

Northrop Gamma 2E

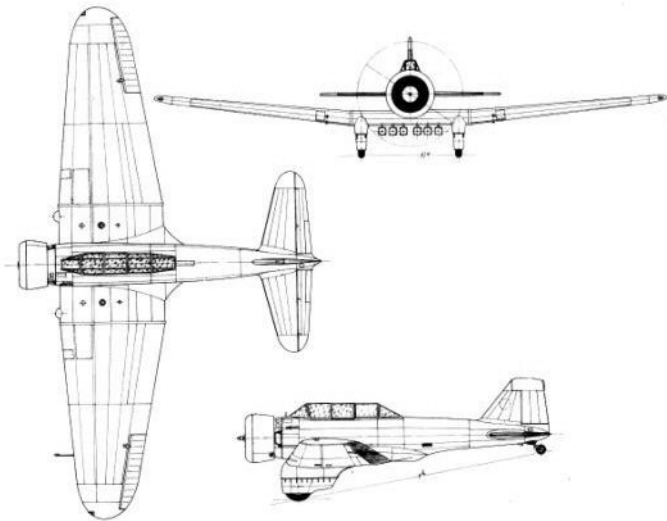
Country: China

Service Entry Date: May, 1934

A/C Type: Light bomber
 Engine(s): One Wright SR-1820-F3 radial
 Eng. Pwr: 710 hp, air-cooled, Non F.I
 A/C Crew: Pilot, Gunner

Maximum Speed: 207 mph at 11,500 ft
 Maximum Ceiling: 21,700 ft.
 Defense factor: 5 Size Modifier: +0
 Damage Factor: 7/11 Endurance: 265
 Cockpit View: Fair Blind Area: None
 Protection: Cockpit +0 Fuel +0 Engine +0
 Climb Dece/ Dive Accel: 3.0 / 1.0
 Weight and Load Limit: 1600 / 6-9

Wpn Stations	Weight	Allowed Loads
1,2,3,4,5,6	250	1 bomb



Class: L

Victory Points: 3-5

AIRCRAFT PERFORMANCE CHART

Altitude		Minimum	Maximum	Maximum	Min	Min	Min	Min	Altitude		Average
Levels	Bands	Speed	Speed	Dive Spd	TT(2)	HT(3)	BT(3)	ET(4)	Levels	Bands	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	3.5	7.5	3.0	4.0	5.0	6.0	19-24	MH	300
13-18	ML	1.5	3.5	7.0	2.5	3.5	4.5	5.5	13-18	ML	600
7-12	LO	1.5	4.0	7.0	2.0	3.0	4.0	5.0	7-12	LO	1,000
1-6	VL	1.5	4.0	6.5	2.0	3.0	3.5	4.5	1-6	VL	1,300

FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
W1	One .30 cal mg	8	4
W2	One .30 cal mg	8	4
DVG	One .30 cal mg	7	4

GUN ATTACK FACTORS

Range	W1	W2	DG	VG	Total
0	6	6	4	3	12
1	4	4	3	2	8
2	3	3	2	2	6
3	2	2	1	1	4
4	1	1	1	1	2
5	1	1	1	1	2
6	--	--	--	--	--
7	--	--	--	--	--

WEAPON STATION LOCATION



1,2,3 4,5,6

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	1.5	--	--	--	MH
13-18	ML	2	--	--	--	ML
7-12	LO	3	--	--	--	LO
1-6	VL	3	--	--	--	VL
Banking FPs		2	2	4	--	
Side Slip FPs		3	4	6	--	

NOTES AND VARIANTS

Defensive Gun:

DG: 04:08, Level to Hi; 6:00 High only.

VG: 05:07, low

Northrop Gamma 2E: Avail May-34. Light bomber developed from Gamma 2 single-engine airliner. Partially retractable bomb-aimer's tub under the fuselage just aft of the wing was operated by the bomb-aimer/gunner. Half manufactured and assembled by Northrop, others were delivered in kit form and assembled by CAMCO at Loiwing. Used against the Japanese when they invaded China in August 1937, including the "Black Saturday" Shanghai attacks. Most were shot down or grounded and out of service by 1938. Fixed gear, telescopic sight. 50 built for China.

One gun. Takes 2 turns to switch gun between DG and VG position; gun in position after second turn. Same movement restrictions as during reloading.

Northrop A-17A Nomad

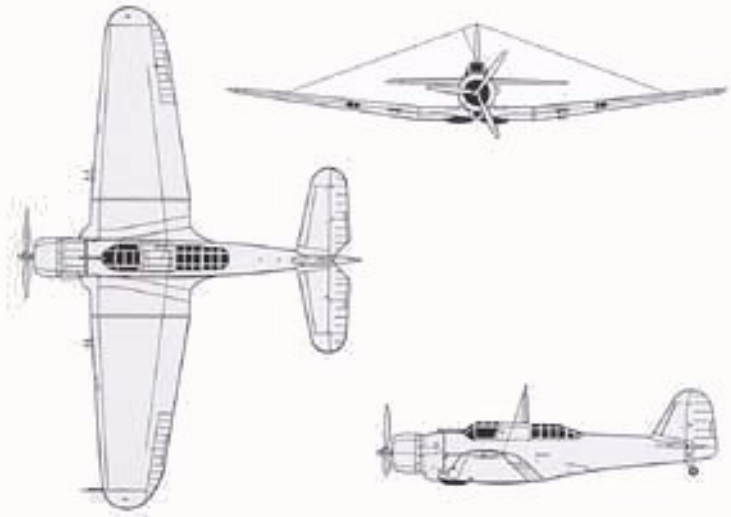
A/C Type: Attack bomber
 Engine(s): One P&W R-1535-35 Twin Wasp
 Eng. Pwr: 825-hp, air-cooled, Non-F.I.
 A/C Crew: Pilot, gunner/observer

Maximum Speed: 220 mph at Sea level ft
 Maximum Ceiling: 19,400 / 15,500 / 11,000 ft.
 Defense factor: 5 Size Modifier: +0
 Damage Factor: 8/12 Endurance: 155
 Cockpit View: Fair Blind Area: Rear
 Protection: Cockpit +0 Fuel +0 Engine +0
 Climb Dece/ Dive Accel: 3.0 / 1.0
 Weight and Load Limit: 1,000 / 3-5

Wpn Stations	Weight	Allowed Loads
1, 2, 4, 5	100 lbs	1x 100 lb bomb
3 (bombbay)	600	20x 30-lb bomb

Country: USA

Service Entry Date: February 1937



Class: L

Victory Points: 3-5

AIRCRAFT PERFORMANCE CHART

Altitude		Minimum	Maximum	Maximum	Min	Min	Min	Min	Altitude		Average
Levels	Bands	Speed	Speed	Dive Spd	TT(2)	HT(3)	BT(3)	ET(4)	Levels	Bands	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	3.5	8.0	3.0	4.0	5.0	6.0	19-24	MH	400
13-18	ML	2.0	3.5	7.0	2.5	3.5	4.5	5.5	13-18	ML	800
7-12	LO	1.5	4.0	7.0	2.0	3.0	4.0	5.0	7-12	LO	1,100
1-6	VL	1.5	4.0	6.5	2.0	3.0	3.5	4.5	1-6	VL	1,300

FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
W1	Two .30 cal MG	12	4
W2	Two .30 cal MG	12	4
DG	One .30 cal MG	10	4

GUN ATTACK FACTORS

Range	W1	W2	DG	Total
0	12	12	4	24
1	8	8	3	16
2	6	6	2	12
3	4	4	1	8
4	3	3	1	6
5	2	2	1	4
6	--	--	--	--
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	3	--	--	--	MH
13-18	ML	4	--	--	--	ML
7-12	LO	5	--	--	--	LO
1-6	VL	5	--	--	--	VL
Banking FPs		2	3	4	6	
Side Slip FPs		3	4	5	7	

NOTES AND VARIANTS

Northrop A-17: Available Dec-35. Northrop Gamma 2F. Larger, more aerodynamic than Gamma 2E, bought in quantity by USAAC. Replaced in front-line service by 1938. 750-hp P&W engine: ceiling: 20,700; Roc: +200 End: 265. Telescopic sight, dive brakes, fixed gear. 110 built.

Northrop A-17A: Avail Feb-37. Improved A-17; engine, retractable gear. Same bombload & guns. Handled well. In 1940, 93 returned to Douglas Aircraft for resale to France, but not delivered before France fell. 61 sold to RAF, 32 to Canada. RAF named them Nomad I, and passed 57 to South African AF. All used for training. Telescopic sight, dive brakes. 129 built.

Export versions with various weapons & engines sold by Douglas: DB-8A for Sweden (64), 8A-2 to Argentina (30), 8A-3P to Peru (10 - used vs. Ecuador), 8A-3N to Netherlands (18), 8A-4 to Iraq(15), 8A-5N to Norway (36 - sent to little Norway in Canada; 13 re-sold 1943 to Peru)

Vultee V-11GB

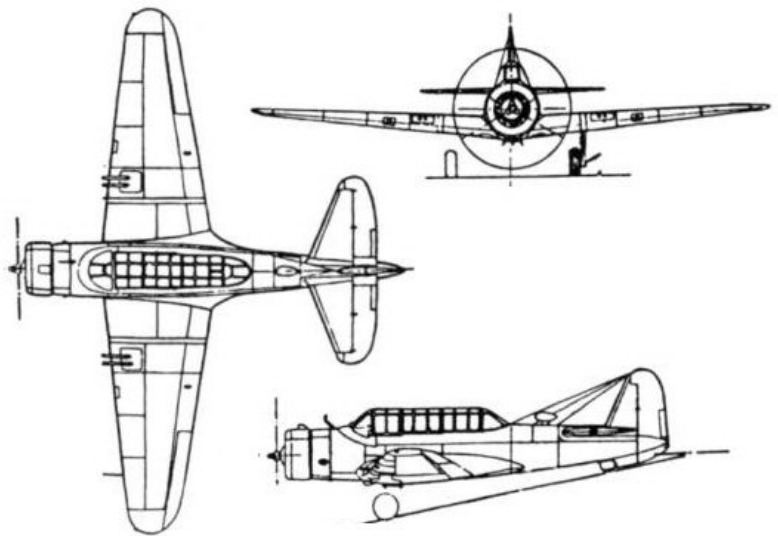
Country: China, Turkey

Service Entry Date: July, 1937

A/C Type: Light bomber
 Engine(s): One Wright R-1820-G2 Cyclone
 Eng. Pwr: 850-hp, air-cooled, Non-F.I.
 A/C Crew: Pilot, Bombardier/Camera op, Gunner

Maximum Speed: 229 mph at 6,500 ft
 Maximum Ceiling: 22,100 / 12,6000 / 11,100 ft.
 Defense factor: 5 Size Modifier: +0
 Damage Factor: 8/12 Endurance: 215
 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: 1000 / 2-3

Wpn Stations	Weight	Allowed Loads
1, 2, 4, 5	112	1x 112 lb bomb
3 (Bombbay)	500	36x 30 lb bomb



Class: L

Victory Points: 3-5

AIRCRAFT PERFORMANCE CHART

Altitude		Minimum	Maximum	Maximum	Min	Min	Min	Min	Altitude		Average
Levels	Bands	Speed	Speed	Dive Spd	TT(2)	HT(3)	BT(4)	ET(5)	Levels	Bands	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	3.5	7.5	3.0	4.0	5.0	6.0	19-24	MH	600
13-18	ML	1.5	4.0	7.5	2.5	3.5	4.5	5.5	13-18	ML	1,000
7-12	LO	1.5	4.5	7.5	2.0	3.0	4.0	5.0	7-12	LO	1,300
1-6	VL	1.5	4.5	7.0	2.0	3.0	3.5	4.5	1-6	VL	1,500

FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
W1	1/2 .30 cal mg	12	4
W2	1/2 .30 cal mg	12	4
DG	One .30 cal mg	10	4
VG	One .30 cal mg	8	4

GUN ATTACK FACTORS

Range	W1	W2	DG	DG	Total
0	6/12	6/12	4	3	12/24
1	4/8	4/8	3	2	8/16
2	3/6	3/6	2	1	6/12
3	2/4	2/4	1	1	4/8
4	1.5/3	1.5/3	1	1	3/6
5	1/2	1/2	1	1	2/4
6	--	--	--	--	--
7	--	--	--	--	--

WEAPON STATION LOCATION



1 2 3 4 5

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	2	--	--	--	MH
13-18	ML	3	--	--	--	ML
7-12	LO	3	--	--	--	LO
1-6	VL	4	--	--	--	VL
Banking FPs		2	3	5	--	
Side Slip FPs		3	4	6	--	

NOTES AND VARIANTS

Defensive Gun:

DG: 04:08, Level to Hi; 6:00 High only.
 VG: 05:07, low (GB only)

Vultee V-11G: Available Jul-37. Light 2-seat bomber based on V-1A single-engine transport. Used by Chinese 14th (International) Sqdn in 1937-8. Armed with single .30 in each wing (use numbers to left of slash, no VG). Telescopic sight. 30 V-11Gs to China in 1937-38.

Vultee V-11GB: 3-seater attack version of V-11. Turkey ordered 40 (GBT), Brazil 26 (GB2). USSR bought four and built 31 licensed versions as Psh-43 courier w/ 920hp M-62 engine (went with I-15bis as attack aircraft).

Vultee YA-19: Available Jan-39. V-11G with bigger engine. After deciding to develop twin-engine attack aircraft, converted to VIP transports. 7 built.

Vultee V-12C

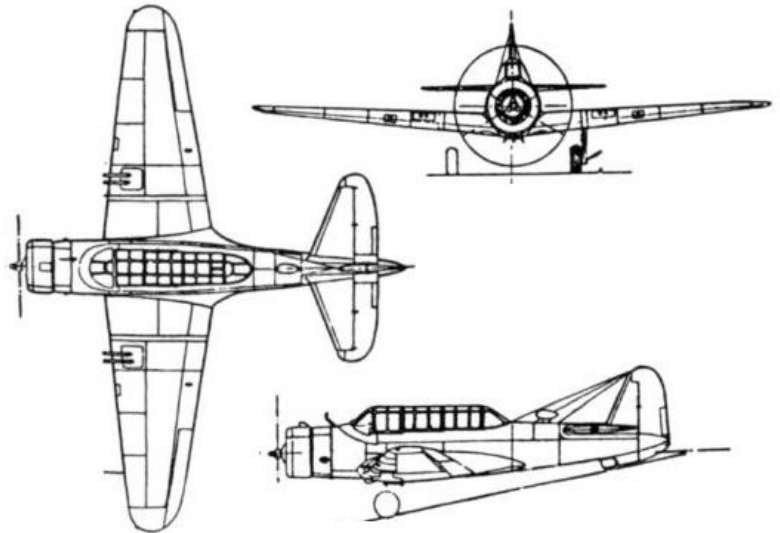
Country: China

Service Entry Date: August, 1940

A/C Type: Light bomber
 Engine(s): One Wright R-1820-F53 radial
 Eng. Pwr: 900-hp, air-cooled, Non-F.I.
 A/C Crew: Pilot, Bombardier/Gunner

Maximum Speed: 254 mph at 18,000 ft
 Maximum Ceiling: 25,200 / 16,700 / 10,300 ft.
 Defense factor: 5 Size Modifier: +0
 Damage Factor: 8/12 Endurance: 240
 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: 1,000 / 4-6

Wpn Stations	Weight	Allowed Loads
1, 2, 4, 5	112	1x 112 lb bomb
3 (Bombbay)	500	36x 30 lb bomb



Class: F

Victory Points: 3-5

AIRCRAFT PERFORMANCE CHART

Altitude		Minimum	Maximum	Maximum	Min	Min	Min	Min	Altitude		Average
Levels	Bands	Speed	Speed	Dive Spd	TT(3)	HT(4)	BT(5)	ET(6)	Levels	Bands	Rate of Climb
43+	UH	--	--	--	--	--	--	--	43+	UH	--
37-42	EH	--	--	--	--	--	--	--	37-42	EH	--
31-36	VH	--	--	--	--	--	--	--	31-36	VH	--
25-30	HI	2.5	4.0	8.0	3.5	4.5	5.5	6.5	25-30	HI	200
19-24	MH	2.0	4.0	8.0 (8.5)	3.0	4.0	5.0	6.0	19-24	MH	600
13-18	ML	1.5	4.5 (5.0)	8.0 (8.5)	2.5	3.5	4.5	5.5	13-18	ML	1,200
7-12	LO	1.5	5.0 (5.5)	8.0 (8.5)	2.0	3.0	3.5	4.5	7-12	LO	1,700
1-6	VL	1.5	4.5 (5.0)	7.0 (7.5)	2.0	3.0	4.0	5.0	1-6	VL	2,000

FIRE POWER CHART

Guns	Type Weapons	Ammo	Criticals
W1	One .50 cal M2 mg	8	3
W2	One .30 cal M1 mg	10	4
W3	One .30 cal M1 mg	10	4
W4	One .30 cal M2 mg	8	3
DG	One .30 cal M1 mg	8	4
VG	One .30 cal M1 mg	8	4

GUN ATTACK FACTORS

Rng	W1	W2	W3	W4	DG	DG	Total
0	9	6	6	9	4	3	30
1	6	4	4	6	3	2	20
2	4	3	3	4	2	1	14
3	3	2	2	3	1	1	10
4	2	1	1	2	1	1	6
5	1	1	1	1	1	1	4
6	1	--	--	1	--	--	2
7	--	--	--	--	--	--	--

WEAPON STATION LOCATION



1 2 3 4 5

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	1.5/2 (3/4)	--	--	--	HI
19-24	MH	2/3 (4/5)	--	--	--	MH
13-18	ML	2/3 (5/6)	(2/3)	--	--	ML
7-12	LO	3/4 (5/6)	1/2 (3/4)	--	--	LO
1-6	VL	3/4 (5/6)	(3/4)	--	--	VL
Banking FPs		2	3	5	--	
Side Slip FPs		3	4	6	--	

NOTES AND VARIANTS

Vultee V-12: Available 1940. Improved V-11 with larger engine, heavier weapons. China ordered 26 V-12C and 52 V-12Ds, receiving 1 of each model in 1940, and the rest in kit form for assembly by CAMCO.

V-12C: Available 1940. 900-hp R-1820-G105A engine; saw some use against Japanese in 1940-early 41 26 built.

V-12D: Available 1940. 1600-hp R-2600-A5B engine; max speed 281 @ 11,000 ft; ceiling 28,000/21,300/19,000 ft; use values in parentheses; roc +200 at ML and above; End =215; +2 pwr at all alts. However, few were completed. Most were destroyed half completed on the ground at Loiwing (along with Curtiss-Wright Demons) when bombed in Oct-40.