

# Blohm & Voss Bv138C

A/C Type: LR Recon & SAR  
 Engine(s): Three Jumo 205D Diesel  
 Eng. Pwr: 2640 hp, air-cooled  
 A/C Crew: Pilot, CoPilot, Navigator, Radio Op  
 Flight Engineer, 3 Gunners

Maximum Speed: 177 mph at 4,800 ft  
 Maximum Ceiling: 16,400 / 14,000 / 9,200 ft.

Defense factor: 6 Size Modifier: +1  
 Damage Factor: 16/24 Endurance: 235  
 Cockpit View: Fair Blind Area: None

Protection: Cockpit +1 Fuel +1 Engine +0

Climb Dece/ Dive Accel: 2.0 / 1.0

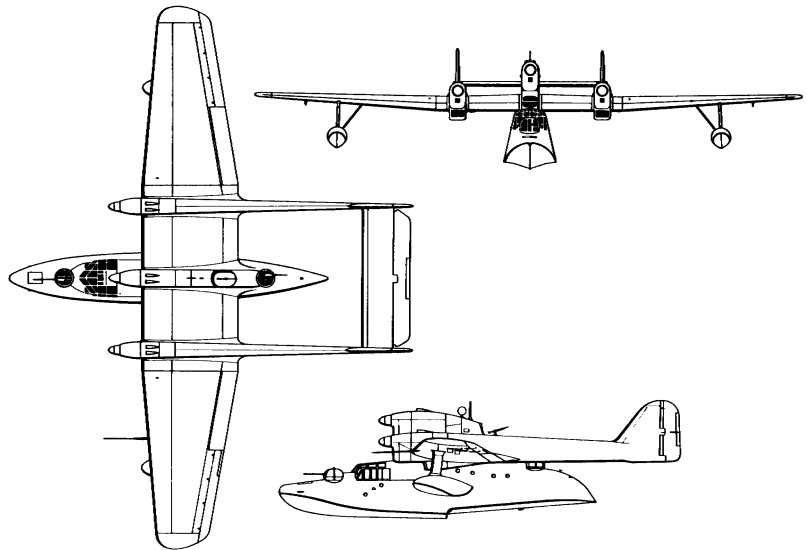
Weight and Load Limit: 4,000 / 6-12

Wpn Stations      Weight      Allowed Loads  
 1, 2, 3                  110 lbs      1x 50 kg bomb

U1 version              330lb      2x 50kg bombs or  
 a 150kg depth chg

Country: USA

Service Entry Date: June, 1941



Class: M

Victory Points: 6-12

## AIRCRAFT PERFORMANCE CHART

Altitude Levels	Bands	Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(5)	Min HT(6)	Min BT(-)	Min ET(-)	Altitude Levels	Bands	Average Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	--	--	--	--	--	--	--	19-24	MH	--
13-18	ML	2.0	3.0	6.5	3.0	4.0	--	--	13-18	ML	300
7-12	LO	2.0	3.5	6.5	2.5	3.0	--	--	7-12	LO	400
1-6	VL	1.5	3.5	5.5	2.5	3.0	--	--	1-6	VL	400

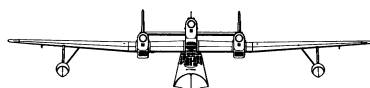
## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
FT	One 20mm MG151 can	10	2
DG	One 13mm MG-131 mg	8	3
TT	One 20mm MG151 can	10	2
RG	One 7.92mm MG15 mg	3x3	4

## GUN ATTACK FACTORS

Range	FT	DG	TT	RG
0	22	6	22	4
1	15	4	15	3
2	10	3	10	2
3	6	2	6	1
4	4	1	4	1
5	3	1	3	1
6	2	1	2	--
7	--	--	--	--

## WEAPON STATION LOCATION



1,2,3

## POWER VERSUS SPEED CHART

(per engine)

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	--	--	--	--	MH
13-18	ML	0.75	--	--	--	ML
7-12	LO	1.0	--	--	--	LO
1-6	VL	1.0	--	--	--	VL
Banking FPs		4	5	7	--	
Side Slip FPs		5	6	8	--	

## NOTES AND VARIANTS

### Defensive Gun Arcs

FT: Front+30, level to high  
 DG: Rear +30, level to high  
 RG: Right + 30, level  
 TT: Rear, level to high

**Bv138:** Sturdy flying boat used for long range recon. 10 passengers or 7000 lbs cargo.

Bv138A-1: Available Oct-40. Not as sturdy (13/20 dmg). Armed with 7.92mm MG15 in open FG, DG, TG (all as RG). 25 built.

Bv138C-1: Available Jun-41. (Similar B-1 avail Dec-40; 21 built). Some carried FuG200 Hohentwiel search radar. 70 equipped for cat launch. 225 built.

Bv138C-1/U-1: Strong stations: 2x 50 kg bombs or a 150kg depth charge ea.

Diesels: Diesels did not like rapid changes in RPM. If power changed by >1 pwr/turn, roll 1D10 for each engine: engine cuts out on 10+.

# Blohm & Voss Bv222 Wiking

Country: Germany

Service Entry Date: May, 1942

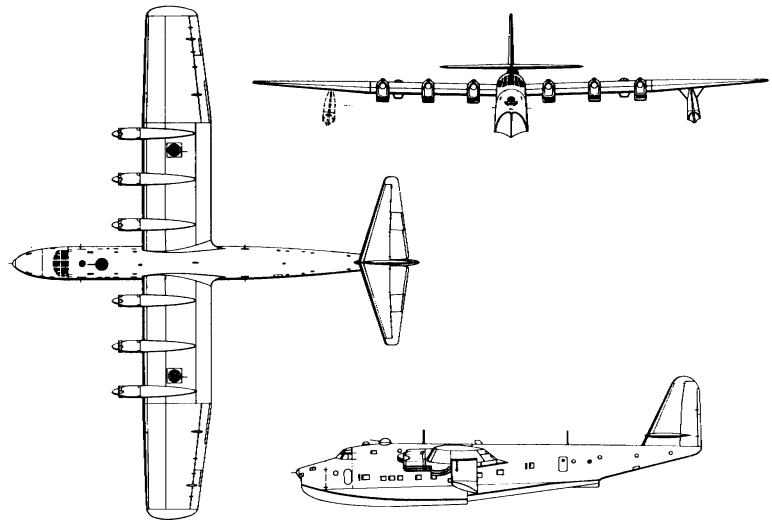
A/C Type: Large Transport Flying Boat  
 Engine(s): Six Jumo 207C diesel  
 Eng. Pwr: 1000-hp, liquid-cooled  
 A/C Crew: Pilot, copilot, navigator, engineer,  
 Radio op, 5+ Gunners

Maximum Speed: 242 mph at 16,400 ft  
 Maximum Ceiling: 23,950 ft.

Defense factor: 7 Size Modifier: +2  
 Damage Factor: 18/27 Endurance: 1000  
 Cockpit View: Fair Blind Area: None

Protection: Cockpit +0 Fuel +0 Engine +0  
 Climb Dece/ Dive Accel: 2.0 / 1.0  
 Weight and Load Limit: 3500 lbs / 10-16

Wpn Stations      Weight   Allowed Loads



Class: H

Victory Points: 7-13

## AIRCRAFT PERFORMANCE CHART

Altitude Levels	Bands	Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(3)	Min HT(4)	Min BT(-)	Min ET(-)	Altitude Levels	Bands	Average Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	2.0	4.5	7.5	3.0	4.5	--	--	19-24	MH	300
13-18	ML	1.5	4.5	7.5	2.5	4.0	--	--	13-18	ML	400
7-12	LO	1.5	4.5	7.0	2.0	3.5	--	--	7-12	LO	400
1-6	VL	1.5	4.0	6.0	2.0	3.0	--	--	1-6	VL	400

## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
DT	One 20mm MG151 can	12	2
WT*	One 20mm MG151 can	12	2
FG	One 13mm MG131 mg	15	3
L/RG1	*One 13mm MG131 mg	10	3
L/RG2	*One 13mm MG131 mg	10	3

\* Two LG/RGs on each side of the aircraft. Each gun has a gunner. WT: turret mounted on wing

## GUN ATTACK FACTORS

Range	DT	WT*	FG	LG	RG
0	22	22	6	6	6
1	15	15	4	4	4
2	10	10	3	3	3
3	6	6	2	2	2
4	4	4	1	1	1
5	3	3	1	1	1
6	2	2	1	1	1
7	--	--	--	--	--

## WEAPON STATION LOCATION



## POWER VERSUS SPEED CHART

(per engine)

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	.25	--	--	--	MH
13-18	ML	.25	--	--	--	ML
7-12	LO	.25	--	--	--	LO
1-6	VL	.25	--	--	--	VL
Banking FPs		4	5	--	--	
Side Slip FPs		5	6	--	--	

## NOTES AND VARIANTS

### Defensive Gun Arcs

FG: front, low to high  
 DT: All, level to high; 6:00 hi only  
 WTR/L: 6:00 to rear+30; level to high  
 LG: Left +/-30, level to high  
 RG: Right +/-30, level to high

**Bv222C Wiking:** Avail May-42. Giant transport flying boat. Prototype used in the Med from Aug-41. 8 prototypes built plus 4 "production" versions. Carried 92 troops, 72 stretcher cases or 40,000 lbs cargo.

Most served with LuftTransportStaffel (LTS) See 222. Two survived the war.

**Maritime Patrol:** Feb-43, 4 prototypes converted to LR maritime patrol: two DTs, no FG, 1L/RG, FuG200 Hohentweil ASV radar, and FuG216R Neptun tailwarning radar; -1 to max speed. They served with Fleigerfuhrer Atlantik.

Diesels did not like rapid changes in RPM. If power changed by >1 accel/turn, roll 1D10 for each engine: engine cuts out on 10+.

# Heinkel He115C

A/C Type: Maritime Patrol Bomber Seaplane  
 Engine(s): Two BWM 132K 9-cyl radial  
 Eng. Pwr: 1380-1940hp, air-cooled  
 A/C Crew: Pilot, bombardier/nav,  
 Radio op/Gunner

Maximum Speed: 203 mph at 11,150 ft  
 Maximum Ceiling: 17,060 / 12585 / 9023 ft.

Defense factor: 6 Size Modifier: +1  
 Damage Factor: 13/20 Endurance: 300  
 Cockpit View: Fair Blind Area: None

Protection: Cockpit +1 Fuel +1 Engine +0

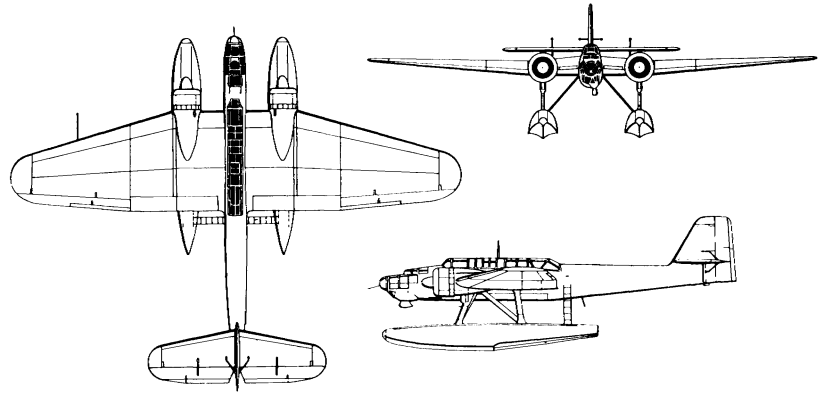
Climb Decel/ Dive Accel: 2.0 / 1.0

Weight and Load Limit: 3,200 / 10-18

<u>Wpn Stations</u>	<u>Weight</u>	<u>Allowed Loads</u>
1 (external)	2,028	1x 800 kg torp or 1x 2028lb mine or 3x 250 kg bomb
2 (bombbay)	1,100	2x 350 kg bomb or aux FT

Country: Germany

Service Entry Date: June 1940



Class: M

Victory Points: 7-13

## AIRCRAFT PERFORMANCE CHART

Altitude Levels	Bands	Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(2)	Min HT(3)	Min BT(-)	Min ET(-)	Altitude Levels	Bands	Average Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	--	--	--	--	--	--	--	19-24	MH	--
13-18	ML	2.0	3.5	6.0	3.0	4.0	--	--	13-18	ML	700
7-12	LO	2.0	4.0	6.5	2.5	3.5	--	--	7-12	LO	700
1-6	VL	2.0	3.5	5.5	2.5	3.0	--	--	1-6	VL	700

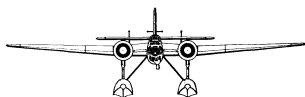
## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
FG1	One 7.92mm MG15 mg	3x3	4
DG2	One 7.92mm MG15 mg	3x3	4
NG	One 20mm MG151 can	8	2
FG2	One 7.92mm MG81Z mg	12	4
DG2	One 7.92mm MG81Z mg	12	4

## GUN ATTACK FACTORS

Range	FG1/2	DG1/2	N1
0	3/6	4/8	26
1	2/4	3/6	20
2	2/3	2/4	13
3	1/2	1/3	9
4	1/1	1/2	6
5	1/1	1/1	4
6	--	--	3
7	--	--	--

## WEAPON STATION LOCATION



1,2

## POWER VERSUS SPEED CHART

(per engine)

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	--	--	--	--	MH
13-18	ML	.75/1.0	--	--	--	ML
7-12	LO	1/1.5	--	--	--	LO
1-6	VL	1/1.5	--	--	--	VL
Banking FPs		2	3	--	--	
Side Slip FPs		3	4	--	8	

## NOTES AND VARIANTS

### Defensive Gun Arcs

FG: front, low to high

DG: Rear+30, level to hi; 6:00 hi only

He115A-2: Available 1937. 6 sold to Norway in 1939; 10 to Sweden. Armed with FG1,DG1; no prot; End: 240. 50 built.

He115B: Avail 1939. Armed with FG1/DG1. Served in Norway. 60 built.

He115C: Avail 1940. Uses N1; can carry aux. FTs in bombbay vice bombs for +100 end. Production ended 1941 due to other priorities. 76 built.

He115E: Avail early 1944. Re-started production in 1943. Armed with FG2/ DG2 (NG on 2- die role on D10). 141 built

# Dornier Do18G-1

A/C Type: Maritime Patrol Seaplane  
 Engine(s): Two Jumo 205D 6-cyl diesel  
 Eng. Pwr: 1760-hp, liquid-cooled  
 A/C Crew: Pilot, navigator, Radio op/Gunner, Gunner

Maximum Speed: 165 mph at 6,560 ft.  
 Maximum Ceiling: 13,800 / 10,000 / 8,000 ft.

Defense factor: 6 Size Modifier: +1  
 Damage Factor: 11/16 Endurance: 560  
 Cockpit View: Fair Blind Area: 6:00 low

Protection: Cockpit +0 Fuel +0 Engine +0

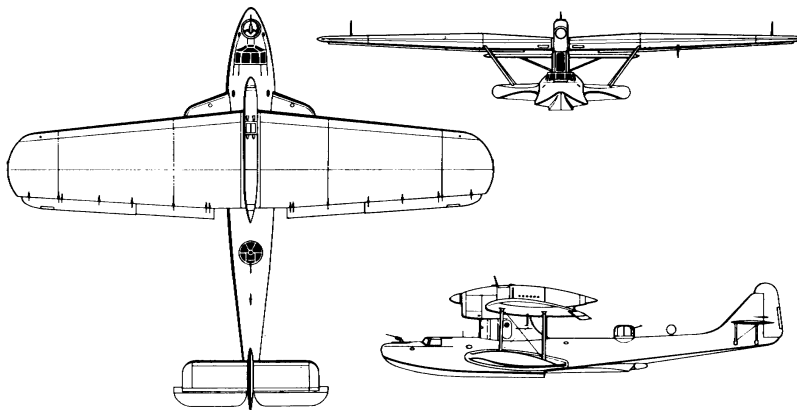
Climb Dece/ Dive Accel: 3.0 / 1.0

Weight and Load Limit: 440 lbs / 2-4

Wpn Stations      Weight    Allowed Loads  
 1,2                      220        2x 50 kg bomb

Country: Germany

Service Entry Date: November 1939



Class: M

Victory Points: 4-7

## AIRCRAFT PERFORMANCE CHART

Altitude Levels	Bands	Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(2)	Min HT(3)	Min BT(-)	Min ET(-)	Altitude Levels	Bands	Average Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	--	--	--	--	--	--	--	19-24	MH	--
13-18	ML	2.0	3.0	5.5	2.0	3.0	--	--	13-18	ML	200
7-12	LO	1.5	3.0	5.5	2.0	2.5	--	--	7-12	LO	300
1-6	VL	1.5	3.0	5.0	2.0	2.5	--	--	1-6	VL	400

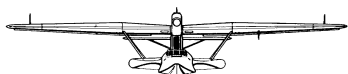
## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
FG	One 13mm MG131 mg	8	3
TT	One 20mm MG151 mg	10	4

## GUN ATTACK FACTORS

Range	FG	DG
0	6	22
1	4	15
2	3	10
3	2	6
4	1	4
5	1	3
6	1	2
7	--	--

## WEAPON STATION LOCATION



1                      2

## POWER VERSUS SPEED CHART

(per engine)

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	--	--	--	--	MH
13-18	ML	0.5/1.0	--	--	--	ML
7-12	LO	1.0/1.5	--	--	--	LO
1-6	VL	1.5/2.0	--	--	--	VL
Banking FPs		2	3	--	--	
Side Slip FPs		3	4	--	--	

## NOTES AND VARIANTS

### Defensive Gun Arcs

FG: Front+30, low to high  
 TT: Rear+30, level to hi; 6:00 hi only

**Do18:** Recon seaplane used early in WW2. First German aircraft shot down in WW2 was a Do18 tracking HMS *Ark Royal* attacked by Skuas on CAP (two

others escaped; what does that say about the Skua?). All transferred to S&R units 41-42. Post-war studies show some were Elint flights.

**Do18D-1:** Available 1938. 600-hp Jumo 205C engines (-0.5 pwr/eng), armed with FG,DG both flexible 7.62mm MG15, ammo 3x3, 4/3/2/1/1/1/-/- gun factors, same bombload. 70 built.

**Do18G-1:** Avail Nov-39. Armed 6 recon staffeln through 1941. ~60 built.

**Diesel engines:** Diesels did not like rapid changes in RPM. If power changed by >1 accel/turn, roll 1D10 for each engine: engine cuts out on 10+.

# Dornier Do24T-1

A/C Type: Maritime Patrol Bomber  
 Engine(s): 3x Bramo 323-R radial  
 Eng. Pwr: 3000 hp, air-cooled  
 A/C Crew: Pilot, 3 Gunners

Maximum Speed: 206 mph at 6,500 ft  
 Maximum Ceiling: 19,300 ft.

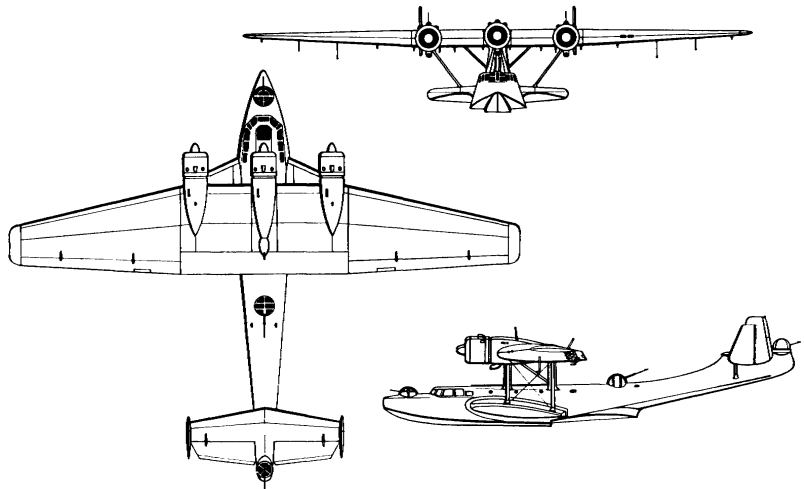
Defense factor: 7 Size Modifier: +2  
 Damage Factor: 14/20 Endurance: 485  
 Cockpit View: Fair Blind Area: None

Protection: Cockpit +0 Fuel +0 Engine +0  
 Climb Dece/ Dive Accel: 2.0 / 1.0  
 Weight and Load Limit: 3600 / 3-6

Wpn Stations	Weight	Allowed Loads
1,4	330	3x 50 kg bombs
2,3	1800	1000 l. wing tank

Country: Germany

Service Entry Date: June, 1941



Class: H

Victory Points: 6-12

## AIRCRAFT PERFORMANCE CHART

Altitude		Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(3)	Min HT(4)	Min BT(-)	Min ET(-)	Altitude		Average Rate of Climb
Levels	Bands								Levels	Bands	
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	--	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	2.0	3.0	6.5	3.5	4.5	--	--	19-24	MH	400
13-18	ML	1.5	3.5	6.5	3.0	4.0	--	--	13-18	ML	800
7-12	LO	1.5	4.0	6.5	2.5	3.5	--	--	7-12	LO	1200
1-6	VL	1.5	3.5	6.0	2.5	3.0	--	--	1-6	VL	1000

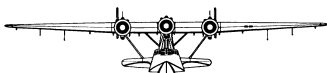
## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
FG	One 7.62mm MG15 mg	20	4
TT	One 20mm MG151 can	8	2
TG	One 7.62mm MG15 mg	20	4

## GUN ATTACK FACTORS

Range	FG	TT	TG
0	4	22	4
1	3	15	3
2	3	10	3
3	2	7	2
4	1	5	1
5	1	3	1
6	--	2	-
7	--	--	--

## WEAPON STATION LOCATION



1

2

## POWER VERSUS SPEED CHART

(per engine)

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	0.75	--	--	--	MH
13-18	ML	1.0	--	--	--	ML
7-12	LO	1.25	--	--	--	LO
1-6	VL	1.25	--	--	--	VL
Banking FPs		3	4	--	--	
Side Slip FPs		3	5	--	--	

## NOTES AND VARIANTS

### Defensive Gun Arcs

FG: Front +30, level to high  
 DG: L/R+Lft R/Rt R, level to high  
 TG: Rear+30, low to high

**Dornier 24:** Flying boat ordered by Dutch Navy for use in the East Indies. Construction taken over during German occupation

**Do24N-1:** Available Nov-40. Unarmed Dutch-built K-1s with 890-hp Wright R-1820-F52 radial engines used for SAR over by Luftwaffe: -.25 pwr/eng; roc -100. About 12 built.

**Do24T-1:** Available Jun-41. Dornier-built version. Used for SAR and recon. About 200 built in Germany and France. 22 built and used postwar by French Aeronavale.

1000 l. wing tank Wgt: 1800 lbs

Ld: 7.0/4.0

End: +75

# Arado Ar196A-3

Country: Germany

Service Entry Date: April 1940

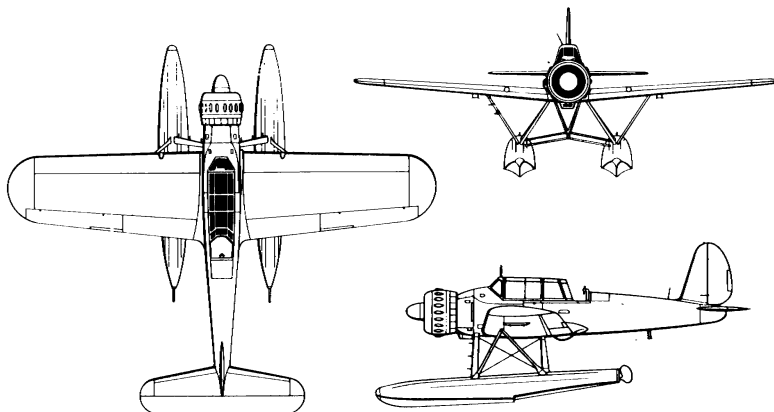
A/C Type: Recon Patrol Seaplane  
 Engine(s): One BMW 132K 9-cylinder radial  
 Eng. Pwr: 970 hp, air-cooled  
 A/C Crew: Pilot, Radio Op/Gunner

Maximum Speed: 193 mph @13,120 ft  
 Maximum Ceiling: 23,000 ft.

Defense factor: 5 Size Modifier: 0  
 Damage Factor: 9/13 Endurance: 155  
 Cockpit View: Fair Blind Area: Rear,Low

Protection: Cockpit +0 Fuel +0 Engine +0  
 Climb Dece/ Dive Accel: 3.0 / 1.0  
 Weight and Load Limit: 220 / 1-2

Wpn Stations	Weight	Allowed Loads
1,2	110 lb.	1x 50 kg bomb



Class: L

Victory Points: 3-6

## AIRCRAFT PERFORMANCE CHART

Altitude Levels	Bands	Minimum Speed	Maximum Speed	Maximum Dive Spd	Min TT(3)	Min HT(4)	Min BT(5)	Min ET(6)	Altitude Levels	Bands	Average Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	--	--	--	--	--	--	--	25-30	HI	--
19-24	MH	2.0	3.0	6.0	3.5	4.5	5.5	6.5	19-24	MH	500
13-18	ML	1.5	3.5	6.5	3.0	4.0	5.0	6.0	13-18	ML	800
7-12	LO	1.5	3.5	6.0	2.5	3.5	4.5	5.5	7-12	LO	1,100
1-6	VL	1.5	3.5	5.5	2.0	3.0	4.0	5.0	1-6	VL	1,300

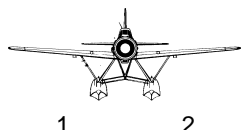
## FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
N1	One 7.92mm MG15 mg	12	4
W1	One 20mm MG FF can	3	2
W2	One 20mm MG FF can	3	2
DG1	1/2 7.62mm MG17 mg	3x3	4

## GUN ATTACK FACTORS

Rng	N1	W1	W2	DG	Total
0	6	11	11	4/8	28
1	4	9	9	3/6	22
2	3	6	6	2/4	15
3	2	4	4	1/3	10
4	1	3	3	1/2	7
5	1	2	2	1/1	5
6	--	1	1	--	2
7	--	--	--	--	--

## WEAPON STATION LOCATION



## POWER VERSUS SPEED CHART

Levels	Bands	1.0 - 4.5	5.0 - 7.5	8.0 - 9.5	10.0+	Band
43+	UH	--	--	--	--	UH
37-42	EH	--	--	--	--	EH
31-36	VH	--	--	--	--	VH
25-30	HI	--	--	--	--	HI
19-24	MH	1/2	--	--	--	MH
13-18	ML	2/3	--	--	--	ML
7-12	LO	2/3	--	--	--	LO
1-6	VL	3/4	--	--	--	VL
Banking FPs		2	3	--	--	
Side Slip FPs		3	4	--	--	

## NOTES AND VARIANTS

**DG:** Rear+30, level to hi; 6:00 hi only

**Ar196A-1:** Available Aug-39. Seaplane carried by Kriegsmarine capital ships as local recon aircraft. Fixed gear (pontoons). Armed with N1 and single DG only (use N1 for air or strafing combat; use DG values to the left of slash). Stressed for catapult use. 26 built.

**Ar196A-3:** Available 1940. Used from land bases as well as from ships. Adds W1 & W2, and twin MG17 mgs as DG (use value to right of slash). Used for coastal patrol, attacks vs subs and light marine craft in the Med in '41, against Coastal Command Whitleys in the Channel, and for convoy escort. Armed 10 shore-based squadrons. Fixed gear (pontoons). 460 built.