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COVER 1
Containing:-
Section 1 & 2

AIR PUBLICATION
101B-1902-1A
(Formerly A.P.4505B, Vol.1, Book 1)

VULCAN B Mk.2 AIRCRAFT

AIRCRAFT SERVICING MANUAL

BY COMMAND OF THE DEFENCE COUNCIL

L. T. Dunnett

Ministry of Defence

FOR USE IN THE ROYAL AIR FORCE

(Prepared by the Ministry of Aviation)

Issued with A.L.71, July 68

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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
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3	J. Michaelwitz	14/3/60
4	J. Michaelwitz	4/5/60
5	J. Michaelwitz	19/4/60
6	A.B. Titheridge	28/4/60
7	J. Michaelwitz	3/8/60
8	J. Michaelwitz	21/9/60
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11	J. Michaelwitz	21/9/60
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14	J. Michaelwitz	14/11/60
15	J. Michaelwitz	14/11/60
16	A. Titheridge	27-10-60
17	J. Michaelwitz	24/2/61
18	J. Michaelwitz	30/3/61
19	J. Michaelwitz	3/2/61
20	J. Michaelwitz	19/5/61
21	A. Titheridge	27/5/61
22	A. Titheridge	14/12/61
23	A. Titheridge	18/10/61
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27	A. Titheridge	18/12/61
28	A. Titheridge	18/10/61
29	M Robinson	8/11/61
30	M Robinson	13/2/62
31	M Robinson	5/4/62
32	M Robinson	5/4/62
33	A. Titheridge	11/6/62
34	M Robinson	13/2/62
35	A. Titheridge	11/6/62
36	A. Titheridge	12/9/62
37	A. Titheridge	12/9/62
38	J. Michaelwitz	21/11/62
39	A. Titheridge	28/1/63
40	A. Titheridge	5/2/63
41	M Robinson	3/4/63
42	A. Titheridge	18/7/63
43	A. Titheridge	18/12/63
44	M Robinson	8/10/63
45	A. Titheridge	19/12/63
46	A. Titheridge	23/12/63
47	A. Titheridge	23/12/63
48	A. Titheridge	13/2/64

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53	[illegible]	24/3/65
54	[illegible]	14-4-65
55	MJ	19/5/65
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57	MJ	3/12/65
58	MJ	19/4/66
59	MJ	30/5/66
60	[illegible]	1/8/66
61	[illegible]	15.11.66
62	[illegible]	1.1.67
63	[illegible]	[illegible]
64	[illegible]	[illegible]
65	[illegible]	[illegible]
66	[illegible]	1.7.67
67	[illegible]	19.8.67
68	[illegible]	15.10.67
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71	M Jagger	13.11.68
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74	MJ	30.10.70
75		—
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77	P. Cook	7/1/72
78	E. Hughes	3/1/72
79	MJ	2.2.73
80	E. Hughes	6.4.73
81	E. Hughes	2.7.73
82	E. Hughes	11.7.73
83	E. Hughes	17.7.73
84	MJ	17/7/74
85	E. Hughes	5.9.74
86	E. Hughes	16/10/74
87	E. Hughes	8/1/75
88	MJ	23.4.75
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93	E. Hughes	14
94		3
95	E. Hughes	77
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97	INCORP.	
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99	E. Hughes	11/2/80
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101	Wallace	18/9/81
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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.

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

The reference number of this publication was altered from A.P. 4505B to A.P.101B-1902 in November 1966. No general revision of page captions has been undertaken, but the code number appears in place of the earlier A.P. reference on new or amended leaves issued subsequent to that date.

▶◀

LIST OF AIR DIAGRAMS

	A.D.
Access panels and drain holes	*7086Q*
Cabin air conditioning and pressurisation	*7086V*
De-icing systems	*6022D*
E.C.U. installations	*7086E*
Electrical installations	*7086L*
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Pneumatic systems	*7086P*

LAYOUT OF A.P. 101B-1902

VULCAN B. MK.2 AIRCRAFT

Code No.	Title
101B-1902-1	**Aircraft servicing manual**
Issued in five books as follows:	
101B-1902-1A Cover 1	*Sect. 1 & 2*
101B-1902-1A Cover 2	*Sect. 3, 4 & 5*
101B-1902-1B Cover 1	*Sect. 6 Chapters 1-12*
101B-1902-1B Cover 2	*Sect. 6 Chapters 13-24*
101B-1902-1C	*Sect. 7 to 9*
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**	**Modification lists** ▶
101B-1902-15	**Pilot's notes**
101B-1902-16	**Operating data manual**

LUBRICATION SYMBOLS

The following symbols and abbreviations are used to indicate lubrication on the appropriate illustrations throughout the book.

Symbol	Lubricant	N.A.T.O. Code No.
◣	Grease XG-273	G-357
⊟	Grease XG-293	G-395
□	Grease XG-287	G-354
⊠	Grease XG-315	G-394
⊡	Grease ZX-38	S-722
△	Grease ZX-30	–
○	Oil OX-14	0-147
⊗	Oil OX-16	–
◎	Oil OX-23	–
⊢▬▶	Gun lubrication	
P	Pre-packed bearings	

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" 2 - Controls and equipment at crew stations
" 3 - Emergency controls, equipment and exits - method of operation

Section 2 - Ground Handling and Preparation for Flight . . . . . .

Chapter 1 - Ground handling
" 2 - Preparation for flight
" 3 - Loading and C.G. data
" 3A - Hydrostatic weighing of aircraft
◀ " 3B - Fatigue index data ▶
" 4 - General servicing
" 5 - Change of role - Conversion to Blue Steel role
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" 5B - Change of role - Conversion to Air Monitoring role ▶
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Section 8 - Wireless Installations

Section 9 - Radar installations

Section 10 - EW installations

PUBLISHED SEPARATELY - refer to:-
A.P.101B-1902-1B for Sect.6
A.P.101B-1902-1C, Cover 1 for Sect.7, 8 and 9
A.P.101B-1902-1C, Cover 2 for Sect.10

ASSISTED ESCAPE SYSTEMS AND ASSOCIATED EXPLOSIVE OPERATED JETTISON MECHANISMS

1. The assisted escape system and associated explosive operated jettison mechanisms fitted to aircraft are a potential source of lethal injury to personnel and damage to Government property if inadvertently operated.

2. Safety devices in the form of safety pins, levers and switches are provided for use when the aircraft is on the ground to safeguard against this danger.

3. On entering the cockpit/cabin of an aircraft, it is the responsibility of the individual to be able to recognise the assisted escape system safety devices in that aircraft and to ensure that they are correctly applied at all times in accordance with para.4 below.

4. Instructions for the correct positioning of the assisted escape system safety devices in each aircraft type and mark are detailed in the Servicing Schedules and Aircrew Manual relating to that aircraft.

ELECTRICAL SYSTEM

5. 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

6. 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

7. 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 areas indicated on the illustration overleaf. The areas are to be roped off and notices displayed warning personnel to keep clear.

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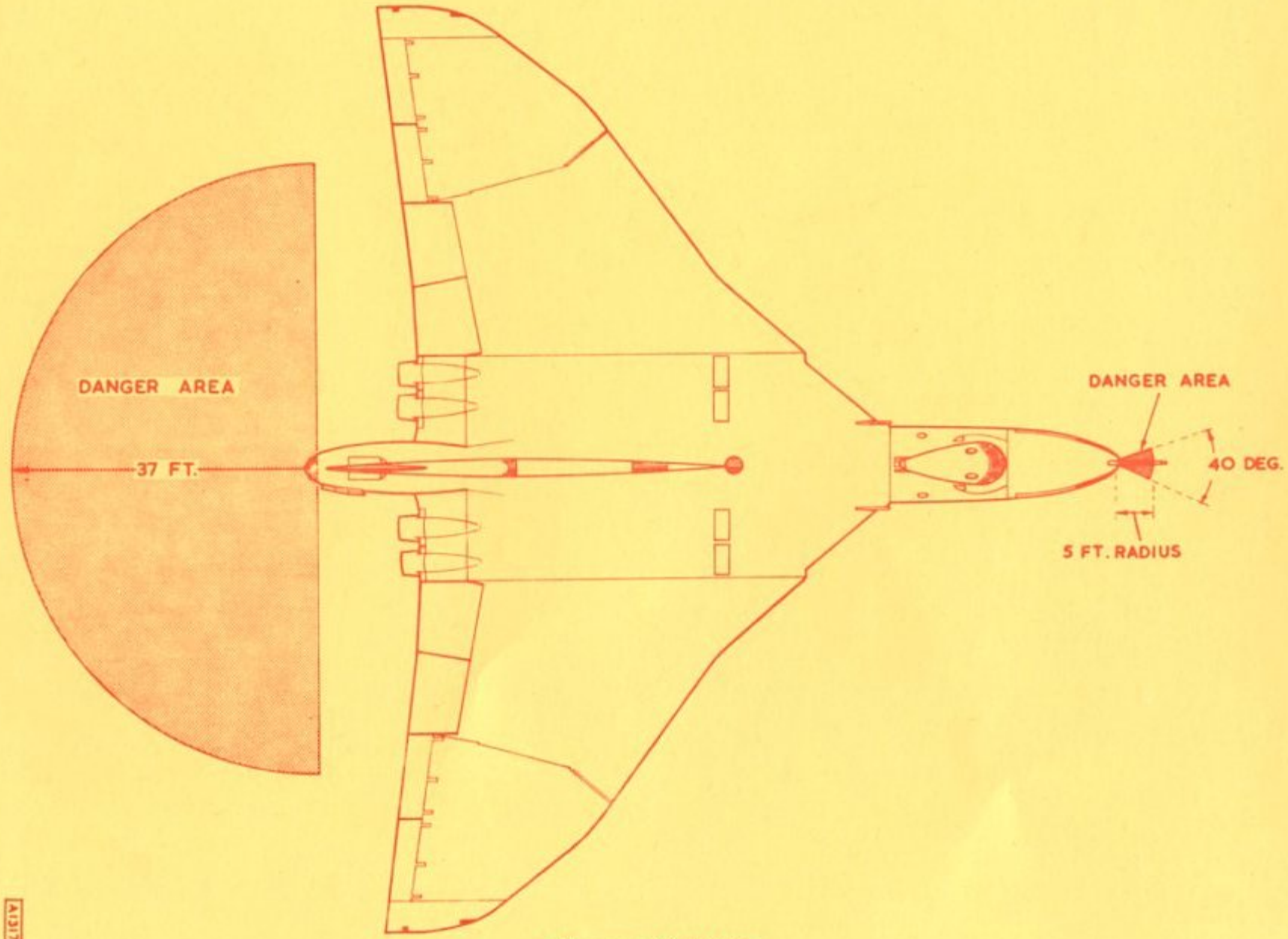

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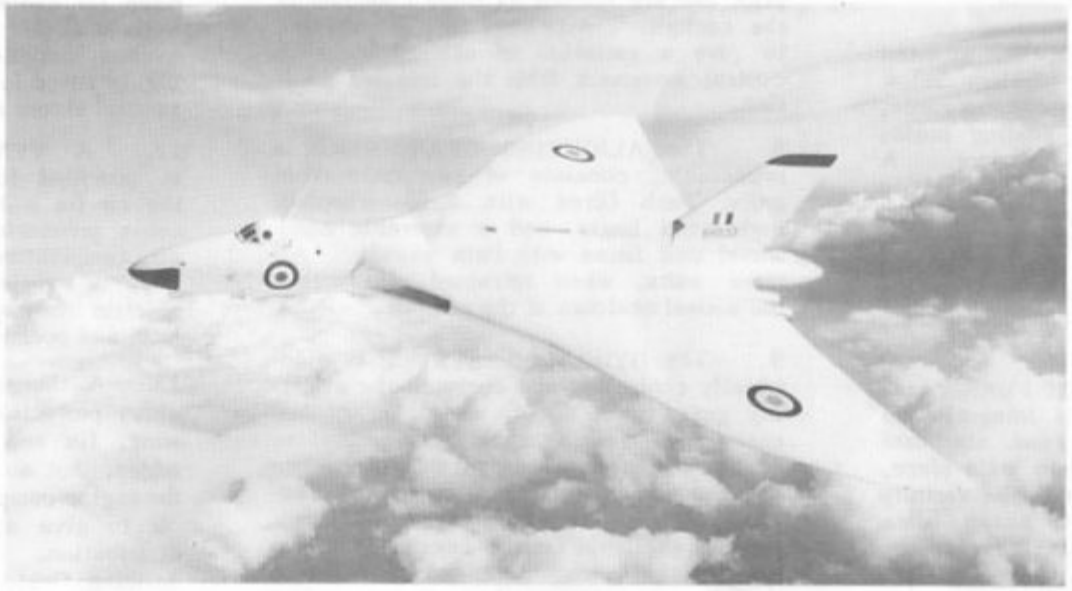
Microwave radiation areas

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

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 controllers 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 slinging 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 pressurised to prevent vaporisation and consequent loss of fuel at altitude, air from the engine compressors being used for this purpose. To protect the tanks from internal fires or explosions, a Graviner Explosion Protection system is fitted. 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 water-glycol 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.C.M. 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 c/s. 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 c/s, a.c. Power at 115 volt, 3 phase, 400 c/s, 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 c/s, 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. A ground supply plug is provided on the port side aft fuselage for the 200 volt a.c. system, and two 28 volt plugs are provided, adjacent to the nose wheel bay for ground servicing supply. In the unlikely event of the 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 equipment consists of a general purpose H.F. (under control of the air electronics officer), U.H.F., I.L.S. and twin V.H.F. installations (controlled by the navigator. A low range radio altimeter provides indication for, and is controlled by, the first pilot. A high range radar altimeter provides indication for, and is controlled by, the navigator/air bomber. Radar installations, consisting of Gee, Green Satin, Tail Warning, I.F.F., N.B.S. and E.C.M. are fitted. Intercommunication between crew members is provided by a separate system, with switching facilities for introducing radio signals and conference inter-com. Five aerials are fitted externally to the fuselage, consisting of two U.H.F., two I.F.F. and one V.H.F. The H.F. transmitter-receiver is fed with signals from a resonant slot in the aircraft fin. The I.L.S. installation has three aerials, two being tuned notches (one in each wing tip) and the third a tuned metal strip contained in a box fitted below No.2 starboard tank bay. The A.D.F. utilises a loop aerial contained in a shallow dish which is fitted in the bomb bay roof, and the radio and radar altimeter installations use recessed reflector type aerials. The H.2.S. installation employs a rotating scanner in the nose.

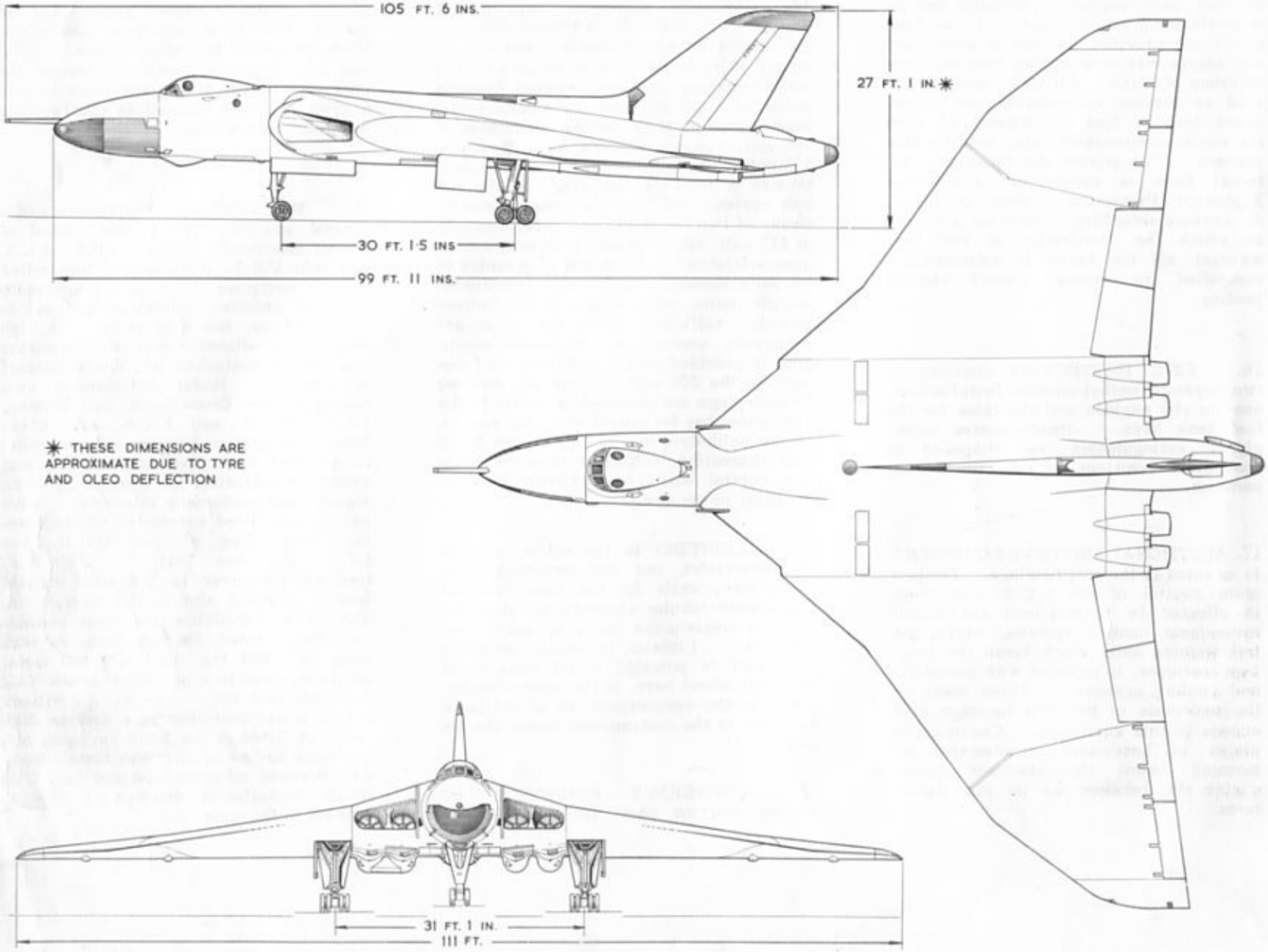


Fig. 1. General arrangement.

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)	40 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/in^2
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

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/FS11	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/in^2
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/in^2
Off-load pressure. . . . . 4 000 lb/in^2
Peak pressure . . . . . 4 400 lb/in^2
Reservoir. . . . . Dowty – 1.03312.001
Capacity (to filling level). . . . . 2¼ 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/in^2
Capacity (each). . . . . 1 250 litres

PNEUMATIC SYSTEMS

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

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

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*

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, 40kVA, Type 158B (Ref.No.5UA/4357453)*
Transformer-rectifier units, 7.5 kW (Two)	*(Ref.No.5UC/4395968)*
Main transformers 3kVA (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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