

PART V OPERATING DATA

84. Pressure error corrections

The pressure error corrections at sea level are:—

From	150	200	250	300	350	400	450	knots
To	200	250	300	350	400	450	500	knots
	0	+3	+5	+6	+7	+8	+9	knots

85. Flight planning data

- (i) The tables on the following pages show the climb, cruise and descent data in tabular form for various configurations. Heights are given at 10,000 ft. intervals, but interpolation is possible for intermediate heights.
- (ii) The climb and descent data tables give the necessary information for climbing or descending from any one height to another. Climb distances are included where necessary in the cruise data table but not descent distances, since in some cases the descent may be made from overhead and in others some distance from the destination. Allowance is made for fuel used on the descent.
- (iii) Each cruise data table consists of five separate altitude blocks. Each block shows:—
 - (a) The level flight range to the let-down point in nautical miles, at the particular height for various fuel states.

PART V—OPERATING DATA

- (b) The best range IAS at the particular height together with approximate A.N.M. per 100 lb. fuel used and the approximate fuel consumption in lb./hr.
 - (c) The range, including the distance covered on the climb if a climb is made, to any other altitude during flight.
- iv) *Use of the tables*

(a) Pre-flight planning

Enter the appropriate cruise data table in the sea level block at the fuel state applying immediately after take-off.

Select the height at which maximum range is available at that fuel state. The distance available includes distance covered on the climb, but not on the descent. (Absolute maximum range is obtained by adding on the descent distance, provided that the let-down is commenced at that distance from the destination.)

For short range flights inspect the sea level block and select the height at which the distance to be covered requires the least amount of fuel. This is the best altitude for the flight.

(b) In-flight planning

At any stage of a flight the available range may be ascertained by applying the fuel state to the level flight range in the particular altitude block.

If an increase in range is required, or if a climb has to be made, the new available range may be obtained by entering the existing altitude block at the particular fuel state and moving vertically downwards within the block until the new altitude is reached. Figures in heavy type indicate the best altitude for the maximum increase in range. Above these heights no further range increase is possible.

If a descent is necessitated the new range is shown by moving direct from the existing altitude level flight range for the particular fuel state to the new altitude level flight range.

86. Fuel consumptions

The approximate fuel consumptions in lb./min. for varying r.p.m. at different altitudes are given below. If

PART V—OPERATING DATA

CLEAN AIRCRAFT

FUEL CONTENTS:— 342 GALLONS
 2,736 lb. AVTUR (8 lb./gall.)
 2,630 lb. NORMAL AVTAG (7.7 lb./gall.)
 TAXY AND TAKE-OFF ALLOWANCE = 336 lb. (42 gall.)
 LANDING ALLOWANCE = 480 lb. (60 gall.)
 (excluding descent fuel)

CLIMB DATA

From	To	Lb.	Dist.	Mins.
Sea Level	10,000'	160	10	1½
	20,000'	280	20	3
	30,000'	400	35	5
	40,000'	520	60	8½
10,000'	20,000'	120	10	1½
	30,000'	240	25	3½
	40,000'	360	50	7
20,000'	30,000'	120	15	2
	40,000'	240	40	5½
30,000'	40,000'	120	25	3½
Climb at: 10,250 r.p.m. below 25,000' 10,100 r.p.m. above 25,000'				

DESCENT DATA

From	To	Lb.	Dist.	Mins.
40,000'	30,000'	15	75	4
	20,000'	40	45	7
	10,000'	65	60	10
	Sea Level	115	80	14
30,000'	20,000'	25	20	3
	10,000'	50	35	6
	Sea Level	100	55	10
20,000'	10,000'	25	15	3
	Sea Level	75	35	7
10,000'	Sea Level	50	20	4
AIRBRAKES - IN R.P.M. - 6,500 SPEED - 0.67M above 25,000' 270K below 25,000'				

PART V—OPERATING DATA

CRUISE DATA — CLEAN AIRCRAFT

FUEL STATE—LB.		2400	2000	1600	1200	800	
Sea Level	Range	220	175	130	85	40	
	ANM/100 lb.—11.4	10,000'	280	215	150	90	30
	Lb./hr. —2200	20,000'	365	275	185	95	—
	IAS —250K	30,000'	460	335	210	85	—
	40,000'	525	370	220	70	—	
10,000 ft.	Range	—	235	170	105	40	
	ANM/100 lb.—16	20,000'	—	305	215	125	30
	Lb./hr. —1,640	30,000'	—	380	255	130	—
	IAS —230K	40,000'	—	420	270	120	—
20,000 ft.	Range	—	320	230	140	50	
	ANM/100 lb.—22.7	20,000'	—	410	285	160	35
	Lb./hr. —1,250	30,000'	—	410	285	160	35
	IAS —210K	40,000'	—	455	305	155	—
30,000 ft.	Range	—	430	305	180	55	
	ANM/100 lb.—31.0	20,000'	—	430	305	180	55
	Lb./hr. —1,000	40,000'	—	485	335	185	35
	IAS —200K	—	—	—	—	—	—
40,000 ft.	Range	—	—	355	205	55	
	ANM/100 lb.—37.4	20,000'	—	—	355	205	55
	Lb./hr. —960	30,000'	—	—	355	205	55
	IAS —185K	40,000'	—	—	—	—	—
Fuel State—Gals. AVTUR		300	250	200	150	100	

PART V—OPERATING DATA

WITH TIP TANKS

FUEL CONTENTS:— 498 GALLONS
 3,984 lb. AVTUR (8 lb./gall.)
 3,840 lb. NORMAL AVTAG (7.7 lb./gall.)
 TAXY AND TAKE-OFF ALLOWANCE 360 lb. (45 gall.)
 LANDING ALLOWANCE (excluding
 descent fuel) 480 lb. (60 gall.)

CLIMB DATA

From	To	Lb.	Dist.	Mins.
Sea Level	10,000'	200	10	2
	20,000'	360	20	4
	30,000'	520	45	6½
	40,000'	680	70	12
10,000'	20,000'	160	10	2
	30,000'	320	35	4½
	40,000'	480	60	10
20,000'	30,000'	160	25	2½
	40,000'	320	50	8
30,000'	40,000'	160	25	5½
Climb at: 10,250 r.p.m. below 25,000'				
10,100 r.p.m. above 25,000'				

DESCENT DATA

From	To	Lb.	Dist.	Mins.
40,000'	30,000'	15	10	3
	20,000'	35	30	5½
	10,000'	60	45	8½
	Sea Level	105	65	12½
30,000'	20,000'	20	20	2½
	10,000'	45	35	5½
	Sea Level	90	55	9½
20,000'	10,000'	25	15	3
	Sea Level	70	35	7
10,000'	Sea Level	45	20	4
AIRBRAKES - IN				
R.P.M. - 6,500				
SPEED 0.67M above 25,000'				
- 270K below 25,000'				

PART V—OPERATING DATA

CRUISE DATA — WITH TIP TANKS

FUEL STATE—LB.	3600	3200	2400	1600	800	
Sea Level	Range	340	295	210	125	35
ANM/100 lb.—10.9	10,000'	450	390	265	140	15
Lb./hr. —2,360	20,000'	595	505	335	160	—
IAS —255K	30,000'	725	615	395	170	—
	40,000'	880	740	455	170	—
10,000 ft.	Range	—	415	290	165	40
ANM/100lb. —15.6	20,000'	—	560	385	215	40
Lb./hr. —1760	30,000'	—	660	440	220	—
IAS —235K	40,000'	—	800	515	230	—
20,000 ft.	Range	—	565	390	220	45
ANM/100 lb.—21.6						
Lb./hr. —1,400	30,000'	—	700	475	250	30
IAS —220K	40,000'	—	845	580	295	—
30,000 ft.	Range	—	720	500	280	50
ANM/100 lb.—27.7						
Lb./hr. —1,160	40,000'	—	880	600	310	20
IAS —205K						
40,000 ft.	Range	—	—	625	340	55
ANM/100 lb.—35.6						
Lb./hr. —1,040						
IAS —195K						
Fuel State—Gals. AVTUR		450	400	300	200	100

PART V—OPERATING DATA

WITH TIP TANKS AND 8 R.P.'s.

FUEL CONTENTS:— 498 GALLONS
 3,984 lb. AVTUR (8 lb./gall.)
 3,840 lb. NORMAL AVTAG (7.7 lb./gall.)
 TAXY AND TAKE-OFF ALLOWANCE 360 lb. (45 gall.)
 LANDING ALLOWANCE ... 480 lb. (60 gall.)
 (excluding descent fuel)

CLIMB DATA

From	To	Lb.	Dist.	Mins.
Sea Level	10,000'	200	10	2
	20,000'	400	25	4½
	30,000'	600	45	8½
	40,000'	840	85	15
10,000'	20,000'	200	15	2½
	30,000'	400	35	6½
	40,000'	640	75	13
20,000'	30,000'	200	20	4
	40,000'	440	60	10½
30,000'	40,000'	240	40	6½
Climb at: 10,250 r.p.m. below 25,000'				
10,100 r.p.m. above 25,000'				

DESCENT DATA

From	To	Lb.	Dist.	Mins.
40,000'	30,000'	20	15	2½
	20,000'	40	25	4¼
	10,000'	80	40	6½
	Sea Level	160	55	10
30,000'	20,000'	20	10	1¾
	10,000'	60	25	4
	Sea Level	140	40	7½
20,000'	10,000'	40	15	2¼
	Sea Level	120	30	5½
10,000'	Sea Level	80	15	3½
AIRBRAKES - IN				
R.P.M. - 6,500				
SPEED - 0.67M above 25,000'				
- 270K below 25,000'				

PART V—OPERATING DATA

CRUISE DATA—

WITH TIP TANKS AND 8 R.P.'s

FUEL STATE—LB.		3600	3200	2400	1600	800	
Sea Level	Range	310	270	190	110	30	
	ANM/100 lb.—10	10,000'	400	345	235	125	15
	Lb./hr. —2,360	20,000'	490	420	270	125	—
	IAS —235K	30,000'	620	525	335	145	—
	40,000'	675	565	340	120	—	
10,000 ft.	Range	—	365	255	145	35	
	ANM/100 lb.—13.8	20,000'	—	445	300	160	15
	Lb./hr. —1,840	30,000'	—	555	365	175	—
	IAS —220K	40,000'	—	610	385	165	—
20,000 ft.	Range	—	465	325	180	35	
	ANM/100 lb.—17.9	30,000'	—	585	395	205	—
	Lb./hr. —1,600	40,000'	—	650	430	205	—
	IAS —210K						
30,000 ft.	Range	—	615	425	235	45	
	ANM/100 lb.—23.7	40,000'	—	685	460	240	—
	Lb./hr. —1,320						
	IAS —200K						
40,000 ft.	Range	—	—	490	270	45	
	ANM/100 lb.—27.7						
	Lb./hr. —1,320						
	IAS —165K						
Fuel State—Gals. AVTUR		450	400	300	200	100	

**PART V—OPERATING DATA
WITH TIP AND PYLON TANKS**

FUEL CONTENTS:— 658 GALLONS
5,264 lb. AVTUR (8 lb./gall.)
5,070 lb. NORMAL AVTAG (7.7 lb. gall.)
TAXY AND TAKE-OFF ALLOWANCE 360 lb. (45 gall.)
LANDING ALLOWANCE (excluding
descent fuel) 480 lb. (60 gall.)

CLIMB DATA

From	To	Lb.	Dist.	Mins.
Sea Level	10,000'	225	10	2½
	20,000'	450	30	5½
	30,000'	690	60	9¾
	40,000'	995	115	18
10,000'	20,000'	225	20	3
	30,000'	465	50	7½
	40,000'	770	105	15¾
20,000'	30,000'	240	30	4½
	40,000'	545	85	12¾
30,000'	40,000'	305	55	8½
Climb at: 10,250 r.p.m. below 25,000' 10,100 r.p.m. above 25,000'				

DESCENT DATA

From	To	Lb.	Dist.	Mins.
40,000'	30,000'	20	15	2¾
	20,000'	40	30	4¾
	10,000'	80	45	7½
	Sea Level	155	65	11¼
30,000'	20,000'	20	15	2
	10,000'	60	30	4¾
	Sea Level	135	50	8¾
20,000'	10,000'	40	15	2¾
	Sea Level	115	35	6½
10,000'	Sea Level	75	20	3¾
AIRBRAKES - IN R.P.M. - 6500 SPEED - 0.67M above 25,000' - 270K below 25,000'				

PART V—OPERATING DATA

CRUISE DATA—

WITH TIP AND PYLON TANKS

FUEL STATE—LB.		4700	4000	3000	2500	2000	1500	1000
Sea Level	Range	455	380	275	230	165	115	60
ANM/100 lb.—10.65	10,000'	600	500	355	280	205	130	50
Lb./hr. —2,500	20,000'	760	630	435	335	235	130	—
IAS —260K	30,000'	945	775	520	390	255	120	—
	40,000'	1120	910	595	425	250	—	—
10,000 ft.	Range	—	520	375	300	225	150	70
ANM/100 lb.—14.7	20,000'	—	660	465	365	265	165	60
Lb./hr. —1,910	30,000'	—	820	565	435	305	170	—
IAS —240K	40,000'	—	960	650	485	320	140	—
20,000 ft.	Range	—	680	490	390	290	190	90
ANM/100 lb.—19.6								
Lb./hr. —1,570	30,000'	—	850	600	475	340	210	75
IAS —225K	40,000'	—	1010	700	545	375	205	—
30,000 ft.	Range	—	880	640	510	380	245	110
ANM/100 lb.—25.5								
Lb./hr. —1,330	40,000'	—	1050	750	590	425	255	80
IAS —210K								
40,000 ft.								
ANM/100 lb.—31.6								
Lb./hr. —1,245	Range	—	—	790	635	475	305	135
IAS —200K								
Fuel State—Gals. AVTUR		585	500	375	312	250	187	125

PART V—OPERATING DATA

it is required to know the consumptions in gall./min. divide the figures by the fuel density.

AVTUR=8.0 lb./gall.

NORMAL AVTAG=7.7 lb./gall.

Height	At 10,250 r.p.m.	At 9,750 r.p.m.	At best range speed		
			Clean	Tip tanks & R.P's	Tip tanks
Sea level	120	90	36	38	38
10,000 ft.	90	70	27	31	29
20,000 ft.	70	55	21	26	23
30,000 ft.	50	40	16	22	19
40,000 ft.	35	25	16	22	18

87. Take-off distances

The approximate take-off distances, in yards, are given below.

(i) *With tip tanks (13,320 lb.)*

Temperature		-15°C.	0°C.	+15°C.	+30°C.	+45°C.
No Wind	Ground run	700	800	900	1,050	1,150
	Clear 50 ft.	1,250	1,420	1,620	1,830	2,000
30 kt. Wind	Ground run	380	440	500	580	630
	Clear 50 ft.	770	830	950	1,070	1,170

(ii) *With tip tanks and R.P's (14,132 lb.)*

Temperature		-15°C.	0°C.	+15°C.	+30°C.	+45°C.
No Wind	Ground run	800	900	1,050	1,180	1,300
	Clear 50 ft.	1,430	1,600	1,830	2,060	2,270
30 kt. Wind	Ground run	430	500	570	650	710
	Clear 50 ft.	910	1,020	1,160	1,300	1,440

The ground run and distance to clear 50 feet should be increased by approximately 10% for every 1,000 ft. the aerodrome is above sea level.

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