

The operational data on the following pages are presented for two purposes; first, so that you may know what to expect from your aircraft under various conditions and second, to enable you to plan your flights in detail and with reasonable accuracy.

A power setting selected from the range charts usually will be more efficient than a random setting, since it will permit accurate fuel flow settings and your fuel consumption can be estimated closely. You will find that using the charts and your power computer will pay dividends in over-all efficiency.

The data in the charts has been compiled from actual flight tests with the aircraft and engines in good condition, and using average piloting techniques. Note also that the range charts make no allowances for wind, navigational errors, warm-up, takeoff, climb, etc. You must estimate these variables for yourself and make allowances accordingly.

<b>AIR SPEED NOMENCLATURE SUMMARY</b>			
<b>GROSS WEIGHT 5300 POUNDS</b>			
<b>MULTI-ENGINE</b>	<b>KIAS</b>	<b>SINGLE ENGINE</b>	<b>KIAS</b>
Takeoff & Climb to 50 Ft. (0° Flaps)	90	Minimum Control Speed Takeoff & Climb to 50 Ft. (0° Flaps)	75 90
Best Angle of Climb Speed	81	Best Angle of Climb Speed	93
Best Rate-of-Climb Speed	107	Best Rate-of-Climb Speed	102
Landing Approach Speed (35° Flaps)	89	Landing Approach Speed (35° Flaps)	94
Maneuvering Speed	148	When Landing is Assured	89
Structural Cruise Speed	183		
Never Exceed Speed (Red Line)	224		

<b>AIRSPEED CORRECTION TABLE</b>					
<b>FLAPS 0°</b>		<b>FLAPS 15° *</b>		<b>FLAPS 35° **</b>	
<b>KIAS</b>	<b>KCAS</b>	<b>KIAS</b>	<b>KCAS</b>	<b>KIAS</b>	<b>KCAS</b>
70	70	70	71	60	62
80	80	80	81	70	71
100	101	90	91	80	81
120	121	100	101	90	91
140	142	110	111	100	100
160	162	120	122	110	110
180	183	130	132	120	120
200	203	140	142	130	129
220	224	150	152	140	139
		160	162		

\*Maximum Flap Speed 160 KCAS (15°) \*\*Maximum Flap Speed 140 KCAS (35°)

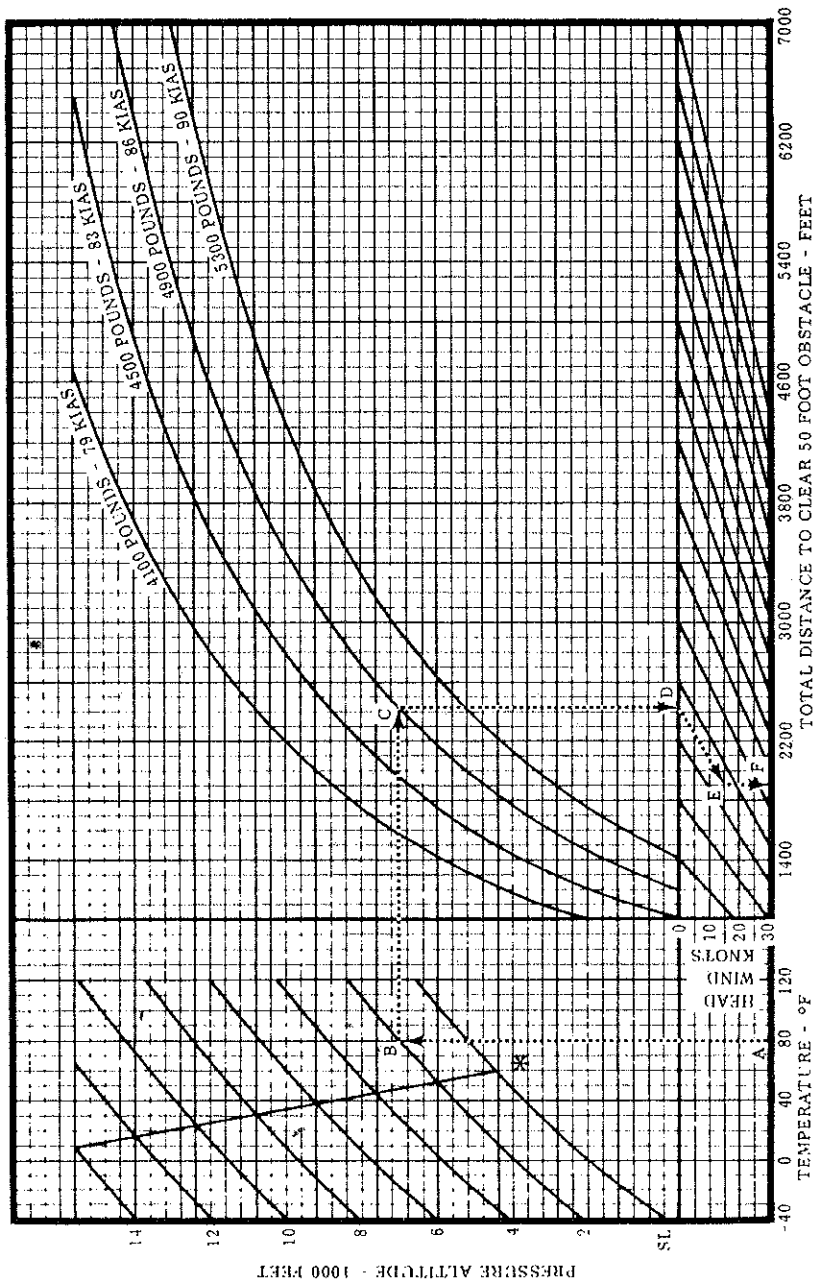
NOTE: The above calibrations are valid for pilot's and copilot's airspeed indicators when using normal static source and the standard pitot static system only. Refer to Pilot's Checklist if alternate static source is used or a dual pitot system is installed.

Figure 6-1

<b>STALL SPEED CHART</b>								
<b>Knots (IAS is Approximate)</b>								
<b>5300 Pounds Gross Weight</b>								
<b>CONFIGURATION</b>	<b>ANGLE OF BANK</b>							
	<b>0°</b>		<b>20°</b>		<b>40°</b>		<b>60°</b>	
	<b>IAS</b>	<b>CAS</b>	<b>IAS</b>	<b>CAS</b>	<b>IAS</b>	<b>CAS</b>	<b>IAS</b>	<b>CAS</b>
Gear and Flaps Up	74	74	77	77	85	85	104	105
Gear Down and Flaps 15°	71	72	73	74	81	82	100	101
Gear Down and Flaps 35°	62	64	64	66	71	73	89	90

Figure 6-2

# NORMAL TAKEOFF DISTANCE



\*STANDARD TEMPERATURE

### CONDITIONS

1. Level Hard Surface Runway
2. Wing Flaps - Up
3. Full Throttle and 2625 RPM Before Releasing Brakes
4. Mixture at Recommended Fuel Flow
5. Maintain Speed to 50 Feet

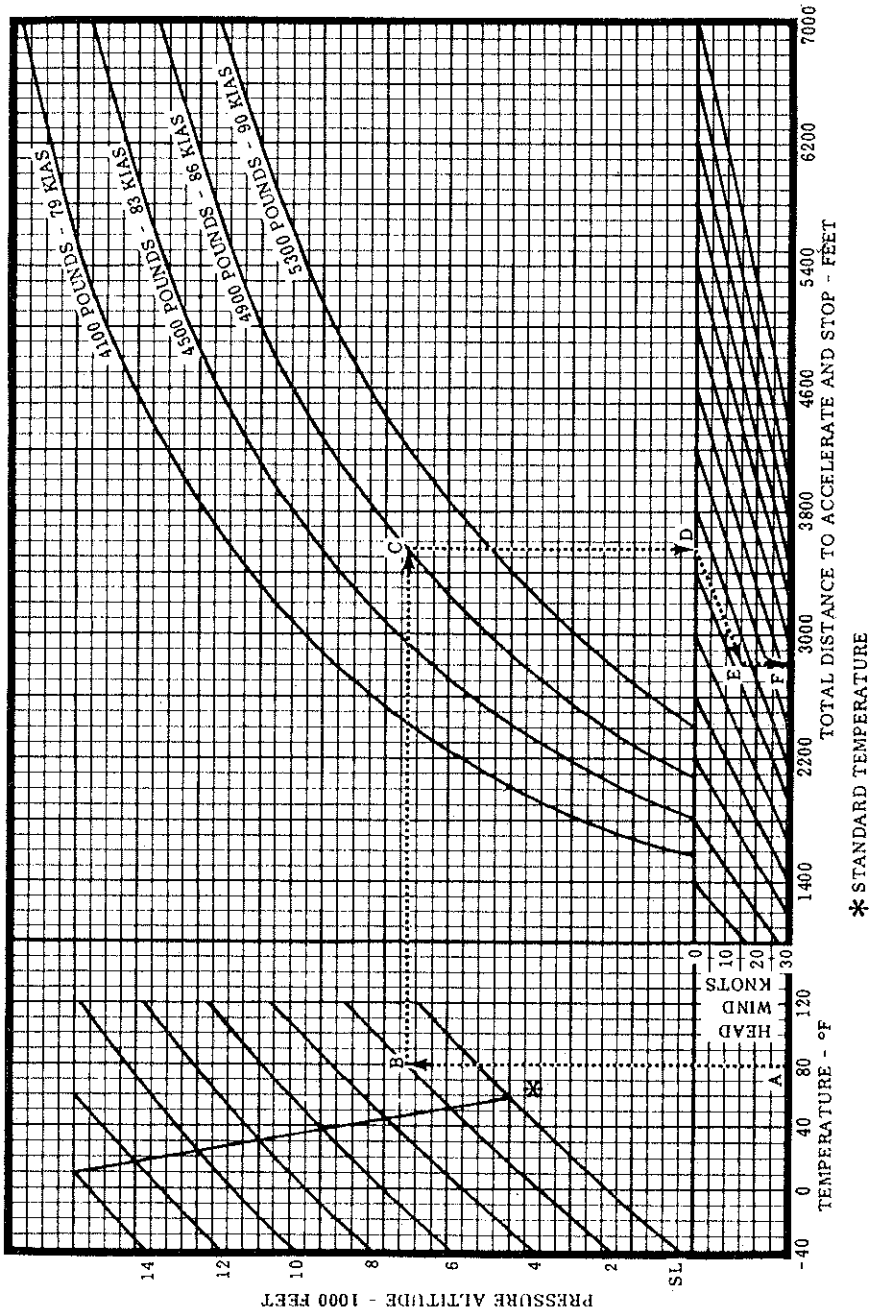
### EXAMPLE

- A. Temperature - 80°F
- B. Pressure Altitude - 2000 Feet
- C. Gross Weight - 4900 Pounds
- D. Total Distance to Clear 50 Foot Obstacle (No Wind) - 2420 Feet
- E. Headwind - 15 Knots
- F. Total Distance to Clear 50 Foot Obstacle (15 Knot Headwind) - 1900 Feet

NOTE: Ground Run is Approximately 87% of Total Distance.  
 Increase Total Distance by 3.5% for Operation on Firm Dry Sod Runway.

Figure 6-3

# ACCELERATE STOP DISTANCE



\* STANDARD TEMPERATURE

### CONDITIONS

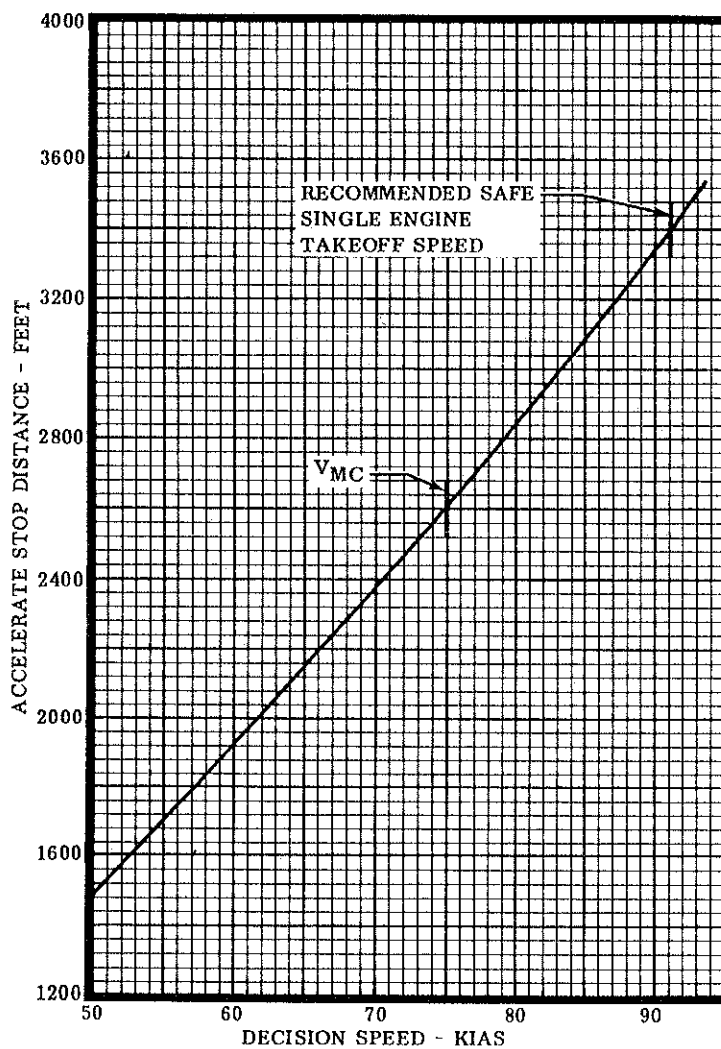
1. Level Hard Surface Runway
2. Wing Flaps - UP
3. Full Throttle and 2625 RPM Before Releasing Brakes
4. Mixture at Recommended Fuel Flow
5. Engine Failure at Takeoff Speed
6. Heavy Braking After Engine Failure

### EXAMPLE

- A. Temperature - 80°F
- B. Pressure Altitude - 2000 Feet
- C. Gross Weight - 4900 Pounds
- D. Total Distance to Stop (No Wind) - 3560 Feet
- E. Headwind - 15 Knots
- F. Total Distance to Stop (15 Knot Headwind) - 2820 Feet

Figure 6-4

## DISTANCE TO ACCELERATE STOP Vs DECISION SPEED



**CAUTION:**

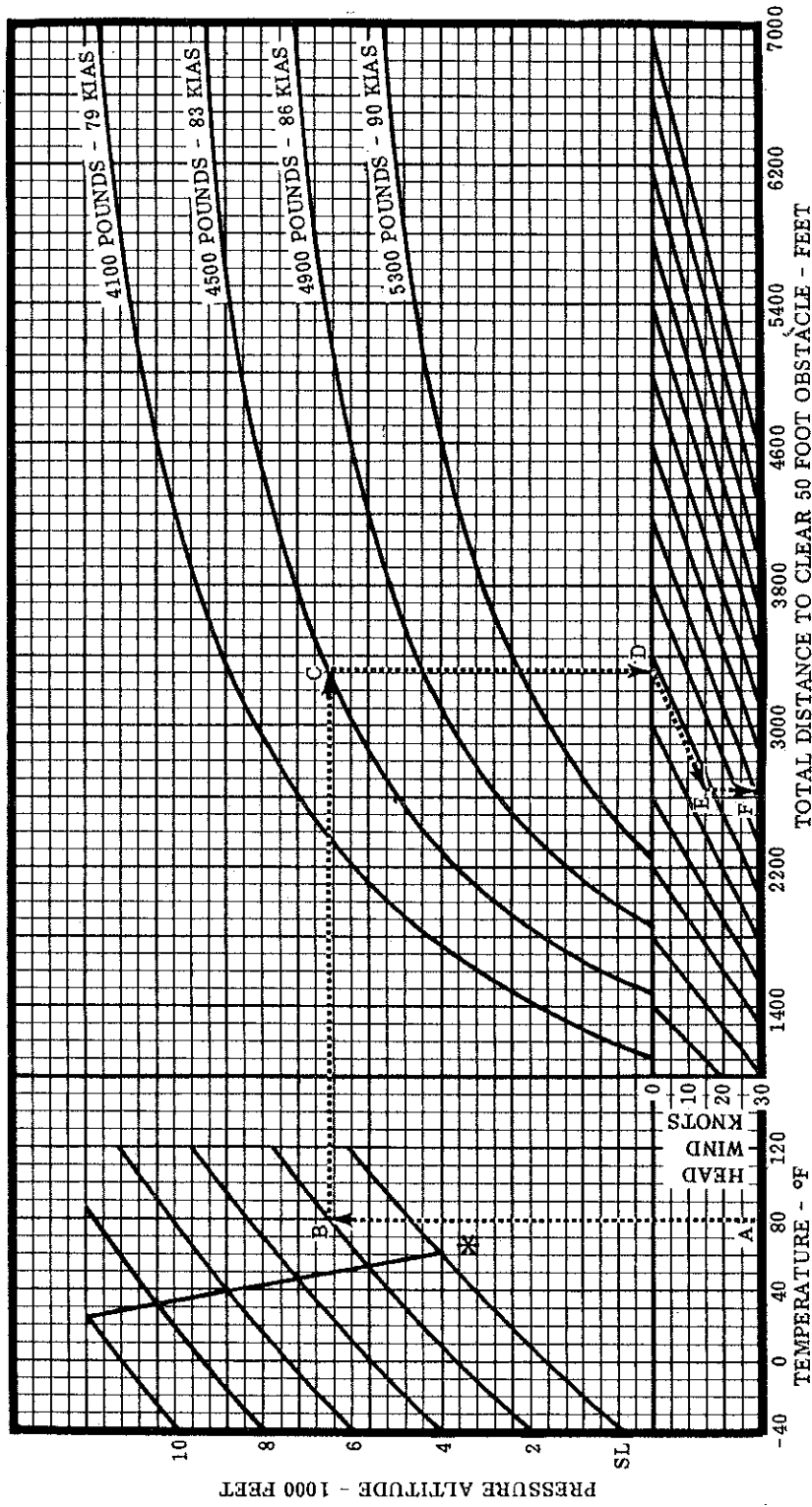
1. Safe Continued Takeoff on Single Engine is Improbable Below Safe Single Engine Speed. (See Section III)
2. Single Engine Control is Improbable Below  $V_{MC}$ .

**CONDITIONS**

1. Level Hard Surface Runway
2. Wing Flaps - UP
3. Full Throttle and 2625 RPM Before Brake Release
4. Mixture at Recommended Fuel Flow
5. Engine Failure at Decision Speed
6. Heavy Braking After Engine Failure
7. Weight 5300 Pounds
8. Sea Level Standard Day

Figure 6-5

# SINGLE ENGINE TAKEOFF DISTANCE



\* STANDARD TEMPERATURE

**CONDITIONS**

1. Level Hard Surface Runway
2. Wing Flaps - UP
3. Full Throttle and 2625 RPM Before Releasing Brakes
4. Mixture at Recommended Fuel Flow
5. Engine Failure at Takeoff Speed \*
6. Propeller Feathered and Gear Retracted During Climb
7. Maintain Speed to 50 Feet

**EXAMPLE**

- A. Temperature - 80°F
- B. Pressure Altitude - 2000 Feet
- C. Gross Weight - 4500 Pounds
- D. Total Distance to Clear 50 Foot Obstacle (No Wind) - 3320 Feet
- E. Headwind - 15 Knots
- F. Total Distance to Clear 50 Foot Obstacle (15 Knot Headwind) - 2630 Feet

Figure 6-6

# MULTI-ENGINE CLIMB DATA AT 5300 POUNDS

NOTE: DECREASE RATE-OF-CLIMB 20 FT/MIN FOR EACH 10°F ABOVE STANDARD TEMPERATURE FOR A PARTICULAR ALTITUDE.

MAXIMUM CLIMB														
SEA LEVEL 59°F		5000 FT. 41°F			10,000 FT. 23°F			15,000 FT. 5°F			20,000 FT. -12°F			
Best Climb KIAS	Rate of Climb Ft/Min	Lbs of Fuel Used	Best Climb KIAS	Rate of Climb Ft/Min	From S.L. Fuel Used	Best Climb KIAS	Rate of Climb Ft/Min	From S.L. Fuel Used	Best Climb KIAS	Rate of Climb Ft/Min	From S.L. Fuel Used	Best Climb KIAS	Rate of Climb Ft/Min	From S.L. Fuel Used
107	1495	24	106	1136	39	105	782	56	104	427	80	104	66	136

NOTE: FULL THROTTLE, 2625 RPM, MIXTURE AT RECOMMENDED FUEL FLOW, FLAPS AND GEAR UP. FUEL USED INCLUDES WARM-UP AND TAKEOFF

## CRUISE CLIMB

NOTE: 2450 RPM, 24 IN. MP TO 5000 FT. FULL THROTTLE AFTERWARDS.

POWER SETTING		5000 FT. 41°F			10,000 FT. 23°F			15,000 FT. 5°F		
RPM	M.P.	FROM SEA LEVEL			FROM SEA LEVEL			FROM SEA LEVEL		
		Dist. Nautical Miles	Time Min.	Fuel Used Lbs.	Dist. Nautical Miles	Time Min.	Fuel Used Lbs.	Dist. Nautical Miles	Time Min.	Fuel Used Lbs.
2450	24	10.3	5.0	40	24.8	11.5	59	58.1	25.2	93

NOTE: WARM-UP AND TAKEOFF ALLOWANCE 24 POUNDS FUEL AT SEA LEVEL. MIXTURE AT RECOMMENDED FUEL FLOW, FLAPS AND GEAR UP.

Figure 6-7

<b>MAXIMUM PERFORMANCE TAKEOFF 15° FLAPS</b>												
Gross Weight Pounds	KIAS at Takeoff	KIAS at Obstacle	Head Wind Knots	DENSITY ALTITUDE								
				SEA LEVEL 59°F		2500 FT 50°F		5000 FT 41°F		7500 FT 32°F		
				Ground Run	Total Distance over 50 Ft Obstacle	Ground Run	Total Distance over 50 Ft Obstacle	Ground Run	Total Distance over 50 Ft Obstacle	Ground Run	Total Distance over 50 Ft Obstacle	
5300	78	78	0 15 30	1519 1130 805	1795 1360 988	1911 1435 1025	2234 1700 1244	2453 1865 1453	2837 2188 1622	3234 2485 1845	3702 2885 2158	

Figure 6-8

<b>SINGLE ENGINE CLIMB DATA</b>											
Gross Weight Pounds	SEA LEVEL 59°F		2500 FT 50°F		5000 FT 41°F		7500 FT 32°F		10,000 FT 23°F		
	Best Climb KIAS	Rate of Climb Ft/Min	Best Climb KIAS	Rate of Climb Ft/Min	Best Climb KIAS	Rate of Climb Ft/Min	Best Climb KIAS	Rate of Climb Ft/Min	Best Climb KIAS	Rate of Climb Ft/Min	
5300	102	327	100	224	98	119	97	15	96	-89	
4900	99	400	97	298	96	195	95	92	94	-10	
4500	96	463	94	360	93	265	92	151	91	47	

NOTE: Flaps and gear up, inoperative propeller-feathered, wing banked 5° toward operating engine, full throttle, 2625 RPM and mixture at recommended leaning schedule. Decrease rate of climb 10 FT/MIN for each 10°F above standard temperature for particular altitude.

Figure 6-9

<b>SINGLE ENGINE SERVICE CEILING</b>								
<b>BEST CLIMB SPEED APPROXIMATELY 102 KIAS</b>								
Gross Weight Pounds	OUTSIDE AIR TEMPERATURE °F							
	-10	0	10	20	30	40	50	
	ALTITUDE- FEET							
5300	7550	7380	7180	6970	6750	6560	6400	
4900	9300	9100	8900	8650	8400	8170	7900	
4500	10,600	10,400	10,200	9900	9630	9400	9100	

NOTE: Table provides performance information to aid in route selection when operating under FAR 135.145 and FAR 91.119 requirements.

Increase indicated service ceilings 100 feet for each 0.10 inch Hg. altimeter setting greater than 29.92.

Decrease indicated service ceilings 100 feet for each 0.10 inch Hg. altimeter setting less than 29.92.

The service ceilings are the highest attainable while maintaining a minimum rate-of-climb of 50 ft/min.

Figure 6-10

**CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE AT 2500 FT**

RPM	MP	%BHP	KTAS	Total Lbs./Hr	Endurance 600 Lbs.	Range 600 lbs. (Naut. Mi.)	Endurance 978 Lbs.	Range 978 lbs. (Naut. Mi.)	Endurance 1218 Lbs.	Range 1218 lbs. (Naut. Mi.)
2450	24	74	181	168	3.57	645	5.82	1051	7.25	1310
	23	70	177	158	3.80	672	6.19	1094	7.71	1363
	22	66	172	147	4.08	703	6.65	1146	8.29	1428
	21	62	168	139	4.32	724	7.04	1180	8.76	1468
2300	24	68	175	153	3.92	685	6.39	1117	7.96	1392
	23	64	170	143	4.20	714	6.84	1163	8.52	1448
	22	60	165	135	4.44	734	7.24	1197	9.02	1491
	21	56	160	127	4.72	756	7.70	1234	9.59	1538
2200	23	58	163	131	4.58	746	7.47	1216	9.30	1514
	22	55	158	124	4.84	765	7.89	1248	9.82	1553
	21	50	151	116	4.17	780	8.43	1272	10.50	1585
	20	47	146	110	5.45	796	8.89	1298	11.07	1616
2100	22	49	150	113	5.31	794	8.65	1294	10.78	1612
	21	46	144	107	5.61	809	9.14	1318	11.38	1640
	20	43	137	101	5.94	816	9.68	1330	12.06	1657
	19	40	131	97	6.19	812	10.08	1322	12.56	1647
	18	37	120	90	6.67	802	10.87	1307	13.53	1627

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, (50°F)  
RECOMMENDED LEAN MIXTURE, 600, 978 and 1218 LBS. OF FUEL (NO RESERVE),  
AND 5300 POUNDS GROSS WEIGHT.

NOTE: See Range Profile, Figure 6-12, for range including climb.

**CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE AT 5000 FT**

RPM	MP	%BHP	KTAS	Total Lbs./Hr	Endurance 600 Lbs.	Range 600 lbs. (Naut. Mi.)	Endurance 978 Lbs.	Range 978 lbs. (Naut. Mi.)	Endurance 1218 Lbs.	Range 1218 lbs. (Naut. Mi.)
2450	24	77	188	174	3.45	649	5.62	1057	7.00	1316
	23	73	184	164	3.66	673	5.96	1096	7.43	1366
	22	68	178	154	3.90	695	6.35	1132	7.91	1410
	21	64	174	145	4.14	718	6.74	1170	8.40	1458
2300	24	70	181	157	3.82	690	6.23	1125	7.76	1401
	23	66	175	148	4.05	711	6.61	1160	8.23	1444
	22	62	171	139	4.32	739	7.04	1205	8.76	1499
	21	58	166	131	4.60	764	7.47	1240	9.30	1544
2200	23	61	170	136	4.41	749	7.19	1221	8.96	1521
	22	57	164	128	4.69	770	7.64	1255	9.52	1563
	21	53	159	121	4.96	787	8.08	1283	10.07	1599
	20	50	154	115	5.22	802	8.50	1306	10.59	1627
2100	22	51	155	118	5.08	789	8.29	1287	10.32	1602
	21	48	150	111	5.41	812	8.81	1323	10.97	1647
	20	45	145	106	5.66	818	9.23	1334	11.49	1660
	19	42	136	99	6.06	826	9.88	1347	12.30	1677
	18	39	127	94	6.38	812	10.40	1323	12.96	1649

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, (41°F)  
RECOMMENDED LEAN MIXTURE, 600, 978 AND 1218 LBS. OF FUEL (NO RESERVE),  
AND 5300 POUNDS GROSS WEIGHT.

NOTE: See Range Profile, Figure 6-12, for range including climb.

Figure 6-11 (Sheet 1 of 3)

CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE AT 7500 FT										
RPM	MP	%BHP	KTAS	Total Lbs./Hr	Endurance 600 Lbs.	Range 600 lbs. (Naut. Mi.)	Endurance 978 Lbs.	Range 978 lbs. (Naut. Mi.)	Endurance 1218 Lbs.	Range 1218 lbs. (Naut. Mi.)
2450	22	71	186	159	3.77	700	6.15	1142	7.66	1422
	21	67	181	150	4.00	723	6.52	1179	8.12	1468
	20	63	176	141	4.26	750	6.94	1221	8.64	1520
	19	58	170	132	4.55	772	7.41	1257	9.23	1565
2300	22	64	177	144	4.17	740	6.79	1205	8.46	1501
	21	60	172	136	4.41	759	7.19	1237	8.96	1541
	20	56	166	127	4.72	785	7.70	1280	9.59	1594
	19	53	161	121	4.96	800	8.08	1304	10.07	1625
2200	22	58	169	132	4.55	769	7.41	1253	9.23	1561
	21	55	165	126	4.76	784	7.76	1278	9.67	1593
	20	52	160	119	5.04	806	8.22	1314	10.24	1637
	19	48	153	112	5.36	818	8.73	1332	10.88	1660
2100	21	50	156	115	5.22	817	8.50	1330	10.59	1657
	20	47	150	110	5.45	818	8.89	1335	11.07	1662
	19	44	144	101	5.94	854	9.68	1392	12.06	1734
	18	40	132	97	6.19	818	10.08	1332	12.56	1660

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, (32°F) RECOMMENDED LEAN MIXTURE, 600, 978 AND 1218 LBS. OF FUEL (NO RESERVE), AND 5300 POUNDS GROSS WEIGHT.

NOTE: See Range Profile, Figure 6-12, for range including climb.

CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE AT 10,000 FT										
RPM	MP	%BHP	KTAS	Total Lbs./Hr	Endurance 600 Lbs.	Range 600 lbs. (Naut. Mi.)	Endurance 987 Lbs.	Range 978 lbs. (Naut. Mi.)	Endurance 1218 Lbs.	Range 1218 lbs. (Naut. Mi.)
2450	20	65	182	147	4.08	743	6.65	1211	8.29	1510
	19	61	177	137	4.38	775	7.14	1263	8.89	1573
	18	57	171	129	4.65	794	7.58	1295	9.44	1612
	17	53	164	121	4.96	815	8.08	1327	10.07	1654
2300	20	59	174	133	4.51	784	7.35	1278	9.16	1593
	19	55	168	125	4.80	805	7.82	1312	9.74	1634
	18	51	161	117	5.13	824	8.36	1343	10.41	1672
	17	48	154	111	5.41	835	8.81	1360	10.97	1694
2200	20	54	166	123	4.88	811	7.95	1321	9.90	1646
	19	50	159	116	5.17	820	8.43	1338	10.50	1666
	18	47	152	109	5.50	836	8.97	1364	11.17	1699
	17	44	138	104	5.77	799	9.40	1301	11.71	1621
2100	20	49	157	113	5.31	832	8.65	1355	10.78	1689
	19	46	149	107	5.61	837	9.14	1363	11.38	1697
	18	43	141	102	5.88	829	9.59	1352	11.94	1683
	17	40	121	96	6.25	758	10.19	1235	12.69	1538

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, (23°F) RECOMMENDED LEAN MIXTURE, 600, 978 AND 1218 LBS. OF FUEL (NO RESERVE), AND 5300 POUNDS GROSS WEIGHT.

NOTE: See Range Profile, Figure 6-12, for range including climb.

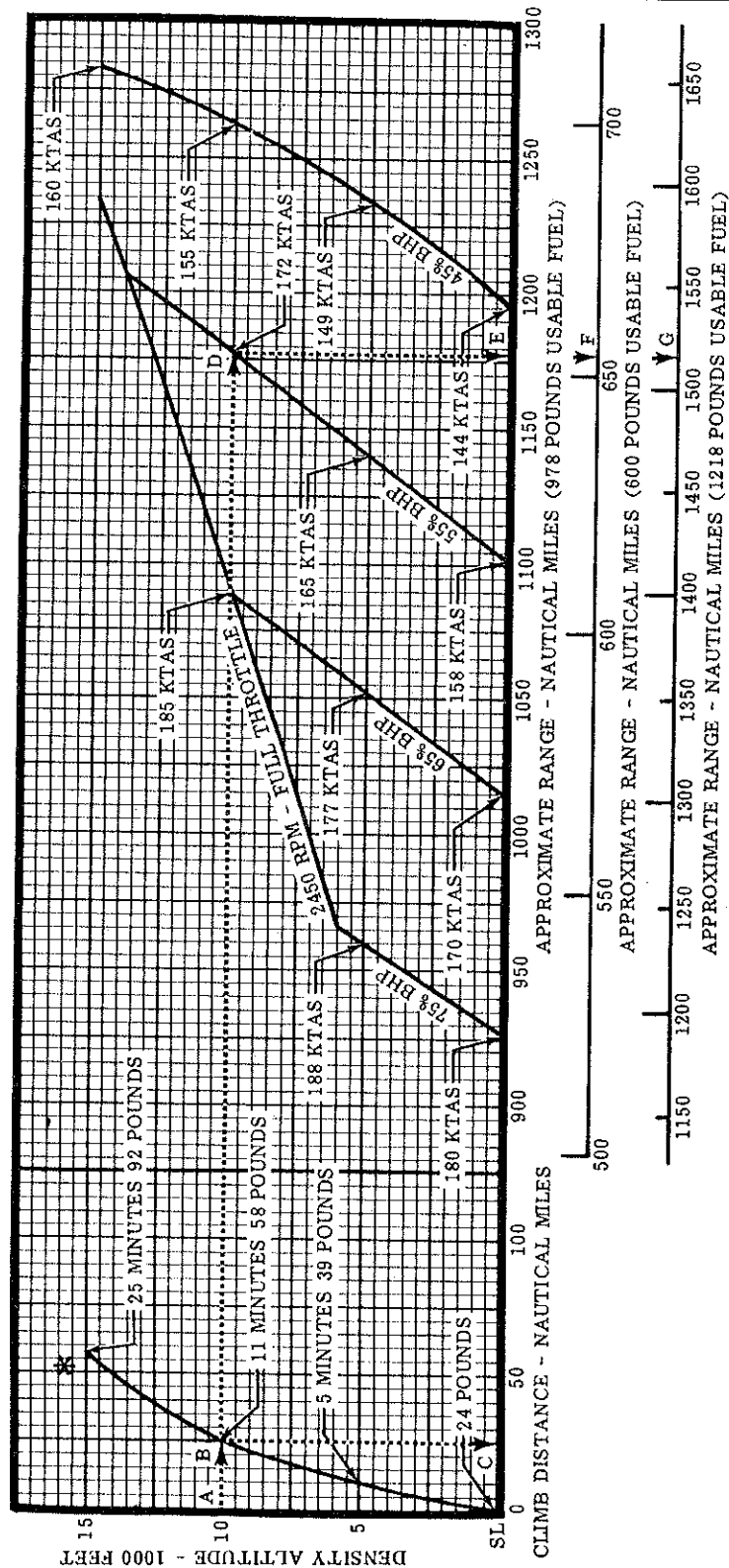
Figure 6-11 (Sheet 2 of 3)

CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE AT 15,000 FT										
RPM	MP	%BHP	KTAS	Total Lbs./Hr	Endurance 600 Lbs.	Range 600 lbs. (Naut. Mi.)	Endurance 978 Lbs.	Range 978 lbs. (Naut. Mi.)	Endurance 1218 Lbs.	Range 1218 lbs. (Naut. Mi.)
2450	16	53	170	121	4.96	841	8.08	1370	10.07	1707
	15	48	156	112	5.36	836	8.73	1362	10.88	1698
	14	44	140	104	5.77	809	9.40	1318	11.71	1641
2300	16	48	156	112	5.36	836	8.73	1362	10.88	1698
	15	44	140	104	5.77	809	9.40	1318	11.71	1641
2200	16	44	140	104	5.77	809	9.40	1318	11.71	1641
<p>CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, (5.5°F)  RECOMMENDED LEAN MIXTURE, 600, 978 AND 1218 LBS. OF FUEL (NO RESERVE),  AND 5300 POUNDS GROSS WEIGHT.</p> <p>NOTE: See Range Profile, Figure 6-12, for range including climb.</p>										

Figure 6-11 (Sheet 3 of 3)

# RANGE PROFILE

\* CRUISE CLIMB AT 2450 RPM, 24.0 In. Hg M.P. (FULL THROTTLE ABOVE 5000 FEET) AND 120 KTAS



## NOTES

1. Maximum Range is not Changed Appreciably with Variations in Climb Power Setting and Climb Speed.
2. Climb Fuel Includes Allowance for Start, Taxi, and Takeoff.

## CONDITIONS

1. Starting Weight - 5300 Pounds
2. Cruise Climb to Desired Cruise Altitude
3. Cruise Fuel Flow, Recommended Lean Mixture
4. Zero Wind
5. 45 Minutes Reserve Fuel (80 Pounds) at 45% BHP

## EXAMPLE

- A. Cruise Altitude - 10,000 Feet
- B. Time and Fuel Used to Climb from Sea Level to 10,000 Feet - 11 Minutes and 58 Pounds
- C. Climb Distance - 25 Nautical Miles
- D. Cruise Power and Speed - 55% BHP and 172 KTAS
- E. Range - 1177 Nautical Miles (978 Pounds Usable Fuel - Optional)
- F. Range - 653 Nautical Miles (600 Pounds Usable Fuel - Standard)
- G. Range - 1517 Nautical Miles (1218 Pounds Usable Fuel - Optional)

Figure 6-12

LANDING PERFORMANCE									
Gross Weight Pounds	KIAS at Obstacle	SEA LEVEL 59°F		2500 FT. 50°F		5000 FT. 41°F		7500 FT. 32°F	
		Ground Run	Total Distance Over 50 Foot Obstacle	Ground Run	Total Distance Over 50 Foot Obstacle	Ground Run	Total Distance Over 50 Foot Obstacle	Ground Run	Total Distance Over 50 Foot Obstacle
5300	89	582	1697	626	1741	675	1790	729	1844
4900	86	490	1605	527	1642	568	1683	613	1728
4500	82	406	1521	437	1552	471	1586	509	1624
4100	78	331	1446	356	1471	384	1499	414	1529
<p>NOTE: WING FLAPS 35°, POWER OFF, HARD SURFACE RUNWAY, ZERO WIND MAXIMUM BRAKING EFFORT, REDUCE LANDING DISTANCE 10% FOR EACH 10 KNOTS HEADWIND.</p> <p>NOTE: INCREASE DISTANCE BY 25% OF GROUND RUN FOR OPERATION ON FIRM SOD RUNWAYS.</p>									

Figure 6-13