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AIR PUBLICATION

4099E

VOLUME I

RESTRICTED

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VAMPIRE FB Mk. 5 AIRCRAFT

Prepared by direction of
the Minister of Supply

A. C. Rowlands.

Promulgated by Order
of the Air Council

J. H. Barnes.

AIR MINISTRY

LIST OF SECTIONS

Leading particulars

Introduction

SECTIONS

- 1 Pilot's controls and equipment**
- 2 Emergency controls, equipment and exits**
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 - Chap. 1 Loading and C.G. data*
 - 2 Ground handling and preparation for flight*
 - 3 General servicing*
- 5 Removal, assembly and dismantling operations**
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- 10 (Not used—see Sect. 6)**
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- 12 Armament installations and servicing**
 - Chap. 1 Guns*
 - 2 Bombing equipment*
 - 3 R.P. equipment*

Note.—A list of contents is given at the beginning of each section or chapter

LIST OF ASSOCIATED PUBLICATIONS

	A.P.
Aircraft operation and servicing under low-temperature conditions	1441A
Air pump units	1519
Armament publications, list of	2264B
Bomb and supply carriers and associated equipment	1664A
Bomb sights	1275D
Compass, distant reading, gyro-magnetic, Mk. 1	1275B
Electrical equipment manual	1095A, B & C
Engineering, R.A.F.	1464A to G
Electrical equipment manual	1095A, B & C
Engineering publications, list of	2462A
Explosives, regulations for the R.A.F.	2608A
External finish of aircraft	2656A
Goblin, Mk. 1 and 2, aero engine	4121A & B
Guns, Hispano 20 mm. Mk. 1 and 2	1641F
Guns, firing control mechanisms	1641E
Gun sights	1730B
Hydraulic equipment, Lockheed	1803B & C
Hydraulic servicing trolley	2306B
Instrument manual	1275A & B
Lighting equipment and haulage accessories	2817A
Power plants (A), Vampire 1, 3 and 5	4174A
Pressure cabin testing, servicing trolley	2306G
Pyrotechnics	1661E
Radio equipment, concise details of	2276
Safety equipment manual	1182A & B
Signal dischargers and signal pistols	1641H
Signal manual	1186A, B & D
Standard repairs for airframes	2662A
Wheels, tyres and brake systems, aircraft	2337
	A.D.
Flying controls	3503
Hydraulic system	3505

NOTE TO READERS

The subject matter of this publication may be affected by Air Ministry Orders, or by Volume 2, Part 1, leaflets in this A.P., in the associated publications listed on the page facing Leading Particulars, or even in some others. If possible, Amendment Lists are issued to correct this Volume accordingly, but it is not always practicable to do so. When an order or leaflet contradicts any portion of this publication, the Order or leaflet is to be taken as the overriding authority.

Each leaf bears the date of issue and, when applicable, the number of the Amendment List with which it was issued. New or amended technical information on new leaves which are inserted when this volume is amended is indicated by a line in the margin. This line merely denotes a change and is not a mark of emphasis. When a Section or Chapter is issued in a completely revised form, the line does not appear.

LAYOUT OF

A.P. 4099E — VAMPIRE FB Mk. 5 AIRCRAFT

VOL. 1

SERVICING AND DESCRIPTIVE HANDBOOK

See list of sections opposite

PART 1

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leaflets

- A. Aerofoils
- B. Alighting gear
- C. Armament
- D. Controls
- E. Cooling system
- F. Electrical equipment
- G. Engine starting installation
- H. Fuel system
- J. Fuselage
- K. Instrument installation
- L. Jigs and tools
- M. Miscellaneous equipment
- N. Oil system
- O. Oxygen equipment installation
- P. Power unit
- Q. Wireless equipment installation
- T. General
- Z. Modifications and alterations

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Servicing schedule

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Between flight servicing

SECTION 2

Daily servicing

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Minor and major servicing

VOL. 2

PART 3

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- Chap. 2—Engine mounting and cowlings
- Chap. 3—Systems
- Chap. 4—Fuselage
- Chap. 5—Alighting gear
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- Chap. 7—} Tail unit
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Major repair scheme

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- Group B—Engine mounting and cowlings
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VOL. 3

PART 1

Schedule of spare parts

PART 2

Appendix "A"

VOL. 4

PLANNED SERVICING

**A.P.4099A, C & E
T.S.N.**

A separate handbook

**A.P.4099E
PILOT'S NOTES**

A separate handbook

LEADING PARTICULARS

NAME **VAMPIRE FB Mk. 5**
 TYPE **SINGLE-SEATER, SINGLE-ENGINE JET-PROPELLED, MID-WING MONOPLANE**
 DUTY **GROUND ATTACK FIGHTER AND FIGHTER BOMBER**

Note . . . For principal dimensions refer to General Arrangement illustration

MAIN PLANE DATA

Aerofoil section Thickness grading EC 1240 series camberline :—
 Constant load up to 0.4 C., linear decrease to zero at T.E.
 Incidence Zero to fuselage datum
 Dihedral (measured on top skin at front spar) 1 deg. 15 min.
 Sweepback, 48 in. in 240 in. 11 deg. 19 min.

TAIL PLANE DATA

Chord 34 in.
 Incidence Zero to fuselage datum

AREAS

Main plane, each	109 sq. ft.
Total wing area	261 sq. ft.
Aileron with tab, each	7.7 sq. ft.
Aileron balance tab, each	1.0 sq. ft.
Flaps, total	15.6 sq. ft.
Tail plane and elevator	37 sq. ft.
Elevator and trim tab	10.5 sq. ft.
Elevator trim tab	0.66 sq. ft.
Dive brake, each	3.05 sq. ft.
Fin, each	4.66 sq. ft.
Rudder and tab, each	3.31 sq. ft.
Rudder tab, each	0.175 sq. ft.

ALIGHTING GEAR

UNDERCARRIAGE

Type Two interchangeable cantilever struts, single wheel, sideways retraction
 Track 11 ft. 3 in.
 Shock-absorber legs Lockheed oleo pneumatic AIR 51756-7
 Air pressure 350 lb./sq. in.
 Wheels Dunlop A.H.8218
 Tyres Dunlop FC-N17-N, size 26 x 7.75
 Tubes Dunlop F.C.9
 Tyre pressure Refer to Vol. 2, Part 2
 Brakes Dunlop pneumatic, Type A.H.8902

NOSE WHEEL

Type Retractable, fully castering and self-centring
 Shock absorber leg Lockheed oleo pneumatic AIR 51540 mounted in D.H. nose wheel assembly
 Air pressure 500 lb./sq. in.
 Wheel Dunlop A.H.O. 17219/IX
 Tyre Dunlop NF-R-30, size 6.50 x 5½
 Tube Dunlop N.F.2
 Tyre pressure Refer to Vol. 2, Part 2

LEADING PARTICULARS—(cont.)

POWER PLANT

Type "A"

ENGINE

Type Goblin Mk. 2, turbo-jet
 Fuel Aviation turbine fuel (Stores Ref. 34A/179)
 Oil OM-71 (Stores Ref. 34A/187)
 Cabin pressure system Marshall blower Mk. 22 (Stores Ref. 36KK/11)

TANK CAPACITIES

Fuel tanks
 Fuselage tank 96 gall.
 Inner wing tanks (2 x 52 gall.) 104 gall.
 Leading edge and outer wing tanks (2 x 65 gall.) 130 gall.
 Wing drop tanks (2 x 100 gall.) 200 gall.
Total (with 2 x 100 gall. drop tanks) 530 gall.
 Oil (in engine sump only) 1½ gall.
 De-icing fluid Spec. B.S.3/D9 (Stores Ref. 34B/720) 3 pints

HYDRAULIC, PNEUMATIC AND VACUUM SYSTEMS

HYDRAULIC SYSTEM

Pump Lockheed Mk. 6 (Stores Ref. 37J/263)
 Fluid D.T.D. 585 (Stores Ref. 34A/159)
 Reservoir capacity 1 gall.
Pressures
 Accumulator initial air pressure 1,250 lb./sq. in.
 Cut-out valve 2,500 lb./sq. in.
 Thermal relief valve 3,000 lb./sq. in.

PNEUMATIC SYSTEM

Compressor Hymatic, type SH6/2 (Stores Ref. 39G/501)
 Pressure at air compressor and reservoir 450 lb./sq. in.
 Pressure after reducing valve 200 lb./sq. in.
 Pressure at brakes 150 lb./sq. in.

VACUUM SYSTEM

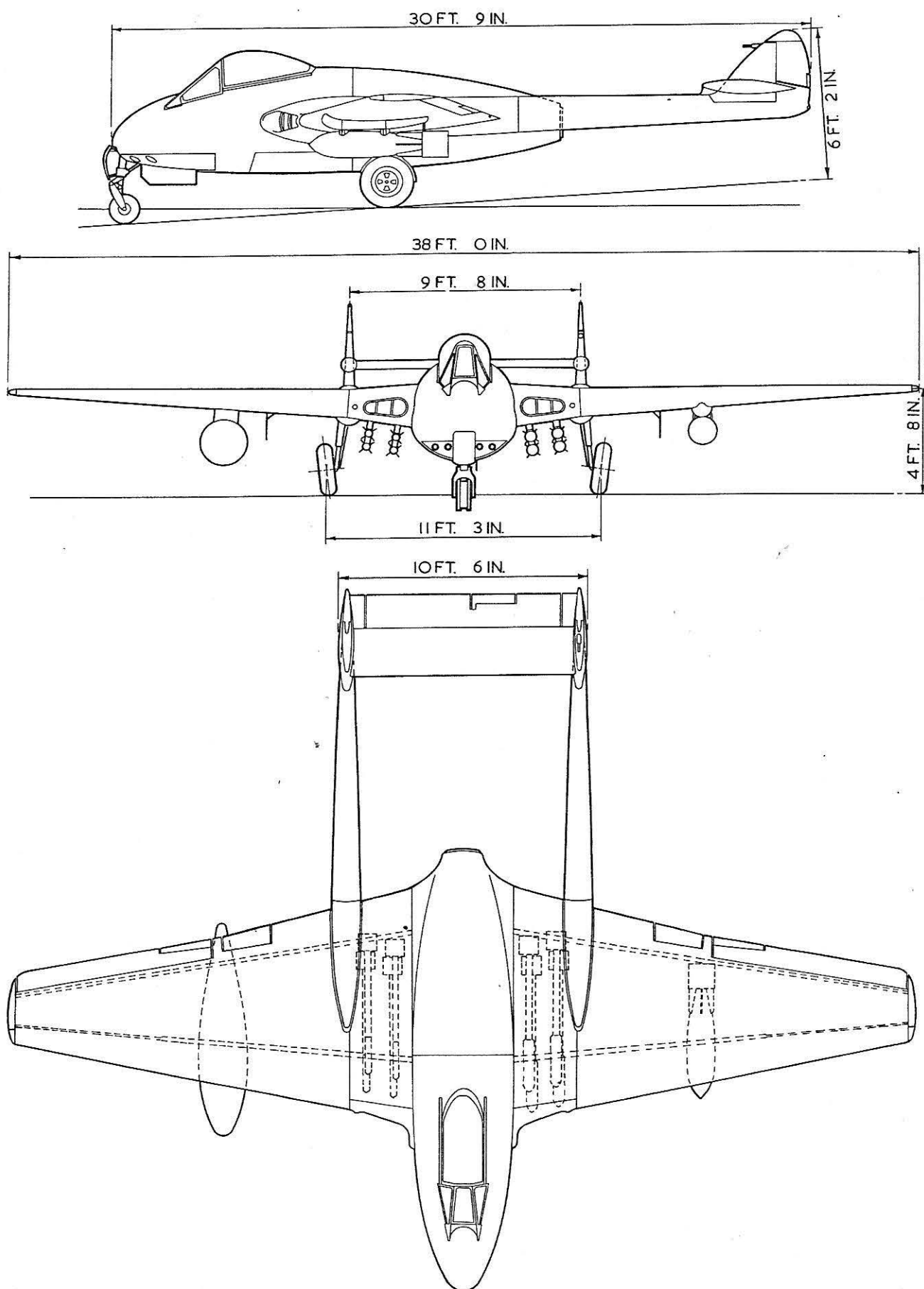
Pump B3 Mk. 2 or X Mk. 2 (Stores Ref. 37J/52 or 6)

PRESSURE HEAD SETTINGS

Position (pressure head) Leading edge of port fin
 Incidence Zero to fuselage datum
 Distance from C/L of aircraft 58 in.
 Distance ahead of leading edge 11.9 in.
 Tolerance on angular setting ± 2 deg.

ELECTRICAL INSTALLATION

Wiring system Breeze
 Voltage 24
 Generator 24V, 1,500 watt, Type HX2 (anti-clock) (Stores Ref. 5U/4184)
 Accumulators (Two) 12 volt



GENERAL ARRANGEMENT

INTRODUCTION

1. The VAMPIRE FB Mk. 5 is a jet-propelled, single-seater fighter bomber or ground attack fighter, powered by a single Goblin Mk. 2 straight-flow-combustion gas turbine engine, mounted at the rear of the fuselage. The aircraft is a mid-wing monoplane of unconventional design, having twin tail booms projecting aft from the main plane. The tail booms support an interposed tail plane and twin rudders.

2. It is armed with four 20 mm. guns, located in the forward underside of the fuselage, together with 150 rounds of ammunition for each gun. In addition to the four guns and ammunition, the following alternative maximum loads may be carried: two 1,000 lb. bombs, or two 100 gall. drop tanks, or two 500 lb. bombs plus eight 60 lb. R.P., together with the various lesser combinations. When carrying either the 1,000 lb. bombs or the 100 gall. drop tanks it is not permissible to fit the R.P. gear.

3. The flying controls, which are operated by cables and pulleys, are conventional in operation. The pendulum-type rudder pedals are adjustable in flight. The elevators and rudders are fitted with trim tabs. The former may be trimmed by the handle in the cockpit, but the rudder tabs can only be adjusted on the ground. The ailerons are fitted with balance tabs, and the setting of these may also be adjusted on the ground.

4. The fuselage is oval in cross-section, and is constructed in two half shells of balsa sandwiched between plywood sheets and joined together along the top and bottom centre lines. The nose fairing, forward of the armoured bulkhead, and the tail cone, which forms a cowl for the engine and jet pipe, are of light-alloy construction. The cockpit is enclosed by a sliding transparent plastic canopy and may be pressurized for high altitude flying.

5. The main plane is a metal cantilever structure with one main spar, to which a false spar is joined by alclad ribs, with spanwise stringers. The whole structure is covered with a light-alloy skin. Extending aft from each wing is a metal tail boom, the front portions of each boom are integral with the wing structure. Each wing is attached to the fuselage by three bolts, two at the main spar end-fittings at bulkhead

No. 4, and one at the drag fitting at bulkhead No. 3. Flaps, dive brakes and round-nose ailerons are fitted to the wings.

6. Integral with the rear end of each tail boom is a metal fin, the tail plane being interposed and attached by four bolts to the base of each fin. A single elevator extends over the whole span of the tail plane and, like the rudders, is a light alloy metal-covered structure.

7. The alighting gear consists of two main wheels which retract outboard into the wing, and a nose wheel which retracts rearwards into the nose of the fuselage. The alighting gear is operated hydraulically, and locked mechanically in both the *up* and *down* positions. The main wheels are provided with pneumatic brakes which are differentially operated by the rudder pedals.

8. The power unit is attached to a tubular steel structure, and is mounted immediately aft of the firewall. The following auxiliaries are driven by the power unit.

<i>Port upper wheel case</i>	<i>Starboard upper wheel case</i>
Hymatic compressor	1,500 watt generator
Marshall blower	Vacuum pump
<i>Port lower wheel case</i>	<i>Starboard lower wheel case</i>
Starter motor	Overspeed fuel governor
Dowty fuel pump	Hydraulic pump

9. Fuel is carried in a centre fuselage tank and four non-rigid bag-type tanks in each wing. The fuel is supplied to the engine-driven fuel pump from an immersed booster pump at the base of the centre tank, through a low-pressure fuel cock and a filter.

10. The 24 volt, 1,500 watt d.c. generator supplies current for all services, except the starter motor, through two 12 volt accumulators mounted in front of the firewall.

11. The radio equipment comprises a general purpose T.R.1464, and an R.3121 identification set. The T.R.1464 is mounted on a tray above the ammunition tanks. The R.3121 set is contained in the nose of the fuselage forward of the armoured bulkhead.

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