

S.I.D.S.

RESTRICTED

COVER 1
Containing:-
SECTIONS 7, 8 AND 9

AP 101B-1902-1C

VULCAN B Mk.2 AIRCRAFT
AIRCRAFT SERVICING MANUAL
INSTRUMENT, WIRELESS AND RADAR
INSTALLATIONS

BY COMMAND OF THE DEFENCE COUNCIL

Michael Cany

Ministry of Defence

Sponsored for use in the

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AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in this publication, sign against the appropriate A.L. No. and insert the date of incorporation

A.L. No.	Amended by	Date
1	R. B. Powell (AKO)	11/20/59
2	ofull	15.2.60
3	ofull	15.2.60
4	ofull	8.3.60
5	Sect. 8. ofull	15.5.60
6	Sect. 8. CH. 2. ofull	15.5.60
7	Sect. 8. CH. 4. ofull	4.7.60
8	Sect. 7. CH. 5. ofull	27.8.60
9	Sect. 8. CH. 7. ofull	5.8.60
10	Sect. 9. ofull	3.10.60
11	Sect. 7. ofull	10.3.61
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46	E. Hammond	26/4/72
47	E. Hammond	26/11/72
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49	J. Hark	15/6/73
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74	E. Hammond	22/3/77
75	E. Hammond	24/3/77
76	E. Hammond	25/3/77
77	E. Hammond	8/12/78
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LETHAL WARNING

EJECTION SEATS AND CANOPY JETTISON
MECHANISMS

1. Ejection seats and canopy jettison mechanisms are sources of potential danger to personnel and of damage to the aircraft. Serious injury (possibly fatal) may result if any firing mechanisms are inadvertently operated whilst the aircraft is on the ground.

2. The following instructions are to be obeyed:-

R.N. Safety precautions contained in A.P.(N) 140 - Naval Aircraft Maintenance Manual.

R.A.F. ALL PERSONNEL before entering the cockpit or cabin of an aircraft fitted with an ejection seat are to report to the N.C.O. immediately in charge of airframe servicing who is to ensure that all safety pins (or other safety devices) are correctly positioned to render the seat and canopy jettison firing mechanism safe. On completion of servicing, tradesmen are to report to the N.C.O.

3. Full instructions for rendering the firing mechanisms safe are contained in the A.P.4288 and A.P.(N) 1023 series, in Aircraft Servicing Schedules and in the A.P.5037 series.

ELECTRICAL SYSTEM

VOLTAGES IN EXCESS OF 100 VOLTS, EITHER A.C. OR D.C., CAN BE DANGEROUS UNDER CERTAIN CIRCUMSTANCES. PERSONNEL MUST THEREFORE ENSURE THAT THE ELECTRICAL SYSTEM IS ELECTRICALLY SAFE BEFORE ANY SERVICING IS ATTEMPTED. WHERE IT IS ESSENTIAL THAT TESTS OR ADJUSTMENTS BE MADE WITH THE ELECTRICAL POWER SWITCHED 'ON' THE GREATEST CARE MUST BE EXERCISED.

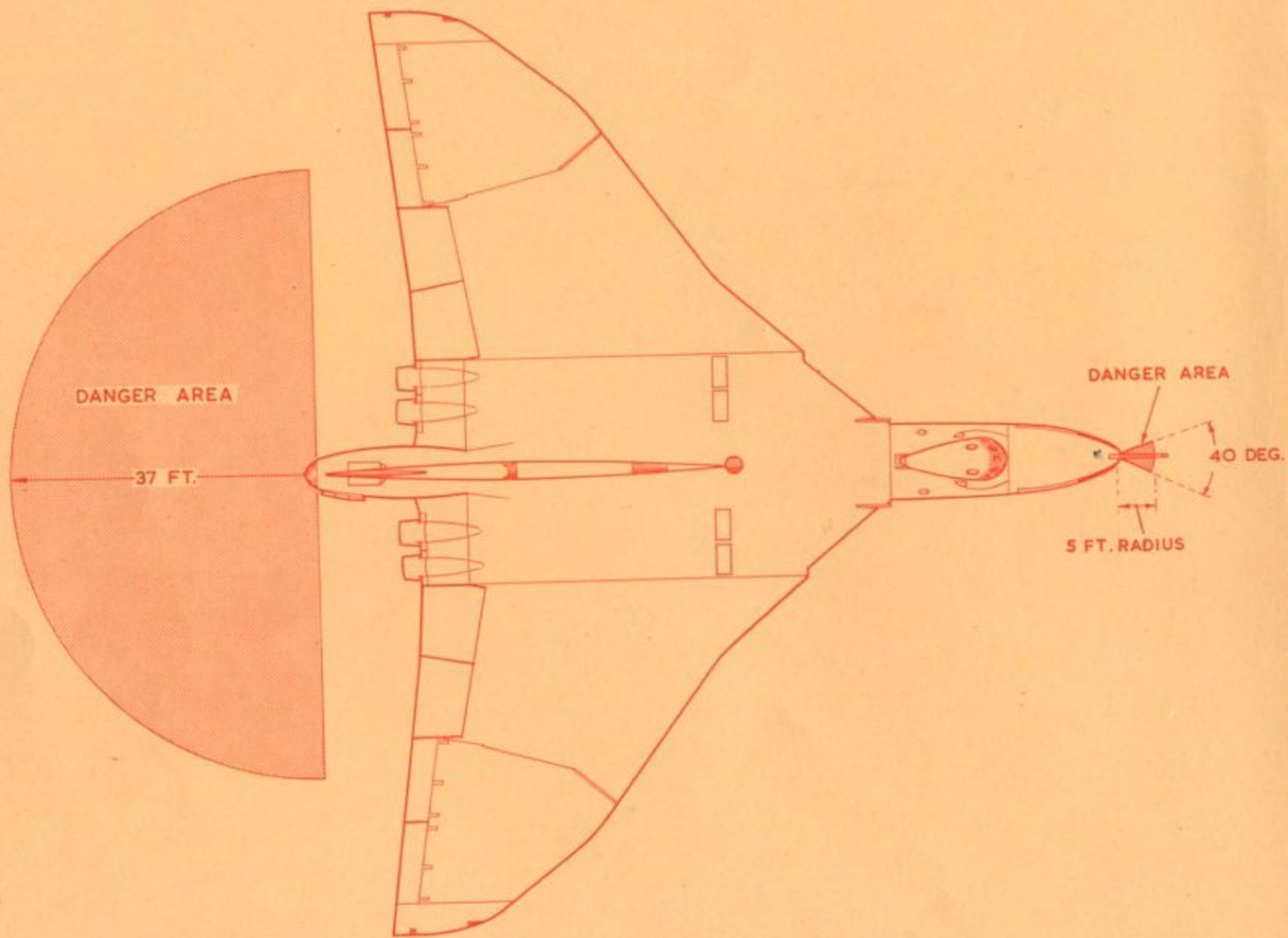
HIGH-ENERGY IGNITION UNITS

THE ENERGY STORED IN THE CAPACITORS OF THE HIGH-ENERGY IGNITION UNITS CAN, UNDER CERTAIN CIRCUMSTANCES BE OF A LETHAL NATURE. NO SERVICING IS TO BE ATTEMPTED UNTIL AT LEAST ONE MINUTE HAS ELAPSED FROM THE DISCONNECTION OF THE L.T. INPUT PLUG.

MICROWAVE RADIATION

There is a MICROWAVE RADIATION HAZARD from certain equipment in this aircraft. To avoid injury to health, all personnel are to keep clear of the area indicated on the illustration overleaf. The area is to be roped off and notices displayed warning personnel to KEEP CLEAR.

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Microwave radiation area

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NOTE TO READERS

The subject matter of this publication may be affected by Defence Council Instructions, or by Servicing Schedules (Vol.4), or General Orders and Modification Leaflets in this A.P., in the associated publications listed below, or even in some others. If possible, Amendment Lists are issued to correct this publication accordingly, but it is not always practicable to do so. When an Instruction, Servicing Schedule or Leaflet contradicts any portion of this publication, the Instruction, Servicing Schedule or Leaflet is to be taken as the overriding authority.

The inclusion of references to items of equipment does not constitute authority for demanding the items.

Each leaf, except the original issue of preliminaries, bears the date of issue and the number of the Amendment List with which it was issued.

New or amended technical matter will be indicated by triangles positioned in the text thus: ◀ . . . ▶ to show the extent of amended text, and thus: ▶ ◀ to show where text has been deleted. When a Section or Chapter is issued in a completely revised form, the triangles will not appear.

◀ This publication was divided into two covers by A.L.71, November 75. Cover 1 contains Sections 7, 8 and 9 and Cover 2 Section 10. No general revisions of page captions has been undertaken, but the Cover Number will appear on new or amended leaves. ▶

If more than one copy of this publication is held, each set of covers should be given an identifying number and be kept together.

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Escape drill	7568
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LAYOUT OF A.P. 101B - 1902

VULCAN B MK.2 AIRCRAFT

Air Publication	Title
101B-1902-1	Aircraft servicing manual
Issued in six books as follows:	
101B-1902-1A Cover 1	Sect.1 and 2
101B-1902-1A Cover 2	Sect.3, 4 and 5
101B-1902-1B Cover 1	Sect.6 Chapter 1-12
101B-1902-1B Cover 2	Sect.6 Chapter 13-24
◀ 101B-1902-1C Cover 1	Sect.7 to 9
101B-1902-1C Cover 2	Sect.10 ▶
101B-1902-2	General orders
101B-1902-3A	Illustrated parts catalogue
101B-1902-3B	Appendix 'A'
101B-1902-3C	Scales of unit equipment
101B-1902-3D	Scales of servicing spares
101B-1902-4	Planned servicing schedule
101B-1902-5	Not applicable
101B-1900-6A	Aircraft repair manual
101B-1902-12	Ground handling notes
◀ 101B-1900-13	Modifications list ▶
101B-1902-15	Pilot's notes
101B-1902-16	Operating data manual

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Introduction

Leading particulars

Section 1 - Controls and exits

Section 2 - Ground handling and preparation for flight

Section 3 - Airframe

Section 4 - Power unit installation

Section 5 - Armament installation

Section 6 - Electrical systems

Section 7 - Instrument installations Chapter



PUBLISHED SEPARATELY - refer to A.P.101B-1902-1A

PUBLISHED SEPARATELY - refer to A.P.101B-1902-1B

- 1 - General information and pitot-static system
- 2 - Flying instruments
- 3 - Engine instruments
- 4 - Miscellaneous instruments
- 5 - Armament instruments
- 6 - Autocontrols, Appendix 1 - Autopilot Mk.10B
- 7 - Military flight system
- 8 - Test equipment artificial feel unit calibrator
- *9 - Air sampling system
- 10 - Heading reference system
- 11 - F95 camera

*to be issued later

Section 8 - Wireless installations Chapter

- 1 - A.R.I.18089 and audio warning
- 2 - A.R.I.5874
- 2A - A.R.I.23090 (Post Mod.2300)
- 3 - N/A
- 4 - A.R.I.18124/2
- 5 - A.R.I.23023
- 6 - A.R.I.18011
- 7 - A.R.I.23172
- 8 - A.R.I.18090
- 9 - A.R.I.23143/1

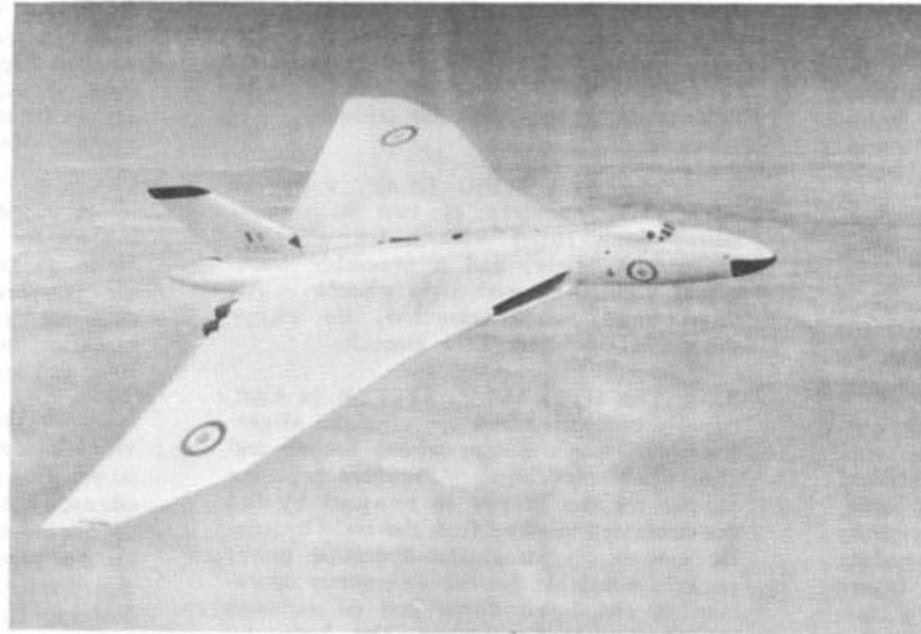
Section 9 - Radar installations Chapter

- 1 - A.R.I.5816 (Mod.1631 removes)
- 2 - A.R.I.5848
- 2A - A.R.I.23134/5/4
- 3 - A.R.I.5919 (Mod.2017 removes)
- 4 - A.R.I.5972
- 5 - A.R.I.5924 (Mod.1707 removes)
- 6 - A.R.I.18107/13
- 7 - A.R.I.5959
- 8 - A.R.I.5952

Section 10 - E.W. installations

PUBLISHED SEPARATELY - refer to Cover 2

INTRODUCTION



1. The VULCAN B Mk.2 is an all metal medium bomber with a tailless delta wing configuration, and is powered by four turbo-jet engines. It has long range, a very fast cruising speed and a high operational ceiling, and can carry a heavy and extensively variable bomb load. Provision is made for flight refuelling, as a receiver aircraft. A comprehensive radar and radio installation and other electronic aids are provided for navigating and bombing. No defensive armament is fitted.

2. The FUSELAGE is a light-alloy stressed skin structure, and is manufactured in four separate sections, which are:-

- (1) Nose fairing, which houses the radar scanner. The upper half is of orthodox metal construction, and the lower half is made of

sandwich material which is transparent to radar signals.

- (2) Front section - comprises the crew's pressure cabin, of circular cross section with a canopy over the cockpit and an air bomber's blister and crew's entrance door in the under surface. The structure of this section is stressed to a working pressure differential of 9 p.s.i.
- (3) Centre section - is integral with the main plane, the width encompassing the four engines and the bomb bay, and the length extending from the rear cabin bulkhead to a point aft of the rear spar. Two strong ribs form the side walls of the bomb bay, separating it from the inboard engine bays; these ribs extend forward of the front spar to enclose a box structure housing two large fuel tanks. Between

this structure and the pressure cabin is the nosewheel bay, which houses pressurisation control gear, radio and radar equipment and two additional fuel tanks. The bomb bay is a single large compartment occupying the full length of the fuselage between front and rear spar.

- (4) Rear section - a light former-stringer-skin structure forming a fairing for the jet pipe tunnels. Attached to this structure are the jet pipe end caps and the tail warning radar scanner cone.

3. SEATS for five crew members are all located in the pressurised cabin in the forward end of the fuselage. The two pilots sit side by side in ejector seats on a raised platform at the forward end of the cabin, and the remaining three crew members sit side by side in

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bucket-type seats facing aft, at a single table extending the full width of the cabin. A prone bombing station is provided in a blister below the cabin.

4. The ENTRANCE DOOR, situated in the lower part of the fuselage below the crew's compartment, opens outwards, entry being made by a folding ladder secured to the inside of the door. A further ladder is provided in the cabin for access to the pilots' position. Manually and pneumatically-operated mechanisms are fitted, the latter being utilised to open the door in flight against the airstream, thus forming a windbreak for emergency exit.

5. The TWO-SPAR MAIN PLANE consists of a centre section integral with the fuselage, and port and starboard outer wings. The complete main plane, which has sufficient depth in the vicinity of the root break joints to accommodate the engines and the alighting gear, tapers in plan and elevation to the wing tips. The skin covering is of aluminium alloy stiffened by Z-section and T-section stringers. Ten compartments are provided, five in each outer wing, to accommodate bag-type flexible fuel tanks.

6. The CONTROL SURFACES consist of four elevons on each outer wing, and a rudder. The outboard elevons are mass balanced by means of mass balances carried on outrigger arms situated near each hinge, and the inboard elevons and rudder embody Westland-Irving type forward sealed balances. Each elevon is operated independently by its own electro-hydraulic power unit, two further units being provided for the rudder. Electrically-operated, rotating-slat-type air brakes are mounted in the main plane above and below the engine air intakes.

7. The PILOTS' FLYING CONTROLS consist of single-grip control handles and conventional rudder pedals provided at each pilot's position. Push-pull control

tubes are used throughout from the cockpit controls to the power units actuating the control surfaces. Further controls for pilot use are housed on three consoles in the cockpit. Artificial feel is provided to give a variation of stick force with control movement from the trimmed position.

8. The ALIGHTING GEAR, which is retractable, consists of two main-wheel units, each fitted with a four-wheeled, eight-tyred bogie, and a steerable nose-wheel unit fitted with twin wheels. All three units, when retracted, lie within the normal contours of the aircraft.

9. The HYDRAULIC SYSTEM is electrically controlled and operates the alighting gear, bomb doors, wheel brakes and nose-wheel steering. A reserve pressure supply for the brakes is retained by two accumulators charged from the main hydraulic system. An electro-hydraulic power pack is available for the emergency operation of the bomb doors and to recharge the brake system when the hydraulic pumps are not operating. When certain special stores are carried an independent electrically driven hydraulic power pack is fitted in the bomb bay.

10. A COMPRESSED AIR SYSTEM is installed to lower the alighting gear in an emergency. A further compressed air system is provided to open or close the main entrance door and also to initiate jettisoning of the canopy.

11. An AIR CONDITIONING SYSTEM is installed to maintain the air in the crew's compartment at reasonable temperatures and pressures. Air from the engine compressors is used for pressurisation and heating, the flow of air being automatically maintained by flow controllers. Air conditioning equipment in the nosewheel bay controls the temperatures of the air entering the cabin, and the pressure in the cabin is maintained by pressure control-

lers which regulate the amount of air allowed to pass to atmosphere through discharge valves. Provision is also made for cabin ventilation during unpressurised flight. A further air conditioning system, supplied with engine compressor air, is fitted in the bomb bay when certain special stores are carried.

12. A VENTILATED SUIT SYSTEM is provided for the five crew members, the air for which is tapped from the main cabin pressurisation system. The inlet air temperature to the individual suits may be varied by manually controlled electric heaters fitted in each supply line, and accessible to each crew member.

13. A thermal DE-ICING SYSTEM provides protection against ice accretion on wing, fin and engine air intake leading edges; hot air for the systems is bled off the engine compressors and mixed with cold air to give a controlled temperature for distribution. A further system, utilising de-icing fluid, is provided for the pilots' and air bomber's windscreens.

14. The ENGINES are housed in pairs inside the main plane centre section, between the front and rear spars. Installation of the engines is by the use of four manually-operated winches from underneath the aircraft, which enables the upper surface of the wing to be maintained as a smooth unbroken surface and avoids the use of large long-jib cranes and sling-gear.

15. FUEL is carried in fourteen bag-type tanks contained in magnesium-alloy compartments, four tanks in the fuselage and five in each outer wing. Each tank is equipped with contents gauge transmitters, electrically-operated fuel pumps, a maximum fuel level cut-off switch and refuelling valves. In addition, No.1 and No.7 tanks each have a transfer pump which can be used to balance the fuel load should the aircraft become nose or tail heavy. The tanks are arranged in groups

so that each engine is normally fed by a particular group of tanks. Cross-feed cocks are provided so that in emergency any engine may receive fuel from any tank or group of tanks. All tanks are pressurized to prevent vapourisation and consequent loss of fuel at altitude, air from the engine compressors being used for this purpose. A pressure refuelling system is provided, in which the distribution of fuel load amongst all the tanks is automatically controlled to ensure correct aircraft loading.

16. FIRE PROTECTION consists of two separate methyl-bromide installations, one for the engines and the other for the fuel tank bays. Hand-operated B.C.F. extinguishers are disposed at convenient positions in the crew's compartment.

17. ADDITIONAL AIRBORNE EQUIPMENT is mounted in the rear fuselage. Temperature control of the E.W. cannisters is effected by water/glycol and vapour cycle heat control systems, whilst the tail warning unit, which forms the fuselage rear cone, is provided with pneumatic and cooling systems. Three doors on the underside of the rear fuselage give access to this equipment. Counterpoise plates of honeycomb construction are mounted below the starboard centre engine rib, between the jet pipe curvatures.

18. Electrical power is supplied by four 40 kVA, 200-volt, 3-phase, 400 Hz a.c. engine-driven alternators, arranged to supply independent load or in parallel via a

synchronising ring main system. Reserve power is supplied from the auxiliary airborne power plant or the ram air turbine at 200-volt, 3-phase, 400 Hz, a.c. Power at 115-volt, 3-phase, 400 Hz, a.c. is provided, through various transformers, from the 200-volt system, and from the same source by means of two frequency changers, a supply at 115-volt, single-phase, 1600 Hz, a.c. is also available. D.C. power is provided at 28 volts through two 7.5 kVA transformer rectifier units, and a single 24-volt battery provides sufficient power for crash and emergency services. Two ground supply plugs, one for 200 volts a.c. and one for 28 volts d.c. are provided on the port side of the rear fuselage. In addition a 28-volt d.c. ground servicing plug for the refuelling circuits, is provided on the starboard outer side of the nose wheel bay. In the unlikely event of failure of all four alternators, sufficient power to maintain control would be available from the auxiliary power units.

19. LIGHTING in the cabin consists of ultra-violet, red and anti-dazzle for the pilots, while for the crew four red fluorescent tubular elements are provided and an angle-poise lamp at each crew position. Lighting to assist servicing personnel is provided in the nose-wheel and main-wheel bays, in the bomb compartment, in the compartment aft of the bomb bay and in the compartment below the fin post.

20. EMERGENCY EQUIPMENT includes

ejection seats for the first and second pilots, a signal pistol, first-aid outfits, fire axes, asbestos gloves and hand-operated fire extinguishers. For use after ditching, each member of the crew has a seat dinghy and there is also a type H dinghy stowed in the fuselage underneath the canopy.

21. WIRELESS installations consisting of A.R.I.18089, A.R.I.5874, A.R.I.23090 (Post Mod.2300), A.R.I.18064, A.R.I.18124/2, A.R.I.23023, A.R.I.18011, A.R.I.23172, A.R.I.18090 and A.R.I.23143/1 are fitted.

22. RADAR installations consisting of A.R.I.5816 (removed if Mod.1631 is embodied and A.R.I.18107/13 fitted in lieu), A.R.I.5848 (Post Mod.2024) or A.R.I.23134/5/4 (Post Mod.2155), A.R.I.5919 (removed if Mod.2017 is embodied and A.R.I.5952 fitted in lieu), A.R.I.5972 (Post Mod.2256), A.R.I.5924 (removed by Mod.1707) and A.R.I.5959 (Post Mod.2057) are fitted.

23. E.W. installations fitted consist of A.R.I.18105 (Removed if Mod.2304 is embodied) A.R.I.18146 (Post Mod.2024), A.R.I.18075, A.R.I.18076, A.R.I.18205/1 and A.R.I.18228/1 (Post Mod.2304).

24. Special instrument systems, namely M.F.S. and H.R.S. are installed and may be integrated with each other and other systems in the aircraft to provide automatic flight, bombing manoeuvres and navigational information.

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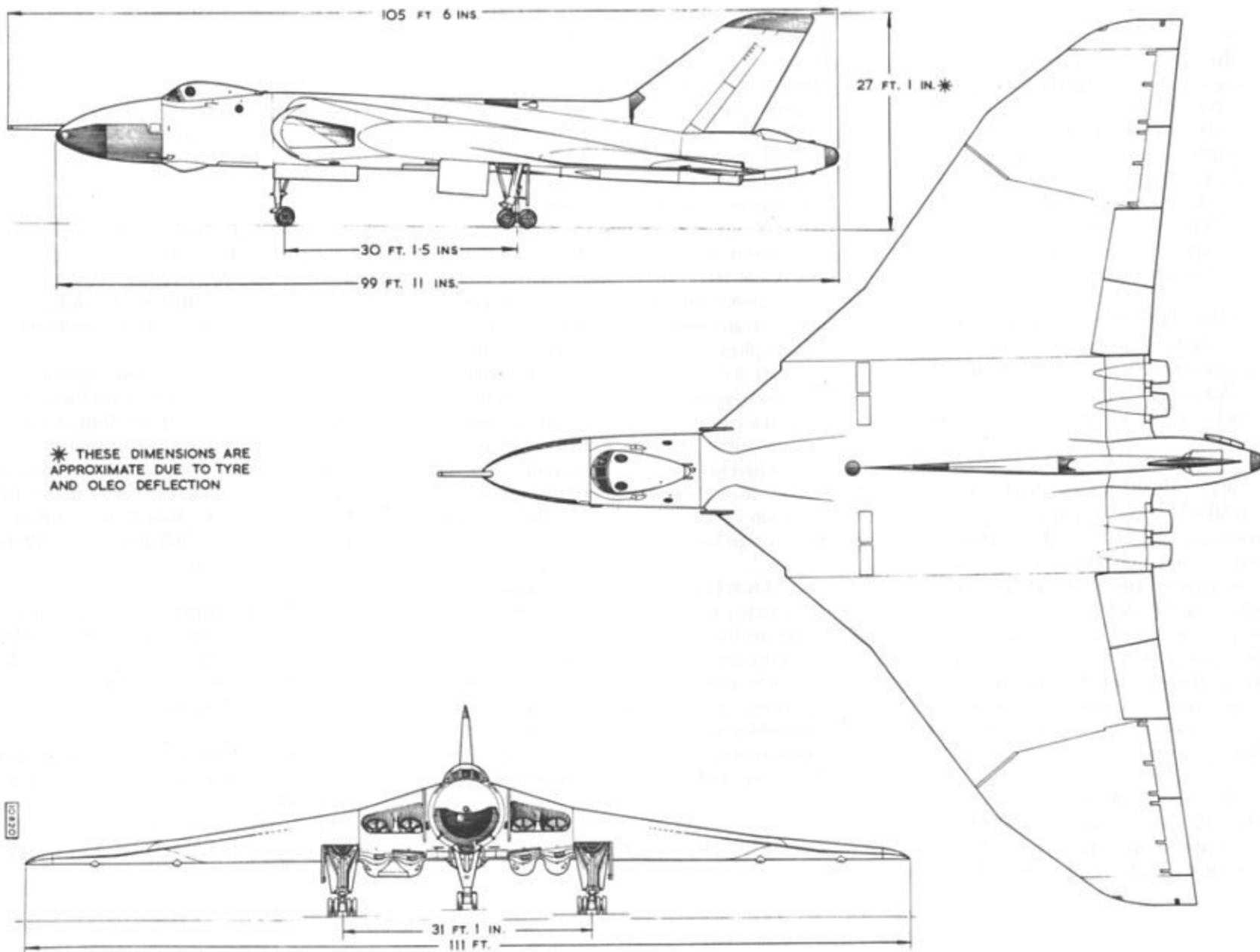


Fig.1 General arrangement

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LEADING PARTICULARS

(Completely revised)

NAME VULCAN B, MK.2
 TYPE DELTA WING MONOPLANE
 DUTY HIGH ALTITUDE, MEDIUM BOMBER
 CREW FIVE, INCLUDING TWO PILOTS

GENERAL DATA AND CONTROL SURFACE AREAS

For main aircraft dimensions refer to Fig.1 - General Arrangement. For settings and range of movement of control surfaces refer to Sect.3, Chap.4.

MAIN PLANE DATA

Aerofoil section at root N.A.C.A.0010
 Aerofoil section Modified R.A.E.104, 5%
 Chord (mean) standard 35.712 ft
 Chord at wing tip 10 ft
 Chord (root) 63.4 ft
 Incidence 5 deg
 Dihedral 0 deg
 Sweepback (leading edge at wing joint) 49 deg 54 min
 Elevons, mean chord (aft of hinge line)
 Inboard inner 6.562 ft
 Inboard outer 6.571 ft
 Outboard inner 2.776 ft
 Outboard outer 2.776 ft
 Main plane areas (in sq ft)
 Gross, including elevons (from aircraft centre line) 3 964
 Nett, excluding fuselage 3 384
 Elevons (aft of hinge line)
 Inboard inner (each) 63.726
 Inboard outer (each) 57.164
 Outboard inner (each) 28.079
 Outboard outer (each) 26.788
 Gross, port and starboard 351.514

FIN AND RUDDER DATA

Fin sweepback, leading edge 49 deg 30 min
 Fin sweepback, trailing edge 25 deg 30 min
 Areas (in sq ft)
 Fin and rudder 224
 Fin (nett) 160.065
 Rudder (aft of hinge line) 63.395

ALIGHTING GEAR

MAIN-WHEEL UNITS

Type Dowty - Two rearward retracting units with four-wheeled, eight-tyred bogies Dowty Part No. 2.00421.048 port and 2.00422.048 starboard
 Shock-absorber strut Dowty Part No.2.00211.005
 Type Liquid spring
 Oil OX-16 Ref.No. 34B/9423149
 Retracting strut unit Dowty Part No.2.00176.001 (port) and 2.00176.002 (starboard)
 Jack assembly Dowty Part No. 1.03024.010 (port) and 1.03025.010 (starboard)
 Wheels Dunlop Part No. A.H.52235
 Tyres (tubeless) Dunlop DRR 0046T (Ref.No.27A/6115998) or Goodyear GA6210 (Ref.No. 27A/6115998)
 Brakes Front port inner and front starboard outer A.H.50723
 Front port outer and front starboard inner A.H.50724
 Rear port inner and rear starboard outer A.H.51711
 Rear port outer and rear starboard inner A.H.51712
 Brakes working pressure 2,500 lb/in²
 Maxaret units Front port inner and front starboard outer A.C.61682
 Front port outer and front starboard inner A.C.61676
 Rear port inner and rear starboard outer A.C.61680
 Rear port outer and rear starboard inner A.C.61678
 NOSE-WHEEL UNIT
 Type Dowty - Rearward retracting steerable Part No. 2.00065.022

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Shock-absorber strut Part No. 2.00066.004
 Type Liquid spring
 Fluid OX-16 Ref.No.34B/9423149
 Retracting jack Dowty Part No. 1.01299.014
 Retracting strut Dowty Part No. 2.00051.003
 Wheels Dunlop Part No. AH.50734
 Tyres (tubeless) Dunlop DR4996T (Ref.No. 27A/4560766)
 or Firestone ZA 203 (Ref.No. 27A/4560766)

POWER UNITS

ENGINE

Name Olympus 201, 202 or 301
 Type Turbo-jet
 Number Four

OIL SYSTEM

Type Integral with engine
 Oil OX-38 (Ref.No.34B/9100591) N.A.T.O. Code No. 0-149
 Tank capacity (201 & 202 engines) 4.5 gall oil,
 1.5 gall air space

Engine capacity 2.25 gall
 Total oil capacity 6.75 gall
 Tank capacity (301) 3.875 gall oil,
 1.125 gall air space

Engine capacity 2.25 gall
 Total oil capacity 6.125 gall

STARTING SYSTEM

Olympus 201 & 202 Rotax (low pressure air)
 Type CT.0806 (one per engine)
 Olympus 301 Rotax (combuster)
 Type CT.1303 (one per engine)

ENGINE-DRIVEN AUXILIARIES

Hydraulic pumps Dowty - Part No. 1.00500.044
 (1, 2 & 3 engines)

Alternators
 Type (201 & 202 engines) AE.2039
 Type (301 engine) AE.2039 Mk.2

Constant speed drive unit AE.8004
 C.S.D. lubrication system Oil - OX-38

Tank capacity 11 Pints oil - 3.5 pints air space
 Total capacity of system 12.75 pints

AIRBORNE AUXILIARY POWER PLANT

Type ROVER 10301 Gas turbine
 Number One
 Lubrication system Oil (sump type) integral with engine
 Oil OX-38
 Sump capacity 5.5 pints
 Starting system (A.A.P.P.)

Normal Electric - Rotax C1050 (28V)
 Emergency Cartridge, electric (Ref.No. 12K/9635210)

FUEL SYSTEM

FUEL

UK Inter-service designation	NATO Code	USA Inter-service designation	Reference number
Avtur/FSII	F-34	JP8	34A/2201036
Avtag/FSII	F-40	JP4	34A/2201037

Fuel pumps, main P.A.C. 1200 Mk.3
 Fuel pumps, auxiliary P.A.C. 100 Mk.3
 Fuel transfer pumps P.A.C. 500 Mk.3
 Fuel pumps - A.A.P.P. P.A.C. 20 Mk.2
 Fuel L.P. warning switch setting 5 lb/in²
 Refuelling valves F.R. Mk.40
 Rate of flow (each) 75 gall per min
 Tanks - Wing 14
 Bomb bay 2
 A.A.P.P. 1

HYDRAULIC SYSTEM

PUMPS

Type Dowty 1.00500.044
 Ref.No. 37J/6092159

Number Three
 Working pressure 3 600 lb/in²
 Off-load pressure 4 000 lb/in²
 Peak pressure 4 400 lb/in²
 Reservoir Dowty - 1.03312.001
 Capacity (to filling level) 2 1/4 gall approx.
 Fluid Oil OM-15 (Ref.No. 34B/9100572)
 N.A.T.O. Code No. H-515

System capacity 12 gall approx.

EMERGENCY AIR SYSTEM

CYLINDERS Mk.5F (Ref.No. 6D/9429887)
 Number Two
 Charging pressure 3 000 lb/in²
 Capacity (each) 1 250 litres

PNEUMATIC SYSTEMS

ENTRANCE DOOR

Cylinders Mk.5F (Ref.No. 6D/9429887)
 Number Two

RESTRICTED

F.S./2

RESTRICTED

Charging pressure	2,000 p.s.i.
Capacity (each)	1,250 litres
T4 BOMBSIGHT	
Cylinder	Mk.5F (Ref.No.6D/9429887)
Number	One
Charging pressure	2,000 p.s.i.
Capacity	1,250 litres
N.B.C. Mk.1A & H.2.S.	
Cylinders	Mk.5D (Ref.No.6D/9429885)
Number	Two
Charging capacity	1,800 p.s.i.
Capacity (each)	750 litres

NITROGEN PURGE-FLIGHT REFUELLING

CYLINDER	Mk.5D (Ref.No.6D/9429890)
Number	One
Charging pressure	1,800 p.s.i.
Capacity	750 litres

AIR CONDITIONING SYSTEM

TURBINE UNIT	
Type	B.T.15 Mk.2A (Ref.No.27UA/493)
Lubrication	Oil OX-38 (Ref.No.34B/9100591)
	N.A.T.O. Code No.0-149
Capacity	210 c.c.

FLYING CONTROL SYSTEM

POWER UNITS	
Type	Hydraulic
Outer elevons (Four)	P.135
Inner elevons (four)	P.132
Rudder (two)	P.138
Fluid	Oil OM-15 (Ref.No.34B/9100572)
Capacity (each)	4 pints
Outer elevons	4 pints
Inner elevons	8 pints
AIR BRAKES	
Gearbox lubrication	Oil OX-14 (Ref.No.34B/2246128)
	N.A.T.O. Code No.0-147

DE-ICING SYSTEMS

AIR BOMBER'S WINDOW (rendered inoperative)

FIRE PROTECTION SYSTEMS**EXTINGUISHERS**

Engine bay	System operated
Type	Mk.13A Methyl bromide (Ref.No.27N/990)
Number	Four
Wing tanks	System operated
Type	Mk.14A Methyl bromide (Ref.No.27N/102)
Number	Twelve
Fuselage tanks	System operated
Type	Mk.13A, Methyl bromide (Ref.No.27N/990)
Number	four
Leading edge	System operated
Type	Mk.13A, Methyl bromide (Ref.No.27N/990)
Number	six
A.A.P.P. Installation	System operated
Type	Mk.4AX, Methyl bromide (Ref.No.27N/152)
	(or 27N/100)
Number	One
Bomb bay	System operated
Type	Mk.13A, Methyl bromide (Ref.No.27N/990)
Number	Eight
Crew's cabin	Hand operated
Type	Mk.34H, Bromochlorodifluoromethane (B.C.F.)
	(Ref.No.27N/299)
Number	Five
External compartment	Hand operated
Type	Mk.34H, Bromochlorodifluoromethane (B.C.F.)
	(Ref.No.27N/299)
Number	One

AIR SPEED INDICATING SYSTEM

PRESSURE HEADS	Mk.8W, (Ref.No.6A/4333460)
Number	Two
Position	Underside of fuselage at forward end of cabin, port and starboard

OXYGEN SYSTEM

Type	Mk.21B, demand system
Cylinders	Mk.10A, (Ref.No.6D/9429900)
Number	Twelve
Charge pressure	1,800 p.s.i.
Capacity (each cylinder)	2,250 litres

RESTRICTED

RESTRICTED

SAFETY EQUIPMENT

EJECTION SEATS

First pilot Type 3KS1 Mk.4 (Ref.No.27L/50166)
 Second pilot Type 3KS2 Mk.4 (Ref.No.27L/50168)

CREW SEATS

Outboard seats Swivel and sliding (pneumatically assisted)
 (Ref.No.27HS/4527211) with (Part No.S1.003.1 and S1.003.2)
 Centre seat Sliding (pneumatically assisted)
 (Part No. 1/N3288)

DINGHY M.S.5., Mk.1 (Ref.No.27C/9497567)

ADDITIONAL AIRBORNE EQUIPMENT

PNEUMATIC SYSTEM

Cylinders Mk.5F (Ref.No.6D/9429887)
 Number Two
 Charging pressure 3,000 p.s.i.
 Capacity 1,250 litres

WATER/GLYCOL SYSTEM

Reservoir Dowty (Part No.1.00467.101)
 Capacity (filling level) 7.5 pints
 Air space 110 cu. in.
 System capacity 7.5 gall. approx.
 Fluid AL-26 (Ref.No.34B/1407)
 Pumps (with U.P.V.) S.P.E.16291
 Number Two
 Capacity (each) 300 g.p.h. at 10 p.s.i.

REFRIGERATION SYSTEM

Cooling pack Godfrey Type V.C.P.1 Mk.1
 (Part No.159102)

Refrigerant Arcton 11 or Freon 11
 Weight of refrigerant 11 lb
 Oil OM-11 (Ref.No.34B/9105055)
 N.A.T.O. Code No.0-135
 Oil capacity 300 c.c.
 Condenser D1177/2A

ELECTRICAL SYSTEM

Wiring system Insulated and earth return
 Type Avro
 A.C. generators (four) 200-volt, 3 phase, 400 c/s, 40k VA,
 Type 158B (Ref.No.5UA/4357453)
 Transformer-rectifier units, 7.5 kW (Two) (Ref.No.5UC/4395968)
 Main transformers 3k VA (two) (Ref.No.5UB/4342575)
 Battery (one) Type K, 24-volt, 40 c.h.
 Frequency changers (two) B.T.H. Type 270 (Ref.No.5UB/4357500)

BOMBING GEAR

A. V.179 Septuple carrier (3 off)
 or
 A. V.176 Special carrier plus A. V.258 fittings (1 off)
 No.1, Mk.2 Special carrier (Ref.No.11A/4762) (1 off)
 or
 No.2, Mk.1 Carrier (Ref.No.11A/4759) (1 off)
 with
 Adapter assembly No.1, Mk.1 (Ref.No.11A/4486965)
 Blue Steel carrier beam and associated (Mod.200) fittings (Part No.
 1/Z10005) for aircraft with Mod. Nos. 108, 199, 525 and 748 embodied.



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