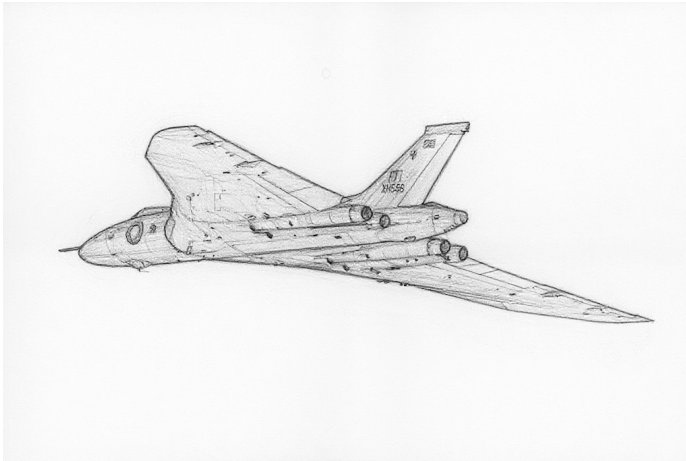


Avro Vulcan



The Avro Vulcan was a strategic bomber. It featured a tail-less delta-wing configuration designed for high-speed subsonic flight at high altitude, and was the last and most advanced of the V-bombers.

Versions

Vulcan B.1

The initial B.1 version had the Rolls-Royce Olympus 101 engine (12,000 lbf) and lacked ECM systems, tail-warning radar, and in-flight refueling capability. It entered service with the RAF in 1956. Many were converted to B.1As in 1959 to 1963 and the remainder retired in 1966.

Vulcan B.1A

The B.1A version was an upgrade of the B.1 with a more powerful Rolls-Royce Olympus 104 engines (13,500 lbf), ECM systems and a tail-warning radar similar to those in the B.2, and in-flight refueling capability. The first modified aircraft became available in 1960 and all were retired in 1968.

Vulcan B.2

The B.2 version was built with a larger wing to accommodate the Olympus 200/300-series engine (17,000 to 20,000 lbf), ECM systems and a tail-warning radar in an extended tail cone, and in-flight refueling capability. It served with the RAF from 1960 to 1982.

Some B.2s were modified to permit the carriage of the Blue Steel nuclear stand-off missile semi-recessed in the bomb bay and the cancelled Skybolt air-launched nuclear ballistic missile on under-wing station. TFR was fitted starting in 1966 and an improved RWR the mid 1970s.

In 1982, for the *Black Buck* missions in the South Atlantic War, several B.2s were modified to permit the carriage of

Shrike ARMs or an ALQ-101D ECM pod on the underwing pylons originally installed for Skybolt.

Vulcan B.2(MRR)

Several B.2s were converted to maritime radar-reconnaissance aircraft (MRR) in 1973 and served until 1982.

Vulcan K.2

The South Atlantic War consumed much of the remaining fatigue life of the RAF's fleet of Victor tankers. To compensate, several Vulcan B.2s were converted to single-point tankers and designated K.2. They served from 1982 to 1984.

Vulcan F.3

The F.3 is a hypothetical long-range interceptor. At least two options were considered in the 1970s: one with twelve AIM-54 Phoenix missiles and another with ten air-launched variants of the Sea Dart missile.

Armament and Stores

The bomb bay could accommodate twenty-one 1,000 lb bombs, one nuclear bomb (Blue Danube, Violet Club, Mark 5, Yellow Sun, Red Beard, and WE.177B), or (in modified B.2s from 1960), or one Blue Steel nuclear stand-off missile. The B.2s modified for the *Black Buck* missions could also carry AGM-45 Shrike ARMs on under-wing stations.

Combat

Vulcans only saw combat in the *Black Buck* missions in the South Atlantic War.

ADCs

ADCs are provided for:

- Vulcan B.2
- Vulcan B.2(MRR)
- Vulcan F.3 (Phoenix)
- Vulcan F.3 (Sea Dart)

Photo Credit

- Avro Vulcan: John5199 (CC BY 2.0)

<div>Vulcan B.2</div>										Crew: Pilot, Copilot, Navigator, Radar Navigator, and Air Electronics Officer																																		
										Maneuver HFPs/DPs:																																		
LR/DR — —																																												
VR —																																												
Turn DPs:																																												
Power APs/DPs/FPs: ○○○○ <table><tr><td></td><td>CL</td><td>1/2</td><td>DT</td><td>Fuel</td></tr><tr><td>AB</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>M</td><td>2.0</td><td>1.5</td><td>1.5</td><td>8.0</td></tr><tr><td>N</td><td>0.0</td><td>0.0</td><td>0.0</td><td>4.0</td></tr><tr><td>I</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.0</td></tr><tr><td>SPBR</td><td>0.5</td><td>1.0</td><td>1.0</td><td>—</td></tr></table>						CL	1/2	DT	Fuel	AB	—	—	—	—	M	2.0	1.5	1.5	8.0	N	0.0	0.0	0.0	4.0	I	0.5	0.5	0.5	0.0	SPBR	0.5	1.0	1.0	—	Cruise Speed: 5.0					Restr. Arcs: -				
						CL	1/2	DT	Fuel																																			
					AB	—	—	—	—																																			
					M	2.0	1.5	1.5	8.0																																			
N	0.0	0.0	0.0	4.0																																								
I	0.5	0.5	0.5	0.0																																								
SPBR	0.5	1.0	1.0	—																																								
Climb Speed: 3.5					Blind Arcs: 60–																																							
Visibility: 12					Internal Fuel: 3600																																							
Size: –2					AtA Refuel: Yes																																							
Vulnerability: +2					Ejection Seat: Std																																							
										No rolling maneuvers allowed.																																		
Speeds and Ceilings										Climb Capabilities																																		
Alt. Band		Conf. Ceil.		CL 64		1/2 61		DT 59		Dive Speed		CL AB Oth		1/2 AB Oth		DT AB Oth		Alt. Band																										
EH+		46+		3.5 – 6.5		3.5 – 6.0		4.0 – 6.0		6.5		— 0.5		— 0.5		— 0.5		EH+																										
VH		36–45		3.0 – 6.5		3.0 – 6.0		3.5 – 6.0		6.5		— 1.0		— 1.0		— 0.5		VH																										
HI		26–35		2.5 – 6.5		2.5 – 6.0		3.0 – 6.0		6.5		— 1.0		— 1.0		— 1.0		HI																										
MH		17–25		2.0 – 6.0		2.0 – 5.5		3.0 – 5.5		6.5		— 1.0		— 1.0		— 1.0		MH																										
ML		8–16		1.5 – 6.0		2.0 – 5.5		2.5 – 5.5		7.0		— 1.5		— 1.0		— 1.0		ML																										
LO		0–7		1.0 – 6.0		1.5 – 5.5		2.0 – 5.5		7.0		— 1.5		— 1.5		— 1.5		LO																										
Radar: H2S Mk.9A					ECM: IFF					Weapon Stations Diagram:																																		
ECCM: 2					RWR: B																																							
Arcs: 150+					DDS: A																																							
Search: Gr. Nav. (60)					DJM: B2																																							
Track: Gr. Attack (40)					AJM: B2					Load Point Limits: CL : 0–24 1/2: 25–43																																		
Lock-On: 6					BJM: B2																																							
Guns: —					Technology:															Weight Limit: 42,000 DT : 44+																								
To Hit: —					TFR-A																																							
Ammunition: —										Station Limit Allowed Loads																																		
Gunsight: —																																												
Ranging: —										1 and 3 1,000 ARM MDR EP																																		
AtA/AtG: —																				2 28,000 BB NAM FT																								
Bomb System: Ballistic					Load Notes:																																							
Notes: 1. The Avro Vulcan B.2 is a strategic conventional and nuclear bomber. 2. High transonic drag (HTD). Low roll rate (LRR). 3. DDS capacity is 60 CH. 4. Tail Radar. Equipped with a Red Steer tail radar with ECCM of 2, arc of 60–, search of 40-8, track of 18-6. and lock-on of 7. 5. Only the pilot and copilot have ejection seats. The other crew members can bail out three game turns after declaring their intent to do so. 6. TFR from 1965.																																												
VPs: 40/27/13/7										v1 0000000 0000-00-00T00:00:00																																		

<div>Vulcan B.2(MRR)</div> <div><div>Power APs/DPs/FPs: ○○○○</div><table><tr><td>CL</td><td>1/2</td><td>DT</td><td>Fuel</td></tr><tr><td>AB</td><td>—</td><td>—</td><td>—</td></tr><tr><td>M</td><td>2.0</td><td>1.5</td><td>1.5</td><td>8.0</td></tr><tr><td>N</td><td>0.0</td><td>0.0</td><td>0.0</td><td>4.0</td></tr><tr><td>I</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.0</td></tr><tr><td>SPBR</td><td>0.5</td><td>1.0</td><td>1.0</td><td>—</td></tr></table></div>						CL	1/2	DT	Fuel	AB	—	—	—	M	2.0	1.5	1.5	8.0	N	0.0	0.0	0.0	4.0	I	0.5	0.5	0.5	0.0	SPBR	0.5	1.0	1.0	—	<div>Crew: Pilot, Copilot, Navigator, Radar Navigator, and Air Electronics Officer</div> <div>Maneuver HFPs/DPs: LR/DR — — VR — —</div> <div>Turn DPs: <table><tr><td>CL</td><td>1/2</td><td>DT</td></tr><tr><td>TT</td><td>1.0</td><td>2.0</td><td>2.0</td></tr><tr><td>HT</td><td>2.0</td><td>3.0</td><td>4.0</td></tr><tr><td>BT</td><td>—</td><td>—</td><td>—</td></tr><tr><td>ET</td><td>—</td><td>—</td><td>—</td></tr></table></div> <div>Cruise Speed: 5.0 Restr. Arcs: - Climb Speed: 3.5 Blind Arcs: 60– Visibility: 12 Internal Fuel: 3600 Size: –2 AtA Refuel: Yes Vulnerability: +2 Ejection Seat: Std</div>						CL	1/2	DT	TT	1.0	2.0	2.0	HT	2.0	3.0	4.0	BT	—	—	—	ET	—	—	—
						CL	1/2	DT	Fuel																																																	
						AB	—	—	—																																																	
						M	2.0	1.5	1.5	8.0																																																
N	0.0	0.0	0.0	4.0																																																						
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TT	1.0	2.0	2.0																																																							
HT	2.0	3.0	4.0																																																							
BT	—	—	—																																																							
ET	—	—	—																																																							
Speeds and Ceilings						Climb Capabilities																																																				
Alt. Band	Conf. Ceil.	CL 64	1/2 61	DT 59	Dive Speed	CL AB	Oth	1/2 AB	Oth	DT AB	Oth	Alt. Band																																														
EH+	46+	3.5 – 6.5	3.5 – 6.0	4.0 – 6.0	6.5	—	0.5	—	0.5	—	0.5	EH+																																														
VH	36–45	3.0 – 6.5	3.0 – 6.0	3.5 – 6.0	6.5	—	1.0	—	1.0	—	0.5	VH																																														
HI	26–35	2.5 – 6.5	2.5 – 6.0	3.0 – 6.0	6.5	—	1.0	—	1.0	—	1.0	HI																																														
MH	17–25	2.0 – 6.0	2.0 – 5.5	3.0 – 5.5	6.5	—	1.0	—	1.0	—	1.0	MH																																														
ML	8–16	1.5 – 6.0	2.0 – 5.5	2.5 – 5.5	7.0	—	1.5	—	1.0	—	1.0	ML																																														
LO	0–7	1.0 – 6.0	1.5 – 5.5	2.0 – 5.5	7.0	—	1.5	—	1.5	—	1.5	LO																																														

<div>Radar: H2S Mk.9A ECCM: 2 Arcs: 150+ Search: Gr. Nav. (60) Track: Gr. Attack (40) Lock-On: 6</div> <div>Guns: — To Hit: — Ammunition: — Gunsight: — Ranging: — AtA/AtG: —</div> <div>Bomb System: Ballistic</div>	<div>ECM: IFF RWR: B DDS: A DJM: B2 AJM: B2 BJM: B2</div> <div>Technology: None</div>	<div>Weapon Stations Diagram:</div> <div>Load Point Limits: CL : 0–24 1/2: 25–43</div> <div>Weight Limit: 42,000 DT : 44+</div> <table><tr><td>Station</td><td>Limit</td><td>Allowed Loads</td></tr><tr><td>1 and 3</td><td>1,000</td><td>ARM MDR EP</td></tr><tr><td>2</td><td>28,000</td><td>BB NAM FT</td></tr></table> <div>Load Notes: 1. Stations 1 and 3 are the under-wing stations. From 1982, each may carry two Shrike ARM or one ALQ-101D EP. 2. Station 2 is the internal bomb bay. Load options include (a) twenty-one 1000 lb BB in three groups of seven; (b) two auxiliary fuel tanks; (c) seven 1000 lb bombs and one auxiliary fuel tank; (d) one Blue Steel NAM. All bombs must be the same type and low-drag. 3. An auxiliary fuel tank has a weight of 14000, 14 load points, and 700 fuel points. 4. As an exception to the normal rules for load points, internal loads contribute 1 load point for each 1,000 of weight and internal fuel contributes 1 load point for each 50 fuel points. A return mission will typically require leaving the target with at least 1200 fuel points (24 load points).</div>	Station	Limit	Allowed Loads	1 and 3	1,000	ARM MDR EP	2	28,000	BB NAM FT
Station	Limit	Allowed Loads									
1 and 3	1,000	ARM MDR EP									
2	28,000	BB NAM FT									
<div>Notes: 1. The Avro Vulcan B.2(MRR) is a maritime radar reconnaissance aircraft. 2. High transonic drag (HTD). Low roll rate (LRR). 3. DDS capacity is 60 CH. 4. Tail Radar. Equipped with a Red Steer tail radar with ECCM of 2, arc of 60–, search of 40-8, track of 18-6. and lock-on of 7. 5. Only the pilot and copilot have ejection seats. The other crew members can bail out three game turns after declaring their intent to do so.</div>		VPs: 40/27/13/7		v1 0000000 0000-00-00T00:00:00							

<div>Vulcan F.3 (Phoenix)</div>										Crew: Pilot, Copilot, Navigator, Weapons System Officer, and Air Electronics Officer									
										Maneuver HFPs/DPs:									
LR/DR — —																			
VR — —																			
Turn DPs:																			
Power APs/DPs/FPs: ○○○○					Cruise Speed: 5.0					Restr. Arcs: -									
CL 1/2 DT Fuel					Climb Speed: 3.5					Blind Arcs: 60–									
AB — — — —					Visibility: 12					Internal Fuel: 3600									
M 2.0 1.5 1.5 8.0					Size: –2					AtA Refuel: Yes									
N 0.0 0.0 0.0 4.0					Vulnerability: +2					Ejection Seat: Std									
I 0.5 0.5 0.5 0.0																			
SPBR 0.5 1.0 1.0 —																			
										No rolling maneuvers allowed.									
Speeds and Ceilings										Climb Capabilities									
Alt. Conf.		CL		1/2		DT		Dive		CL		1/2		DT		Alt.			
Band Ceil.		64		61		59		Speed		AB Oth		AB Oth		AB Oth		Band			
EH+ 46+		3.5 – 6.5		3.5 – 6.0		4.0 – 6.0		6.5		— 0.5		— 0.5		— 0.5		EH+			
VH 36–45		3.0 – 6.5		3.0 – 6.0		3.5 – 6.0		6.5		— 1.0		— 1.0		— 0.5		VH			
HI 26–35		2.5 – 6.5		2.5 – 6.0		3.0 – 6.0		6.5		— 1.0		— 1.0		— 1.0		HI			
MH 17–25		2.0 – 6.0		2.0 – 5.5		3.0 – 5.5		6.5		— 1.0		— 1.0		— 1.0		MH			
ML 8–16		1.5 – 6.0		2.0 – 5.5		2.5 – 5.5		7.0		— 1.5		— 1.0		— 1.0		ML			
LO 0–7		1.0 – 6.0		1.5 – 5.5		2.0 – 5.5		7.0		— 1.5		— 1.5		— 1.5		LO			

Radar:		AWG-9		ECM:		IFF		Weapon Stations Diagram:											
ECCM:		3		RWR:		B													
Arcs:		150+		DDS:		A													
Search:		500–60		DJM:		B2													
Track:		360–60		AJM:		B2													
Lock-On:		7		BJM:		B2													
Guns:		—		Technology: Look-Down Radar, Track-While-Scan (18), and Multi-Target (6)				Load Point Limits:				CL : 0–24							
To Hit:		—										1/2: 25–43							
Ammunition:		—						Weight Limit:				42,000 DT : 44+							
Gunsight:		—						Station				Limit		Allowed Loads					
Ranging:		—						1–3 and 5–7				2,000		AHM					
AtA/AtG:		—						4				28,000		FT					
Bomb System:		Ballistic		Load Notes: 1. Stations 1 to 3 and 5 to 7 are underwing stations. Each may carry two AIM-54A AHMs. 2. Station 4 is the internal bomb bay. It may carry two auxiliary fuel tanks. 3. An auxiliary fuel tank has a weight of 14000, 14 load points, and 700 fuel points. 4. As an exception to the normal rules for load points, internal loads contribute 1 load point for each 1,000 of weight and internal fuel contributes 1 load point for each 50 fuel points.															
Notes:																			
1. The Avro Vulcan F.3A is a long-range interceptor. This variant is equipped with AIM-54 Phoenix missiles and the AWG-9 radar from the F-14A. 2. High transonic drag (HTD). Low roll rate (LRR). 3. DDS capacity is 60 CH. 4. Only the pilot and copilot have ejection seats. The other crew members can bail out three game turns after declaring their intent to do so.																			
VPs: 40/27/13/7										v1 0000000 0000-00-00T00:00:00									

Vulcan F.3 (Sea Dart)										Crew: Pilot, Copilot, Navigator, Weapons System Officer, and Air Electronics Officer										
										Maneuver HFPs/DPs:										
LR/DR										—										
VR										—										
Power APs/DPs/FPs: ○○○○ CL 1/2 DT Fuel AB — — — — M 2.0 1.5 1.5 8.0 N 0.0 0.0 0.0 4.0 I 0.5 0.5 0.5 0.0 SPBR 0.5 1.0 1.0 —										Turn DPs: CL 1/2 DT TT 1.0 2.0 2.0 HT 2.0 3.0 4.0 BT — — — ET — — —					No rolling maneuvers allowed.					
					Cruise Speed: 5.0 Restr. Arcs: -															
					Climb Speed: 3.5 Blind Arcs: 60–															
					Visibility: 12 Internal Fuel: 3600															
					Size: –2 AtA Refuel: Yes															
					Vulnerability: +2 Ejection Seat: Std															
Speeds and Ceilings										Climb Capabilities										
Alt. Band	Conf. Ceil.	CL 64		1/2 61		DT 59		Dive Speed		CL AB Oth		1/2 AB Oth		DT AB Oth		Alt. Band				
EH+	46+	3.5 – 6.5		3.5 – 6.0		4.0 – 6.0		6.5		— 0.5		— 0.5		— 0.5		EH+				
VH	36–45	3.0 – 6.5		3.0 – 6.0		3.5 – 6.0		6.5		— 1.0		— 1.0		— 0.5		VH				
HI	26–35	2.5 – 6.5		2.5 – 6.0		3.0 – 6.0		6.5		— 1.0		— 1.0		— 1.0		HI				
MH	17–25	2.0 – 6.0		2.0 – 5.5		3.0 – 5.5		6.5		— 1.0		— 1.0		— 1.0		MH				
ML	8–16	1.5 – 6.0		2.0 – 5.5		2.5 – 5.5		7.0		— 1.5		— 1.0		— 1.0		ML				
LO	0–7	1.0 – 6.0		1.5 – 5.5		2.0 – 5.5		7.0		— 1.5		— 1.5		— 1.5		LO				
Radar:				Fox Finder				ECM:				IFF				Weapon Stations Diagram:				
ECCM:				2				RWR:				B								
Arcs:				150+				DDS:				A								
Search:				300–40				DJM:				B2								
Track:				300–30				AJM:				B2								
Lock-On:				7				BJM:				B2								
Guns:				—				Technology:								Load Point Limits:				
To Hit:				—				Look-Down Radar and Track-While-Scan (6)								CL : 0–24				
Ammunition:				—												1/2: 25–43				
Gunsight:				—												Weight Limit: 42,000 DT : 44+				
Ranging:				—																
AtA/AtG:				—																
Bomb System:				Ballistic																
Notes:																				
1. The Avro Vulcan F.3A is a long-range interceptor. This variant is equipped with air-launched Sea Dart missiles and an early version of the Fox Hunter radar.																				
2. High transonic drag (HTD). Low roll rate (LRR).																				
3. DDS capacity is 60 CH.																				
4. Only the pilot and copilot have ejection seats. The other crew members can bail out three game turns after declaring their intent to do so.																				