PERFORMANE DATA

F100-PW-220 / F100-PW-220E

TABLE OF CONTENTS

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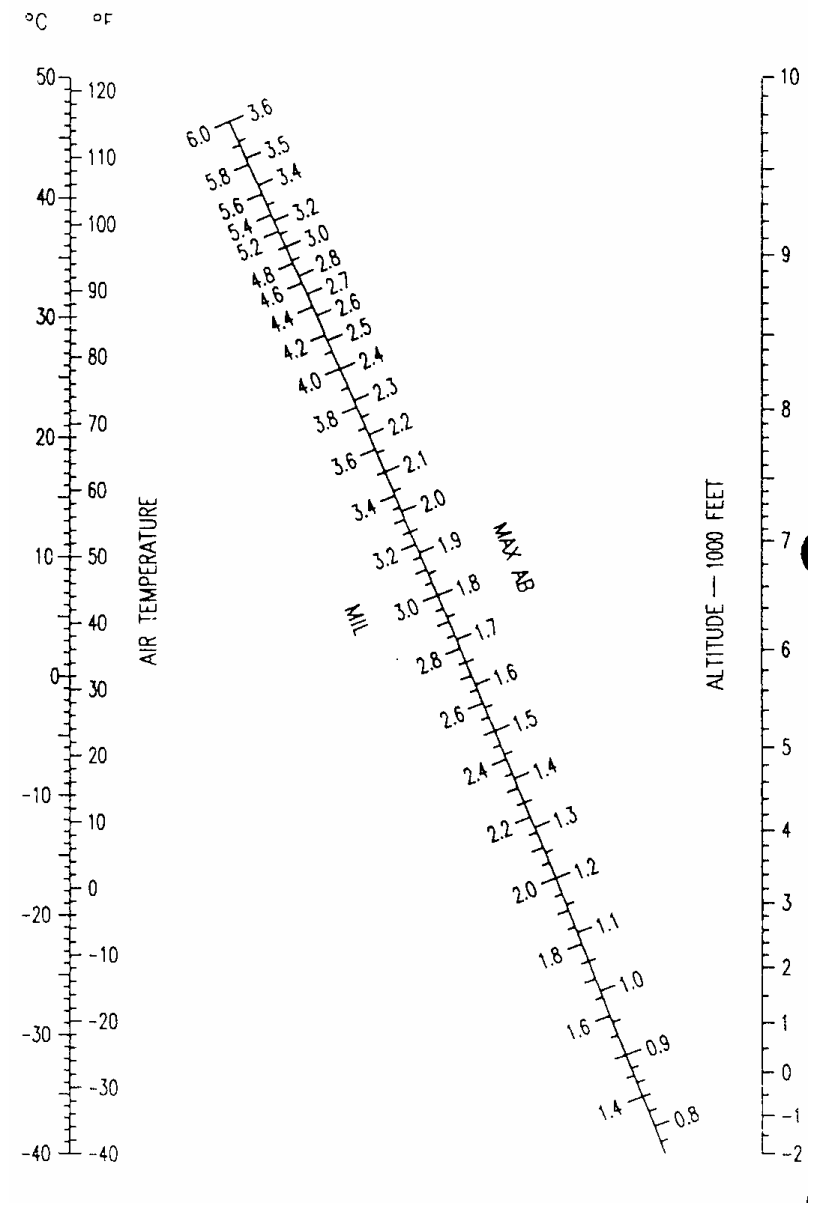
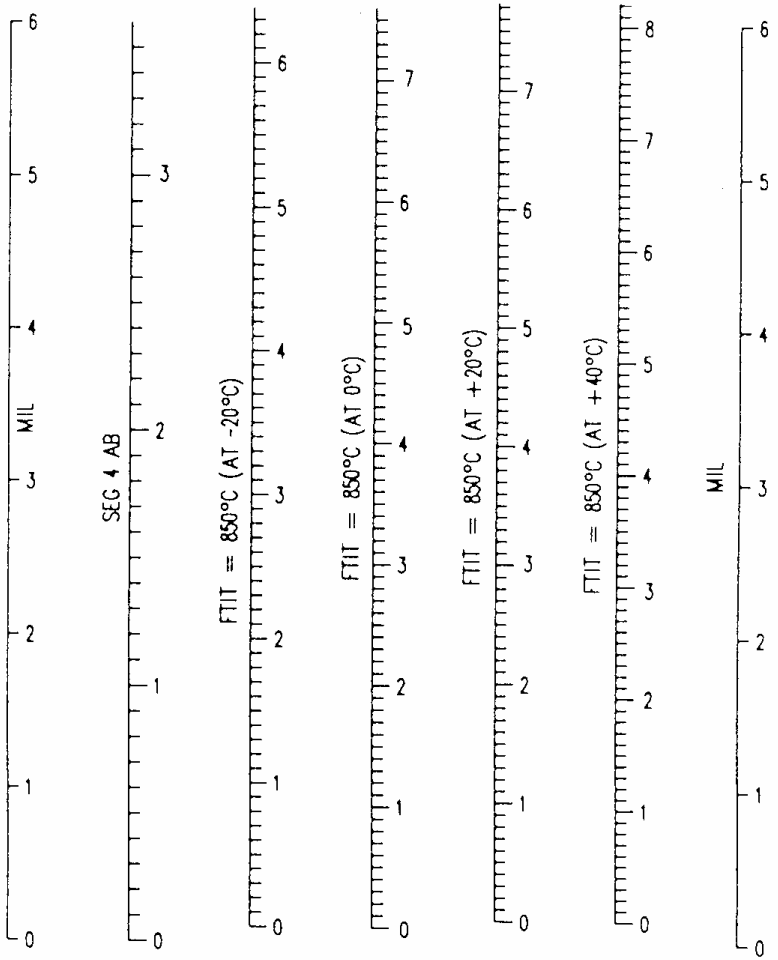
TAKE-OFF FACTOR



TAKE-OFF FACTOR



TAKE-OFF SPEED & DISTANCE (Non-AB)

P-04

CONFIGURATION:

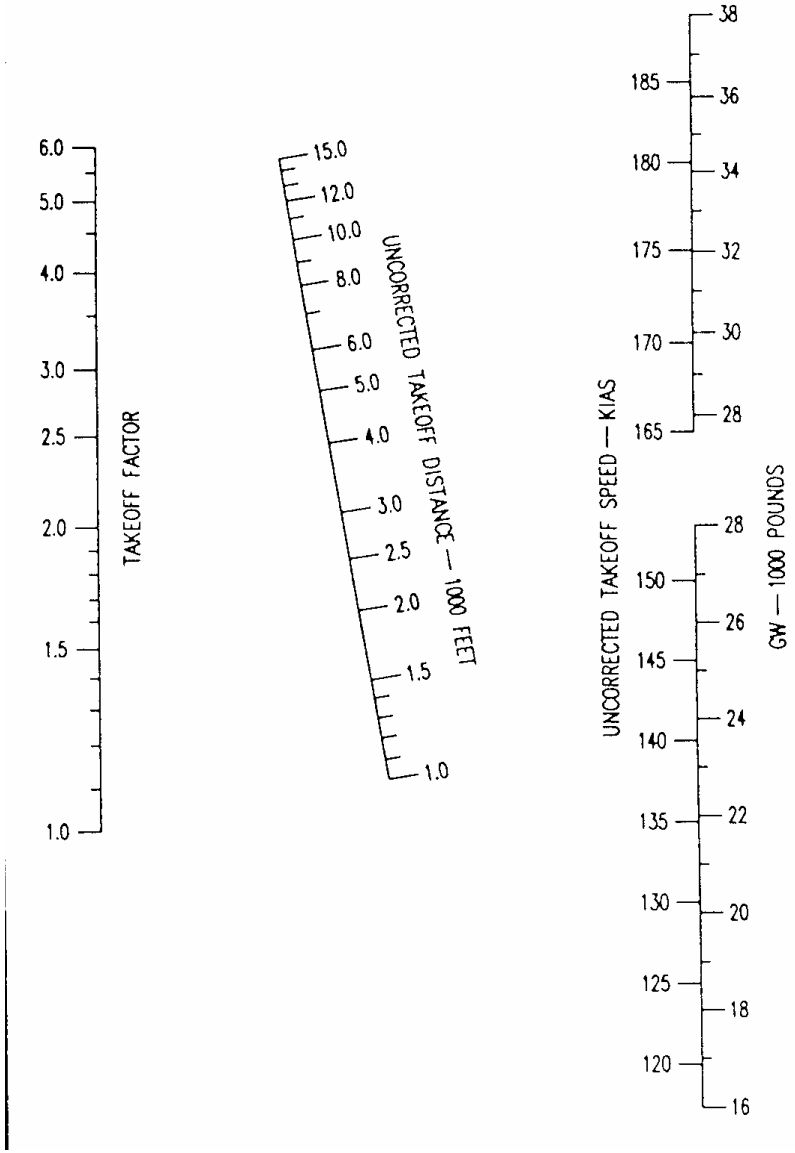
- ALL DRAG INDEXES
- ZERO ROLL TRIM

CONDITIONS:

- ALL ALTITUDES
- ALL TEMPERATURES
- 10 DEGREES PITCH ATTITUDE

NOTES:

Refer to sheet 3.



TAKE-OFF SPEED & DISTANCE (AB)

P-05

CONFIGURATION:

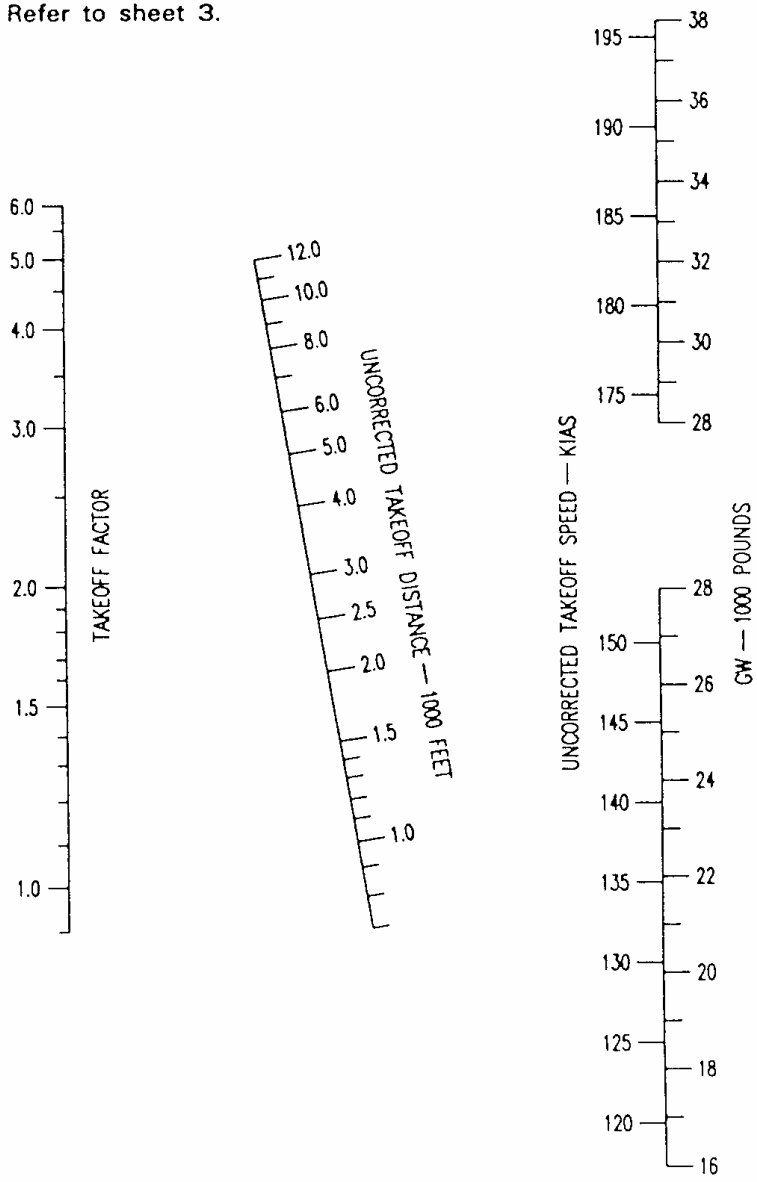
- ALL DRAG INDEXES
- ZERO ROLL TRIM

CONDITIONS:

- ALL ALTITUDES
- ALL TEMPERATURES
- 10 DEGREES PITCH ATTITUDE

NOTES:

Refer to sheet 3.



TAKE-OFF SPEED & DISTANCE

CONFIGURATION:

- ALL DRAG INDEXES
- CG=35% MAC
- ZERO ROLL TRIM

CONDITIONS:

- ALL ALTITUDES
- ALL TEMPERATURES
- 10 DEGREES PITCH ATTITUDE

NOTES:

- ROTATE AT 15 KIAS (AB) LESS THAN TAKEOFF SPEED.
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE TAKEOFF SPEED 10% AND DISTANCE 18% FOR AN 8° PITCH ATTITUDE ROTATION.
- DECREASE TAKEOFF SPEED 7 KNOTS KIAS AND DISTANCE 11% WHEN GW IS > 28,000 LB FOR CONFIGURATIONS WITH EMPTY 370-GALLON FUEL TANKS.
- INCREASE TAKEOFF SPEED 7 KIAS AND DISTANCE 11% WHEN GW IS < 28,000 LB FOR CONFIGURATIONS WITH CL 300-GALLON FUEL TANK.
- INCREASE/DECREASE TAKEOFF SPEED 4 KIAS AND DISTANCE 6% FOR EACH 1% FORWARD/AFT OF 35% MAC.
- USE TAKEOFF SPEED AT 38% MAC FOR TAKEOFF CG > 38% MAC.
- INCREASE DISTANCE 3% PER 100 DRAG INDEX.
- INCREASE/DECREASE DISTANCE 4% PER 1% UPSLOPE/DOWNSLOPE.
- INCREASE DISTANCE 12% PER 10 KTS TAILWIND.
- DECREASE DISTANCE 10% PER 10 KTS HEADWIND.
- FOR TAKEOFF SPEED CORRECTION WITH ROLL TRIM OTHER THAN ZERO, REFER TO TAKEOFF ROLL TRIM WITH ASYMMETRIC STORES, FIGURE N-1, PAGE N-7.

TAKE-OFF SPEED & DISTANCE

DATA BASIS FLT TEST **ENGINE F100–PW–220**

CONFIGURATION:

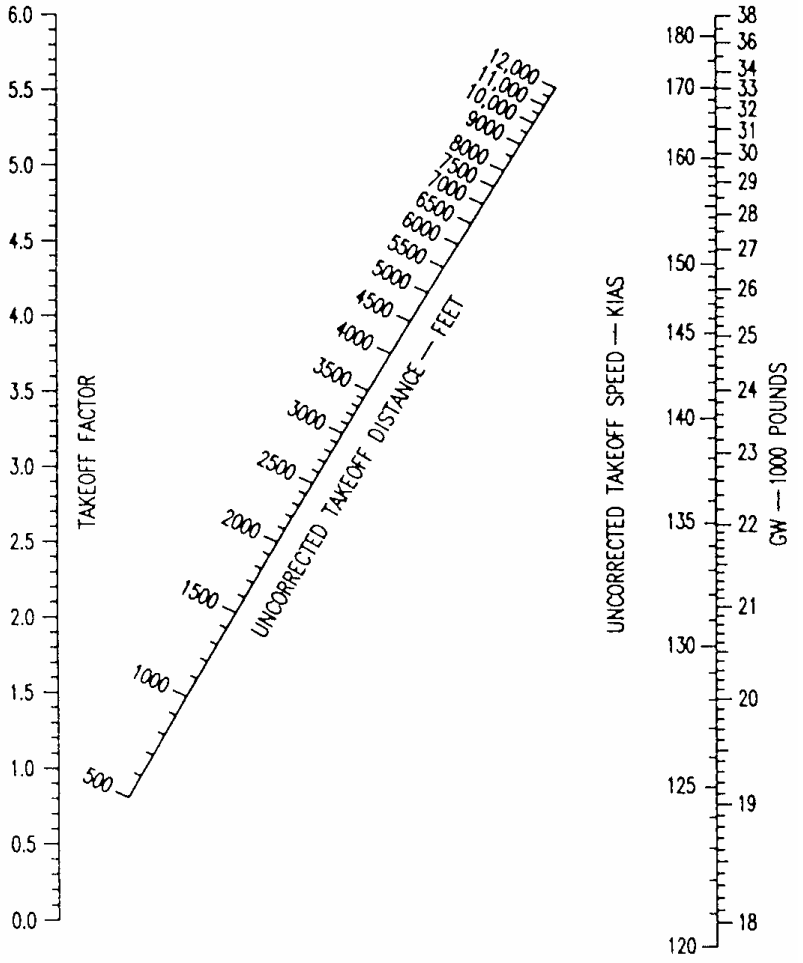
- ALL DRAG INDEXES
- CG = 35% MAC
- ZERO ROLL TRIM

CONDITIONS:

- ALL ALTITUDES
- ALL TEMPERATURES
- 10 DEGREES PITCH ATTITUDE

NOTES:

Refer to sheet 5.



TAKE-OFF SPEED & DISTANCE

DATA BASE FLT TEST **ENGINE F100-PW-220**

CONFIGURATION:

- ALL DRAG INDEXES
- CG=35% MAC
- ZERO ROLL TRIM

CONDITIONS:

- ALL ALTITUDES
- ALL TEMPERATURES
- 10 DEGREES PITCH ATTITUDE

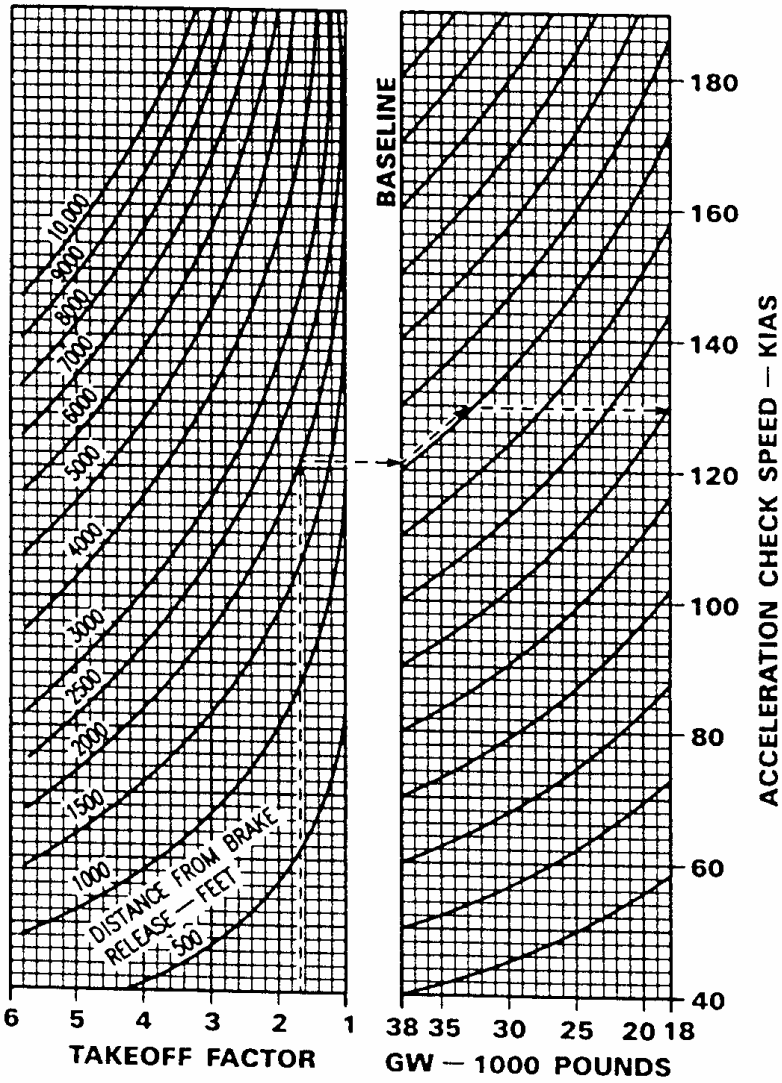
NOTES

- ROTATE AT 10 KIAS (NON-AB) OR 15 KIAS (AB) LESS THAN TAKEOFF SPEED.
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE TAKEOFF SPEED 8% AND DISTANCE 18% FOR AN 8° PITCH ATTITUDE ROTATION.
- INCREASE/DECREASE TAKEOFF SPEED 0.8 KIAS FOR EACH 1% FORWARD/AFT OF 35% MAC.
- INCREASE/DECREASE DISTANCE 1% FOR EACH 1% FORWARD/AFT OF 35% MAC.
- INCREASE DISTANCE 1.5% PER 100 DRAG INDEX.
- INCREASE/DECREASE DISTANCE 3% PER 1% UPSLOPE/DOWNSLOPE.
- INCREASE DISTANCE 12% PER 10 KTS TAILWIND.
- DECREASE DISTANCE 10% PER 10 KTS HEADWIND.
- FOR TAKEOFF SPEED CORRECTION WITH ROLL TRIM OTHER THAN ZERO, REFER TO TAKEOFF ROLL TRIM WITH ASYMMETRIC STORES, FIGURE N-1, PAGE N-7.

ACCELERATION CHECK SPEED

NOTES:

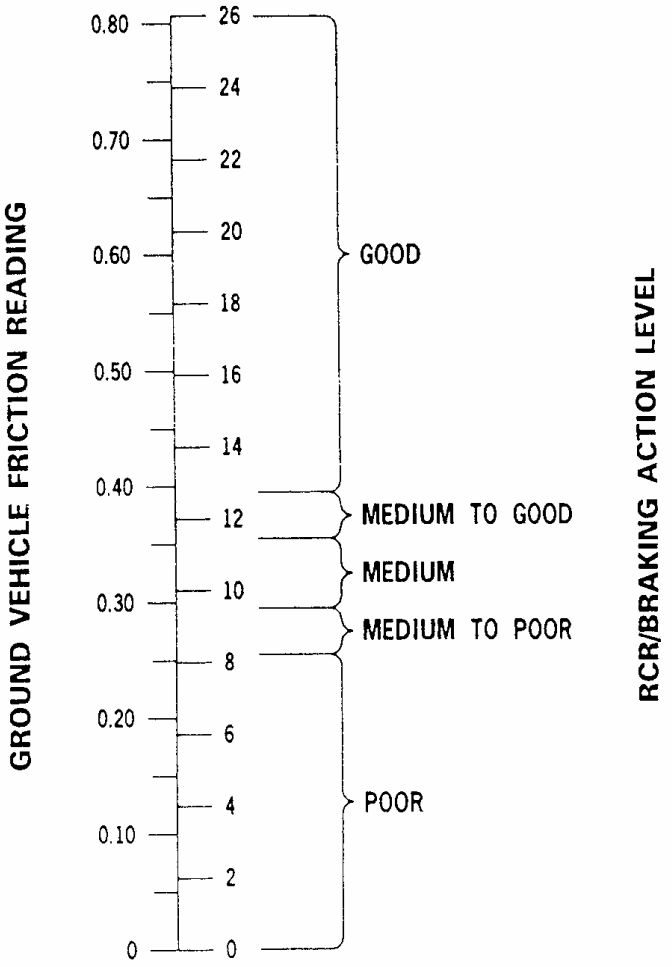
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE SPEED 1% PER 100 DRAG INDEX.
- INCREASE SPEED 7 KIAS PER 10 KTS HEADWIND.
- DECREASE SPEED 7 KIAS PER 10 KTS TAILWIND.
- INCREASE SPEED 3% PER 1% DOWNHILL SLOPE.
- DECREASE SPEED 3% PER 1% UPHILL SLOPE.



GROUND VEHICLE FRICTION

NOTES:

- IN MANY AREAS, GROUND VEHICLE FRICTION READING IS THE ONLY AVAILABLE MEASURE FOR RUNWAY BRAKING ACTION.
- NORMALLY THE GROUND VEHICLE FRICTION READING, ALSO REFERRED TO AS BRAKING ACTION COEFFICIENT, IS GIVEN AS WHOLE NUMBERS, NOT AS DECIMALS (I.E., 40 INSTEAD OF 0.40).



REFUSAL SPEED

DATA BASIS ESTIMATED ENGINE F100-PW-220

CONFIGURATION:

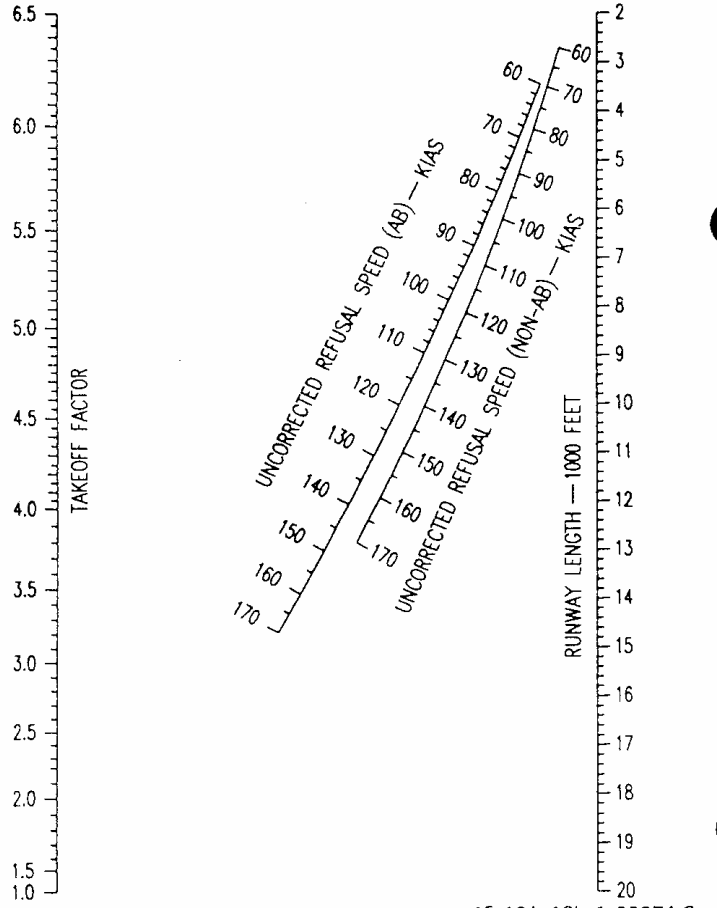
- **ALL DRAG INDEXES**
- **SPEEDBRAKES — OPEN**
- **GW = 28,000 LB**

CONDITIONS:

- **IDLE SELECTED AT REFUSAL SPEED**
- **MAX EFFORT BRAKING**
- **DRY CONCRETE (RCR=23)**

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- FOR RCR=16 (DRY) DECREASE NON-AB/AB DRY RUNWAY REFUSAL SPEED BY 4/5 KIAS.
- INCREASE/DECREASE REFUSAL SPEED 1.4%/1.3% WITH NON-AB AND 1.2%/1.5% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 5 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 0/2 KIAS WITH NON-AB AND 2/4 KIAS WITH AB PER 1% UPSLOPE/ DOWNSLOPE.



DATA BASIS ESTIMATED **ENGINE F100-PW-220**

CONFIGURATION:

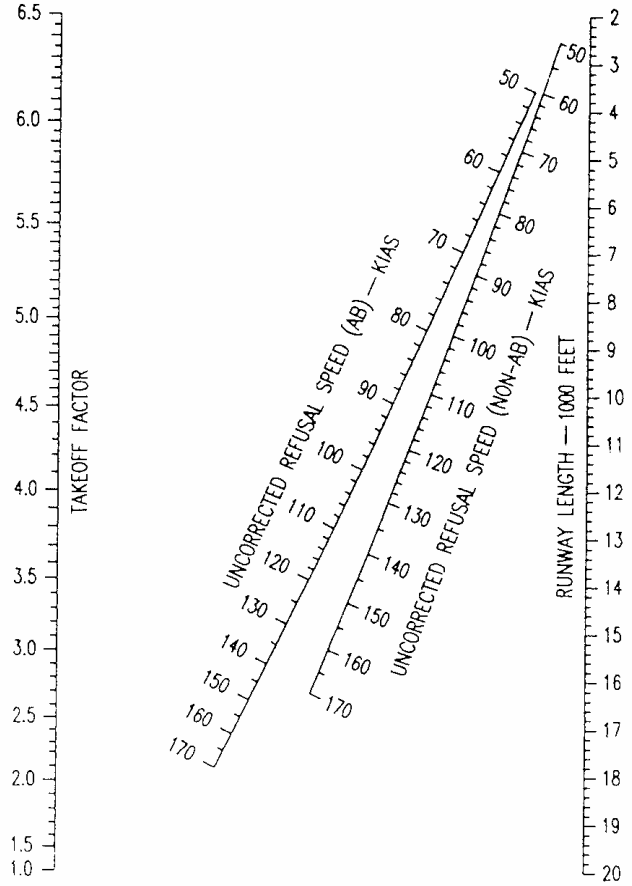
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- WET CONCRETE (RCR=18)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- FOR RCR=12 (WET) DECREASE NON-AB/AB WET RUNWAY REFUSAL SPEED BY 11/12 KIAS.
- INCREASE/DECREASE REFUSAL SPEED 0.9%/1.1% WITH NON-AB AND 0.7%/0.4% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 7 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 4/7 KIAS WITH NON-AB AND 6/9 KIAS WITH AB PER 1% UPSLOPE/ DOWNSLOPE.



CONFIGURATION:

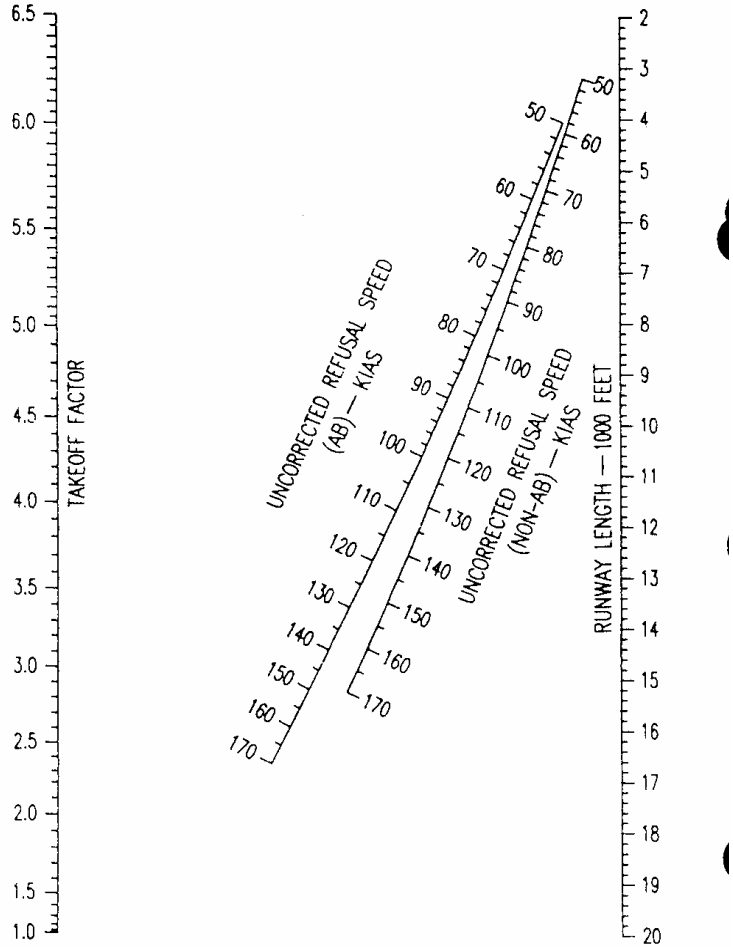
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- SNOW (RCR=8)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE/DECREASE REFUSAL SPEED 0.8%/0.7% WITH NON-AB AND 0.8%/0.6% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 7 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 4/9 KIAS WITH NON-AB AND 7/12 KIAS WITH AB PER 1% UPSLOPE/ DOWNSLOPE.



REFUSAL SPEED

P-14

CONFIGURATION:

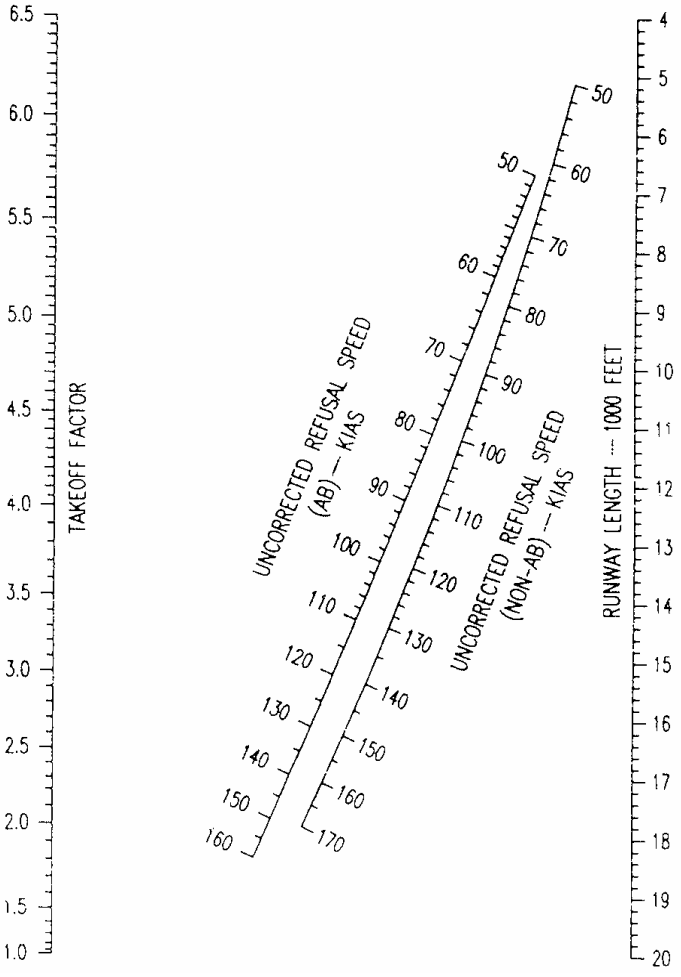
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- ICY (RCR=4)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE/DECREASE REFUSAL SPEED 0.2% PER 1000 LB LESS/ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 7 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 4/9 KIAS WITH NON-AB AND 7/12 KIAS WITH AB PER 1% UPSLOPE/DOWNSLOPE.



REFUSAL SPEED WITH DRAG-PARACHUTE

P-15

CONFIGURATION:

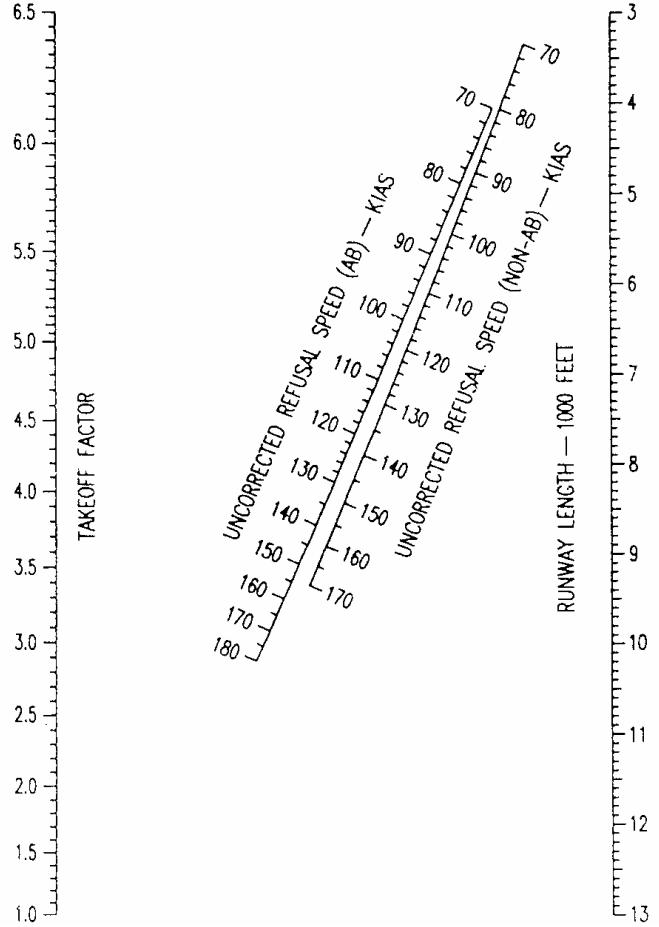
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- DRY CONCRETE (RCR=23)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- FOR RCR=16 (DRY) DECREASE DRY RUNWAY REFUSAL SPEED BY 3 KIAS.
- INCREASE/DECREASE REFUSAL SPEED 2.0%/2.1% WITH NON-AB AND 2.0%/1.8% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 6 KIAS PER 5 KTS HEADWIND/TAILWIND.
- DECREASE/INCREASE REFUSAL SPEED 1.3 KIAS WITH NON-AB PER 1% UPSLOPE/DOWNSLOPE.
- INCREASE/DECREASE REFUSAL SPEED 0.7/1.0 KIAS WITH AB PER 1% UPSLOPE/DOWNSLOPE.



REFUSAL SPEED WITH DRAG-PARACHUTE

CONFIGURATION:

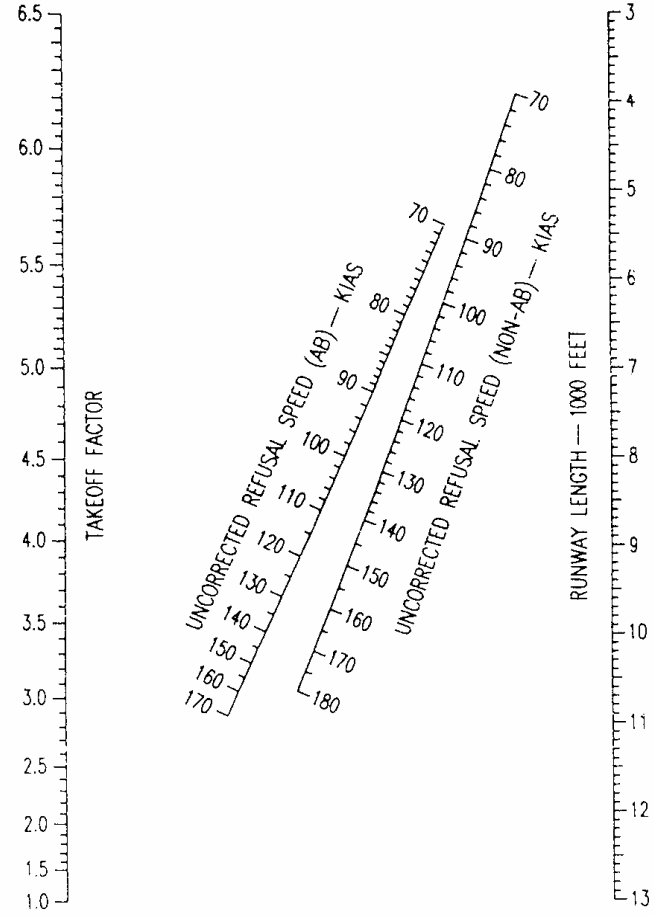
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- WET CONCRETE (RCR=18)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- FOR RCR=12 (WET) DECREASE NON-AB/AB WET RUNWAY REFUSAL SPEED BY 7/8 KIAS.
- INCREASE/DECREASE REFUSAL SPEED 2.2%/1.7% WITH NON-AB AND 2.2%/1.6% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 8 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 0 KIAS WITH NON-AB AND 1.5/1.7 KIAS WITH AB PER 1% UPSLOPE/ DOWNSLOPE.



REFUSAL SPEED WITH DRAG-PARACHUTE

CONFIGURATION:

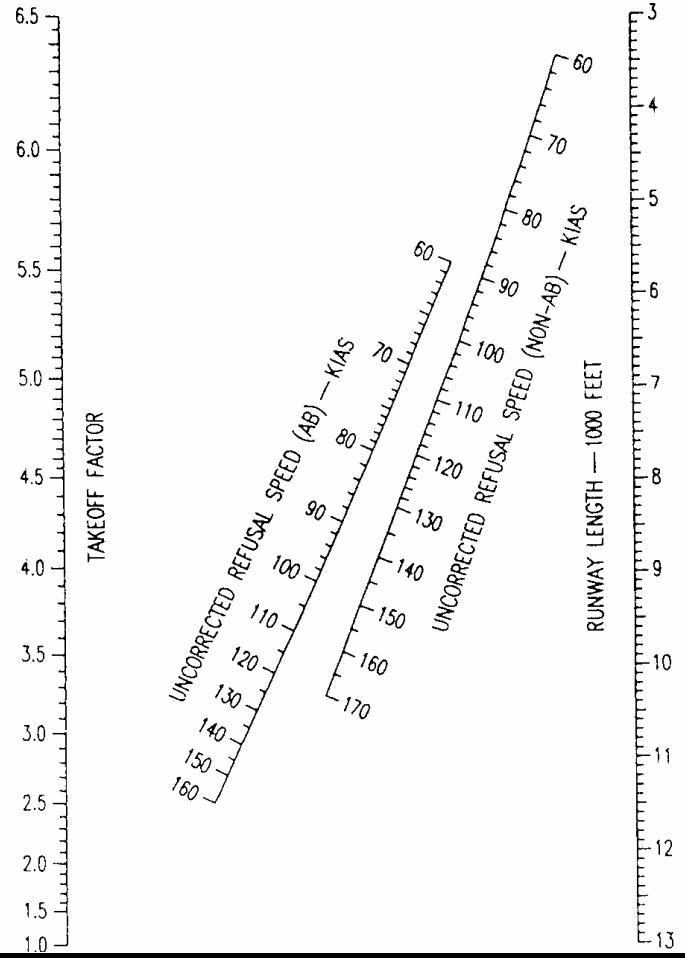
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- SNOW (RCR=8)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE/DECREASE REFUSAL SPEED 2.3%/1.5% WITH NON-AB AND 2.2%/1.6% WITH AB PER 1000 LB LESS/ ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 9 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 1.0/1.6 KIAS WITH NON-AB AND 2.3/4.0 KIAS WITH AB PER 1% UPSLOPE/DOWNSLOPE.



REFUSAL SPEED WITH DRAG-PARACHUTE

CONFIGURATION:

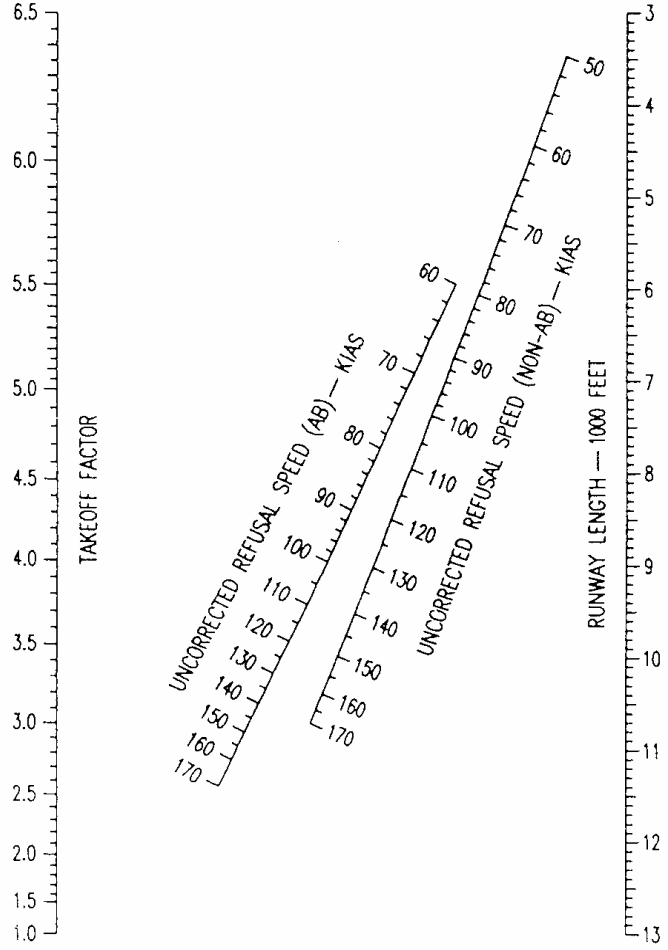
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN
- GW = 28,000 LB

CONDITIONS:

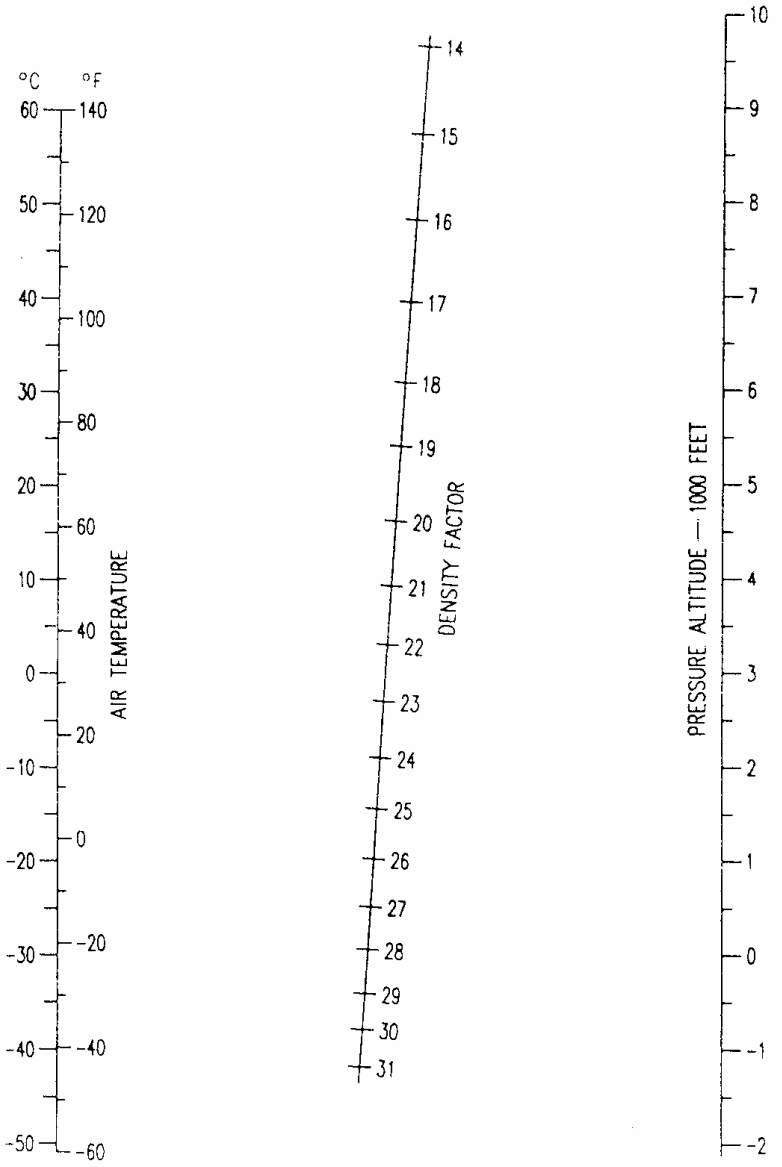
- IDLE SELECTED AT REFUSAL SPEED
- MAX EFFORT BRAKING
- ICY (RCR=4)

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- INCREASE/DECREASE REFUSAL SPEED 2.4%/1.5% WITH NON-AB AND 2.5%/1.8% WITH AB PER 1000 LB LESS/ADDITIONAL GW.
- INCREASE/DECREASE REFUSAL SPEED 13 KIAS PER 5 KTS HEADWIND/TAILWIND.
- INCREASE/DECREASE REFUSAL SPEED 3/4 KIAS WITH NON-AB AND 4/10 KIAS WITH AB PER 1% UPSLOPE/DOWNSLOPE.



LANDING DENSITY FACTOR



APPROACH SPEED

DATA BASIS FLIGHT TEST **ENGINE F100-PW-220**

CONFIGURATION
- ALL DRAG INDEXES

CONDITIONS:
- ALL TEMPERATURES
- ALL ALTITUDES
- 13 DEGREES AOA (INDEXER ON SPEED)

GROSS WEIGHT	AIRSPEED (KIAS)
17,000	125
18,000	129
19,000	132
20,000	136
21,000	139
22,000	142
23,000	146
24,000	149
25,000	152
26,000	155
27,000	158
28,000	161
29,000	164
30,000	166
31,000	169
32,000	172
33,000	174
34,000	177
35,000	180
36,000	182
37,000	185
38,000	187

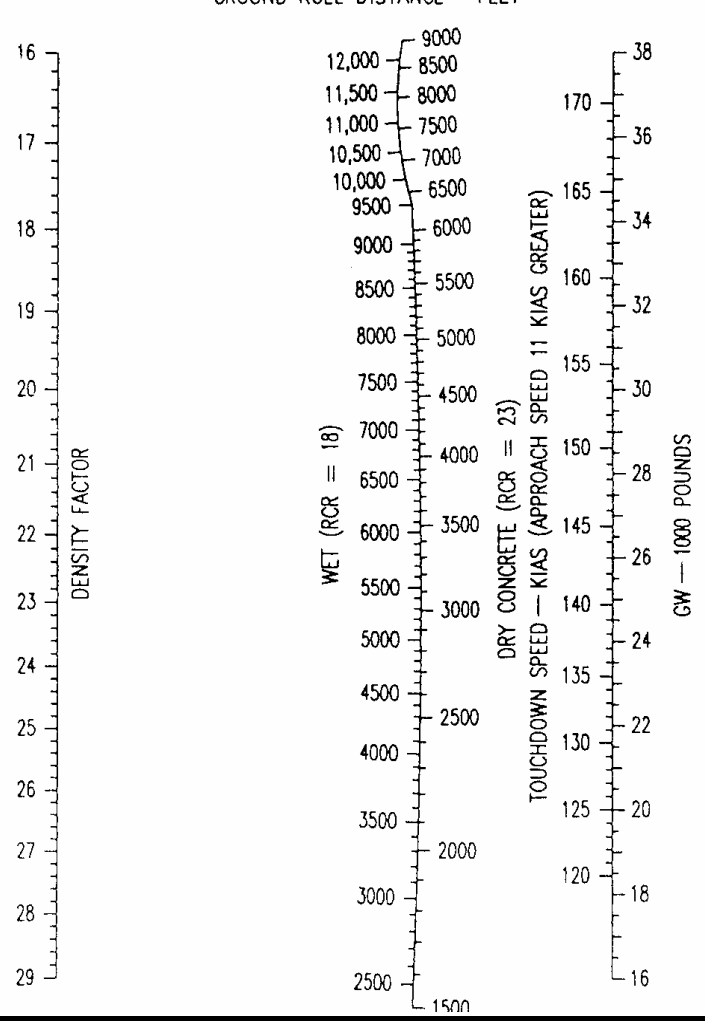
NOTE: Add 8 KIAS for an 11° AOA approach.

REFUSAL SPEED WITH DRAG-PARACHUTE

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.5% PER 1 KT HEADWIND.
- INCREASE DISTANCE 2.2% PER 1 KT TAILWIND.
- DECREASE DISTANCE 6.0% PER 1% UPSLOPE.
- INCREASE DISTANCE 6.0% PER 1% DOWNSLOPE.

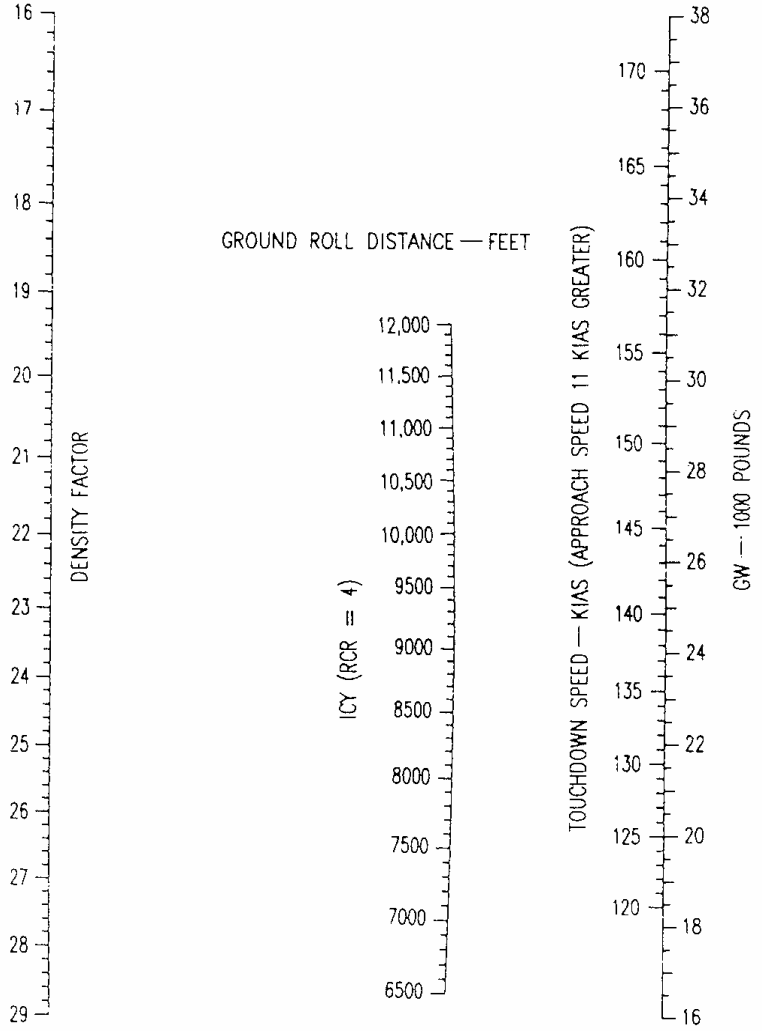


SHORT FIELD LANDING DISTANCE

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.5% PER 1 KT HEADWIND.
- INCREASE DISTANCE 2.2% PER 1 KT TAILWIND.
- DECREASE DISTANCE 6.0% PER 1% UPSLOPE.
- INCREASE DISTANCE 6.0% PER 1% DOWNSLOPE.

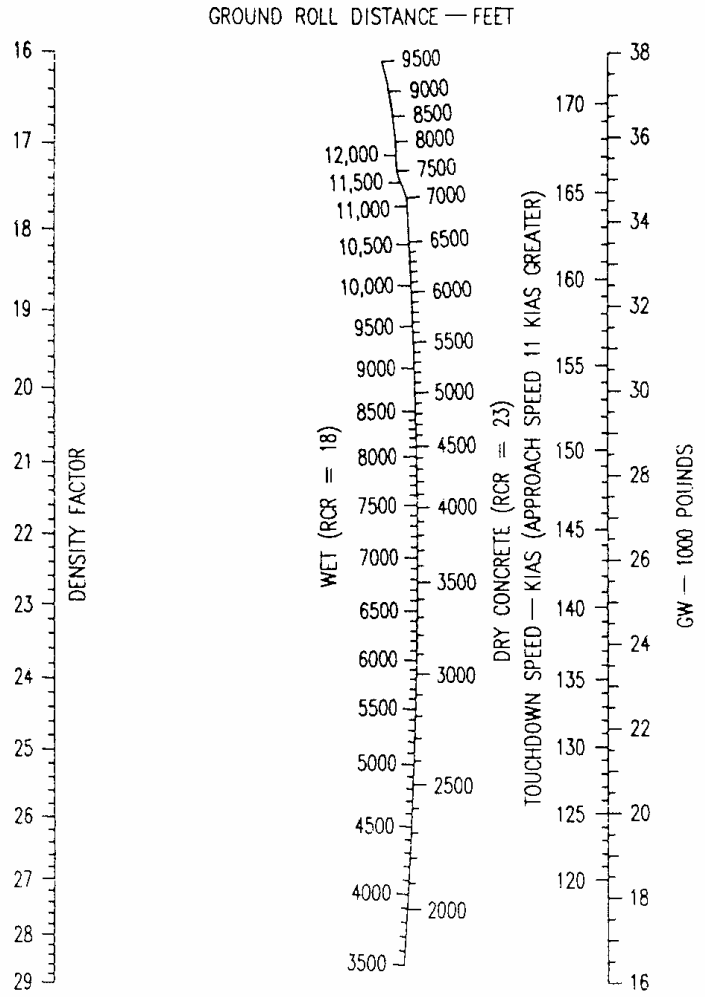


SHORT FIELD LANDING DISTANCE - SEC

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.5% PER 1 KT HEADWIND.
- INCREASE DISTANCE 2.2% PER 1 KT TAILWIND.
- DECREASE DISTANCE 6.0% PER 1% UPSLOPE.
- INCREASE DISTANCE 6.0% PER 1% DOWNSLOPE.

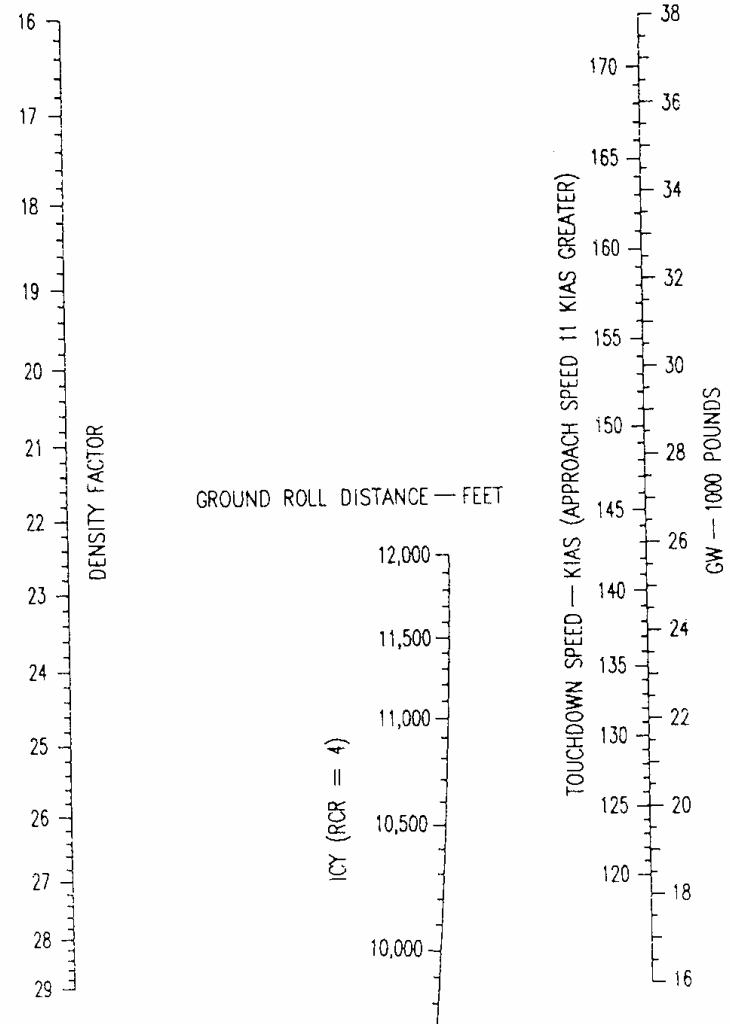


SHORT FIELD LANDING DISTANCE - SEC

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.5% PER 1 KT HEADWIND.
- INCREASE DISTANCE 2.2% PER 1 KT TAILWIND.
- DECREASE DISTANCE 6.0% PER 1% UPSLOPE.
- INCREASE DISTANCE 6.0% PER 1% DOWNSLOPE.

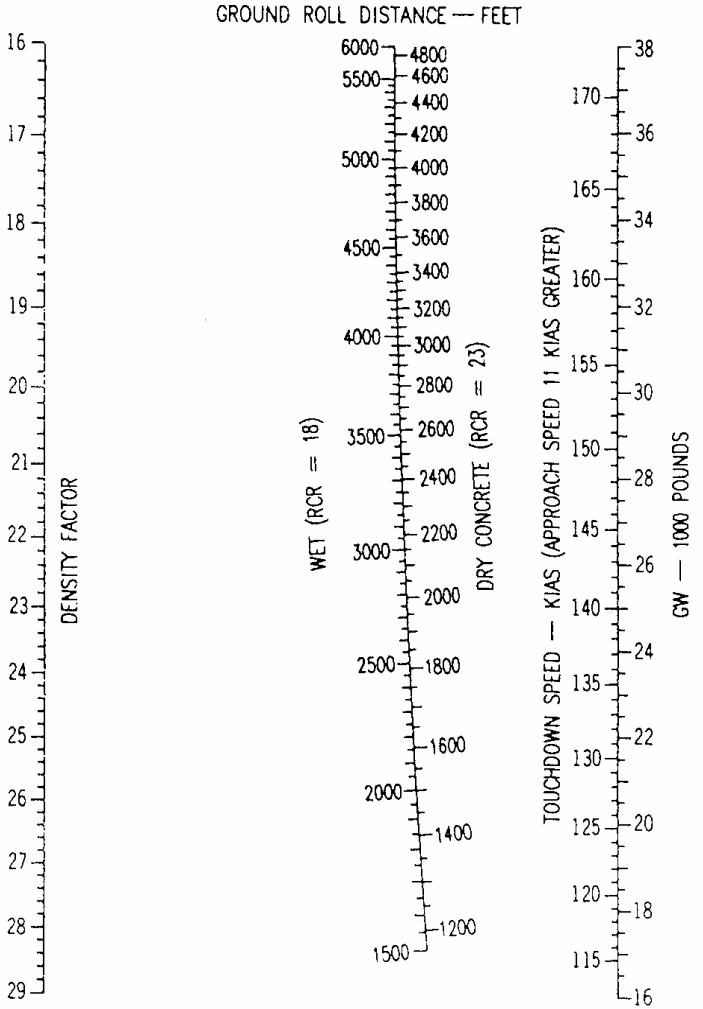


SHORT FIELD LANDING DISTANCE – DRAG CHUTE

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.2% PER 1 KT HEADWIND.
- INCREASE DISTANCE 1.5% PER 1 KT TAILWIND.
- DECREASE DISTANCE 2.3% PER 1% UPSLOPE.
- INCREASE DISTANCE 3.0% PER 1% DOWNSLOPE.

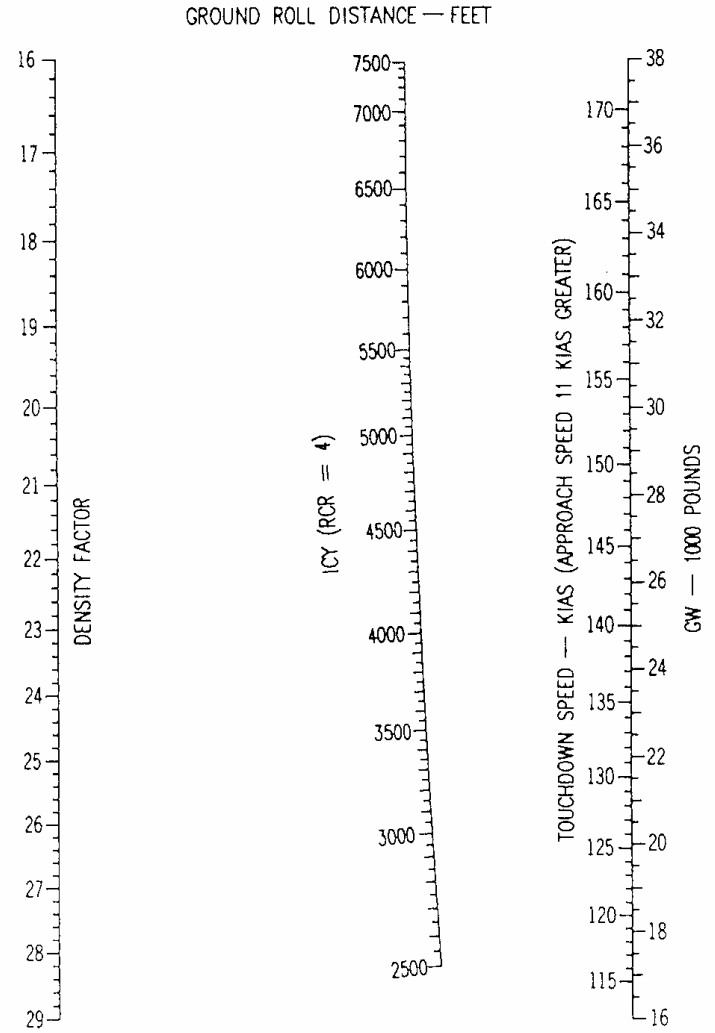


SHORT FIELD LANDING DISTANCE – DRAG CHUTE

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.2% PER 1 KT HEADWIND.
- INCREASE DISTANCE 1.5% PER 1 KT TAILWIND.
- DECREASE DISTANCE 2.3% PER 1% UPSLOPE.
- INCREASE DISTANCE 3.0% PER 1% DOWNSLOPE.

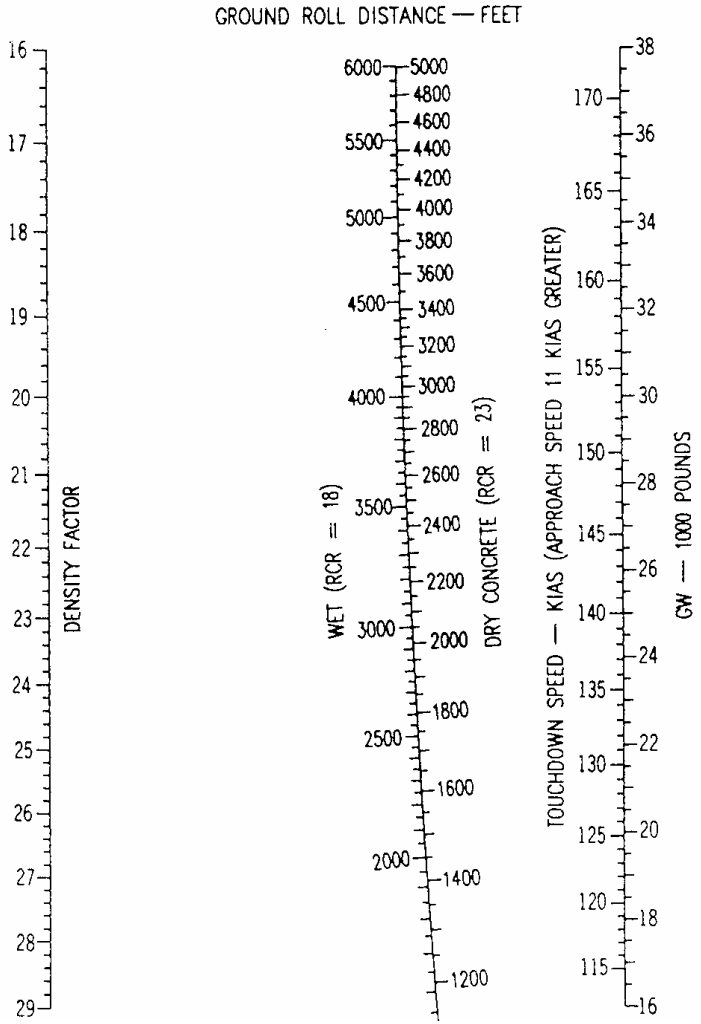


SHORT FIELD LNDG DIST – SEC & DRAG CHUTE

CONFIGURATION:
- ALL DRAG INDEXES
- SPEEDBRAKES — OPEN

CONDITIONS:
- TOUCHDOWN AT 13 DEGREES AOA
- ZERO WIND AND SLOPE
- IDLE
- MAX EFFORT BRAKING

NOTES:
- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.2% PER 1 KT HEADWIND.
- INCREASE DISTANCE 1.5% PER 1 KT TAILWIND.
- DECREASE DISTANCE 2.3% PER 1% UPSLOPE.
- INCREASE DISTANCE 3.0% PER 1% DOWNSLOPE.



SHORT FIELD LNDG DIST – SEC & DRAG CHUTE

CONFIGURATION:

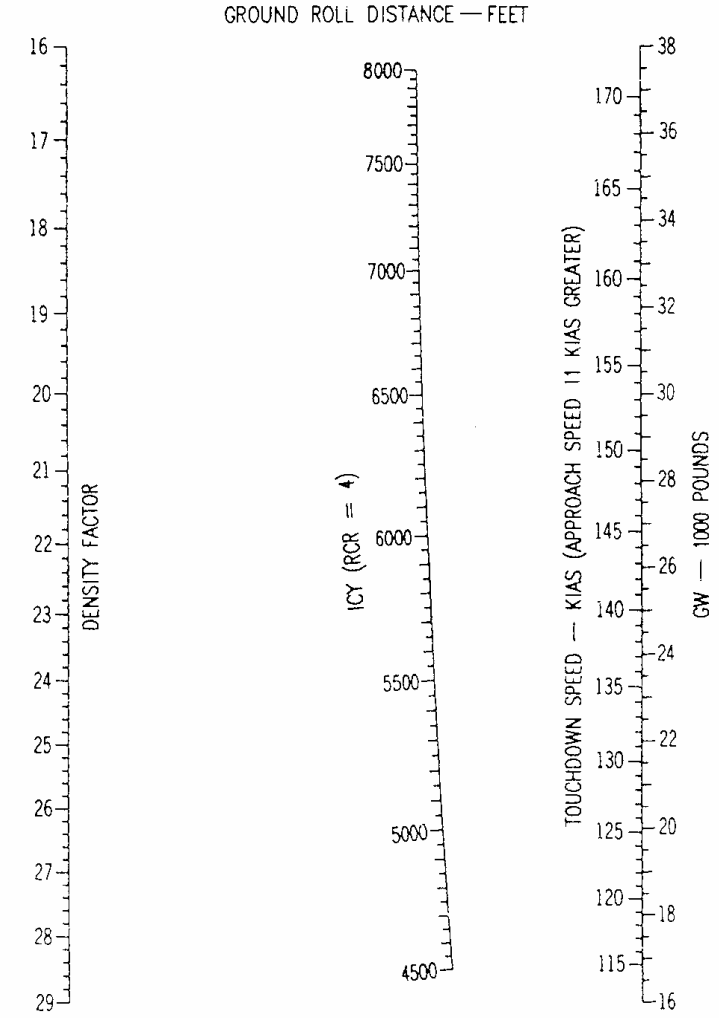
- **ALL DRAG INDEXES**
- **SPEEDBRAKES — OPEN**

CONDITIONS:

- **TOUCHDOWN AT 13 DEGREES AOA**
- **ZERO WIND AND SLOPE**
- **IDLE**
- **MAX EFFORT BRAKING**

NOTES:

- COMPUTE % INCREASE/DECREASE CHANGES INDIVIDUALLY.
- DECREASE DISTANCE 1.2% PER 1 KT HEADWIND.
- INCREASE DISTANCE 1.5% PER 1 KT TAILWIND.
- DECREASE DISTANCE 2.3% PER 1% UPSLOPE.
- INCREASE DISTANCE 3.0% PER 1% DOWNSLOPE.



CLIMB – OPTIMUM CRUISE DI = 0

NOTES:

- STD DAY/FULLY SERVICED FUEL = 7294 LB.
- 800 LB FUEL ALLOWANCE FOR GROUND OPERATION AND TAKEOFF/ACCELERATION TO MIL CLIMB AIRSPEED (ASSUME 30 MIN GROUND TIME).
- CLIMB AT KIAS/MACH NO., WHICHEVER IS SLOWER.

MIL CLIMB					OPTIMUM CRUISE	
					AT LEVEL OFF	
ALT 1000 FEET	CLIMB @ KIAS / MACH	TIME (MIN)	DIST (NM)	FUEL REMAINING AT LEVEL OFF (LB)	MACH/KIAS/KTAS	TOTAL FUEL FLOW (LB/HR)
50	- - -	- - -	- - -	- - -	- - -	- - -
45	450 / 0.88	8.1	68.0	5784	0.88/239/502	2222
40	450 / 0.85	5.1	41.6	5943	0.85/260/488	2087
35	450 / 0.83	3.6	29.3	6038	0.83/282/476	2143
30	450 / 0.77	2.8	21.1	6120	0.77/291/453	2231
25	450 / 0.70	2.1	14.5	6200	0.70/293/421	2283
20	0.66	1.5	10.1	6262	0.66/302/402	2425
10	0.55	0.7	4.1	6370	0.55/303/349	2643
SL	0.46	0	0	6494	0.46/306/306	2948

OPTIMUM CRUISE

	5000 LB REMAINING		3000 LB REMAINING		2000 LB REMAINING	
ALT 1000 FEET	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)
50	- - -	- - -	- - -	- - -	- - -	- - -
45	0.88/239/502	2145	0.88/239/502	1922	0.88/239/502	1831
40	0.85/259/488	2028	0.85/259/488	1898	0.85/259/488	1838
35	0.81/276/467	2058	0.80/272/461	1927	0.79/269/456	1859
30	0.75/284/443	2130	0.73/275/430	1977	0.71/268/420	1882
25	0.70/292/421	2231	0.69/286/413	2101	0.66/276/399	1995
20	0.64/293/391	2314	0.60/277/371	2121	0.60/275/369	2068
10	0.53/293/337	2508	0.50/277/319	2301	0.50/277/319	2265
SL	0.45/297/296	2811	0.43/283/283	2620	0.42/277/276	2523

CLIMB – OPTIMUM CRUISE DI = 22

NOTES:

- STD DAY/FULLY SERVICED FUEL = 7294 LB + 2040 = 9334 LB.
- 800 LB FUEL ALLOWANCE FOR GROUND OPERATION AND TAKEOFF/ACCELERATION TO MIL CLIMB AIRSPEED (ASSUME 30 MIN GROUND TIME).
- CLIMB AT KIAS/MACH NO., WHICHEVER IS SLOWER.

MIL CLIMB					OPTIMUM CRUISE	
					AT LEVEL OFF	
ALT 1000 FEET	CLIMB @ KIAS / MACH	TIME (MIN)	DIST (NM)	FUEL REMAINING AT LEVEL OFF (LB)	MACH/KIAS/KTAS	TOTAL FUEL FLOW (LB/HR)
45	- - -	- - -	- - -	- - -	- - -	- - -
40	435 / 0.88	6.5	54.1	7833	0.88/268/502	2463
35	435 / 0.84	4.5	36.5	7971	0.84/289/486	2458
30	435 / 0.79	3.3	26.0	8078	0.79/299/464	2526
25	435 / 0.72	2.5	18.0	8176	0.72/299/430	2574
20	435 / 0.66	1.8	12.0	8264	0.66/302/402	2641
10	0.56	0.8	4.8	8394	0.56/312/359	2924
SL	0.47	0	0	8534	0.47/312/312	3214

OPTIMUM CRUISE

	5000 LB REMAINING		3000 LB REMAINING		2000 LB REMAINING	
ALT 1000 FEET	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)
45	- - -	- - -	- - -	- - -	- - -	- - -
40	0.85/259/488	2174	0.85/259/488	2040	0.84/255/481	1953
35	0.80/272/461	2169	0.80/272/461	2058	0.78/264/449	1956
30	0.75/283/442	2266	0.72/272/425	2085	0.70/264/415	1983
25	0.69/287/415	2338	0.66/273/395	2135	0.65/270/391	2067
20	0.63/288/385	2396	0.60/275/369	2215	0.60/275/369	2176
10	0.52/288/332	2587	0.50/277/319	2413	0.50/276/319	2370
SL	0.44/291/291	2883	0.42/279/279	2689	0.41/272/272	2588

CLIMB – OPTIMUM CRUISE DI = 53

NOTES:

- STD DAY/FULLY SERVICED FUEL = 7294 LB + 5032 LB = 12,326 LB.
- 800 LB FUEL ALLOWANCE FOR GROUND OPERATION AND TAKEOFF/ACCELERATION TO MIL CLIMB AIRSPEED (ASSUME 30 MIN GROUND TIME).
- CLIMB AT KIAS/MACH NO., WHICHEVER IS SLOWER.

MIL CLIMB					OPTIMUM CRUISE	
					AT LEVEL OFF	
ALT 1000 FEET	CLIMB @ KIAS / MACH	TIME (MIN)	DIST (NM)	FUEL REMAINING AT LEVEL OFF (LB)	MACH/KIAS/KTAS	TOTAL FUEL FLOW (LB/HR)
45	- - -	- - -	- - -	- - -	- - -	- - -
40	413 / 0.87	10.9	90.3	10,470	0.87/266/498	3040
35	413 / 0.85	6.1	49.4	10,776	0.85/291/490	2890
30	413 / 0.80	4.4	34.3	10,928	0.80/304/471	2959
25	413 / 0.74	3.2	23.8	11,057	0.74/309/443	3021
20	413 / 0.68	2.3	16.0	11,173	0.68/312/415	3095
10	0.58	1.0	6.0	11,360	0.58/324/372	3346
SL	0.49	0	0	11,526	0.49/321/321	3610

OPTIMUM CRUISE

	8000 LB REMAINING		5000 LB REMAINING		2000 LB REMAINING	
ALT 1000 FEET	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)
45	- - -	- - -	- - -	- - -	- - -	- - -
40	0.85/259/488	2677	0.85/259/488	2370	0.82/249/470	2071
35	0.82/280/473	2609	0.80/272/461	2353	0.76/256/436	2052
30	0.77/290/451	2665	0.74/278/434	2400	0.70/263/413	2123
25	0.70/292/421	2714	0.67/280/405	2453	0.63/260/377	2138
20	0.64/294/393	2767	0.60/275/369	2445	0.59/269/361	2264
10	0.54/302/347	2996	0.51/281/324	2669	0.49/269/310	2440
SL	0.46/302/302	3264	0.43/283/283	2954	0.40/265/265	2647

CLIMB – OPTIMUM CRUISE DI = 79

NOTES:

- STD DAY/FULLY SERVICED FUEL = 7294 LB + 5032 LB +2040 LB = 14,366 LB.
- 1400 LB FUEL ALLOWANCE FOR GROUND OPERATION AND MAX AB TAKEOFF/ACCELERATION TO MIL CLIMB AIRSPEED (ASSUME 30 MIN GROUND TIME).
- TAKEOFF AND CLIMB TO MIL CLIMB AIRSPEED WITH MAX AB.
- CLIMB AT KIAS/MACH NO., WHICHEVER IS SLOWER.

MIL CLIMB					OPTIMUM CRUISE	
					AT LEVEL OFF	
ALT 1000 FEET	CLIMB @ KIAS / MACH	TIME (MIN)	DIST (NM)	FUEL REMAINING AT LEVEL OFF (LB)	MACH/KIAS/KTAS	TOTAL FUEL FLOW (LB/HR)
40	- - -	- - -	- - -	- - -	- - -	- - -
35	395 / 0.85	7.6	61.3	12,053	0.85/291/490	3235
30	395 / 0.80	5.3	40.7	12,258	0.80/304/471	3244
25	395 / 0.74	3.8	27.7	12,417	0.74/308/443	3284
20	395 / 0.68	2.7	18.7	12,551	0.68/314/417	3366
10	0.58	1.1	6.6	12,780	0.58/320/368	3544
SL	0.49	0	0	12,966	0.49/323/323	3856

OPTIMUM CRUISE

	9000 LB REMAINING		5000 LB REMAINING		2000 LB REMAINING	
ALT 1000 FEET	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)	MACH/KIAS/ KTAS	TOTAL FUEL FLOW (LB/HR)
40	- - -	- - -	- - -	- - -	- - -	- - -
35	0.82/280/474	2882	0.80/270/458	2506	0.75/253/432	2180
30	0.76/289/450	2910	0.72/272/426	2510	0.69/260/408	2237
25	0.70/293/422	2945	0.66/275/398	2566	0.62/256/372	2242
20	0.64/295/394	3001	0.60/275/369	2593	0.58/268/359	2374
10	0.55/307/353	3238	0.51/283/326	2822	0.48/266/307	2537
SL	0.46/305/305	3493	0.43/282/282	3069	0.40/265/265	2765

DIVERT – DECISION

CONDITIONS:

- **CLIMB AT MIL, 400 KIAS OR OPTIMUM ALTITUDE MACH NUMBER, WHICHEVER IS LESS**
- **DESCEND AT IDLE, 205 KIAS**
- **STANDARD DAY**
- **NO FUEL RESERVE**
- **ZERO WIND**
- **ALL DESCENTS ARE TO SEA LEVEL**
- **DRAG INDEX = 49**

NOTES:

- 4.0% RANGE GAIN FOR 10 KTS TAILWIND.
- 2.5% RANGE LOSS FOR 10 KTS HEADWIND.
- SUBTRACT 2.6 NM FROM DESCENT DISTANCE FOR EACH 1000 FT OF DESTINATION ELEVATION.
- TOTAL DIVERT RANGE AT CURRENT ALTITUDE INCLUDES CRUISE AND DESCENT, AND TOTAL DIVERT RANGE AT OPTIMUM ALTITUDE INCLUDES CLIMB, CRUISE, AND DESCENT.

IF YOU ARE AT SEA LEVEL

FUEL ON BOARD –LB	REMAIN AT SEA LEVEL	CLIMB TO OPT ALTITUDE		DESCEND	
	TOTAL DIVERT RANGE–NM	ALT/MACH	TOTAL DIVERT RANGE–NM	FROM OPT ALT –NM	FUEL USED IN DESCENT –LB
200	22	8.0K/0.45	24	20	107
400	43	20.0K/0.55	55	46	191
600	64	28.0K/0.65	92	68	251
800	84 0.40M	34.0K/0.72	134	85	293
1000	105	37.0K/0.76	179	94	316
1500	157	43.0K/0.85	295	116	369
2000	208	44.0K/0.85	411	121	380

IF YOU ARE AT 5000 FEET

FUEL ON BOARD –LB	REMAIN AT 5000 FT TOTAL DIVERT RANGE–NM*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL DIVERT RANGE–NM	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	29	11.0K/0.48	30	27	131
400	52	23.0K/0.59	63	53	212
600	76	30.0K/0.67	103	72	261
800	99 0.43M	37.0K/0.75	146	92	312
1000	123	39.0K/0.80	191	103	337
1500	181	43.0K/0.85	308	116	369
2000	239	44.0K/0.85	425	121	380

* START DESCENT AT 14 NM. 78 LB FUEL USED IN DESCENT.

IF YOU ARE AT 10,000 FEET

FUEL ON BOARD –LB	REMAIN AT 10,000 FT TOTAL DIVERT RANGE–NM*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL DIVERT RANGE–NM	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	35	13.0K/0.50	36	31	147
400	62	26.0K/0.62	71	61	232
600	89	34.0K/0.71	114	83	289
800	115 0.48M	37.0K/0.75	158	92	312
1000	142	39.0K/0.80	204	103	337
1500	207	44.0K/0.85	322	121	380
2000	273	44.0K/0.85	438	121	380

* START DESCENT AT 25 NM. 126 LB FUEL USED IN DESCENT.

IF YOU ARE AT 20,000 FEET

FUEL ON BOARD –LB	REMAIN AT 20,000 FT TOTAL DIVERT RANGE–NM*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL DIVERT RANGE–NM	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	48	20.0K/0.56	48	47	194
400	82	31.0K/0.69	87	76	271
600	115	40.0K/0.81	134	107	346
800	148 0.56M	43.0K/0.84	182	116	370
1000	182	43.0K/0.84	230	116	369
1500	264	44.0K/0.85	349	121	380
2000	346	44.0K/0.85	465	121	380

* START DESCENT AT 47 NM. 194 LB FUEL USED IN DESCENT.

IF YOU ARE AT 30,000 FEET

FUEL ON BOARD –LB	REMAIN AT 30,000 FT TOTAL DIVERT RANGE–NM*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL DIVERT RANGE–NM	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	---	---	---	---	---
400	101	35.0K/0.73	103	87	299
600	142	43.0K/0.85	152	118	373
800	182 0.68M	43.0K/0.85	200	118	373
1000	223	43.0K/0.85	248	118	373
1500	323	44.0K/0.85	367	119	377
2000	423	44.0K/0.85	483	119	377

* START DESCENT AT 72 NM. 262 LB FUEL USED IN DESCENT.

CONDITIONS:

- **CLIMB AT MIL, 400 KIAS OR OPTIMUM ALTITUDE MACH NUMBER, WHICHEVER IS LESS**
- **DESCEND AT IDLE, 205 KIAS**
- **STANDARD DAY**
- **NO FUEL RESERVE**
- **ZERO WIND**
- **ALL DESCENTS ARE TO SEA LEVEL**
- **DRAG INDEX = 49**

NOTES:

- LOITER TIME AT CONSTANT ALTITUDE BASED ON 10 NM HOLDING PATTERN WHEN 30-DEGREE BANK TURNS.
- ADD 2.2 MIN TO LOITER TIME FOR EACH 1000 FT OF DESTINATION ELEVATION.
- SUBTRACT 2.3 NM FROM DESCENT DISTANCE FOR EACH 1000 FT OF DESTINATION ELEVATION.
- TOTAL LOITER TIME AT CURRENT ALTITUDE INCLUDES LOITER AND DESCENT, AND TOTAL TIME AT OPTIMUM ALTITUDE INCLUDES CLIMB, LOITER, AND DESCENT.

IF YOU ARE AT SEA LEVEL

FUEL ON BOARD –LB	REMAIN AT SEA LEVEL TOTAL LOITER TIME–MIN	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL TIME–MIN	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	---	---	---	---	---
400	11	4.0K/0.34	11	11	61
600	16	17.0K/0.42	18	37	166
800	21 0.31M	30.0K/0.54	26	67	250
1000	26	35.0K/0.60	33	81	285
1500	38	35.0K/0.61	48	81	284
2000	51	34.0K/0.60	62	78	278

IF YOU ARE AT 5000 FEET

FUEL ON BOARD –LB	REMAIN AT 5000 FT TOTAL LOITER TIME–MIN*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL TIME–MIN	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	---	---	---	---	---
400	13	8.0K/0.36	13	19	100
600	18	21.0K/0.45	20	46	192
800	24 0.35M	33.0K/0.57	28	75	270
1000	29	36.0K/0.62	34	85	295
1500	42	36.0K/0.63	49	85	294
2000	55	33.0K/0.60	64	78	276

*** START DESCENT AT 12 NM. 70 LB FUEL USED IN DESCENT.**

IF YOU ARE AT 10,000 FEET

FUEL ON BOARD –LB	REMAIN AT 10,000 FT TOTAL LOITER TIME–MIN*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL TIME–MIN	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
200	---	---	---	---	---
400	15	12.0K/0.39	15	27	132
600	21	24.0K/0.48	22	53	212
800	26 0.39M	35.0K/0.61	29	83	289
1000	32	36.0K/0.62	35	85	295
1500	46	36.0K/0.63	50	85	294
2000	59	34.0K/0.60	65	78	279

*** START DESCENT AT 23 NM. 118 LB FUEL USED IN DESCENT.**

LOITER - DECISION

IF YOU ARE AT 20,000 FEET

FUEL ON BOARD –LB	REMAIN AT 20,000 FT TOTAL LOITER TIME–MIN*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL TIME–MIN	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
400	---	---	---	---	---
600	24	30.0K/0.54	25	68	252
800	31 0.45M	36.0K/0.62	32	85	295
1000	37	36.0K/0.62	38	85	294
1500	51	33.0K/0.60	53	77	276
2000	66	33.0K/0.59	67	75	270

*** START DESCENT AT 44 NM. 186 LB FUEL USED IN DESCENT.**

IF YOU ARE AT 30,000 FEET

FUEL ON BOARD –LB	REMAIN AT 30,000 FT TOTAL LOITER TIME–MIN*	CLIMB TO OPT ALTITUDE ALT/MACH	CLIMB TO OPT ALTITUDE TOTAL TIME–MIN	DESCEND FROM OPT ALT –NM	DESCEND FUEL USED IN DESCENT –LB
400	---	---	---	---	---
600	27	36.0K/0.62	28	84	292
800	34 0.55M	36.0K/0.62	34	84	293
1000	40	36.0K/0.62	40	84	291
1500	55	34.0K/0.61	55	80	281
2000	69	33.0K/0.60	69	77	275

*** START DESCENT AT 68 NM. 252 LB FUEL USED IN DESCENT.**

BEST CRUISE ALTITUDE FOR SHORT RANGE MISSIONS – MAXIMUM RANGE DESCENT

CONDITIONS:

- STANDARD DAY
- NO WIND
- MIL CLIMB AT SCHEDULED KIAS OR CONSTANT ALTITUDE OPTIMUM CRUISE MACH NO., WHICHEVER IS LOWER
- CRUISE AT CONSTANT ALTITUDE AT OPTIMUM MACH
- DESCEND AT IDLE WITH SPEEDBRAKES CLOSED
- DRAG INDEX/DESCENT SPEED KIAS = 0/200, 50/205, AND ≥ 100/210

ST CL GW* LB–1000	TOT MSN RG** NM	BEST CR ALT FT–1000	TOTAL FUEL CONSUMED (LB)/DESCENT RANGE (NM) DI 0	DI 100	DI 200
20.0	50	16.7	361/44.0	405/34.7	452/28.8
20.0	100	30.0	601/80.7	687/63.2	781/52.1
20.0	150	35.6	816/101.7	938/77.8	1077/63.8
20.0	200	38.1	1008/112.1	1174/85.7	1357/69.2
20.0	250	39.4	1197/118.7	1406/89.5	1634/72.0
24.0	50	17.7	384/41.6	428/35.6	493/29.7
24.0	100	27.9	661/66.1	769/56.4	878/48.0
24.0	150	33.0	904/80.4	1060/67.6	1224/57.8
24.0	200	35.5	1126/87.8	1334/74.1	1551/62.9
24.0	250	36.5	1346/91.5	1600/76.7	1874/65.0
28.0	50	15.5	---	471/29.4	540/25.7
28.0	100	25.1	---	852/47.9	981/41.7
28.0	150	30.4	---	1188/58.0	1373/51.0
28.0	200	31.9	---	1503/61.5	1753/53.9
28.0	250	33.5	---	1809/65.4	2121/57.2

*** CLIMB BEGINS AT SL.**
**** CLIMB/CRUISE/DESCENT.**

BEST CRUISE ALTITUDE FOR SHORT RANGE MISSIONS – MAXIMUM RANGE DESCENT

CONDITIONS:

- STANDARD DAY
- NO WIND
- MIL CLIMB AT SCHEDULED KIAS OR CONSTANT ALTITUDE OPTIMUM CRUISE MACH NO., WHICHEVER IS LOWER
- CRUISE AT CONSTANT ALTITUDE AT OPTIMUM MACH
- DESCEND AT IDLE WITH SPEEDBRAKES CLOSED
- DRAG INDEX/DESCENT SPEED KIAS = 0/200, 50/205, AND ≥ 100/210

ST CL GW*	TOT MSN RG**	BEST CR ALT	TOTAL FUEL CONSUMED (LB)/DESCENT RANGE (NM)		
LB–1000	NM	FT–1000	DI 0	DI 100	DI 200
32.0	50	12.5	---	512/23.1	591/20.2
32.0	100	21.5	---	941/38.2	1089/33.6
32.0	150	27.5	---	1318/48.5	1533/43.2
32.0	200	29.5	---	1675/52.2	1962/46.7
32.0	250	30.2	---	2024/53.9	2379/48.2
36.0	50	10.0	---	552/18.3	642/15.8
36.0	100	19.1	---	1030/31.7	1197/28.3
36.0	150	25.0	---	1453/40.8	1695/36.9
36.0	200	26.7	---	1852/43.7	2175/39.4
36.0	250	28.2	---	2243/46.6	2642/42.2
38.0	50	8.5	---	571/15.8	666/13.6
38.0	100	17.3	---	1075/28.2	1251/25.1
38.0	150	23.1	---	1520/36.6	1775/33.1
38.0	200	25.4	---	1941/40.2	2282/36.5
38.0	250	26.9	---	2351/42.8	2773/39.0

* CLIMB BEGINS AT SL.
** CLIMB/CRUISE/DESCENT

AIR AMBIANT TEMPERATURE

ALTITUDE —1000 FT	STD TEMP °C	STD TEMP °F
SL	15	59
5	5	41
10	-5	23
15	-15	6
20	-25	-12
25	-35	-30
30	-44	-48
35	-54	-66
40	-56	-70
45	-56	-70
50	-56	-70
55	-56	-70
60	-56	-70

°F = (9/5 °C) + 32°
°C = 5/9(°F - 32°)