Stone Productions Bell-412 HP Performance Calculator

This spreadsheet is an automated tool for interpreting flight manual data graphs. With this spreadsheet a large range of helicopter performance indicators are determined in a few seconds where working through all the required graphs would take about 30 minutes. This makes it an ideal tool to experiment with different input data to get an idea of expected performance.

This spreadsheet is limited to performance data for Bell-412 HP model with either 3BE or 3BG engines with Mast Torque system modification.

By just entering basic weight data, temperature and pressure altitude a series of Performance data is calculated automatically.

Bell 412 HP TOLD Card

			Weights in lbs		amend	result
Aircraft		XCO	Basic Empty Weight	7875		7875
Configuration		XCO MT	Equipment Weight	652		652
Fuel	2150					2150
POB	4	200	Av Weight	Total 800		800
Night Sun		no		0		0
						11477

			PT6T-BE Eng Limits	
Take Off Weight	11477		**AEO**	
Pressure Altitude	2100		Mast Tq	
Temperature	25		Max Cont	81%
			5 min	100%
Engine	PT6T-3BE (with Mast Tq System)		ITT	
			Max Cont	765°C
			5 min TO	810°C
OGE Operations		CDP Cat A LDP	N1	
Cat B Ops Max GW	11900	n.a.	Max Cont	100.8%
Cat A Ops Max GW	8855	n.a. n.a.		
			OEI	
Cat A Performance	NOT Available	n.a.	Eng Tq	
Vtoss	65 kts	n.a. n.a.	Max Cont	58.9%
Climb Grad to 500 ft	n.a. %	n.a. n.a.	30 min	73.2%
			ITT	
Rej TO Dist TO Space Landing Dist			Max Cont	810°C
> 422 m > 460 m > 210 m			30 min	822°C
			2.5 min	850°C

SE Performance						N1	
	ROC	Ceiling	Drift Down	Climb		Max Cont	100.8%
			Alt	Grad		2.5 min	102.4%
2.5 min	270						
30 min	83	@ 11900 lbs		1.2%			
30 min	136	3059		1.9%			
MCP	-13	@ 11900 lbs		@ 70 kts			
MCP	44		2844			Stone productions	

Bell 412 HP TOLD Card

			Weights in lbs		
Aircraft		XCO	Basic Empty Weight	7875	
Configuration		XCO MT	Equipment Weight	652	
Fuel state	2150		Fuel Weight	2150	
POB	4	200	Av Weight Total	800	
Night Sun		no		0	
				11477	

			PT6T-BG Eng Limits	
Take Off Weight	11477		**AEO**	
Pressure Altitude	2100		Mast Tq	
Temperature	25		Max Cont	81%
			5 min	100%
Engine	PT6T-3BG (with Mast Tq System)		ITT	
			Max Cont	765°C
			5 min TO	810°C
OGE Operations		CDP Cat A LDP	N1	
Cat B Ops Max GW	11900	n.a.	Max Cont	101.8%
Cat A Ops Max GW	8855	n.a. n.a.		
			OEI	
Cat A Performance	NOT Available	n.a.	Eng Tq	
Vtoss	65 kts	n.a. n.a.	Max Cont	58.9%
Climb Grad to 500ft	n.a. %	n.a. n.a.	30 min	73.2%
			ITT	
Rej TO Dist TO Space Landing Dist			Max Cont	810°C
> 422 m > 460 m > 210 m			30 min	850°C

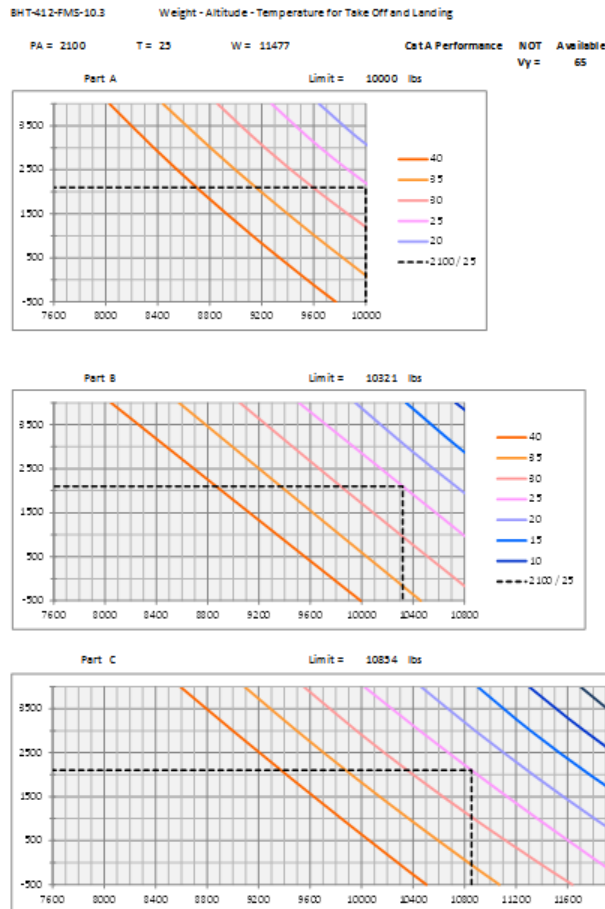| SE Performance						N1	
	ROC	Ceiling	Drift Down	Climb		Max Cont	101.8%
			Alt			2.5 min	103.4%
30 min	270	5095		3.8%			
MCP	-13	@ 11900 lbs		Grad			
MCP	44		2844	@ 70 kts		Stone productions	

All individual performance indicator calculations can be checked graphically in the respective calculation sheets.

On the following pages some snippets are displayed from the calculation sheets.

Cat B Operations with 9 or less passenger seats

PA = 2100   T =   25   **Max GW = 11900**

HOVER CEILING OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 150 AMPS(EA.)

SKID HEIGHT 60 FEET
HEATER ON OR OFF
0 TO 52°C

NOTE: THESE DATA VALID FOR ZERO WIND OUTSIDE OF THE CRITICAL
WIND AZIMUTH AREA (REFER TO FIGURE 4-5)
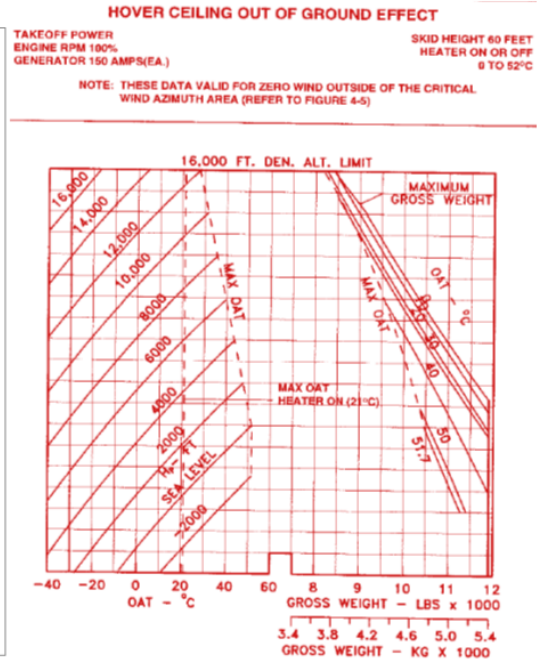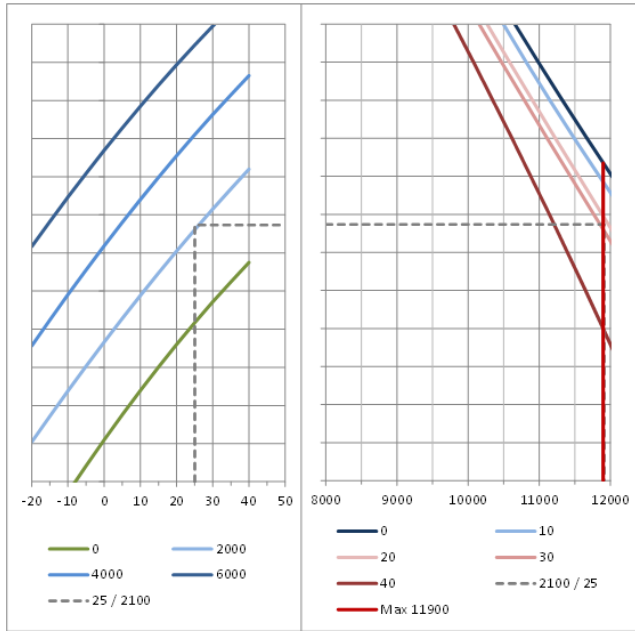
Hover Ceiling OGE Snippet

BHT-412-FMS-10.3   Weight - Altitude - Temperature for Take Off and Landing

PA = 2100   T = 25   W = 11477   Cat A Performance   NOT   Available
                                                      Vy =   65

Cat A Performance Weight Limits snippet

Cat A Performance   NOT   Available   Climb Grad =   n.a.
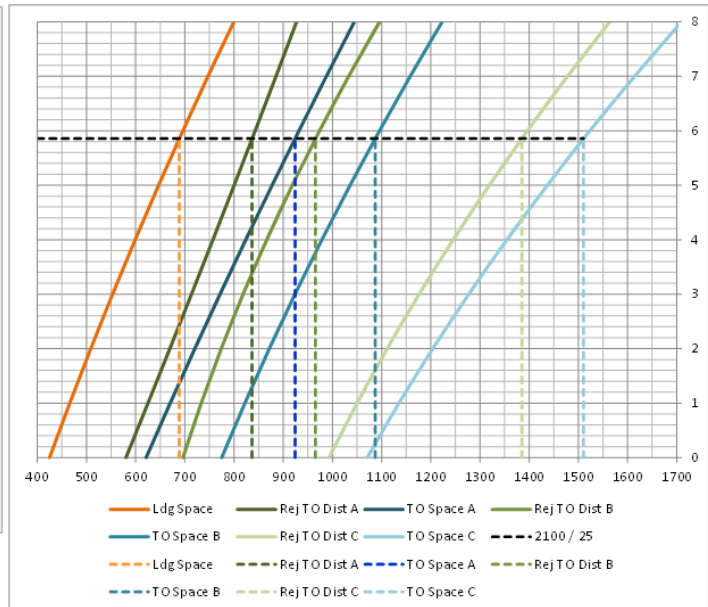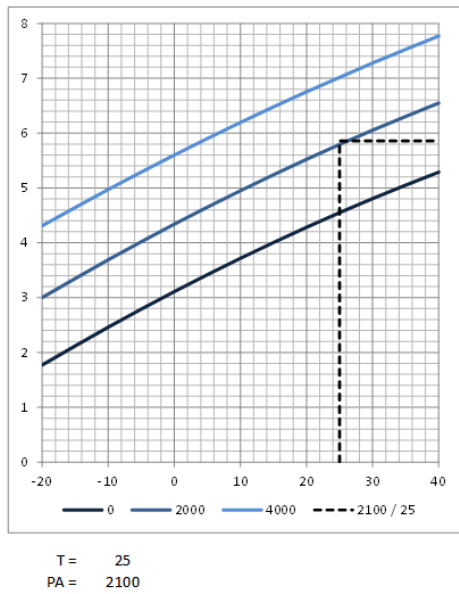
PA =   2100   T =   25   W = 11477
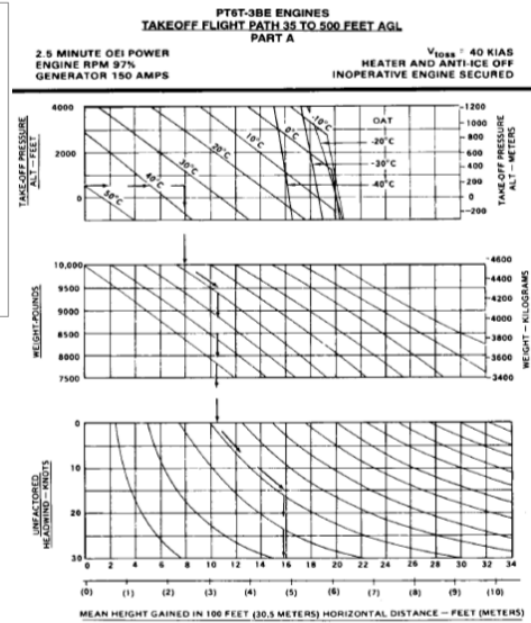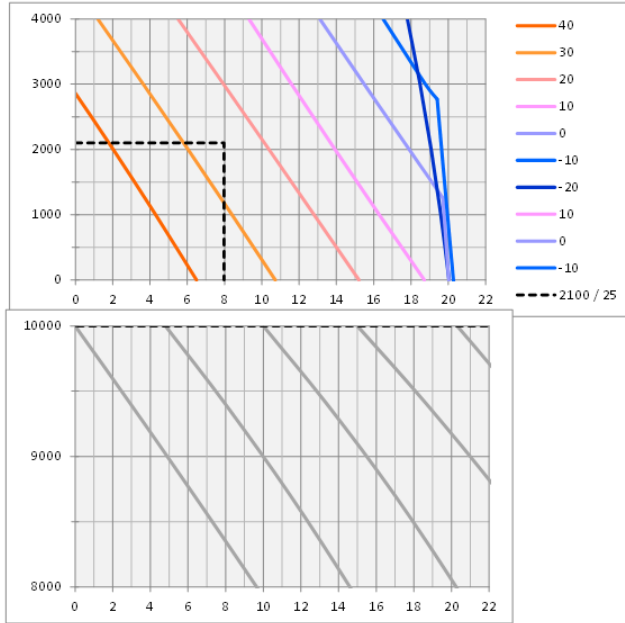
Vtoss Climb Gradient snippet

		(ft)		
	Part	A	B	C
BHT-412-FMS-10.3 Category A Operations for helicopters equiped with PT6T-3BE or PT6T-BG Engines				
Rejected Take Off Distance Required	Rej TO Dist	837	966	1385
Take Off Space Required Cat A Performance NOT Available	TO Space	924	1087	1510
Landing Space Required	Landing Space		689	

T =   25
PA =   2100

Rejected Take Distance, Take Off Space, Landing Space Required snippets

BHT-412-FMS-67.1 67.2   Single Engine Rate of Climb   30 min Limit for BG Engines
                                                                 2.5 min Limit for BE Engines (valid up to 4000')   Airspeed 70 KIAS

PA = 2100   T = 25   W = 11477   ROC =   270
                                               SE Ceiling = 5095   BG Engines
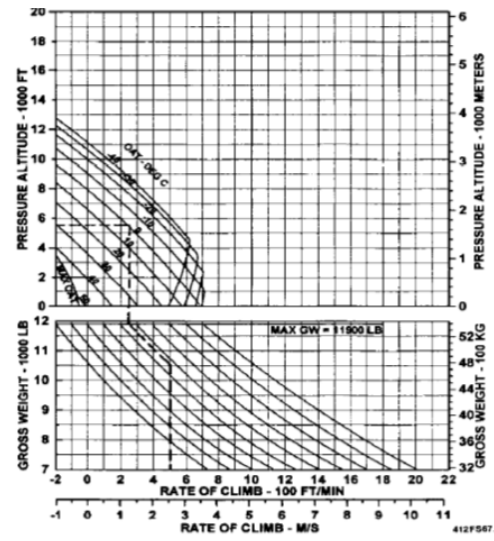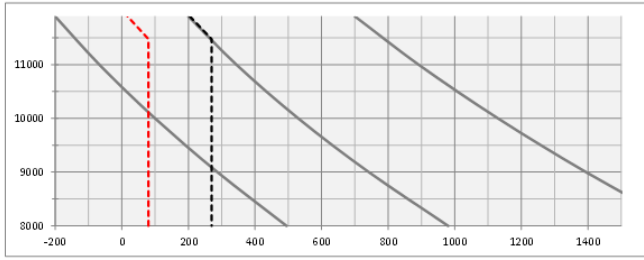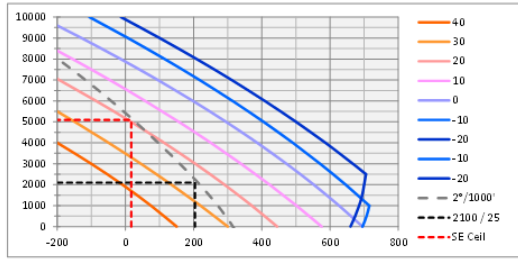
SE Rate of Climb snippet

Stone Productions can develop similar products for your aircraft or equipment.

For any inquiries contact Stone Productions.