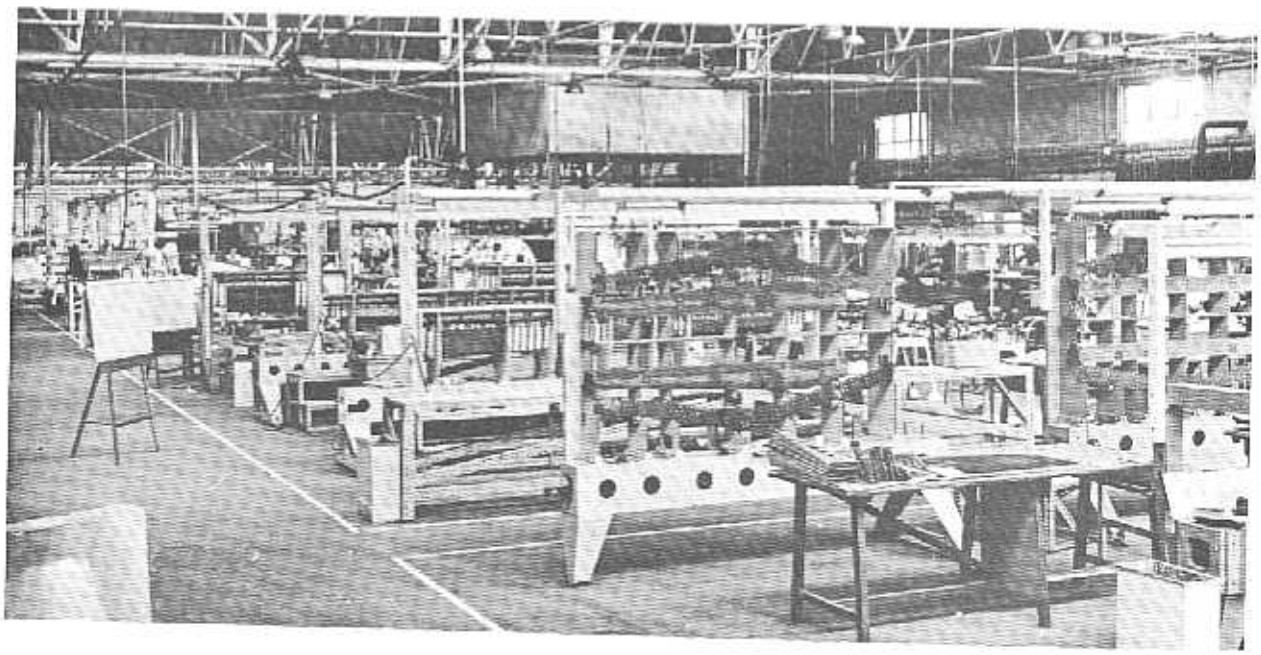
## SHEET METAL

The Christchurch Factory is well equipped for the manufacture of sheet metal aircraft components.

Below is a picture of the Sheridan press in action.

The maximum sheet size which can be handled on this machine is 22 ft 6 ins long by 5 ft wide. The side jaws will accommodate a sheet 6 ft wide.





A Section of the Sub Assembly Shop shewing the Empennage components of the D. H. Trident in process of assembly on Christchurch constructed jigs.

# MACHINE SHOP

Nearly 100 machines are installed, giving an overall capacity to machine the majority of normal aircraft requirements, with the exception of specialised machines for sculpture milling or for larger units, such as undercarriages which is undertaken by other factories within the De Havilland Enterprise.

The following is a list of the principal machines sited at Christchurch, including their capacities :

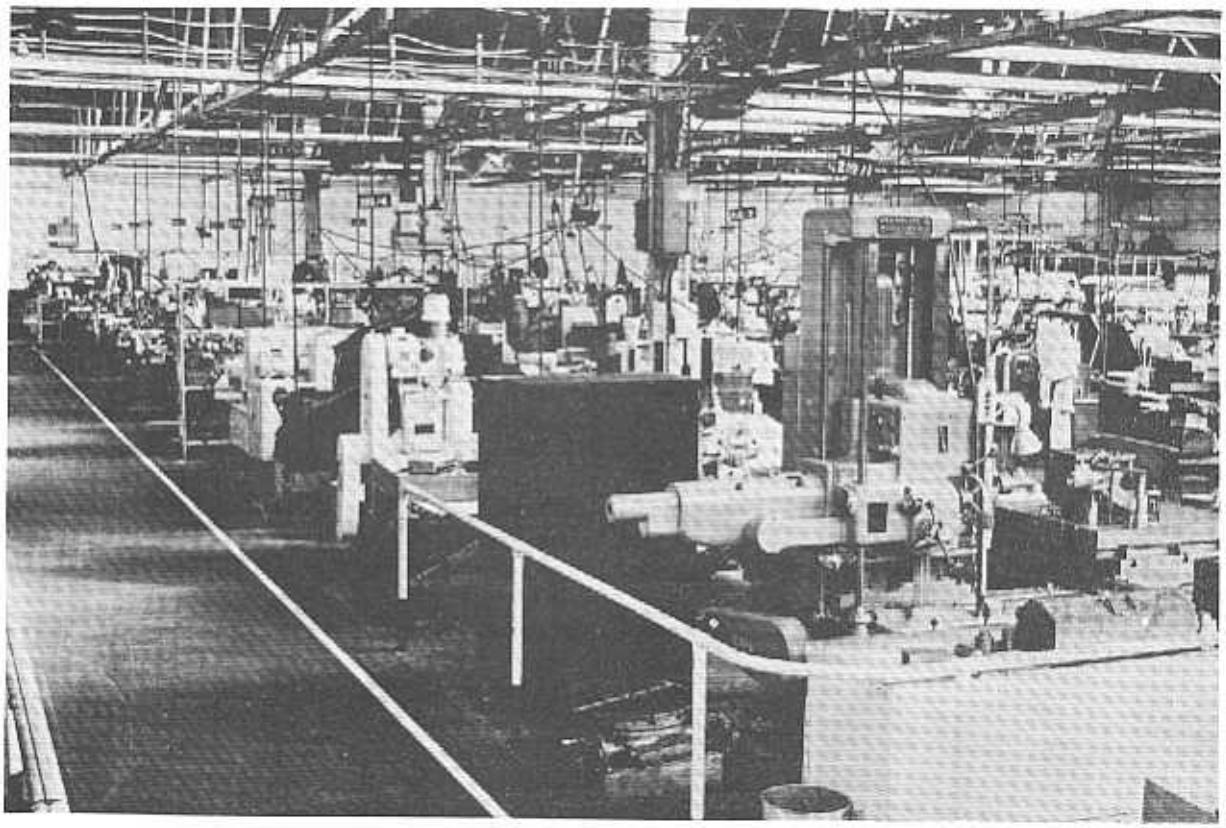
## TURNING

### CAPSTAN LATHES

| | | Max capacity |
|---|---|---|
| Herbert No. 0 | - Collets, three machines | $\frac{1}{2}$" dia |
| Herbert No. 3 | - Chuck, two machines | $1\frac{1}{4}$" dia |
| Herbert No. 4 | - Chuck and Collets | $1\frac{1}{4}$" dia |
| Fiat | - Chuck, three machines | 2" dia |
| Noel Ernhalt | - Collets | $2\frac{1}{4}$" dia |
| Herbert No. 8 | - Chuck - taper turning | $3\frac{3}{4}$" dia |
| Herbert No. 9 | - Chuck | $4\frac{1}{4}$" dia |

### CENTRE LATHES

| | Capacity | | | | |
|---|---|---|---|---|---|
| | Swing over Bed | Gap | Between Centres | Hollow Mandrel | |
| Swift Sentinel | 11" | 15" | 60" | $2\frac{1}{2}$" | |
| " " | 13" | 16" | 60" | $2\frac{1}{2}$" | |
| " " | 11" | 15" | 60" | $2\frac{1}{2}$" | |
| Swift | 11" | 18" | 66" | $2\frac{1}{2}$" | |
| Swift | 9" | 16" | 78" | $2\frac{1}{2}$" | |
| Somua | 10" | 15" | 48" | $2\frac{1}{2}$" | Taper turning attachment |
| Dean, Smith & Grace | 10" | 16" | 48" | $3\frac{1}{2}$" | |
| Troglia | 8" | No gap | 36" | $1\frac{1}{4}$" | |
| Smart & Brown | 4" | No gap | 24" | 1" | |
| Fortis | 6" | No gap | 24" | 1" | |
| Colchester Master | $6\frac{1}{2}$" | 9" | 36" | $1\frac{1}{2}$" | |
| Cardiff | $6\frac{1}{2}$" | 10" | 48" | $1\frac{3}{4}$" | |
| W. Haggis & Smith | 9" | No gap | 60" | 2" | Taper turning attachment |
| Holbrook (4 machines) | $6\frac{1}{2}$" | No gap | 30" | 1. 3/16" | Taper turning attachment |
| Colchester Triumph (3 machines) | $7\frac{1}{2}$" | No gap | 30" | 2" | |
| Student | 6" | $9\frac{1}{2}$" | 24" | $1\frac{1}{2}$" | |



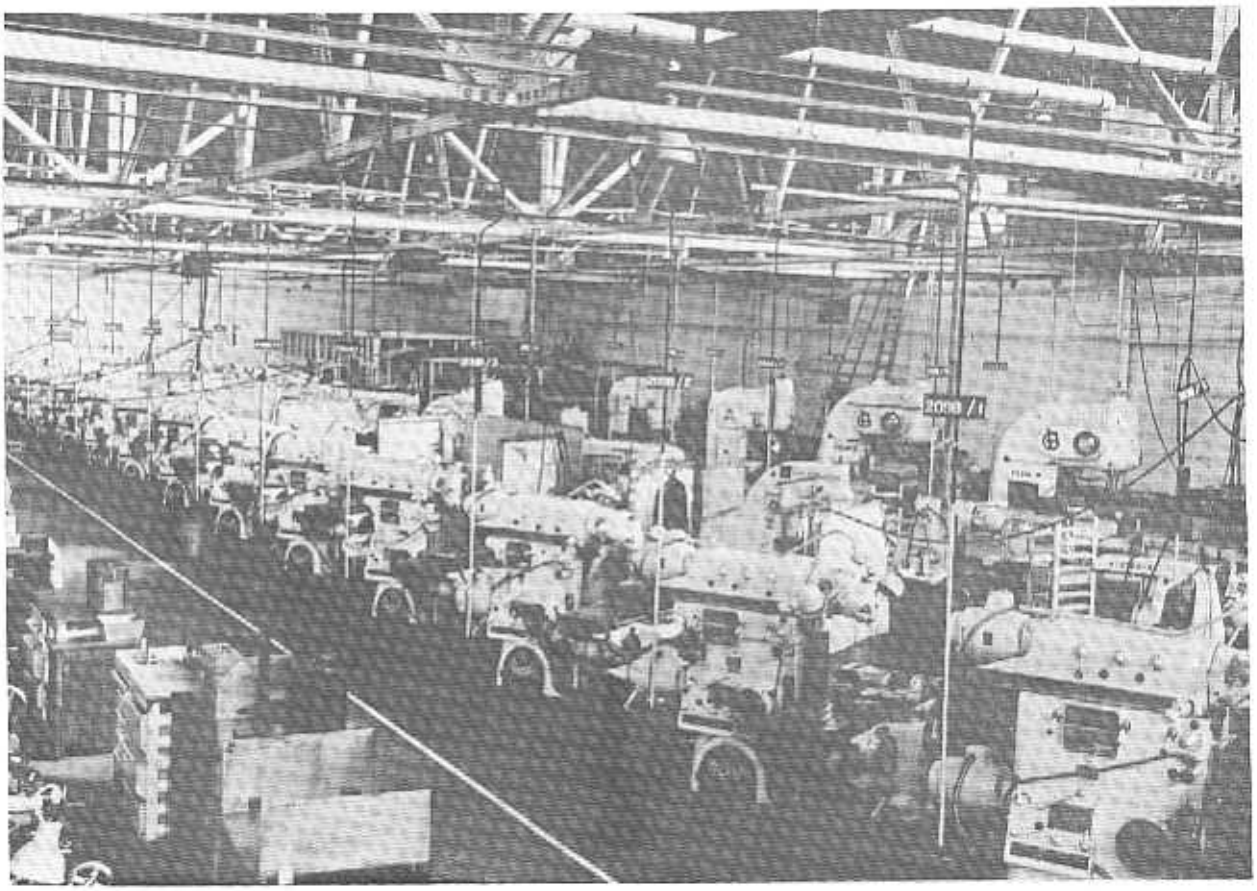
One lane of the Machine Shop shewing Boring, Gear Cutting and Capstan Machines

# MILLING

| UNIVERSAL MILLS | | Working Surface | Table Traverse Long | Transv | Vert |
|---|---|---|---|---|---|
| Huron KU 4 | - three machines | 56½" x 16½" | 43¼" | 27½" | 19¾" |
| Huron KU 5 | - eleven machines | 64¼" x 16½" | 50" | 27½" | 19¾" |
| Huron KU 6 | - one machine | 78¾" x 16½" | 59" | 27½" | 19¾" |
| Cincinnati | - one machine | 52¾" x 12¼" | 28" | 10" | 18" |
| Van Norman | - one machine | 45" x 10" | 23" | 10" | 16" |
| Dufour | - one machine | 36" x 10" | 23" | 8" | 15" |

| HORIZONTAL MILLS | | | | | |
|---|---|---|---|---|---|
| Cincinnati | - two machines | 52¾" x 12¼" | 28" | 10" | 10" |
| Victoria with Vertical Head | | 25" x 8" | 18" | 6" | 12" |

| VERTICAL MILLS | | | | | |
|---|---|---|---|---|---|
| Cincinnati | - two machines | 52¾" x 12¼" | 28" | 12" | 13" |
| Heller F.V.140 | - two machines | 62" x 18" | 48" | 16" | 24" |
| Adcock & Shipley | - two machines | 48" x 15" | 36" | 15" | 16" |



A view of the Milling Section of the Machine Shop

## GRINDING

| | Working size |
|---|---|
| **SURFACE** | |
| Jones and Shipman | 14" x 6" |
| Jones and Shipman | 16" x 6" |
| **UNIVERSAL** | |
| Jones and Shipman | 28" between centres, 6" diameter |
| Churchill P. B. W. | 72" bed x 12" diameter |
| **CENTRELESS** | |
| Scrivener | $\frac{1}{4}$" to 5" diameter |
| Scrivener | 1/16" to $1\frac{1}{2}$" diameter |
| **CUTTER GRINDERS** | |
| Jones and Shipman | 36" x 5" |
| Selson | 42" x 6" |
| Cincinatti | 42" x 6" |
| **DRILL GRINDERS** | |
| Zwicky | $\frac{1}{4}$" diameter |
| Vilar | $2\frac{1}{4}$" diameter |

## HONING

| | Capacity |
|---|---|
| Delapena Model 301 | 0.120" - 3.125" spindle speeds 245-380 -550-675 r.p.m. |

## DRILLING

| | |
|---|---|
| **RADIAL** | |
| Archdale | 36" swing |
| Asquith | 36" swing |
| **4 - SPINDLE DRILLS** | |
| Herbert No. 1 | 48" span at 12" centres |
| Herbert No. 2 | 48" span at 12" centres |
| **2 - SPINDLE DRILLS** | |
| Archdale No. 1 | 24" span at 12" centres |
| Archdale No. 2 | 24" span at 12" centres |
| **PILLAR DRILLS** - eight machines | |

## BORING

| | Spindle diameter | Working surface revolving table |
|---|---|---|
| Kearns 450 C | 3" | 36" x 36" |
| Kearns OB | $2\frac{3}{4}$" | 36" x 48" |

## SHAPING

| | Stroke |
|---|---|
| Atlas | 14" |
| G.S.P. | $23\frac{3}{4}$" |
| Butler | 26" |

## SLOTTER

| | | |
|---|---|---|
| Butler | Tool Room Precision 8" stroke | Table 24" diameter |

## GEAR SHAPING

| | | |
|---|---|---|
| Maxicut 2A | Max. capacity external Spur Gears | 7" P.C.D. x 2" face x D.P. |
| Gleason Model 14. | | |
| | Straight bevel gear generator | |
| | Longest cone distance | $3\frac{1}{2}$" face - 12" |
| | Largest pitch | 24 P |
| | Length of stroke | $\frac{1}{2}$" - $4\frac{1}{4}$" |

## ENGRAVING

| | Working surface | Table traverse | | |
|---|---|---|---|---|
| | | Long | Transv | Vert |
| Taylor Hobson "CX" - two machines | 15" x 8" | 14" | 6" | 6" |

## PROFILE CUTTER

| | | |
|---|---|---|
| Hancock | 72" x 42" table. | Capacity up to 8" Mild Steel |

# ROUTER SHOP

The removal of metal by routing is a proved economical process, and the Christchurch factory is well equipped both by machines and technical "know-how" to perform this speedy operation.

The equipment now installed is listed below, with an indication of capacities.

| | | Table size |
|---|---|---|
| WADKIN HYR 5 | Heavy duty - fixed head, vacuum table, vertical traversing | 78 ins x 36 ins |
| WADKIN LYR | Heavy duty - fixed head, Tee Slot table, vertical traversing | 60 ins x 42 ins |
| WADKIN LEG | Radial Arm | 20 ft x 48 ins |
| WADKIN LEG | Radial Arm | 96 ins x 48 ins |
| CENTEG Senior - | Three machines | 30 ins x 30 ins<br>Can be converted to portable |

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| CENTEG Senior - | Three machines | 30 ins x 30 ins<br>Can be converted to portable |

# TREATMENTS

Comprehensive equipment associated with the forming and protection of metals is installed and controlled by the Laboratory staff.

| | | Maximum size |
|---|---|---|
| **HEAT TREATMENT** | | |
| Salt Bath | 500°C | 6 ft x 3 ft x 2 ft |
| Hot Air Circulating Oven | 100° - 500°C | 10 ft x 5 ft x 2 ft 9 ins |
| **REFRIGERATION** | | |
| Operating Temperature | 15°C | 13 ft x 9 ft x 8 ft |
| **CHROMATING** | | |
| For Magnesium based alloys | | 6 ft x 3 ft x 3 ft |
| **ANODISING** | | |
| Chromic Acid | | 8 ft x 3 ft 6 ins x 2 ft 3 ins |
| **PLATING** | | |
| Cadmium | | 4 ft x 2 ft 9 ins x 2 ft |
| Cadmium Barrel Unit | | 1 ft diameter x 1 ft deep |
| Nickel strike (for Cadmium plating) | | 3 ft x 2 ft x 1 ft 6 ins |
| Anodic Etch (for Stainless Steel) | | 3 ft x 2 ft x 1 ft 6 ins |
| **PARKERISING** | | 2 ft x 2 ft x 2 ft |
| **DEGREASING** | | |
| Vapour baths | | 14 ft x 6 ft x 2 ft<br>3 ft x 2 ft x 2 ft (two) |
| **GRIT BLAST** | | |
| Jackman Cabinet | | 2 ft x 2 ft x 2 ft |
| **VACU-BLAST** | | |
| Using Alumina abrasive | | 4 ft x 2 ft x 1 ft |

**DALIC PLATING :-**

Used on expensive steel or aluminium alloy components to build up bearing surfaces or housings with such material as Nickel

| | |
|---|---|
| **PICKLING (Cleaning)** | |
| Aluminium weld | 5 ft x 2 ft x 1 ft 6 ins |
| Stainless Steel | 6 ft x 1 ft 6 ins x 1 ft 6 ins |
| Mild Steel | 4 ft x 2 ft x 1 ft 6 ins |
| Copper and Tungum | 6 ft 6 ins x 2 ft x 1 ft |

**METAL SPRAYING**

Aluminium or Zinc for anti-corrosion.

| | |
|---|---|
| **CLEANING** | |
| Alocleine | 24 ft x 4 ft x 2 ft |
| Stripaline | 8 ft 6 ins x 4 ft 6 ins x 1 ft 6 ins |

# TOOLING

## DESIGN

An experienced team of draughtsmen is available for the design of Assembly and Sub Assembly Jigs, Machine Tooling and Fixtures.

## MANUFACTURE

The Tool Room capacity is adequate for the needs of the Christchurch factory, and apart from the manufacture of Jigs and Tools, is responsible for the production of reference gauges and special purpose small tools.

The Wood Jig Shop and Woodmill are equipped to manufacture compressed wood form tools, wooden stretch press blocks, models, and detail tooling for fibreglass components.

## DETAIL FITTING SHOP

In addition to the manufacture of sheet metal and metal fabricated details, this department completes the assembly of mechanical, hydraulic and pneumatic components, some of which are illustrated below.

Pines automatic draw bar pipe benders are installed in the Coppersmith Section.

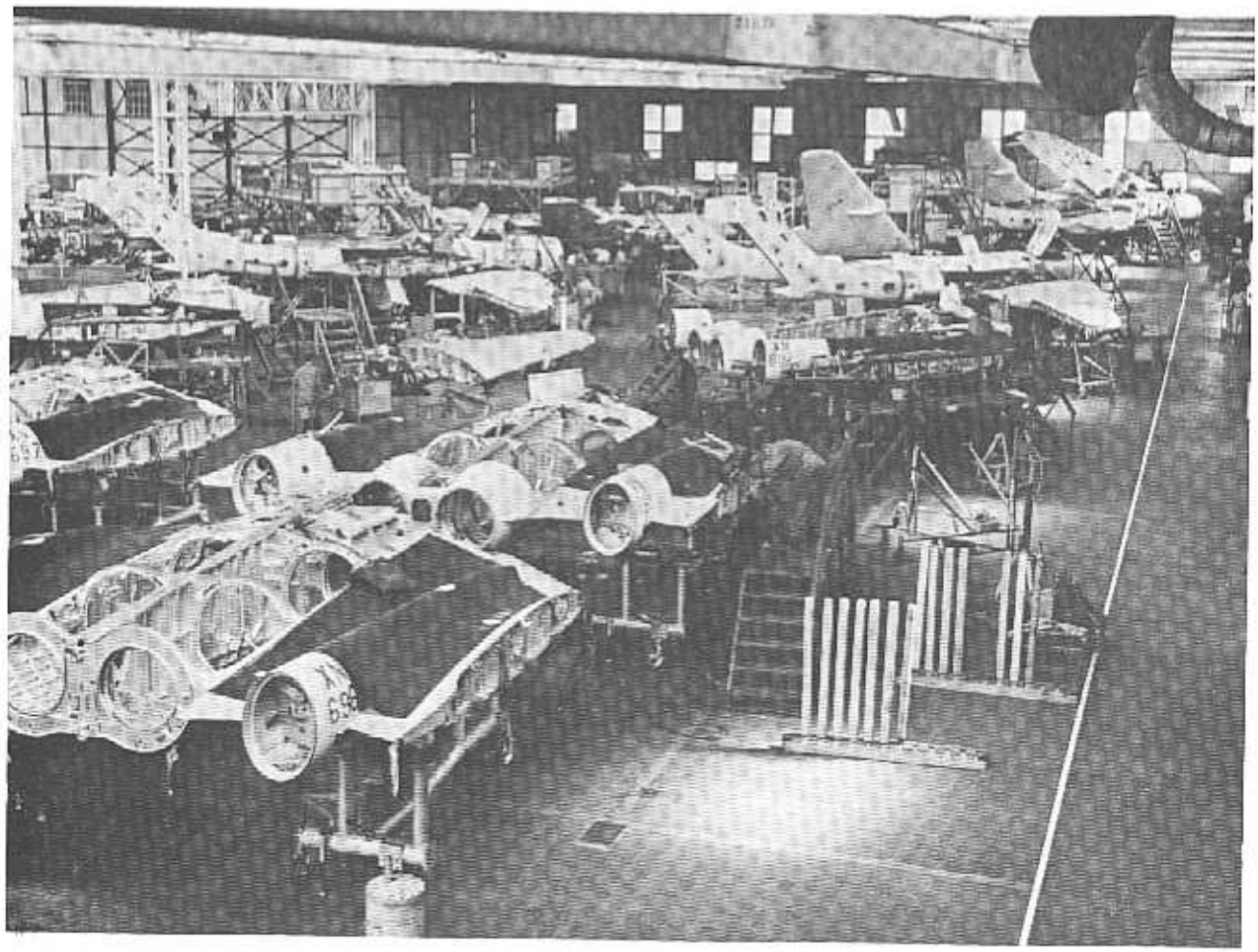
# ASSEMBLY SHOP

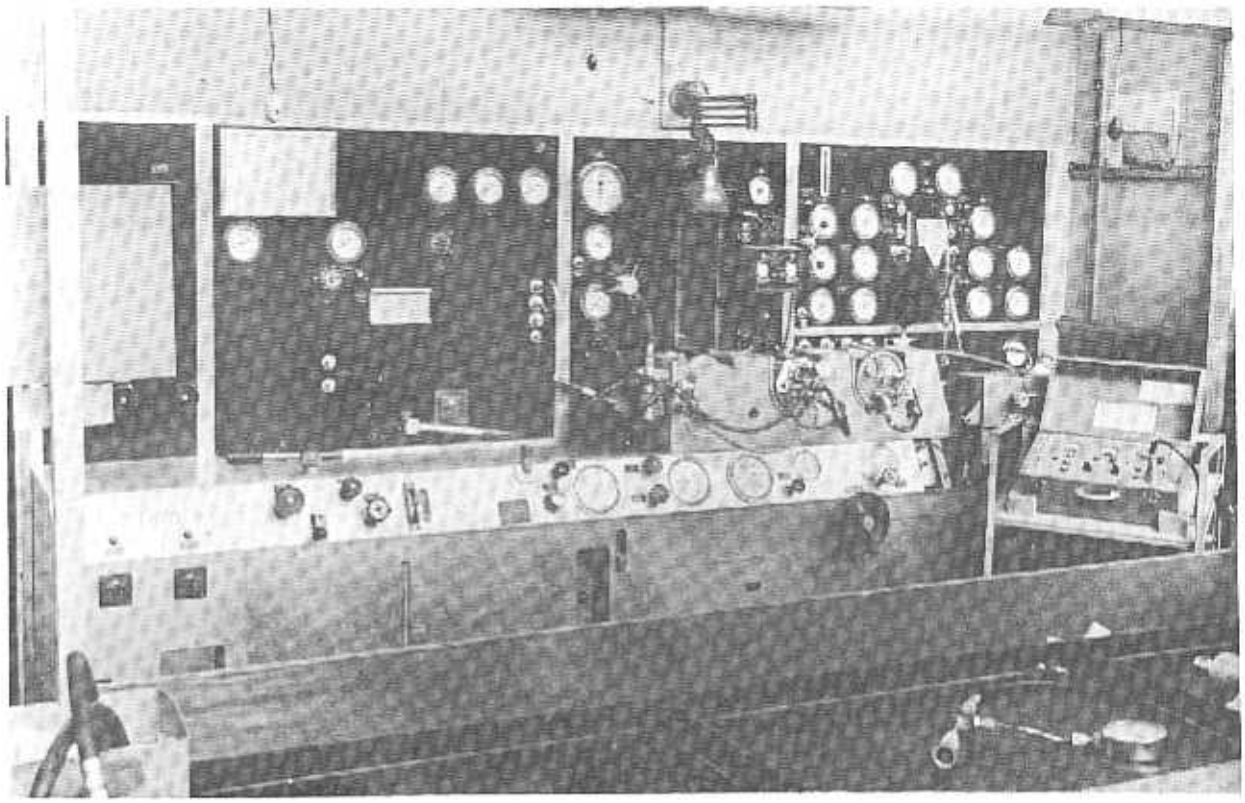
In this, the largest of the Christchurch Shops, the final assembly of complete aircraft is carried out to tight production programmes.

Sub-Assembly and equipping of fuselages is carried out prior to installation on the line; all services receive an initial check before the Aircraft is transferred to the Flight Test Hangar.

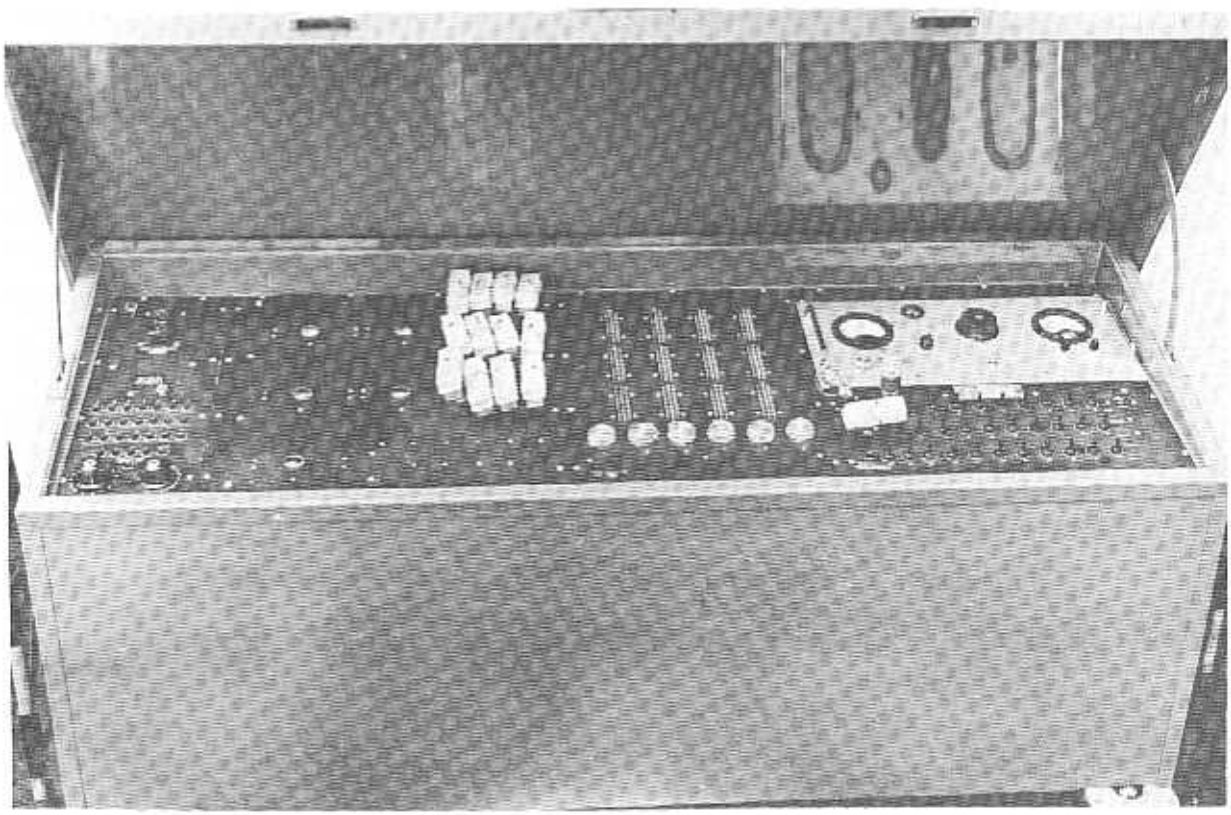
A separate Paint Shop leads off the Assembly Shop, the floor area of which is readily adjustable to suit the size of aircraft to be painted.

The photograph below shews the Assembly Shop with Sea Vixen Centre Wings being prepared for final assembly to the fuselages.





An Hydraulic Alternator set being tested on one of the Hydraulic Rigs



Hadar loom continuity, insulation, and proof voltage tester

# TESTING

Extensive facilities are available for testing every item of equipment installed in a modern aircraft. These facilities are backed by a Technical Department responsible for the design and operation of this equipment, and its maintenance in service.

The following is a brief summary of Test Equipment at present available:-

## HYDRAULIC AND PNEUMATIC

Static pressures up to 8,000 p.s.i.

Flows can be controlled up to 4,500 cubic ins/min at pressures up to 3,000 p.s.i.

Fluid temperatures can be controlled from $20^{\circ}$ - $90^{\circ}$C.

Pneumatic pressures are controlled to 3,500 p.s.i. with recorded flows from .2 to 30 cubic ft/min.

Air to NATO Standards.

Vacuum to 29" Hg.

## FUEL

Flow tests can be carried out with all aviation spirits.

Flow rates from 100 - 10,000 Imperial gallons/hour at pressures up to 90 p.s.i.

Electrical supplies 0 - 30 volts D.C.
0 - 60 amps D.C.

Air supply up to 3,000 p.s.i.

## MECHANICAL

Proof loading, fatigue testing, and cyclic testing of unit assemblies.

Cables and strip, proof tested to 3 tons x 50 ft and 45 tons x 13 ft.

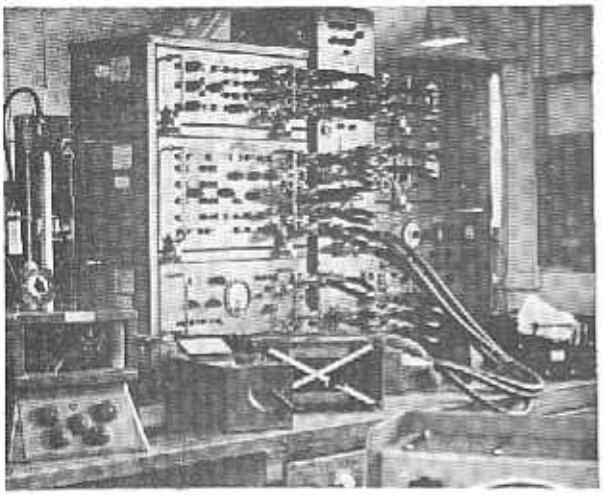
Official Certification of hoists and lifting tackle to Factories Act Specifications.

## ELECTRICAL

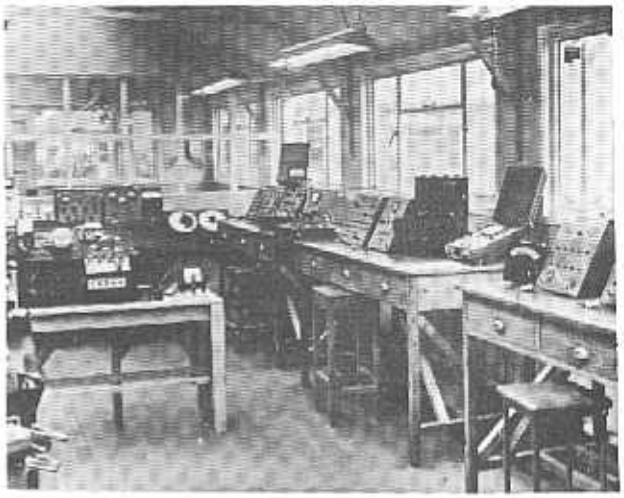
Testing looms and cable assemblies, connectors, junction boxes and control panels.

Plugs and sockets sealed with Araldite and rubberised PR 720 and PR 1201 methods.

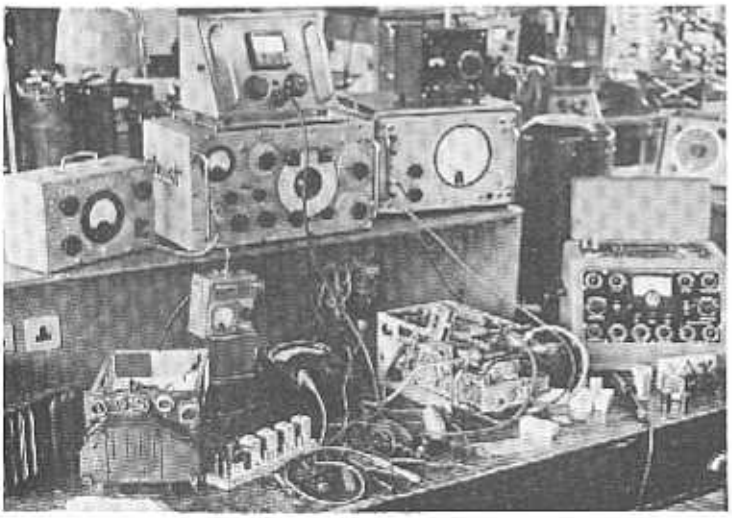
Supplies up to 10,000 volts D.C. and 5,000 volts A.C. using the epsylon and B.P.L. voltage equipment.



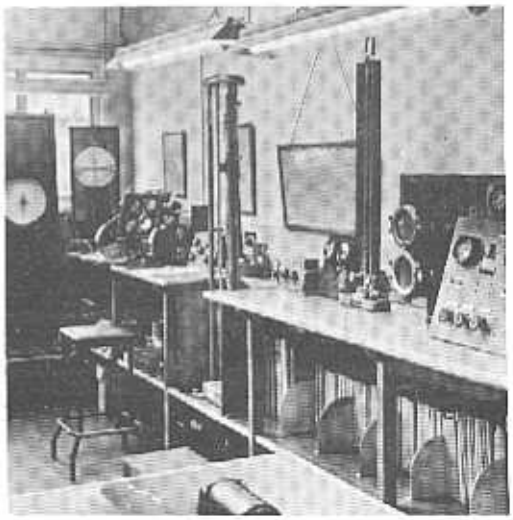
Testing a Guided Missile Aircraft Unit



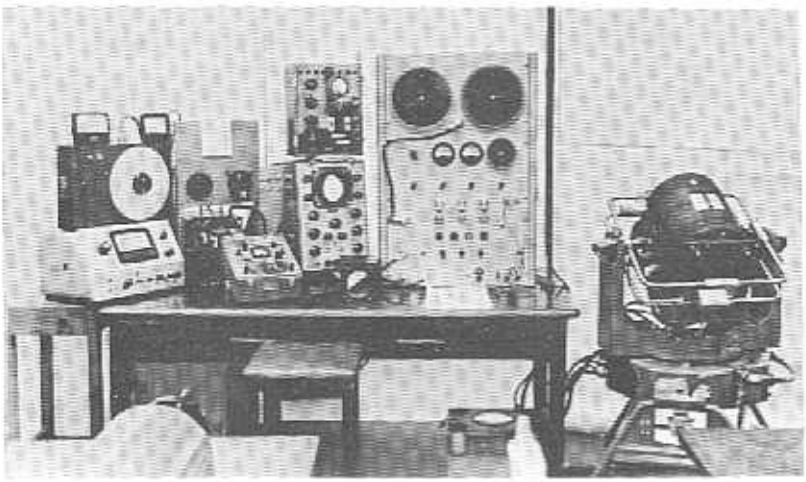
Auto Pilot Equipment Layout for testing Rate Gyro's, Servo Motors etc.



Multi channel VHF Communications Transmitter/Receiver under test



Laboratory Equipment for testing & servicing Airspeed, Altimeter, Machmeter system and general instruments.



Master Reference Gyro on test complete with Compass and Attitude Indicator system

# ELECTRONICS

RADAR INSTRUMENTATION COMMUNICATION

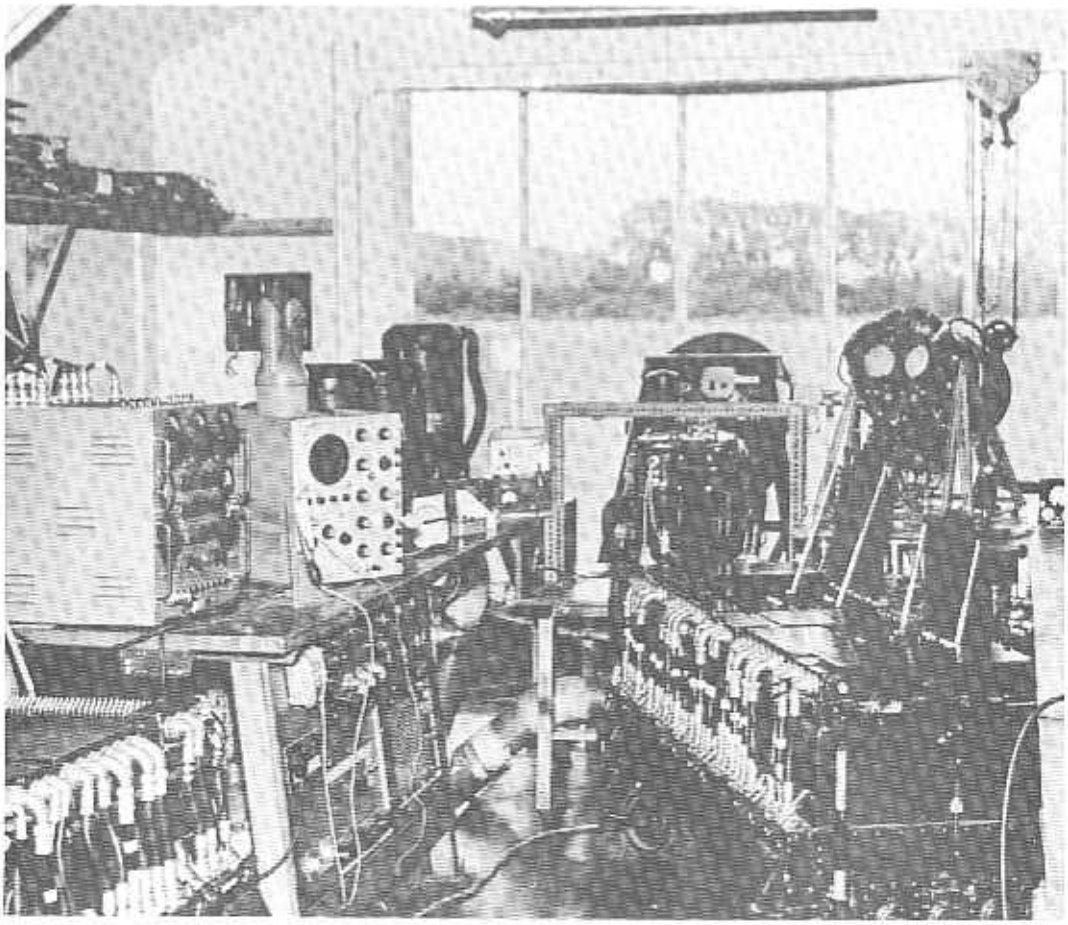
Comprehensive Test Equipment is available for carrying out functional tests on a wide range of Radar, Radio, Weapon, Auto-Pilot and general instrumentation, on advanced military aircraft. This includes installation, alignment, harmonisation of guided weapons and other armament.

This requirement has demanded the setting up of well equipped Electronics and instrumentation Laboratories and Workshops and the organisation of Personnel Training Schemes, in order to develop the now specialised team of Engineers and Mechanics.

The existing facilities are suitable for all types of installations, such as trials and experimental work on airborne, seaborne and land-based equipment.

A great deal of experience has been gained in the proving of specifications concerning the Sea Vixen; this could be extended to any other types of electronic equipment.

Micro-wave equipment is available for the transparency testing of Radomes.



Radar test bay laid out to test the airborne radar as a system, also main and ancilliary equipment for checking overall performance, and Servo loop responses.

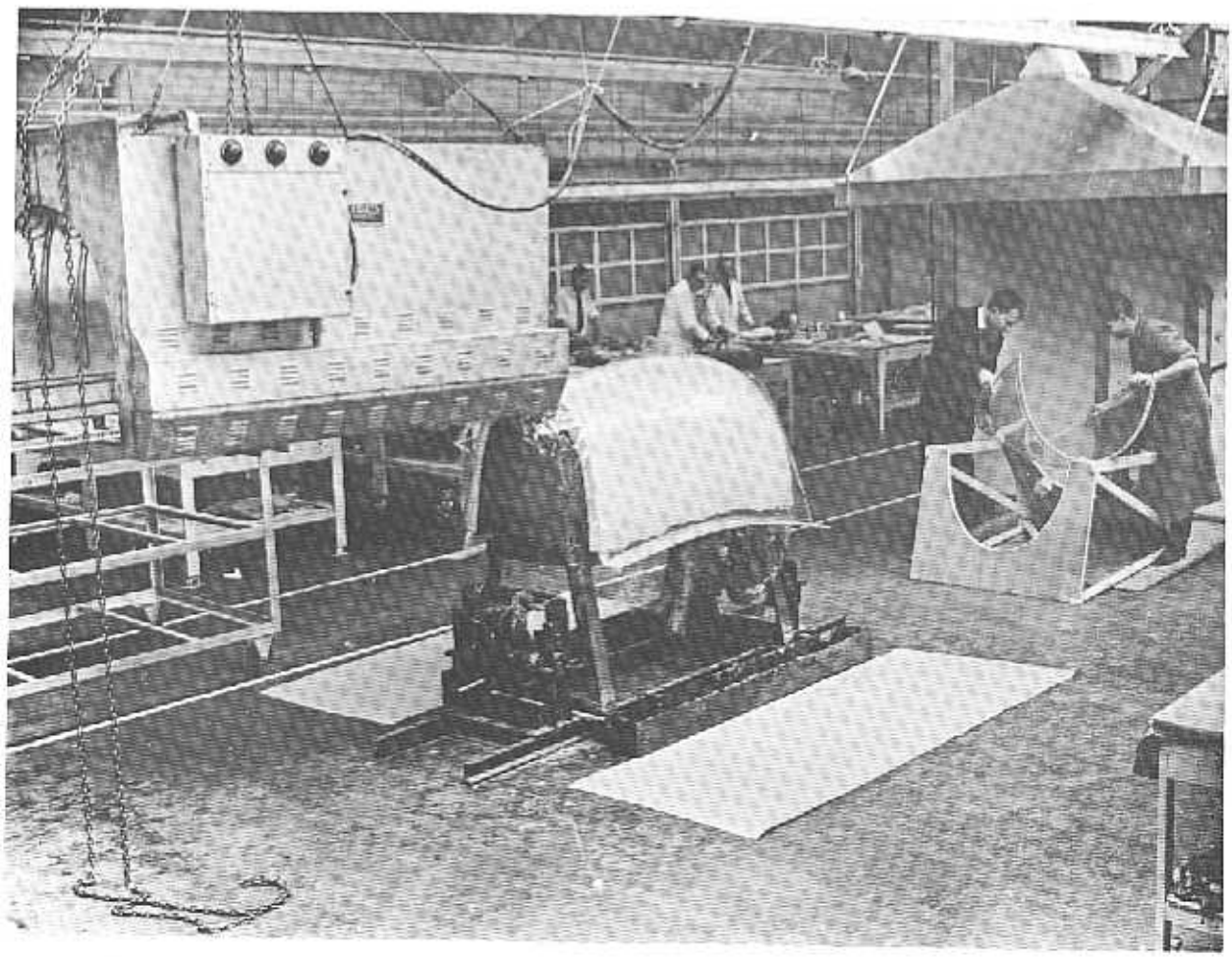
# PLASTICS

## PERSPEX

This up to date department is equipped for the manufacture of moulded Perspex sheet components, pressure and vacuum formed.

Maximum oven size 12 ft x 7 ft x 5 ft.

The illustration shews a typical canopy hood being formed over a heated mould.

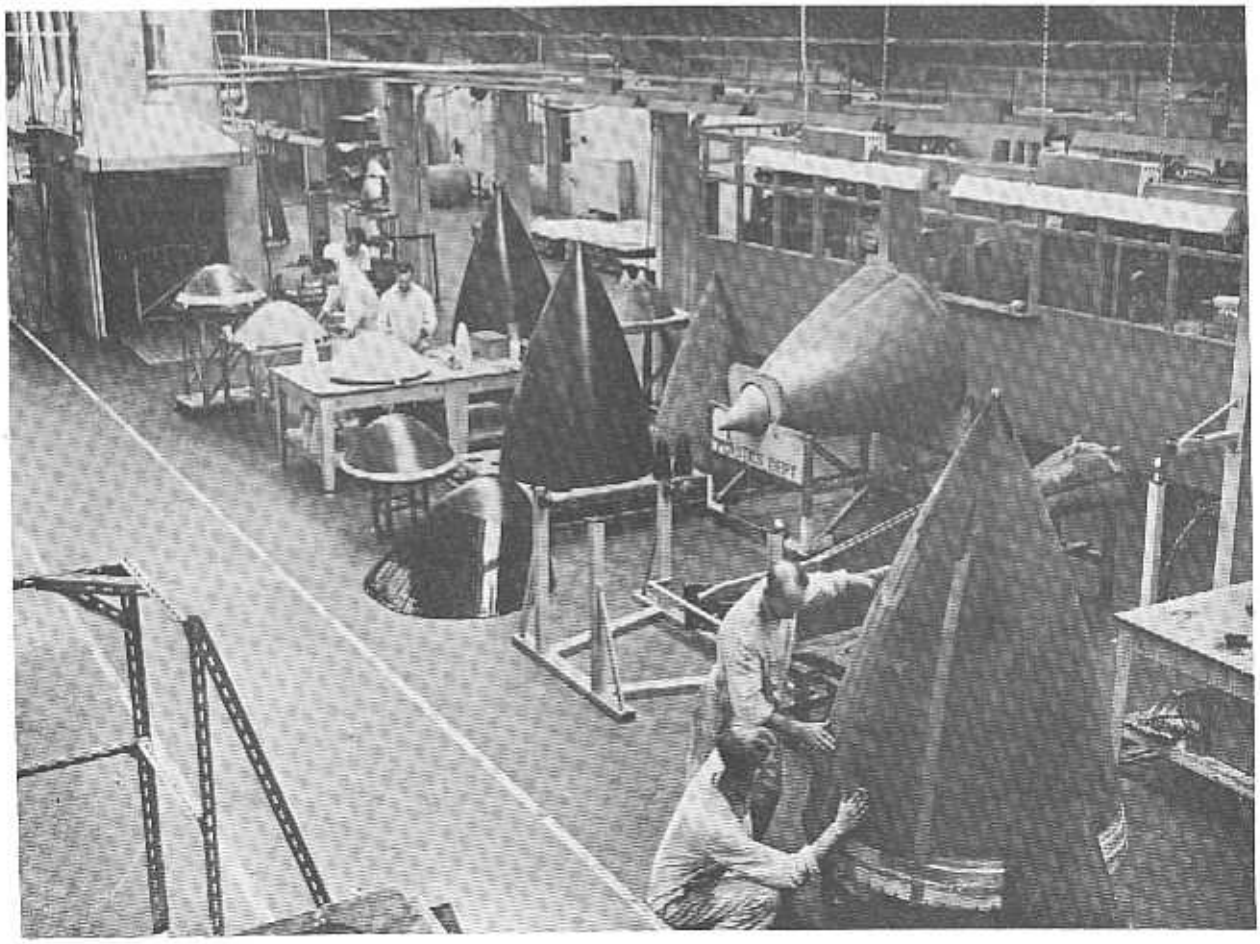


# PLASTICS

## FIBREGLASS

A range of details are manufactured in Fibreglass.

Illustrated below are Sea Vixen, Comet and Trident Radomes.



Another section of the Plastic Department shewing the well laid out and ventilated shop.

A staff of research engineers is continually investigating the latest methods and materials in this relatively young industry.

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