

Flight Planning

Date:	
Callsign:	HB-SHB HB-SHC
AC Type:	DA40 NG

Time Referenz	
UTC=LT +/-	

Departure:	
OAT:	
Elevation:	
QNH hPa:	
Wind:	
RWY Length:	

EOBT:	
ETOT:	

Enroute	
OAT:	
Temp -> ISA:	
FL:	
Wind:	

ETE:	
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Destination:	
OAT.:	
Elevation:	
QNH hPa:	
Wind:	
RWY Length:	

ETA:	
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Flight Planning

Personenbezogene Dokumente		Check
Amtlicher Lichtbildausweis	persönlich	
Flugplatz Ausweis	persönlich	
Pilotenlizenz, gültiges Rating	persönlich	
Language Proficiency	persönlich	
Funkerzeugnis	persönlich	
Medizinisches Tauglichkeitszeugnis	persönlich	
Flugbuch – 90 Tage Regel beachten:	persönlich	

Luftfahrzeugbezogene Dokumente		Check
Eintragungsschein	Bordtasche	
Lufttüchtigkeitszeugnis	Bordtasche	
Nachprüfbescheinigung der Lufttüchtigkeit	Bordtasche	
Lärmschutzzeugnis	Bordtasche	
Versicherungsnachweis	Bordtasche	
Fernmeldebehördliche Bewilligung Funkstelle	Bordtasche	
Flughandbuch	Bordtasche	
Checklisten	griffbereit	
Bordbuch	Bordtasche	

Flugbetriebliche Dokumente Flugvorbereitung		Check
NOTAMs / DABS für die geplante Flugroute	Papier	
Flugwetterberatung	Papier	
Flugplanung Route inkl. Karten, Anflugblätter usw.	Papier	
Flugplanung Alternate, Route inkl. Karten, Anflugbl.	Papier	
ATC-Flugplan (falls notwendig)	elektronisch	
Zollanmeldung (falls notwendig)	elektronisch	
Weight & Balance	Papier	
Performance	Papier	
Fuel Calculation	Papier	

Speeds (based on MTOM 1310kg, MLW 1280kg)

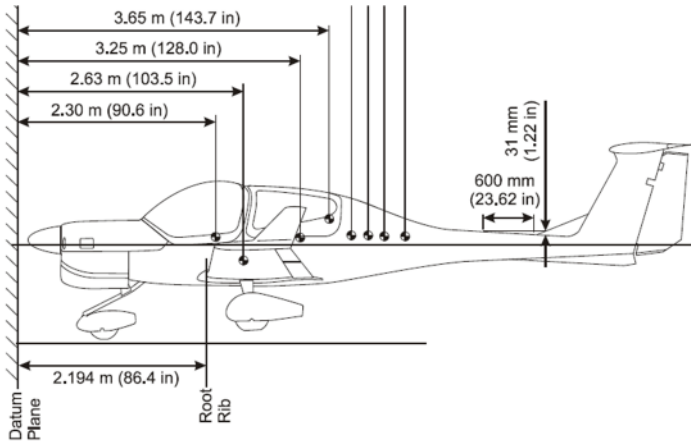
V_R	Rotate Speed	67 KIAS
V_{50}	Initial Climb Speed	72 KIAS
V_{YTO}	Best ROC Speed Flaps T/O	72 KIAS
V_{YCLN}	Best ROC Speed Flaps UP	88 KIAS
V_{CC}	Cruise Climb Speed	88 KIAS
V_G	Best Glide Speed	88 KIAS
V_O	Operation Manoeuvring Speed	113 KIAS
V_{FE}	Max Flap Extended Speed	110 KIAS @ Flaps T/O 98 KIAS @ Flaps LAND
V_{REF}	Landing Reference Speed	
	Normal Oper. LW < 1280kg	76 KIAS @ Flaps LAND
	Abnormal Oper. LW > 1310kg	77 KIAS @ Flaps LAND
V_{NO}	Max Struct. Cruising Speed	130 KIAS
V_{NE}	Never Exceed Speed	172 KIAS
V_{S1}	Stalling Speed Clean	66 KIAS @ 1310kg
V_{S0}	Stalling Speed in LDG	60 KIAS @ 1310kg

TO and APPR Speeds for this flight

Use "Operating Speeds" Table on Page 10

TOW				LW
kg				kg
V_R	V_{50}	V_{YTO}	V_{YCLN}	V_{REF} Flaps LDG
KIAS	KIAS	KIAS	KIAS	KIAS

Masse & Schwerpunkt



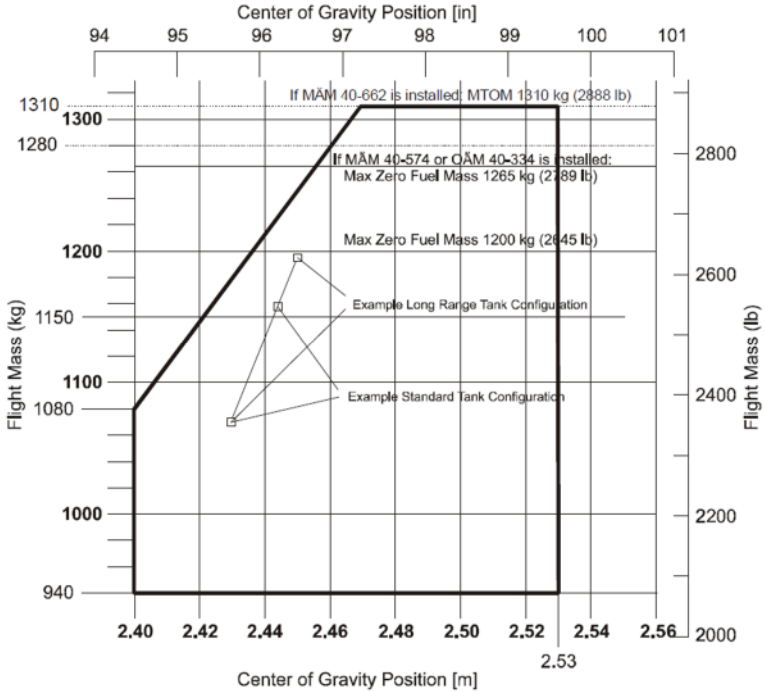
!!! Dimensions in mm !!!

JET A1 @ 0.80kg/l 3.03kg/USG

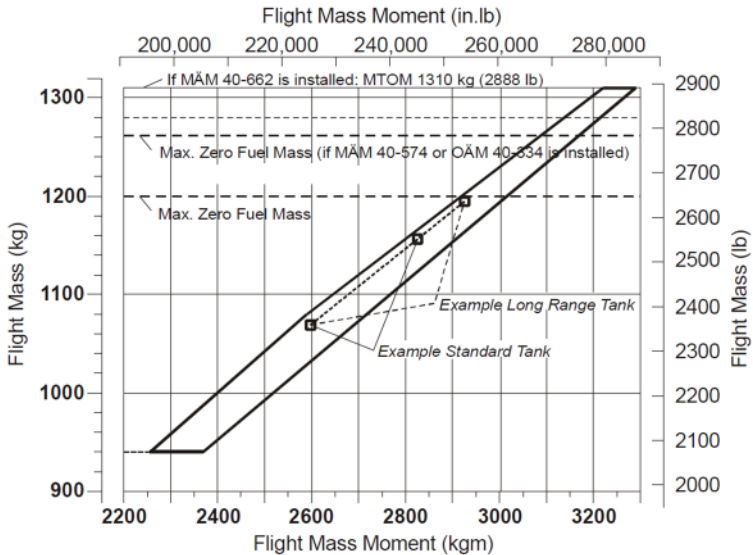
		Masse (kg)	Distanz (m)	Moment (kg*m)
Empty Weight	HB-SHB	934.0	2.44	2281
	HB-SHC	933.4	2.44	2280
Pilot + Front Passenger			2.30	
Rear Passengers			3.25	
Baggage (max 45kg)			3.65	
Zero Fuel Mass / Moment				
Usable Fuel on Board TO _____ USG			2.63	
Total TO Mass / Mom. (max 1310kg)				

Less Fuel to Destination _____ USG			2.63	
Total LDG Condition max 1280kg -> Normal Operation max 1310kg -> Abnormal Operation				

Permissible center of gravity range



Permissible moment range



Performance

Take-off Distance



Warning: For a safe take-off the available runway length must be at least equal to the take-off distance over a 50ft (15m) obstacle.

Take-Off Distance - Normal Procedure - 1310 kg / 2888 lb								
Weight: 1310 kg / 2888 lb				Flaps: T/O				
V _R : 67 KIAS				Power: MAX				
V ₅₀ : 72 KIAS				Runway: dry, paved, level				
Press. Alt. [ft] / [m]	Distance [m]	Outside Air Temperature - [°C] / [°F]						
		0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	ISA
SL	Ground Roll	365	385	410	430	460	495	397
	15 m / 50 ft	550	580	610	640	680	720	590
1000 305	Ground Roll	390	410	435	465	500	535	418
	15 m / 50 ft	580	610	640	680	730	770	616
2000 610	Ground Roll	415	440	465	500	540	575	439
	15 m / 50 ft	610	640	680	730	780	830	646
3000 914	Ground Roll	440	470	500	540	580	625	463
	15 m / 50 ft	650	680	720	780	840	890	677
4000 1219	Ground Roll	470	500	540	590	630	680	490
	15 m / 50 ft	690	720	780	840	900	960	708
5000 1524	Ground Roll	505	535	585	640	685		519
	15 m / 50 ft	730	770	840	910	970		745
6000 1829	Ground Roll	540	585	640	700	750		549
	15 m / 50 ft	770	830	900	980	1040		783
7000 2134	Ground Roll	580	640	700	765	820		585
	15 m / 50 ft	820	900	980	1060	1130		828
8000 2438	Ground Roll	635	700	770	845	900		628
	15 m / 50 ft	890	970	1060	1160	1230		881
9000 2743	Ground Roll	695	770	850	915	990		674
	15 m / 50 ft	970	1060	1160	1250	1330		937
10000 3048	Ground Roll	765	850	910	995			729
	15 m / 50 ft	1050	1160	1240	1340			1000

For the distance in [ft] divide by 0.3048 or multiply by 3.28.

The following factors are to be applied to the computed take-off distance for the noted condition:

Headwind: Decrease by 10% for each 12 kt headwind
 Tailwind: Increase by 10% for each 2 kt tailwind
 Uphill slope: Increase the ground roll by 15% for each 1% slope

Note: Take-off on grass is not recommended for this aircraft and only permitted in agreement with the operator. For Take-off performance calculation -> use flight manual

Climb Performance – Take off Climb

ft/min

Note: The following tables show the **Rate of Climb**. For the calculation of the **Gradient of Climb** use the following formula:

$$\text{Gradient [\%]} = \frac{\text{ROC [fpm]}}{\text{TAS [KTAS]}} \cdot 0.95$$

$$\text{Gradient [\%]} = \frac{\text{ROC [m/s]}}{\text{TAS [KTAS]}} \cdot 190$$

Take - Off Climb - Flaps T/O											
Flaps: T/O		Power: 92% or max. 2100 RPM									
V _y : 72 KIAS		Rate of Climb - [ft/min]									
Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Outside Air Temperature - [°C] / [°F]								ISA
			-20	-10	0	10	20	30	40	50	
			-4	14	32	50	68	86	104	122	
1310 / 2888	SL		660	650	640	630	620	615	590	550	629
	2000	610	640	630	620	610	605	595	555	515	613
	4000	1219	620	610	600	595	585	560	520	475	597
	6000	1829	600	590	580	570	555	520	475	/	580
	8000	2438	580	570	555	540	525	480	435	/	557
	10000	3048	555	540	525	510	480	435	/	/	533
	12000	3658	525	510	495	480	435	400	/	/	509
	14000	4267	500	485	475	460	425	360	/	/	492
	16000	4877	490	470	440	385	325	/	/	/	487
16400	4999	475	450	420	370	305	/	/	/	471	
1280 / 2822	SL		675	665	655	645	635	625	600	560	643
	2000	610	655	645	635	625	615	605	570	525	627
	4000	1219	635	625	615	605	595	575	530	485	611
	6000	1829	615	605	595	580	570	535	485	/	593
	8000	2438	595	580	565	550	535	490	445	/	570
	10000	3048	565	550	535	520	490	445	/	/	545
	12000	3658	535	520	505	490	445	410	/	/	520
	14000	4267	510	495	485	470	430	370	/	/	503
	16000	4877	500	480	450	395	330	/	/	/	498
16400	4999	485	460	430	375	310	/	/	/	482	
1200 / 2645	SL		740	730	720	710	700	690	665	620	707
	2000	610	720	710	700	690	680	670	630	585	691
	4000	1219	700	690	680	670	660	635	590	540	675
	6000	1829	680	670	660	645	630	595	545	/	657
	8000	2438	660	645	630	615	600	545	500	/	633
	10000	3048	630	615	600	585	550	500	/	/	607
	12000	3658	595	580	565	550	505	460	/	/	581
	14000	4267	575	560	545	530	490	420	/	/	564
	16000	4877	560	540	510	450	380	/	/	/	560
16400	4999	545	520	490	430	360	/	/	/	543	

Cruise Performance

KTAS	GAL/hr
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Conditions: - Flaps UP
 - Weight 1310kg

Note: Recommended cruise power setting for best economy is 75%

Cruise Performance															
Press. Alt. [ft] / [m]	Outside Air Temperature - [°C]														
	ISA-10			ISA			ISA+10			ISA+20			ISA+30		
	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]
2000 610	92	8.3	134	92	8.3	136	92	8.3	137	92	8.3	138	92	8.3	140
	75	6.6	123	75	6.6	125	75	6.6	126	75	6.6	127	75	6.6	128
	60	5.1	112	60	5.1	113	60	5.1	114	60	5.1	115	60	5.1	116
	45	4.0	95	45	4.0	96	45	4.0	97	45	4.0	97	45	4.0	98
4000 1219	92	8.3	137	92	8.3	138	92	8.3	140	92	8.3	141	92	8.3	142
	75	6.6	126	75	6.6	127	75	6.6	128	75	6.6	129	75	6.6	131
	60	5.1	113	60	5.1	114	60	5.1	116	60	5.1	117	60	5.1	118
	45	4.0	96	45	4.0	97	45	4.0	98	45	4.0	98	45	4.0	99
6000 1829	92	8.3	139	92	8.3	141	92	8.3	142	92	8.3	144	89	8.0	143
	75	6.6	128	75	6.6	129	75	6.6	130	75	6.6	132	75	6.6	133
	60	5.1	115	60	5.1	116	60	5.1	117	60	5.1	118	60	5.1	119
	45	4.0	98	45	4.0	98	45	4.0	99	45	4.0	99	45	4.0	100
8000 2438	92	8.3	142	92	8.3	143	92	8.3	145	92	8.3	146	89	8.0	146
	75	6.6	130	75	6.6	131	75	6.6	133	75	6.6	134	75	6.6	135
	60	5.1	117	60	5.1	118	60	5.1	119	60	5.1	120	60	5.1	121
	45	4.0	99	45	4.0	99	45	4.0	100	45	4.0	100	45	4.0	100
10000 3048	92	8.3	144	92	8.3	146	92	8.3	148	92	8.3	149	90	8.1	149
	75	6.6	132	75	6.6	134	75	6.6	135	75	6.6	136	75	6.6	138
	60	5.1	119	60	5.1	120	60	5.1	121	60	5.1	122	60	5.1	123
	45	4.0	99	45	4.0	100	45	4.0	100	45	4.0	101	45	4.0	101
12000 3658	92	8.3	147	92	8.3	149	92	8.3	150	92	8.3	152	90	8.1	152
	75	6.6	135	75	6.6	136	75	6.6	137	75	6.6	139	75	6.6	140
	60	5.1	121	60	5.1	122	60	5.1	123	60	5.1	124	60	5.1	125
	45	4.0	100	45	4.0	100	45	4.0	101	45	4.0	101	45	4.0	100
14000 4267	92	8.4	150	92	8.4	151	92	8.4	153	85	7.6	149	80	7.1	147
	75	6.6	137	75	6.6	138	75	6.6	140	75	6.6	141	75	6.6	142
	60	5.1	123	60	5.1	124	60	5.1	125	60	5.1	126	60	5.1	127
	45	4.0	101	45	4.0	101	50	4.4	111	50	4.4	111	50	4.4	112
16000 4877	92	8.4	153	92	8.4	154	90	8.2	155	84	7.5	151	79	7.0	149
	75	6.6	139	75	6.6	141	75	6.6	142	75	6.6	144	75	6.6	145
	60	5.1	124	60	5.1	126	60	5.1	127	60	5.1	127	60	5.1	128
	50	4.4	111	50	4.4	111	50	4.4	112	50	4.4	112	50	4.4	112

Landing Distance



Warning: For a safe landing the available runway length must be at least equal to the landing distance over a 50ft (15m) obstacle.

Landing Distance - Flaps LDG - 1280 kg / 2822 lb								
Weight:		1280 kg / 2822 lb			Flaps: LDG			
V _{REF} :		77 KIAS			Power: IDLE			
		Runway: dry, paved, level						
Press. Alt. [ft] / [m]	Distance [m]	Outside Air Temperature - [°C] / [°F]						ISA
		0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	
SL	Ground Roll	295	305	320	330	345	365	310
	15 m / 50 ft	610	630	650	670	710	750	639
1000 305	Ground Roll	305	320	330	340	365	385	320
	15 m / 50 ft	630	650	670	690	730	770	647
2000 610	Ground Roll	320	330	340	360	380	405	329
	15 m / 50 ft	640	660	680	720	750	800	657
3000 914	Ground Roll	330	340	355	375	400	425	338
	15 m / 50 ft	650	670	700	740	780	830	667
4000 1219	Ground Roll	340	355	375	395	420	445	348
	15 m / 50 ft	670	690	720	770	810	860	679
5000 1524	Ground Roll	355	370	390	415	440		359
	15 m / 50 ft	680	710	750	800	840		690
6000 1829	Ground Roll	365	385	415	440	465		370
	15 m / 50 ft	700	740	780	830	870		702
7000 2134	Ground Roll	395	420	450	475	505		396
	15 m / 50 ft	730	780	820	870	920		732
8000 2438	Ground Roll	450	480	510	540	570		445
	15 m / 50 ft	800	850	900	950	1010		792
9000 2743	Ground Roll	510	545	580	615	650		501
	15 m / 50 ft	880	930	990	1040	1100		861
10000 3048	Ground Roll	575	610	650	685			557
	15 m / 50 ft	960	1010	1070	1130			925

For the distance in [ft] divide by 0.3048 or multiply by 3.28.

The following factors are to be applied to the computed landing distance for the noted condition:

- Headwind: Decrease by 10% for each 20 kt headwind
- Tailwind: Increase by 10% for each 3 kt tailwind
- Paved runway, wet: Increase by 15%
- Downhill slope: Increase the ground roll by 10% for each 1% slope

Note: Take-off on grass is not recommended for this aircraft and only permitted in agreement with the operator. For Take-off performance calculation -> use flight manual

Fuel Calculation

Taxi Fuel				2 USG
Initial Climb Fuel	1)	h	USG /h	USG
Trip Fuel	2)	h	USG /h	USG
Contingency 10%	2)	h	USG /h	USG
Alternate Fuel	2)	h	USG /h	USG
45 min Reserve Fuel	2)	h	USG /h	USG
Minimum Block Fuel				USG
Additional Fuel	2)	h	USG /h	USG
Total				USG
Usable Fuel On-Board	3)			USG

- 1) Use 92% Load for Initial Climb Calculation ~ 9 USG/h
- 2) Use 75% Load in "Cruise Performance" Calculation ~ 7 USG/h
- 3) max. 39 USG (Caution: Fuel Annunciation only shows up to 28 USG)

Operating Speeds (KIAS)

	940kg	1000kg	1100kg	1200kg	1280kg + above	
Rotation speed	56	58	61	65	67	
V ₅₀ up to 50 ft	62	65	67	70	72	
V _y up to safe altitude (Flaps T/O)	72					
Cruise climb speed (Flaps UP)	88					
Max. cruising speed (VNO)	130					
Never exceed speed (VNE)	172					
Max. flap speed (V _{FE}) Flaps T/O	110					
Max. flap speed (V _{FE}) Flaps LDG	98					
	940kg	1000kg	1100kg	1200kg	1216kg +above	1280kg +above
Approach V _{REF} Flaps UP	71	73	78	82	82	83
Approach V _{REF} Flaps T/O	68	70	74	77	77	78
Approach V _{REF} Flaps LDG	66	68	72	76	76	77
Min. GA speed Flaps T/O	72					
	up to 1080 kg		1081-1180 kg		above 1180 kg	
Maneuvering speed (V _o)	101		108		113	
Best gliding Flaps UP, windmilling prop	88					
	Gliding ratio 1:9,7 1,59 NM / 1000 ft					
	Without wheel fairings: Gliding ratio 1:9,4 1,54 NM / 1000 ft					

Notes

Document Info

Fliegerschule St. Gallen – Altenrhein AG, Version 2.0, 22.03.2020

Print as Booklet

No responsibility is taken for the correctness of this information. The Airplane Flight Manual is reference for flight planning and airplane operation.

NAV Flightplan

Checkpoint	ALT	MC	DIST	EET	ETO	ATO	Remark

ENR Notes