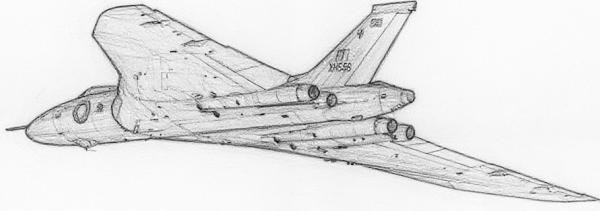


Avro Vulcan



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)

Vulcan B.2								Crew: Pilot, Copilot, Navigator, Radar Navigator, and Air Electronics Officer													
								Maneuver DPs:													
								LR/DR —													
								VR —													
								Turn DPs:													
								CL	1/2	DT											
								TT	1.0	1.5	1.5										
								HT	1.5	2.0	2.5										
								BT	—	—	—										
								ET	—	—	—										
								No rolling maneuvers allowed.													
Speeds and Ceilings																					
Alt. Band	Conf. Ceil.	CL 64	1/2 61	DT 59	Dive Speed	CL AB Oth	1/2 AB Oth	DT AB Oth													
EH+	46+	3.5 – 6.5	3.5 – 6.0	4.0 – 6.0	6.5	— 0.5	— 0.5	— 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	— 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	— 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	— 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	— 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	— 1.5	— 1.5	LO										
Radar: H2S Mk.9A				ECM: IFF	Weapon Stations Diagram:																
ECCM:	2	RWR:	B	DDS:	A																
Arcts:	150+	DJM:	B2	AJM:	B2																
Search:	Gr. Nav. (60)	BJM:	B2																		
Track:	Gr. Attack (40)																				
Lock-On:	6	BJM:	B2																		
Guns: —				Technology: TFR-A				Load Point Limits: CL : <25 1/2: <44													
To Hit:	—									Weight Limit: 42,000 DT : ≥44											
Ammunition:	—									Station Limit Allowed Loads											
Gunsight:	—					1 and 3 1,000 ARM MDR EP				2 28,000 BB NAM FT											
Ranging:	—									Load Notes:											
AtA/AtG:	—					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.											
Bomb System: Ballistic				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).													
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. Equiped 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										v3 0000000 0000-00-00T00:00:00											

Vulcan B.2(MRR)										Crew: Pilot, Copilot, Navigator, Radar Navigator, and Air Electronics Officer
Power APs/DPs: OOOO										Maneuver DPs:
CL 1/2 DT Fuel										LR/DR —
AB — — — —										VR —
M 2.0 1.5 1.5 8.0										
N 0.0 0.0 0.0 4.0					Cruise Spd. 5.0 Restr. Arcs: -					
I 1.0 1.0 1.0 0.0					CL: 3.5 Blind Arcs: 60-					
SPBR 1.0 2.0 2.0 —					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	
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			
Lock-On: 6	BJM: B2			
Guns: —	Technology: None	Load Point Limits: CL : <25 1/2: <44		
To Hit: —		Weight Limit: 42,000 DT : ≥44		
Ammunition: —		Station Limit Allowed Loads		
Gunsight: —		1 and 3 1,000 ARM MDR EP		
Ranging: —		2 28,000 BB NAM FT		
AtA/AtG: —		Load Notes:		
Bomb System: Ballistic		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).		
Notes:		VPs: 40/27/13/7		
1. The Avro Vulcan B.2(MRR) is a maritime radar reconnaissance aircraft.		v3 0000000		
2. High transonic drag (HTD). Low roll rate (LRR).		0000-00-00T00:00:00		
3. DDS capacity is 60 CH.				
4. Tail Radar. Equiped 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.				

Vulcan F.3 (Phoenix)					Crew: Pilot, Copilot, Navigator, Weapons System Officer, and Air Electronics Officer								
					Maneuver DPs:								
Power APs/DPs: OOOO					LR/DR —								
CL 1/2 DT Fuel					VR —								
AB	—	—	—	—	Turn DPs:								
M	2.0	1.5	1.5	8.0	CL 1/2 DT								
N	0.0	0.0	0.0	4.0	Cruise Spd.	5.0	Restr. Arcs:	-	TT	1.0	1.5	1.5	
I	1.0	1.0	1.0	0.0	CL:				HT	1.5	2.0	2.5	
SPBR	1.0	2.0	2.0	—	Climb Spd.:	3.5	Blind Arcs:	60-	BT	—	—	—	
					Visibility:	12	Internal Fuel:	3600	ET	—	—	—	
					Size:	-2	AtA Refuel:	Yes	No rolling maneuvers allowed.				
					Vulnerability:	+2	Ejection Seat:	Std					
Speeds and Ceilings													
Alt. Band	Conf. Ceil.	CL	1/2	DT	Dive Speed	CL AB	1/2 AB	DT AB	Climb Capabilities				
		64	61	59		Oth	Oth	Oth					
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	DDS:	A								
Arcts:	150+	DJM:	B2	AJM:	B2								
Search:	500–60	BJM:	B2										
Track:	360–60												
Lock-On:	7												
Guns: —				Technology:									
To Hit:	—	Look-Down Radar, Track-While-Scan (18), and Multi-Target (6)								Load Point Limits: CL : <25 1/2: <44			
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:									
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.								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.	
VPs: 40/27/13/7										v3 0000000 0000-00-00T00:00:00			

Vulcan F.3 (Sea Dart)										Crew: Pilot, Copilot, Navigator, Weapons System Officer, and Air Electronics Officer
Power APs/DPs: OOOO										Maneuver DPs:
CL 1/2 DT Fuel										LR/DR —
AB — — — —										VR —
M 2.0 1.5 1.5 8.0										
N 0.0 0.0 0.0 4.0					Cruise Spd. 5.0 Restr. Arcs: -					
I 1.0 1.0 1.0 0.0					CL: 3.5 Blind Arcs: 60-					
SPBR 1.0 2.0 2.0 —					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	
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: Look-Down Radar and Track-While-Scan (6)	Load Point Limits: CL : <25 1/2: <44								
To Hit: —		Weight Limit: 42,000 DT : ≥44								
Ammunition: —		Station	Limit	Allowed Loads						
Gunsight: —		1 and 7	1,000	RHM						
Ranging: —		2–3 and 5–6	2,000	RHM						
AtA/AtG: —		4	28,000	FT						
Bomb System: Ballistic		Load Notes:								
Notes:		1. Stations 1 to 3 and 5 to 7 are underwing stations. Stations 1 and 7 may each carry one Sea Dart RHM and the others each may carry two Sea Dark RHMs. 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.								
		VPs: 40/27/13/7							v3 0000000 0000-00-00T00:00:00	