

SECTION V

PERFORMANCE

TABLE OF CONTENTS

<i>SUBJECT</i>	<i>PAGE</i>
Introduction to Performance and	
Flight Planning	5-3
Conditions	5-3
Comments Pertinent to the Use of	
Performance Graphs.....	5-7
Airspeed Calibration - Normal System	5-8
Airspeed Calibration - Alternate System	5-9
Altimeter Correction - Normal System.....	5-10
Altimeter Correction - Alternate System	5-11
Power Off Stall Speeds	5-12
Wind Components	5-13
Take-Off Distance - Hard Surface	5-14
Take-Off Distance - Grass Surface	5-15
Normal Climb	5-16
Time, Fuel, and Distance to Climb	5-17
Cruise Performance	5-18
Landing Distance - Hard Surface	5-20
Landing Distance - Grass Surface	5-21

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**INTRODUCTION TO PERFORMANCE AND FLIGHT
PLANNING**

The graphs and tables in this section present performance information for flight planning at various parameters of weight, power, altitude and temperature. Examples have been presented on some performance charts. Calculations for flight time, block speed and fuel required for a sample VFR trip from Denver to Wichita are detailed below. All examples and calculations assume the following conditions:

CONDITIONS

At Stapleton International (DEN):

Outside Air Temperature 15°C (59°F)
Field Elevation..... 5330 ft
Altimeter Setting..... 29.60 in. Hg
Wind..... 270° at 10 kts
Runway 26L length..... 10,000 ft

Route of Trip

*DEN-V4-GLD-V132-HUT-V73-ICT

For VFR Cruise at 9,500 feet

ROUTE SEGMENT	AVG MAG CRS/AVG MAG VAR	DIST NM	WIND 9500 FEET DIR/KTS	OAT 9500 FEET °C	ALT SETTING IN.HG
DEN-TXC	083°/12°E	80**	010/30	-5	29.60
TXC-GLD	093°/11°E	73	010/30	-5	29.60
GLD-HUT	105°/9°E	195	220/10	0	29.56
HUT-ICT	116°/8°E	33**	220/10	9	29.56

*REFERENCE: Enroute Low Altitude Chart L-6

**Includes distance between airport and VORTAC.

Section V
Performance

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C23 (M-1285 and After)

At Wichita Mid-Continent (ICT):

Outside Air Temperature 25°C (77°F)
Field Elevation..... 1332 ft
Altimeter Setting.....29.56 in. Hg
Wind..... 180° at 10 kts
■ Runway 19L Length7300 ft

To determine pressure altitude at origin and destination airports, add 100 feet to field elevation for each .1 in. Hg below 29.92, and subtract 100 feet from field elevation for each .1 in. Hg above 29.92.

Pressure Altitude at DEN:

$$29.92 - 29.60 = .32 \text{ in. Hg}$$

The pressure altitude at DEN is 320 feet above the field elevation.

$$5330 + 320 = 5650 \text{ ft}$$

Pressure Altitude at ICT:

$$29.92 - 29.56 = .36 \text{ in. Hg}$$

The pressure altitude at ICT is 360 feet above the field elevation.

$$1332 + 360 = 1692 \text{ ft}$$

NOTE

For flight planning, the difference between cruise altitude and cruise pressure altitude has been ignored.

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section V
Performance

Enter the CRUISE PERFORMANCE table for 73 percent maximum continuous power (or full throttle) at 9500 feet:

ALTITUDE FEET	THROTTLE SETTING RPM	FUEL FLOW GPH	TAS KNOTS
9500	2662	10.5	123

Time and fuel used were calculated as follows:

$$\text{Time} = \frac{\text{Distance}}{\text{Ground Speed}}$$

$$\text{Fuel Used} = (\text{Time}) (\text{Fuel Flow})$$

Results are:

ROUTE SEGMENT	DISTANCE NM	EST GROUND SPEED KNOTS	TIME AT CRUISE ALTITUDE HRS: MIN	FUEL USED FOR CRUISE GAL
DEN-TXC	*65	117	:33	5.8
TXC-GLD	73	121	:36	6.3
GLD-HUT	195	125	1:34	16.4
HUT-ICT	33	124	:16	2.8

*Distance required to climb has been subtracted from segment distance.

Section V
Performance

BEEHCRAFT Sundowner 180
C23 (M-1285 and After)

TIME - FUEL - DISTANCE

ITEM	TIME HRS: MINS	FUEL GAL	DISTANCE NM
Start, Runup, Taxi and Take- off acceleration	0:00	1.3	0
Climb	0:11	2.0	15
Cruise	2:59	31.3	366
Total	3:10	34.6	381

Total Flight Time: 3 hours, 10 minutes

■ Block Speed: $381 \text{ NM} \div 3 \text{ hours, 10 minutes} = 120 \text{ knots}$

Reserve Fuel (45 minutes at 57% maximum continuous power)

Enter the CRUISE POWER SETTINGS table for 57% MCP at 2300 RPM. The fuel flow at 57% MCP is 7.8 gallons per hour.

Reserve fuel = (45 min) (7.8 GPH) = 5.9 gallons

■ Total Fuel = $34.6 + 5.9 = 40.5 \text{ gallons}$

The estimated landing weight is determined by subtracting the fuel required for the trip from the ramp weight:

Assumed ramp weight = 2450 lbs

■ Estimated fuel from DEN to ICT = (34.6 gal) (6 lbs/gal)
= 208 lbs

· Estimated landing weight = $2450 - 208 = 2242 \text{ lbs}$

**COMMENTS PERTINENT TO THE USE OF
PERFORMANCE GRAPHS**

1. Indicated airspeeds (IAS) were obtained by using the AIRSPEED CALIBRATION NORMAL SYSTEM Graph.
2. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions, however, performance values determined from charts can only be achieved if specified conditions exist.
3. The full amount of usable fuel is available for all approved flight conditions.
4. Engine and component cooling has been demonstrated for temperatures up to 100°F at sea level with a 3.57°F per 1000 ft lapse rate. (ISA + 41°F)

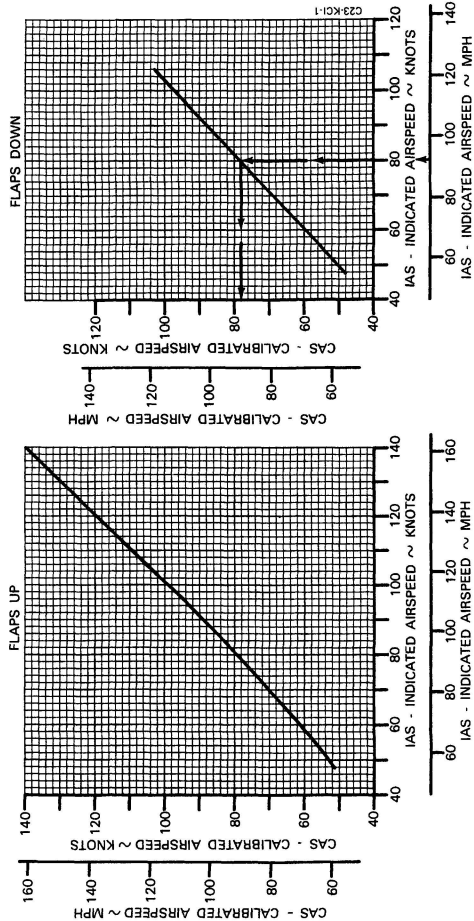
Section V Performance

BEECHCRAFT Sundowner 180 C23 (M-1285 and After)

AIRSPEED CALIBRATION - NORMAL SYSTEM

NOTE: INDICATED AIRSPEED ASSUMES ZERO
INSTRUMENT ERROR

EXAMPLE:
FLAPS
IAS 80 KTS
CAS 78 KTS



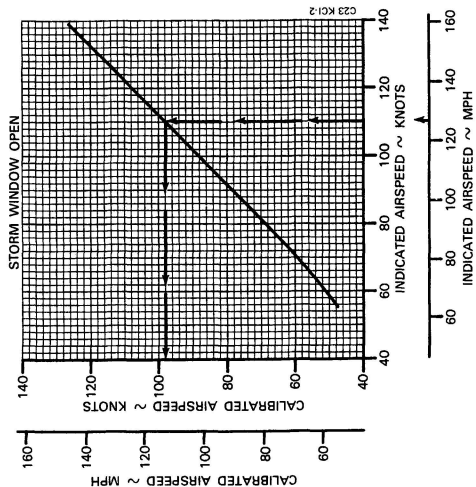
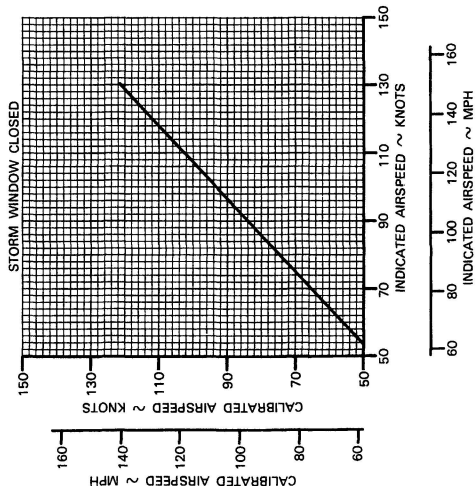
AIRSPEED CALIBRATION - ALTERNATE SYSTEM

ALL FLAP POSITIONS

NOTE: INDICATED AIRSPEED ASSUMES ZERO
 INSTRUMENT ERROR

EXAMPLE:

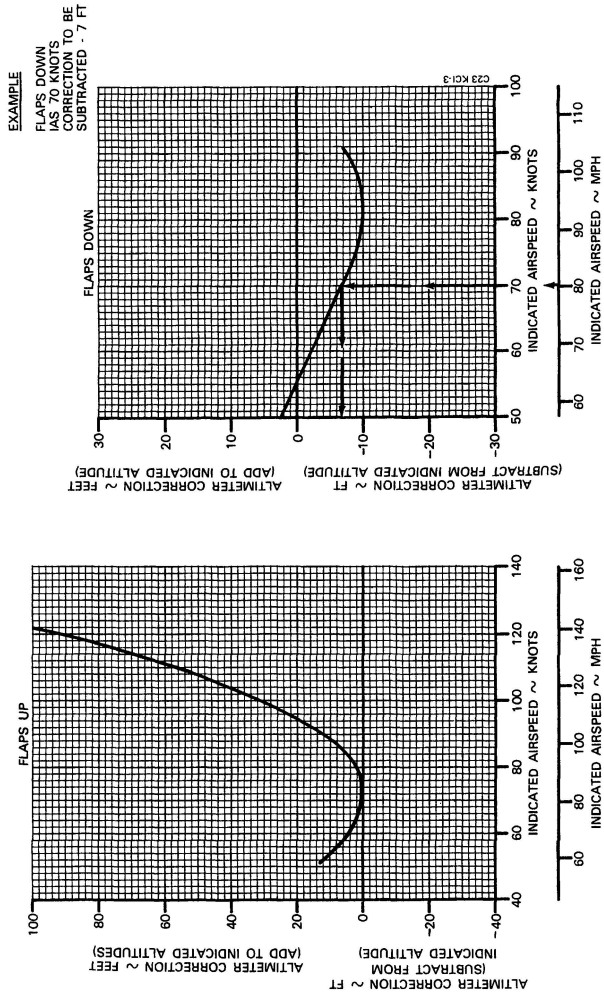
STORM WINDOW - OPEN
 IAS - 110 KNOTS/126 MPH
 CAS - 98 KNOTS/113 MPH



Section V
Performance

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

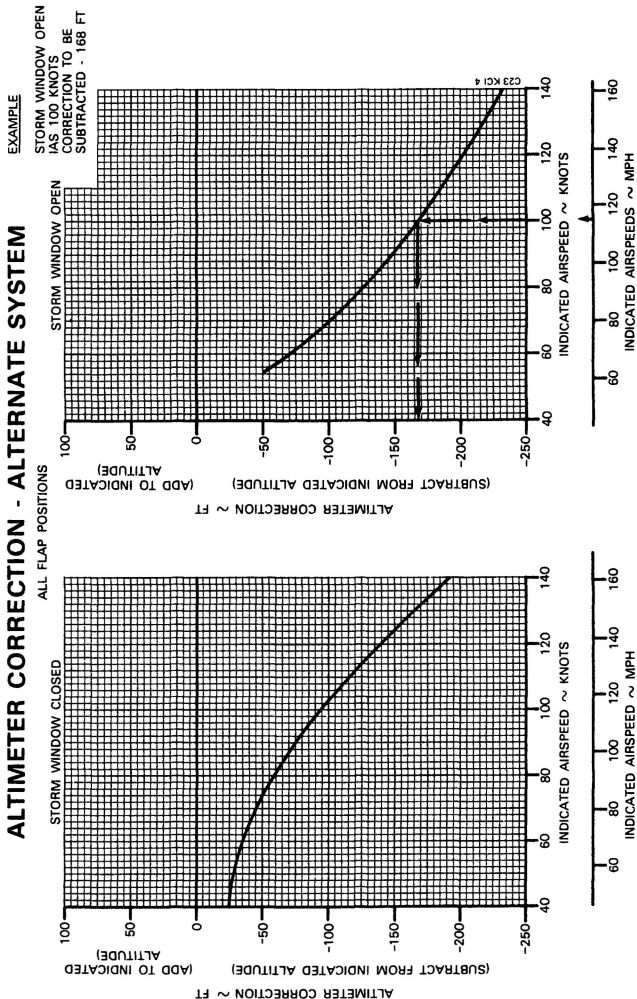
ALTITUDE CORRECTION - NORMAL SYSTEM



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C23 (M-1285 and After)

Section V
Performance

ALTIMETER CORRECTION - ALTERNATE SYSTEM



Section V
Performance

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C23 (M-1285 and After)

POWER OFF STALL SPEEDS

(WEIGHT 2450 LBS)

Maximum altitude loss during a normal stall recovery is approximately 300 ft.

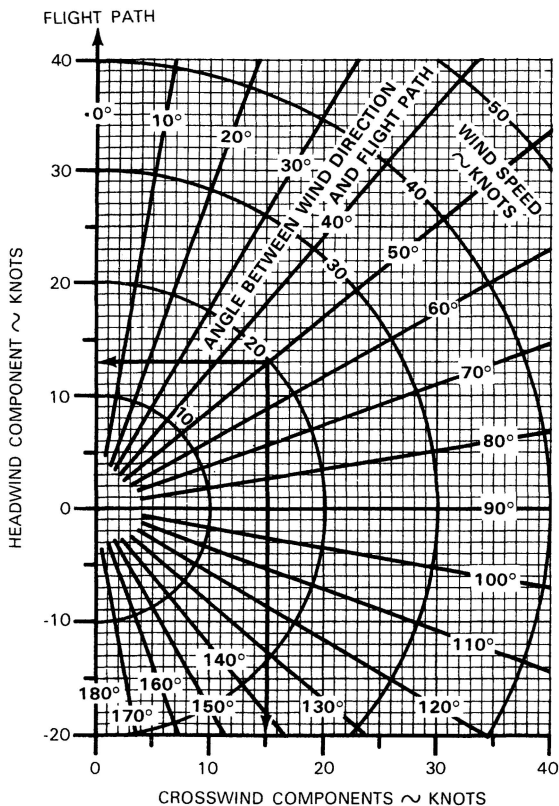
ANGLE OF BANK			
LEVEL	30°	45°	60°
FLAPS-UP			
72 mph 63 kts	77 mph 67 kts	85 mph 74 kts	101 mph 88 kts
FLAPS - DOWN (35°)			
59 mph 51 kts	63 mph 55 kts	70 mph 61 kts	83 mph 72 kts

WIND COMPONENTS

Demonstrated Crosswind Component is 17kts/20mph

EXAMPLE

WIND SPEED	20 KTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	50°
HEADWIND COMPONENT	13 KTS
CROSSWIND COMPONENT	15 KTS



Section V
Performance

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

TAKE-OFF DISTANCE — HARD SURFACE

ASSOCIATED CONDITIONS:

POWER FULL THROTTLE
MIXTURE LEAN TO MAXIMUM RPM, THEN ENRICH SLIGHTLY
FLAPS UP
RUNWAY LEVEL, DRY, HARD SURFACE
WEIGHT 2450 LBS

TAKE-OFF SPEEDS:

LIFT OFF 65 KTS/75 MPH
AT 50 FT 74 KTS/85 MPH

WIND COMPONENT DOWN RUNWAY KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
	OAT °F	OAT °C	GROUND ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	OAT °C	GROUND ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	OAT °C	GROUND ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	OAT °C	GROUND ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	OAT °C	GROUND ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET
0	23 -5	917	1592	1653	16 -9	1046	1805	2051	9 -13	1195	1388	2334	2 -17	1368	1569	2662	-6 -21	1569	2662	
	41 5	1020	1767	1842	34 1	1165	2007	2284	27 -3	1333	1528	2604	20 -7	1528	1756	2975	13 -11	1756	2975	
	59 15	1130	1955	2045	52 11	1293	2224	2535	45 7	1481	1701	2894	38 3	1701	1957	3311	31 -1	1957	3311	
	77 25	1248	2155	2261	70 21	1429	2455	2802	63 17	1640	1856	3204	56 13	1856	2173	3671	49 9	2173	3671	
15	95 35	1373	2369	2492	88 31	1575	2701	3087	81 27	1809	2083	3535	74 23	2083	2404	4055	67 19	2404	4055	
	23 -5	728	1454	1653	16 -9	836	1653	1883	9 -13	961	1108	2149	2 -17	1108	1279	2456	-6 -21	1279	2456	
	41 5	813	1618	1842	34 1	935	1842	2102	27 -3	1077	1243	2402	20 -7	1243	1438	2750	13 -11	1438	2750	
	59 15	904	1793	2045	52 11	1042	2045	2336	45 7	1202	1389	2674	38 3	1389	1609	3067	31 -1	1609	3067	
30	77 25	1003	1980	2261	70 21	1156	2261	2587	63 17	1336	1546	2965	56 13	1546	1793	3406	49 9	1793	3406	
	95 35	1107	2180	2492	88 31	1279	2492	2855	81 27	1479	1714	3277	74 23	1714	1990	3768	67 19	1990	3768	
	23 -5	559	1337	1523	16 -9	647	1523	1739	9 -13	751	873	1988	2 -17	873	1017	2278	-6 -21	1017	2278	
	41 5	628	1490	1700	34 1	728	1700	1944	27 -3	847	985	2227	20 -7	985	1149	2555	13 -11	1149	2555	
	59 15	702	1654	1890	52 11	816	1890	2164	45 7	949	1077	2483	38 3	1077	1292	2854	31 -1	1292	2854	
	77 25	782	1829	2094	70 21	910	2094	2401	63 17	1060	1237	2758	56 13	1237	1446	3174	49 9	1446	3174	
	95 35	868	2017	2311	88 31	1011	2311	2653	81 27	1180	1378	3052	74 23	1378	1613	3518	67 19	1613	3518	

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section V
Performance

TAKE-OFF DISTANCE - GRASS SURFACE

ASSOCIATED CONDITIONS:

POWER Mixture
 Flaps UP
 Runway SHORT, DRY, LEVEL GRASS SURFACE
 Weight 2450 LBS

TAKE-OFF SPEEDS:

LIFT OFF 65 KTS/75 MPH
 AT 50 FT 74 KTS/85 MPH

WIND COMPONENT DOWN RUNWAY KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
	OAT °F	°C	ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	°C	ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	°C	ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	°C	ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET	OAT °F	°C	ROLL FEET	TOTAL OVER 50 FT OBSTACLE FEET
0	23 -5	900	1665	16 -9	1129	1888	9 -13	1290	2146	2 -17	1477	2443	-6 -21	1683	2787	13 -11	1896	31 -1	2113	3467
	41 5	1101	1848	34 1	1258	2100	27 -3	1439	2391	20 -7	1650	2726	13 -11	1896	31 -1	2113	3467	31 -1	2113	3467
	59 15	1220	2045	52 11	1396	2307	45 7	1599	2653	38 3	1836	3030	49 9	2346	3844	56 13	2036	74 23	2249	3701
	77 25	1347	2255	70 21	1543	2569	63 17	1771	2933	56 13	2036	3354	67 19	2595	3927	67 19	2595	67 19	2595	3927
	95 35	1482	2478	88 31	1700	2827	81 27	1954	3231	74 23	2249	3701	81 27	1954	3231	74 23	2249	81 27	1954	3231
15	23 -5	786	1512	16 -9	902	1720	9 -13	1038	1960	2 -17	1196	2237	-6 -21	1381	2558	13 -11	1552	31 -1	2113	3467
	41 5	878	1692	34 1	1009	1917	27 -3	1163	2187	20 -7	1342	2501	13 -11	1552	2885	31 -1	2113	3467	31 -1	2113
	59 15	977	1865	52 11	1125	2128	45 7	1298	2432	38 3	1500	2786	49 9	2346	3844	56 13	2036	74 23	2249	3701
	77 25	1082	2060	70 21	1248	2353	63 17	1442	2683	56 13	2036	3354	67 19	2595	3927	67 19	2595	67 19	2595	3927
	95 35	1196	2268	88 31	1381	2594	81 27	1597	2972	74 23	2249	3701	81 27	1597	2972	74 23	2249	81 27	1597	2972
30	23 -5	603	1381	16 -9	699	1575	9 -13	811	1799	2 -17	943	2058	-6 -21	1098	2359	13 -11	1240	31 -1	2113	3467
	41 5	678	1540	34 1	786	1758	27 -3	914	2011	20 -7	1064	2305	13 -11	1240	2647	31 -1	2113	3467	31 -1	2113
	59 15	758	1710	52 11	881	1955	45 7	1025	2240	38 3	1195	2571	49 9	2346	3844	56 13	2036	74 23	2249	3701
	77 25	845	1892	70 21	983	2166	63 17	1145	2486	56 13	2036	3354	67 19	2595	3927	67 19	2595	67 19	2595	3927
	95 35	938	2086	88 31	1092	2392	81 27	1273	2747	74 23	2249	3701	81 27	1273	2747	74 23	2249	81 27	1273	2747

Section V
Performance

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

NORMAL CLIMB

ASSOCIATED CONDITIONS:
 POWER FULL THROTTLE
 MIXTURE LEAN TO MAXIMUM RPM AND THEN
 FLAPS UP ENRICH SLIGHTLY

NOTE: HIGH HUMIDITY AND OR USE OF RICH MIXTURE HAS
 BEEN FOUND TO RESULT IN APPROXIMATELY 70 FPM
 LOSS IN RATE OF CLIMB FROM THAT SHOWN.

ANY AREA WITH LOW CLOUDS OR A DEWPOINT
 TEMPERATURE OF 60°F (16°C) OR HIGHER IS AN
 AREA OF HIGH HUMIDITY.

WEIGHT POUNDS	SEA LEVEL			4000 FEET			8000 FEET			12,000 FEET		
	OAT ° F	R/C FT/MIN	IAS KTS/MPH	OAT ° F	R/C FT/MIN	IAS KTS/MPH	OAT ° F	R/C FT/MIN	IAS KTS/MPH	OAT ° F	R/C FT/MIN	IAS KTS/MPH
2450	23 -5	841		9 -13	621		-6 -21	389		-20 -29	167	
	41 5	816		27 -3	596		13 -11	362		-2 -19	141	
	59 15	792	78/90	45 7	572	78/87	31 -1	338	74/85	16 -9	117	74/85
	77 25	769		63 17	549		49 9	315		34 1	94	
2200	95 55	747		81 27	527		67 19	293		52 11	72	
	23 -5	1047		9 -13	812		-6 -21	567		-20 -29	327	
	41 5	1021		27 -3	787		13 -11	539		-2 -19	302	
	59 15	997	76/88	45 7	763	74/85	31 -1	515	72/83	16 -9	277	72/83
2000	77 25	974		63 17	740		49 9	492		34 1	254	
	95 55	951		81 27	718		67 19	469		52 11	232	
	23 -5	1243		9 -13	994		-6 -21	735		-20 -29	478	
	41 5	1217		27 -3	969		13 -11	707		-2 -19	453	
2000	59 15	1193	75/86	45 7	945	72/83	31 -1	682	70/81	16 -9	428	70/81
	77 25	1169		63 17	922		49 9	659		34 1	405	
	95 55	1147		81 27	900		67 19	636		52 11	383	

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section V
Performance

TIME, FUEL, AND DISTANCE TO CLIMB

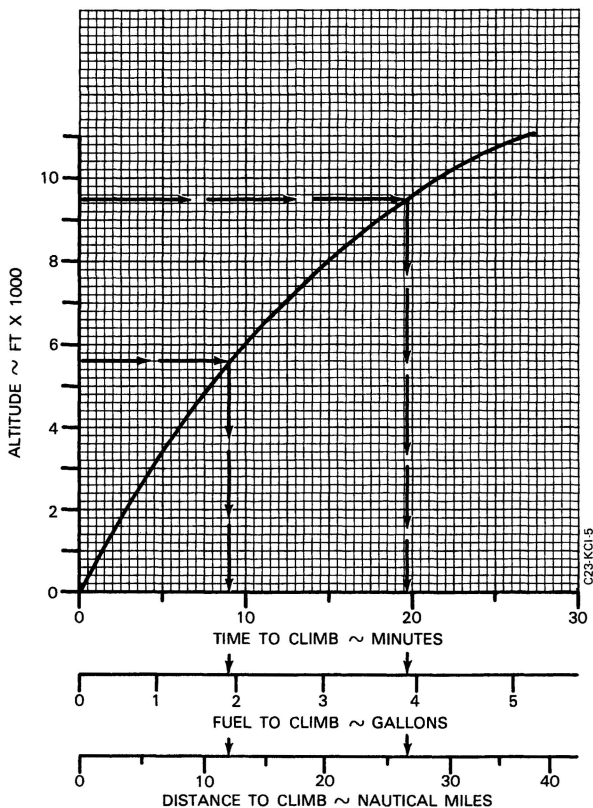
ASSOCIATED CONDITIONS

POWER FULL THROTTLE
 MIXTURE LEAN TO MAXIMUM RPM
 THEN ENRICH SLIGHTLY
 FLAPS UP
 WEIGHT 2450 LBS
 STANDARD DAY

EXAMPLE

AIRPORT PRESSURE ALTITUDE 5650 FT
 CRUISE ALTITUDE 9500 FT
 TIME TO CLIMB $20 - 9 =$ 11 MIN
 FUEL TO CLIMB $3.9 - 1.9 =$ 2 GAL
 DIST TO CLIMB $27 - 12 =$ 15 NM

78 KTS/90 MPH



Section V
Performance

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

CRUISE PERFORMANCE
STANDARD DAY - 2350 LBS

ALTITUDE FEET	POWER SETTINGS			TAS KTS/MPH	RANGE N.M. INITIAL FUEL ONBOARD (USABLE)	
	THROTTLE SETTINGS	BHP %	FUEL FLOW GAL/HR		37 GAL.	57 GAL.
	RPM					
2500	2700	88	13.2	126/145	283	475
	2500	73	10.4	116/134	330	555
	2300	60	8.2	106/122	377	633
3500	2700	86	12.8	126/145	290	484
	2500	71	10.1	116/133	337	567
	2300	59	8.1	105/121	379	638
4500	2700	84	12.5	126/145	298	497
	2500	70	9.8	116/133	346	581
	2300	59	8.0	105/121	381	641
5500	2696	82	12.0	126/145	308	517
	2500	68	9.6	116/133	352	593
	2300	58	7.9	104/120	382	644
6500	2688	79	11.6	125/144	318	534
	2500	67	9.4	115/132	359	606
	2300	58	7.9	103/119	379	640
7500	2680	77	11.2	124/143	324	546
	2500	66	9.2	115/132	365	616
	2300	57	7.9	102/117	378	638
8500	2670	75	10.8	124/143	335	564
	2500	65	9.0	114/131	368	623
	2300	57	7.8	101/116	373	631
9500	2662	73	10.5	123/141	342	577
	2500	64	8.8	114/131	371	629
	2300	57	7.8	100/115	368	623
10.500	2654	71	10.2	122/140	347	587
	2500	63	8.7	113/130	372	632
	2300	57	7.9	99/114	362	613

NOTES:

1. Range allows for start, taxi, climb, and a 45 minute reserve at 57% MCP @ 2300 RPM.
2. Cruise performance is based on best power mixture. Lean to maximum RPM for a given throttle setting.
3. It is recommended that use of tanks be alternated and that a fuel log be maintained showing time remaining in each tank.
4. Determination of in-flight fuel flow: Enter the table at the altitude nearest to the computed density altitude, and read the fuel flow for the TAS value presented that is nearest to the actual true airspeed.

ASSOCIATED CONDITIONS:

Pressure Altitude	4500 FEET
OAT	53°F
Indicated Airspeed	111 KTS

EXAMPLE:

Density Altitude*	5200 FEET
Actual True Airspeed*	121 KTS
Nearest Altitude on Table	5500 FEET
Interpolating Factor	.50
(121 KTS is 50% of the difference between 116 and 126 KTS)	

Fuel Flow

$$(12.0 - 9.6 = 2.4 \times .50 =$$
$$1.2 + 9.6 = 10.8) \quad 10.8 \text{ gal/hr}$$

*Requires a Flight Computer.

Section V
Performance

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

LANDING DISTANCE — HARD SURFACE

ASSOCIATED CONDITIONS:

POWER IDLE
MIXTURE RICH
FLAPS 35°
RUNWAY LEVEL, DRY, HARD SURFACE
WEIGHT 2450 LBS

LANDING SPEEDS:

AT 50 FT 68 KTS/78 MPH
TOUCHDOWN 61 KTS/70 MPH

WIND COMPONENT DOWN RUNWAY KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
	GROUND		TOTAL		GROUND		TOTAL		GROUND		TOTAL		GROUND		TOTAL		GROUND		TOTAL	
	OAT ° F	° C	ROLL FEET	OVER 50 FT OBSTACLE FEET	OAT ° F	° C	ROLL FEET	OVER 50 FT OBSTACLE FEET	OAT ° F	° C	ROLL FEET	OVER 50 FT OBSTACLE FEET	OAT ° F	° C	ROLL FEET	OVER 50 FT OBSTACLE FEET	OAT ° F	° C	ROLL FEET	OVER 50 FT OBSTACLE FEET
0	23	-5	654	1409	16	-9	693	1467	9	-13	735	1532	2	-17	780	1600	-6	-21	828	1672
	41	5	678	1446	34	1	719	1509	27	-3	763	1575	20	-7	810	1644	13	-11	861	1724
	59	15	703	1484	52	11	745	1548	45	7	791	1617	38	3	840	1691	31	-1	894	1776
	77	25	727	1521	70	21	771	1587	63	17	819	1658	56	13	871	1740	49	9	926	1827
	95	35	751	1558	88	31	798	1626	81	27	847	1703	74	23	901	1788	67	19	959	1882
15	23	-5	496	1190	16	-9	530	1243	9	-13	567	1302	2	-17	607	1365	-6	-21	650	1431
	41	5	518	1222	34	1	553	1280	27	-3	592	1342	20	-7	634	1407	13	-11	679	1476
	59	15	539	1257	52	11	576	1317	45	7	617	1381	38	3	661	1448	31	-1	708	1520
	77	25	560	1291	70	21	600	1354	63	17	642	1420	56	13	688	1489	49	9	737	1565
	95	35	582	1326	88	31	623	1390	81	27	667	1458	74	23	715	1530	67	19	766	1614
30	23	-5	361	1005	16	-9	390	1049	9	-13	421	1095	2	-17	456	1149	-6	-21	493	1211
	41	5	379	1032	34	1	409	1078	27	-3	443	1127	20	-7	479	1188	13	-11	518	1252
	59	15	397	1060	52	11	429	1107	45	7	464	1163	38	3	502	1226	31	-1	544	1293
	77	25	416	1088	70	21	449	1138	63	17	486	1200	56	13	526	1264	49	9	569	1334
	95	35	434	1114	88	31	469	1172	81	27	508	1235	74	23	550	1303	67	19	595	1375

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section V
Performance

LANDING DISTANCE - GRASS SURFACE

ASSOCIATED CONDITIONS:

POWER Mixture
 Flaps 35°
 Runway 2450 LBS
 Weight

IDLE

RICH

35°

SHORT, DRY, LEVEL GRASS SURFACE

2450 LBS

LANDING SPEEDS:

AT 50 FT

TOUCHDOWN

68 KTS/78 MPH

61 KTS/70 MPH

WIND COMPONENT DOWN RUNWAY KNOTS	SEA LEVEL						2000 FT						4000 FT						6000 FT						8000 FT					
	OAT			TOTAL			GROUND			TOTAL			GROUND			TOTAL			GROUND			TOTAL			GROUND			TOTAL		
	°F	C	FEET	OVER 50 FT OBSTACLE	FEET	FEET	ROLL	FEET	FEET	OVER 50 FT OBSTACLE	FEET	FEET	ROLL	FEET	FEET	OVER 50 FT OBSTACLE	FEET	FEET	ROLL	FEET	FEET	OVER 50 FT OBSTACLE	FEET	FEET	ROLL	FEET	FEET	OVER 50 FT OBSTACLE	FEET	FEET
0	23	-5	765	1520	16	-9	810	859	1657	9	-13	859	859	1657	2	-17	912	912	1732	-6	-21	969	969	1812	13	-11	1007	1007	1870	1870
	41	5	793	1562	34	1	841	892	1704	27	-3	892	892	1704	20	-7	948	948	1782	13	-11	1007	1007	1870	31	-1	1046	1046	1927	1927
	59	15	822	1603	52	11	872	925	1751	45	7	925	925	1751	38	3	983	983	1834	31	-1	1046	1046	1927	49	9	1084	1084	1985	1985
	77	25	851	1644	70	21	903	959	1797	63	17	959	959	1797	56	13	1019	1019	1888	49	9	1084	1084	1985	67	19	1122	1122	2045	2045
	95	35	879	1685	88	31	933	992	1847	81	27	992	992	1847	74	23	1054	1054	1941	67	19	1122	1122	2045	83	33	1104	1104	2106	2106
15	23	-5	581	1274	16	-9	621	663	1399	9	-13	663	663	1399	2	-17	710	710	1468	-6	-21	760	760	1542	13	-11	794	794	1591	1591
	41	5	606	1310	34	1	647	693	1442	27	-3	693	693	1442	20	-7	741	741	1515	13	-11	794	794	1591	31	-1	828	828	1640	1640
	59	15	631	1349	52	11	674	722	1486	45	7	722	722	1486	38	3	773	773	1561	31	-1	828	828	1640	49	9	862	862	1691	1691
	77	25	656	1387	70	21	701	751	1529	63	17	751	751	1529	56	13	804	804	1606	49	9	862	862	1691	67	19	897	897	1744	1744
	95	35	681	1425	88	31	729	780	1571	81	27	780	780	1571	74	23	836	836	1652	67	19	897	897	1744	83	33	904	904	1752	1752
30	23	-5	422	1066	16	-9	456	493	1167	9	-13	493	493	1167	2	-17	533	533	1226	-6	-21	576	576	1294	13	-11	606	606	1340	1340
	41	5	443	1097	34	1	479	518	1202	27	-3	518	518	1202	20	-7	560	560	1269	13	-11	606	606	1340	31	-1	636	636	1385	1385
	59	15	465	1127	52	11	502	543	1242	45	7	543	543	1242	38	3	588	588	1312	31	-1	636	636	1385	49	9	666	666	1431	1431
	77	25	486	1157	70	21	526	568	1282	63	17	568	568	1282	56	13	615	615	1354	49	9	666	666	1431	67	19	696	696	1476	1476
	95	35	508	1187	88	31	549	594	1321	81	27	594	594	1321	74	23	643	643	1396	67	19	696	696	1476	83	33	704	704	1487	1487

INTENTIONALLY LEFT BLANK