TAKEOFF

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Required Takeoff Field Length (737-600)

Available Runway Length	Wind Corrected Field Length (Feet) Wind Component (minus equals a HEAD WIND)							
	-15	-10	-5	0	10	20	30	40
3,900	2,789	3,182	3,543	3,900	4,167	4,429	4,659	4,921
4,600	3,379	3,773	4,199	4,600	4,856	5,118	5,381	5,643
5,300	3,970	4,396	4,823	5,300	5,512	5,774	6,069	6,365
5,900	4,528	4,987	5,446	5,900	6,168	6,463	6,758	7,087
5,600	5,118	5,610	6,069	5,600	6,857	7,152	7,480	7,808
7,200	5,709	6,201	6,726	7,200	7,513	7,808	8,169	8,563
7,800	6,266	6,824	7,349	7,800	8,169	8,497	8,858	9,285
8,500	6,857	7,415	7,972	8,500	8,825	9,186	9,580	10,006
9,200	7,447	8,038	8,596	9,200	9,514	9,875	10,269	10,728
9,800	8,038	8,629	9,252	9,800	10,170	10,531	10,991	11,450
10,500	8,596	9,252	9,875	10,500	10,827	11,220	11,680	12,205
11,200	9,186	9,842	10,499	11,200	11,483	11,909	12,369	12,926
11,800	9,777	10,433	11,122	11,800	12,172	12,598	13,090	13,648
12,500	10,335	11,056	11,745	12,500	12,828	13,254	13,779	14,370
13,100	10,925	11,647	12,401	13,100	13,484	13,943	14,468	15,092
13,800	11,516	12,270	13,025	13,800	14,173	14,632	15,190	15,813
14,400	12,106	12,861	13,648	14,400	14,829	15,321	15,879	16,568
15,000	12,664	13,484	14,271	15,000	15,485	15,977	16,601	17,290
15,700	13,254	14,075	14,928	15,700	16,142	16,666	17,290	18,012
16,404	13,845	14,698	15,551	16,404	16,831	17,355	17,979	18,733

This table is used to determine the expected length of runway needed when adjusted for headwind or tailwinds on the takeoff runway.

To use the table: Determine the length of the runway that will be used. Enter the table in the far left column using the runway length, then move right until reaching the column that most closely approximates the current headwind or tailwind conditions on the runway. (Note that in this table, a headwind is a negative number while a tailwind is a positive number.) Resulting figure is approximately the amount of runway that will be needed for a dry runway full power takeoff.

For wet runway conditions, add 5% to the needed runway length.

Runway Length Limit Weight (737-600)

Corrected Field Length	Runway Limit Weight (x 1000lbs) OAT										
	<13	14	18	22	24	26	28	30	42	46	50
4,000	128.1	117.7	116.8	116.2	115.7	115.3	115.1	114.6	105.6	103.0	100.1
4,200	137.3	126.1	125.2	124.6	124.1	123.7	123.2	122.8	113.3	110.2	107.1
4,600	146.6	134.7	133.8	132.9	132.5	132.1	131.6	131.2	120.8	117.7	114.4
5,000	155.6	142.9	142.0	141.1	140.4	140.0	139.6	139.1	128.1	124.8	121.3
5,400	159.8	151.5	150.4	149.5	149.0	148.6	147.9	147.5	135.8	132.3	128.7
5,800	159.8	158.1	157.0	156.1	155.4	155.0	154.5	153.9	141.8	138.0	134.0
6,200	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	147.0	143.1	138.9
6,600	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	152.8	148.6	144.2
7,000	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	157.9	153.7	149.0
7,400	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	157.9	153.2
7,800	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	157.4
8,200	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
8,600	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
9,000	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
9,400	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
9,800	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
10,200	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
10,600	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8	159.8
CLIMB	Compare above figure to yellow line below. USE LOWER NUMBER										
LIMIT	151.7	150.4	150.1	150.1	149.9	149.7	149.7	149.5	133.2	128.1	123.0

This table is designed to determine the maximum takeoff weight that is achievable from a runway of a specific length. The table will provide TWO numbers that need to be compared, with the lowest number being the deciding "Limit Weight."

To use this table: (STEP ONE) Determine the length of runway that will be used for takeoff. Enter the table using the far left column at the row that most closely matches the runway length available for takeoff. Move right along the column until reaching the temperature (OAT Celsius) that most closely matches the field temperature. The resulting number is the highest gross weight that can be used for takeoff from that specific runway.

(STEP TWO): Using the temperature column for the current temperature at the departure field, move down to the bottom of the chart. The figure contained in the yellow highlighted CLIMB LIMIT row represents the highest weight figure that the aircraft can carry and be expected to safely climb away from the field after a single engine failure.

USE THE LOWEST OF THE TWO NUMBERS AS YOUR LIMIT WEIGHT

TAKEOFF SPEEDS (B737-600)

Takeoff Speeds – Dry Runway
V1, VR, V2 for Max Takeoff Thrust

Weight	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
158.7	142	143	149	138	139	146	132	132	138	129	129	135	--	--	--
150.0	137	138	145	134	134	142	129	129	135	125	126	132	--	--	--
141.0	133	134	141	129	130	138	124	125	132	121	122	129	121	121	128
132.3	127	128	136	124	125	134	119	120	128	117	117	125	116	116	124
123.5	122	123	132	118	119	129	114	112	123	112	112	121	111	111	120
114.6	116	117	127	112	114	125	108	109	119	106	107	117	106	106	116
106.0	110	111	122	107	108	120	103	104	115	101	102	113	100	101	111
97.0	104	105	117	100	102	115	97	98	110	95	96	108	95	95	107
88.2	98	99	112	94	95	109	91	92	105	90	91	104	89	90	103

Takeoff Speeds – Wet Runway
V1, VR, V2 for Max Takeoff Thrust

Weight (1000 KG)	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
158.7	136	143	149	132	139	146	128	132	138	129	129	135			
150.0	130	138	145	126	134	142	123	129	135	123	126	132			
141.0	125	134	141	121	130	138	118	125	132	117	122	129	116	121	128
132.3	120	128	136	116	125	134	113	120	128	111	117	125	110	116	124
123.5	114	123	132	110	119	128	107	114	123	105	112	121	104	111	120
114.6	108	117	127	104	114	125	101	109	119	100	107	117	99	106	116
106.0	102	111	122	98	108	120	95	104	115	94	102	113	93	101	111
97.0	95	105	117	92	102	115	89	98	110	88	96	108	87	95	107
88.2	89	99	112	85	95	109	83	92	105	82	91	104	81	90	103

V1, VR, V2 Adjustments

TEMP		V1						VR						V2					
		PRESS ALT (1000 FT)						PRESS ALT (1000 FT)						PRESS ALT (1000 FT)					
°C	°F	-2	0	2	4	6	8	-2	0	2	4	6	8	-2	0	2	4	6	8
60	140	4	5	5	6			4	4	5	6			-1	-2	-2	-2		
50	122	3	3	4	5	6	7	2	3	4	5	6	7	-1	-1	-1	-1	-2	-2
40	104	1	2	3	4	5	6	1	2	3	4	5	6	0	-1	-1	-1	-1	-2
30	86	0	0	1	3	4	5	0	0	1	3	4	5	0	0	0	0	-1	-1
20	68	0	0	1	1	3	4	0	0	1	2	3	4	0	0	0	0	0	0
-60	-76	0	0	1	1	2	3	0	0	1	2	2	3	0	0	0	0	0	0

TAKEOFF STABILIZER TRIM SETTING (B737-600)

Flaps 1 and 5

Weight	C.G. (%MAC)								
(1000lbs)	13	15	16	18	21	24	27	30	33
154.3	8 1/2	8 1/2	8 1/4	7 1/4	6 1/2	6	5 1/4	4 1/2	4
132.3	8 1/2	8	7 1/2	6 3/4	6	5 1/4	4 3/4	4	3 1/2
110.2	7 3/4	7 1/4	6 3/4	6	5 1/4	4 3/4	4	3 1/2	2 3/4
88.2	6	5 1/2	5 1/2	5	4 1/4	3 3/4	3 1/4	2 3/4	2 1/4
79.4	5	4 3/4	4 3/4	4 1/2	4	3 1/2	3	2 3/4	2 1/4

Flaps 10, 15 and 25

Weight	C.G. (%MAC)								
(1000lbs)	13	15	16	18	21	24	27	30	33
154.3	8 1/2	8 1/2	8 1/4	7 1/4	6 1/2	6	5 1/4	4 1/2	4
132.3	8 1/2	8	7 1/2	6 3/4	6	5 1/4	4 3/4	4	3 1/2
110.2	7 3/4	7 1/4	6 3/4	6	5 1/4	4 3/4	4	3 1/2	2 3/4
88.2	6	5 1/2	5 1/2	5	4 1/4	3 3/4	3 1/4	2 3/4	2 1/4

TAKEOFF THRUST SETTING (737-600)

	AIRPORT PRESSURE ALTITUDE (FT)												
OAT F	-2000	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
140	87.7	88.3	88.7	88.8	88.9	89.1	89.2	89.2	89.1	88.6	88.3	88.7	89.2
131	88.5	89.1	89.5	89.7	89.8	89.9	90.0	90.0	90.0	89.5	89.0	88.8	88.6
122	89.3	89.8	90.4	90.5	90.6	90.7	90.9	90.8	90.8	90.4	89.9	89.7	89.6
113	90.2	90.7	91.2	91.3	91.4	91.5	91.7	91.6	91.6	91.2	90.8	90.7	90.5
104	91.1	91.6	92.1	92.2	92.3	92.4	92.5	92.4	92.4	92.1	91.7	91.6	91.5
102	91.9	92.5	93.0	93.1	93.2	93.2	93.3	93.3	93.2	92.9	92.5	92.5	92.4
86	91.5	92.6	93.8	93.9	94.0	94.0	94.1	94.0	93.9	93.7	93.4	93.3	93.2
77	90.8	91.9	93.1	93.7	94.4	94.8	94.9	94.8	94.8	94.4	94.0	94.0	94.0
68	90.0	91.1	92.3	93.0	93.6	94.3	95.0	95.6	95.6	95.3	94.9	94.8	94.7
59	89.3	90.4	91.6	92.2	92.8	93.6	94.3	94.8	95.3	95.9	96.1	95.9	95.5
50	88.5	89.6	90.8	91.4	92.1	92.8	93.5	94.0	94.5	95.1	95.7	96.4	97.1
41	87.8	88.9	90.0	90.7	91.3	92.0	92.7	93.2	93.7	94.3	94.9	95.6	96.3
0	87.0	88.1	89.2	89.9	90.5	91.2	91.9	92.4	92.9	93.5	94.1	94.8	95.5
23	86.2	87.3	88.4	89.1	89.7	90.4	91.1	91.6	92.1	92.7	93.3	94.0	94.7
14	85.4	86.5	87.6	88.3	88.9	89.6	90.3	90.8	91.3	91.9	92.5	93.2	93.9
5	84.6	85.7	86.8	87.5	88.1	88.8	89.4	90.0	90.5	91.1	91.7	92.4	93.1
-4	83.8	84.9	86.0	86.6	87.3	87.9	88.6	89.1	89.7	90.3	90.8	91.6	92.3
-13	83.0	84.1	85.2	85.8	86.4	87.1	87.8	88.3	88.8	89.4	90.0	90.7	91.5
-22	82.2	83.3	84.4	85.0	85.6	86.3	86.9	87.4	88.0	88.6	89.2	89.9	90.6
-31	81.4	82.4	83.5	84.1	84.7	85.4	86.1	86.6	87.1	87.7	88.3	89.0	89.8
-40	80.6	81.6	82.7	83.3	83.9	84.5	85.2	85.7	86.2	86.8	87.4	88.2	88.9
-49	79.7	80.7	81.8	82.4	83.0	83.7	84.3	84.8	85.3	86.0	86.6	87.3	88.0
-58	78.9	79.9	80.9	81.5	82.1	82.8	83.4	83.9	84.5	85.1	85.7	86.4	87.2
-28	80.8	81.8	82.8	83.3	83.8	84.4	85.1	85.8	86.5	87.3	88.2	89.4	90.3

This table provides an estimated full power N1 thrust setting for takeoff.

To use this table: Determine temperature at the runway. Enter the table in the far left column at the expected temperature. Move to the right until reaching the pressure altitude of the departure airport. Resulting number is the approximate N1 percentage that will be achieved on a full power takeoff.

Required Takeoff Field Length (737-700)

Available Runway Length	Wind Corrected Field Length (Feet) Wind Component (minus equals a HEAD WIND)							
	-15	-10	-5	0	10	20	30	40
4,200	3,040	3,430	3,810	4,200	4,450	4,710	4,960	5,220
4,600	3,380	3,790	4,190	4,600	4,860	5,130	5,390	5,650
5,000	3,720	4,150	4,570	5,000	5,270	5,540	5,810	6,080
5,400	4,060	4,510	4,950	5,400	5,680	5,960	6,240	6,520
5,800	4,400	4,870	5,330	5,800	6,090	6,380	6,660	6,950
6,200	4,740	5,230	5,710	6,200	6,500	6,790	7,090	7,380
6,600	5,080	5,590	6,090	6,600	6,900	7,210	7,510	7,820
7,000	5,420	5,950	6,470	7,000	7,310	7,630	7,940	8,250
7,400	5,760	6,310	6,850	7,400	7,720	8,040	8,360	8,680
7,800	6,100	6,670	7,230	7,800	8,130	8,460	8,790	9,120
8,200	6,440	7,030	7,610	8,200	8,540	8,880	9,210	9,550
8,600	6,780	7,390	7,990	8,600	8,950	9,290	9,640	9,980
9,000	7,120	7,750	8,370	9,000	9,350	9,710	10,060	10,420
9,400	7,460	8,110	8,750	9,400	9,760	10,130	10,490	10,850
9,800	7,800	8,470	9,130	9,800	10,170	10,540	10,910	11,280
10,200	8,140	8,830	9,510	10,200	10,580	10,960	11,340	11,720
10,600	8,480	9,190	9,890	10,600	10,990	11,380	11,760	12,150
11,000	8,820	9,550	10,270	11,000	11,400	11,790	12,190	12,580
11,400	9,160	9,910	10,650	11,400	11,800	12,210	12,610	13,020
11,800	9,500	10,260	11,030	11,800	12,210	12,630	13,040	13,450

This table is used to determine the expected length of runway needed when adjusted for headwind or tailwinds on the takeoff runway.

To use the table: Determine the length of the runway that will be used. Enter the table in the far left column using the runway length, then move right until reaching the column that most closely approximates the current headwind or tailwind conditions on the runway. (Note that in this table, a headwind is a negative number while a tailwind is a positive number.) Resulting figure is approximately the amount of runway that will be needed for a dry runway full power takeoff.

For wet runway conditions, add 5% to the needed runway length.

Runway Length Limit Weight (737-700)

Corrected Field Length	Runway Limit Weight (x 1000lbs) OAT										
	<13	14	18	22	24	26	28	30	42	46	50
4,000	129.1	119.1	118.1	117.6	117.2	116.9	116.5	111.3	109.3	107.4	103.3
4,200	132.6	122.2	121.2	120.7	120.3	120.0	119.6	114.2	112.2	110.2	106.1
4,600	139.3	128.4	127.3	126.8	126.4	126.0	125.6	120.0	117.9	115.8	111.4
5,000	145.5	134.2	133.0	132.5	132.0	131.7	131.2	125.4	123.2	121.0	116.4
5,400	151.1	139.4	138.2	137.7	137.2	136.8	136.4	130.3	128.1	125.8	121.1
5,800	156.6	144.5	143.3	142.7	142.2	141.8	141.3	135.1	132.8	130.4	125.5
6,200	162.0	149.4	148.2	147.5	147.0	146.7	146.2	139.7	137.3	134.9	129.8
6,600	167.1	154.2	152.9	152.3	151.7	151.4	150.8	144.1	141.7	139.2	133.9
7,000	172.2	158.8	157.5	156.8	156.3	155.9	155.4	148.4	145.9	143.3	137.9
7,400	177.1	163.2	161.9	161.2	160.6	160.2	159.7	152.5	149.9	147.2	141.6
7,800	180.0	167.6	166.2	165.5	164.9	164.5	163.9	156.5	153.8	151.1	145.3
8,200	180.0	172.1	170.6	169.9	169.3	168.9	168.3	160.7	157.9	155.1	149.2
8,600	180.0	176.4	174.9	174.2	173.6	173.1	172.5	164.7	161.9	159.0	152.9
9,000	180.0	180.0	178.6	177.8	177.2	176.7	176.1	168.2	165.2	162.2	156.0
9,400	180.0	180.0	180.0	180.0	180.5	180.0	179.3	171.2	168.2	165.1	158.7
9,800	180.0	180.0	180.0	180.0	180.0	180.0	180.0	174.2	171.1	167.9	161.4
10,200	180.0	180.0	180.0	180.0	180.0	180.0	180.0	177.0	173.9	170.7	164.0
10,600	180.0	180.0	180.0	180.0	180.0	180.0	180.0	179.9	176.6	173.4	166.5
CLIMB	Compare above figure to yellow line below. USE LOWER NUMBER										
LIMIT	164.1	162.6	162.3	162.1	161.9	161.8	161.6	150.5	146.6	142.7	135.1

This table is designed to determine the maximum takeoff weight that is achievable from a runway of a specific length. The table will provide TWO numbers that need to be compared, with the lowest number being the deciding "Limit Weight."

To use this table: (STEP ONE) Determine the length of runway that will be used for takeoff. Enter the table using the far left column at the row that most closely matches the runway length available for takeoff. Move right along the column until reaching the temperature (OAT Celsius) that most closely matches the field temperature. The resulting number is the highest gross weight that can be used for takeoff from that specific runway.

(STEP TWO): Using the temperature column for the current temperature at the departure field, move down to the bottom of the chart. The figure contained in the yellow highlighted CLIMB LIMIT row represents the highest weight figure that the aircraft can carry and be expected to safely climb away from the field after a single engine failure.

USE THE LOWEST OF THE TWO NUMBERS AS YOUR LIMIT WEIGHT

TAKEOFF SPEEDS (B737-700)

Takeoff Speeds – Dry Runway
V1, VR, V2 for Max Takeoff Thrust

WEIGHT	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
(1000lbs)	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
180	153	156	160	150	152	156									
170	148	150	156	144	147	152	138	140	145	136	136	141			
160	143	146	152	140	142	148	134	135	141	132	132	138	131	131	136
150	138	140	147	134	137	144	129	131	137	128	128	135	126	126	133
140	132	135	142	129	132	139	124	126	133	123	123	131	121	122	129
130	125	128	137	123	126	134	118	121	129	117	118	127	116	117	125
120	119	122	132	116	119	129	112	115	124	111	113	122	109	111	121
110	112	115	126	109	113	124	106	109	119	105	107	117	103	106	116
100	104	108	120	102	106	117	99	103	114	98	101	113	97	100	111
90	97	101	114	94	98	111	92	97	109	91	95	107	90	94	106

Takeoff Speeds – Wet Runway
V1, VR, V2 for Max Takeoff Thrust

V1, VR, V2 Adjustments

TEMP		V1						VR						V2					
		PRESS ALT (1000 FT)						PRESS ALT (1000 FT)						PRESS ALT (1000 FT)					
°C	°F	-2	0	2	4	6	8	-2	0	2	4	6	8	-2	0	2	4	6	8
60	140	6	7	9	10			3	4	5	6			-2	-2	-2	-3		
50	122	4	4	6	8	9	11	2	3	4	4	5	6	-1	-1	-2	-2	-3	-3
40	104	1	2	3	5	7	9	1	1	2	3	4	5	0	-1	-1	-2	-2	-2
30	86	0	0	1	3	4	6	0	0	1	2	3	4	0	0	0	-1	-1	-2
20	68	0	0	1	2	3	4	0	0	1	1	2	3	0	0	0	0	-1	-1
-60	-76	0	0	1	2	3	4	0	0	1	1	2	3	0	0	0	0	-1	-1

TAKEOFF STABILIZER TRIM SETTING (B737-700)

Flaps 1 and 5

Weight	C.G. (%MAC)									
(1000lbs)	9	10	12	13	16	20	24	28	30	33
160-180	8 1/2	8 1/2	8 1/2	8 1/2	7 3/4	6 3/4	6	5 1/4	4 3/4	4 1/4
140.0	8 1/2	8 1/2	8 1/4	8	7 1/4	6 1/2	5 1/2	4 3/4	4 1/2	3 3/4
120.0	8 1/2	8 1/4	7 3/4	7 1/2	6 1/2	5 3/4	5	4 1/4	4	3 1/4
80-100	6 3/4	6 1/2	6 1/4	6	5 1/2	5	4 1/4	3 1/2	3 1/4	2 3/4

Flaps 10, 15 and 25

Weight	C.G. (%MAC)									
(1000lbs)	9	10	12	13	16	20	24	28	30	33
160-180	8 1/2	8 1/2	8 1/2	8 1/2	7 1/4	6 1/2	5 1/2	4 1/2	4 1/4	3 1/2
140.0	8 1/2	8 1/2	8 1/4	7 3/4	6 3/4	6	5	4 1/4	3 3/4	3 1/4
120.0	8 1/2	8 1/4	7 1/2	7 1/4	6 1/4	5 1/4	4 1/2	3 3/4	3 1/4	2 3/4
80-100	6 1/4	6 1/4	5 3/4	5 1/2	5	4 1/2	3 3/4	3	2 3/4	2 3/4

TAKEOFF THRUST N1 (B737-700)

Takeoff Thrust (Full Power Takeoff)

	AIRPORT PRESSURE ALTITUDE (FT)												
OAT F	-2000	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
170	87.6	88.0	88.9	89.4	89.8	90.4	91.0	91.7	92.4	92.9	93.4	93.5	93.6
160	88.5	89.0	89.3	89.2	89.1	89.7	90.3	91.0	91.7	92.2	92.6	92.8	92.9
150	89.4	89.9	90.3	90.2	90.1	90.1	90.0	90.3	91.0	91.4	91.9	92.0	92.1
140	90.3	90.8	91.2	91.2	91.1	91.1	91.0	91.1	91.2	91.0	91.2	91.3	91.4
130	91.1	91.7	92.1	92.1	92.0	92.0	92.0	92.0	92.0	91.9	91.8	91.4	90.9
120	92.0	92.6	93.0	93.0	93.0	92.9	92.9	92.9	92.9	92.8	92.7	92.4	92.0
110	92.9	93.5	93.9	93.9	93.8	93.8	93.8	93.7	93.7	93.6	93.6	93.4	93.1
100	93.8	94.3	94.8	94.7	94.7	94.7	94.6	94.6	94.5	94.4	94.4	94.3	94.2
90	94.2	95.3	95.7	95.7	95.7	95.6	95.6	95.5	95.4	95.4	95.3	95.2	95.2
80	93.3	94.5	95.6	96.1	96.5	96.5	96.4	96.4	96.3	96.2	96.2	96.1	96.1
70	92.5	93.7	94.8	95.3	95.8	96.4	97.1	97.4	97.3	97.2	97.1	97.1	97.0
60	91.6	92.8	93.9	94.4	95.0	95.6	96.2	96.9	97.6	98.3	98.5	98.4	98.3
50	90.8	92.0	93.0	93.6	94.1	94.7	95.3	96.0	96.7	97.5	98.2	99.1	100.0
40	89.9	91.1	92.2	92.7	93.2	93.8	94.4	95.1	95.8	96.6	97.4	98.3	99.2
30	89.1	90.2	91.3	91.8	92.3	92.9	93.6	94.2	94.9	95.7	96.5	97.4	98.3
20	88.2	89.3	90.4	90.9	91.4	92.0	92.7	93.4	94.0	94.8	95.6	96.6	97.5
10	87.3	88.4	89.5	90.0	90.5	91.1	91.7	92.4	93.1	93.9	94.7	95.7	96.6
0	86.4	87.5	88.6	89.1	89.6	90.2	90.8	91.5	92.2	93.0	93.8	94.8	95.8
-10	85.5	86.6	87.6	88.1	88.6	89.3	89.9	90.6	91.3	92.1	92.9	94.0	94.9
-20	84.6	85.7	86.7	87.2	87.7	88.3	89.0	89.7	90.4	91.2	92.0	93.1	94.0
-30	83.6	84.7	85.7	86.2	86.7	87.4	88.0	88.7	89.4	90.2	91.1	92.2	93.1
-40	82.7	83.8	84.8	85.3	85.8	86.4	87.0	87.8	88.5	89.3	90.1	91.2	92.2
-50	81.7	82.8	83.8	84.3	84.8	85.4	86.1	86.8	87.5	88.3	89.2	90.3	91.3
-60	80.8	81.8	82.8	83.3	83.8	84.4	85.1	85.8	86.5	87.3	88.2	89.4	90.3

This table provides an estimated full power N1 thrust setting for takeoff.

To use this table: Determine temperature at the runway. Enter the table in the far left column at the expected temperature. Move to the right until reaching the pressure altitude of the departure airport. Resulting number is the approximate N1 percentage that will be achieved on a full power takeoff.

Required Takeoff Field Length (737-800)

Runway Length	Wind Component (minus equals a HEAD WIND)							
	-15	-10	-5	0	10	20	30	40
3,900	2,887	3,248	3,576	3,900	4,134	4,331	4,560	4,823
4,600	3,445	3,839	4,199	4,600	4,790	5,020	5,282	5,545
5,300	4,003	4,429	4,823	5,300	5,479	5,709	5,971	6,266
5,900	4,560	5,020	5,446	5,900	6,135	6,398	6,693	6,988
5,600	5,118	5,577	6,069	5,600	6,824	7,087	7,382	7,710
7,200	5,643	6,168	6,693	7,200	7,480	7,775	8,104	8,432
7,800	6,201	6,758	7,316	7,800	8,169	8,464	8,793	9,153
8,500	6,758	7,349	7,940	8,500	8,825	9,153	9,514	9,875
9,200	7,316	7,940	8,563	9,200	9,514	9,842	10,203	10,597
9,800	7,874	8,530	9,186	9,800	10,170	10,531	10,925	11,352
10,500	8,432	9,121	9,810	10,500	10,859	11,220	11,614	12,073
11,200	7,775	9,711	10,433	11,200	11,516	11,909	12,336	12,795
11,800	9,514	10,269	11,056	11,800	12,205	12,598	13,025	13,517
12,500	10,072	10,859	11,680	12,500	12,861	13,287	13,747	14,239
13,100	10,630	11,450	12,303	13,100	13,550	13,976	14,468	14,960
13,800	11,188	12,041	12,926	13,800	14,206	14,665	15,157	15,682
14,400	11,712	12,631	13,517	14,400	14,895	15,354	15,879	16,404
15,000	12,270	13,222	14,140	15,000	15,551	16,043	16,568	17,126
15,700	12,828	13,812	14,764	15,700	16,240	16,732	17,290	17,848
16,404	13,386	14,403	15,387	16,404	16,896	17,421	17,979	18,569

This table is used to determine the expected length of runway needed when adjusted for headwind or tailwinds on the takeoff runway.

To use the table: Determine the length of the runway that will be used. Enter the table in the far left column using the runway length, then move right until reaching the column that most closely approximates the current headwind or tailwind conditions on the runway. (Note that in this table, a headwind is a negative number while a tailwind is a positive number.) Resulting figure is approximately the amount of runway that will be needed for a dry runway full power takeoff.

For wet runway conditions, add 5% to the needed runway length.

Runway Length Limit Weight (737-800)

Corrected Field Length	Runway Limit Weight (x 1000lbs) OAT										
	<13	14	18	22	24	26	28	30	42	46	50
4,200	139.3	128.3	127.4	126.5	126.3	125.9	125.4	125.0	116.2	113.3	110.5
4,600	150.6	138.7	137.8	136.9	136.5	136.0	135.6	135.1	125.7	122.6	119.5
5,000	161.2	148.2	147.3	146.4	145.9	145.5	145.1	144.4	134.5	131.0	127.6
5,400	171.3	157.2	156.3	155.2	154.8	154.3	153.9	153.2	142.4	138.7	135.1
5,800	180.3	165.6	164.5	163.6	162.9	162.5	161.8	161.4	149.7	145.9	142.0
6,200	188.9	173.3	172.2	171.1	170.6	170.0	169.3	168.9	156.5	152.6	148.4
6,600	190.0	180.3	179.2	178.1	177.5	177.0	176.4	175.7	162.9	158.7	154.3
7,000	190.0	187.2	186.1	184.7	184.3	183.6	183.0	182.3	169.1	164.7	160.3
7,400	190.0	190.0	190.0	190.0	190.0	189.6	188.9	188.5	174.6	170.0	165.3
7,800	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	179.5	174.6	170.0
8,200	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	184.1	179.2	174.4
8,600	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	188.5	183.6	178.6
9,000	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	187.8	182.8
9,400	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	186.7
9,800	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
10,200	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
10,600	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
CLIMB	Compare above figure to yellow line below. USE LOWER NUMBER										
LIMIT	181.9	180.6	180.3	179.9	179.9	179.7	179.5	179.5	162.0	156.5	151.0

This table is designed to determine the maximum takeoff weight that is achievable from a runway of a specific length. The table will provide TWO numbers that need to be compared, with the lowest number being the deciding "Limit Weight."

To use this table: (STEP ONE) Determine the length of runway that will be used for takeoff. Enter the table using the far left column at the row that most closely matches the runway length available for takeoff. Move right along the column until reaching the temperature (OAT Celsius) that most closely matches the field temperature. The resulting number is the highest gross weight that can be used for takeoff from that specific runway.

(STEP TWO): Using the temperature column for the current temperature at the departure field, move down to the bottom of the chart. The figure contained in the yellow highlighted CLIMB LIMIT row represents the highest weight figure that the aircraft can carry and be expected to safely climb away from the field after a single engine failure.

USE THE LOWEST OF THE TWO NUMBERS AS YOUR LIMIT WEIGHT

TAKEOFF SPEEDS (B737-800)

Takeoff Speeds – Dry Runway
V1, VR, V2 for Max Takeoff Thrust

Weight	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
172	162	164	169	158	163	163									
164	159	160	166	154	160	160	151	152	158	148	149	155			
156	154	156	163	150	157	157	147	148	155	144	145	152	141	152	149
147	149	151	159	143	145	154	142	144	152	139	140	149	137	138	146
139	145	146	156	139	141	150	138	139	148	135	136	145	132	133	143
131	140	142	152	134	136	146	133	134	145	130	131	142	128	129	139
123	135	136	148	129	131	142	128	129	141	125	126	138	123	124	136
115	129	131	144	124	125	138	123	124	137	120	121	134	118	119	132
106	124	125	139	119	120	134	118	119	133	115	116	130	113	114	128
98	118	119	134	113	114	130	112	113	128	110	110	126	107	108	124
90	112	113	130	108	108	125	106	107	124	104	105	121	102	103	119
82	106	106	125	102	102	120	101	101	119	98	99	117	96	97	115

Takeoff Speeds – Wet Runway
V1, VR, V2 for Max Takeoff Thrust

Weight (1000 KG)	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
172	156	164	169	149	158	163									
164	151	160	166	145	154	160	144	152	158	141	149	155			
156	146	156	163	140	150	157	140	148	155	137	145	152	135	142	149
147	142	151	159	135	145	154	135	144	152	132	140	149	130	138	146
139	137	146	156	131	141	150	130	139	148	127	136	145	125	133	143
131	132	142	152	126	136	146	125	134	145	122	131	142	120	129	139
123	126	136	148	121	131	142	120	129	141	117	126	138	115	124	136
115	121	131	144	116	125	138	115	124	137	112	121	134	110	119	132
106	115	125	139	110	120	134	109	119	133	107	116	130	105	114	128
98	109	119	134	104	114	130	104	113	128	101	110	126	99	108	124
90	103	113	130	98	108	125	98	107	124	95	105	121	94	103	119
82	96	106	125	92	102	120	92	101	119	89	99	117	88	97	115

V1, VR, V2 Adjustments

TEMP		V1						VR						V2					
		PRESS ALT (1000 FT)						PRESS ALT (1000 FT)						PRESS ALT (1000 FT)					
°C	°F	-2	0	2	4	6	8	-2	0	2	4	6	8	-2	0	2	4	6	8
60	140	5	6	7	8			3	4	5	6			-2	-3	-3	-4		
50	122	3	4	5	6	7	9	2	3	4	5	6	7	-2	-2	-3	-3	-4	-5
40	104	1	2	3	4	5	7	1	1	2	4	5	6	-1	-1	-2	-2	-3	-4
30	86	0	0	1	3	4	6	0	0	1	3	4	5	0	0	-1	-2	-2	-3
20	68	0	0	1	2	4	5	0	0	1	2	3	4	0	0	-1	-1	-2	-3
-60	-76	0	0	1	2	3	5	0	0	1	2	3	4	0	0	-1	-1	-2	-2

TAKEOFF THRUST SETTING (737-800)

	AIRPORT PRESSURE ALTITUDE (FT)												
OAT F	-2000	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
140	94.8	95.4	95.8	95.9	96.0	96.1	96.2	96.3	96.2	95.9	95.8	95.7	95.7
131	95.4	96.0	96.5	96.6	96.7	96.8	96.9	97.1	96.9	96.6	96.3	95.7	95.0
122	96.0	96.6	97.1	97.3	97.4	97.6	97.7	97.8	97.7	97.4	97.1	96.6	96.1
113	96.8	97.4	97.8	98.0	98.1	98.3	98.4	98.5	98.4	98.1	97.8	97.5	97.1
104	97.4	98.1	98.6	98.7	98.8	98.9	99.0	99.2	99.1	98.8	98.5	98.4	98.1
102	98.0	98.7	99.4	99.5	99.6	99.7	99.8	99.9	99.9	99.5	99.2	99.1	99.0
86	97.6	98.8	100.3	100.3	100.4	100.4	100.5	100.5	100.4	100.3	100.0	99.9	99.9
77	96.8	98.1	99.5	100.1	100.7	100.8	100.7	100.7	100.7	100.7	100.6	100.6	100.7
68	96.0	97.3	98.8	99.3	99.9	100.2	100.5	100.8	100.8	100.9	100.8	100.8	100.8
59	95.2	96.5	98.0	98.6	99.2	99.5	99.8	100.1	100.5	100.9	101.1	101.1	101.1
50	94.5	95.8	97.2	97.8	98.4	98.7	99.0	99.4	99.7	100.1	100.5	101.0	101.5
41	93.7	95.0	96.4	97.0	97.6	98.0	98.3	98.6	99.0	99.4	99.8	100.3	100.7
0	92.9	94.2	95.6	96.3	96.9	97.2	97.5	97.9	98.2	98.6	99.0	99.5	100.0
23	92.0	93.4	94.8	95.5	96.1	96.4	96.7	97.1	97.5	97.9	98.3	98.7	99.2
14	91.2	92.6	94.1	94.7	95.3	95.6	96.0	96.3	96.7	97.1	97.5	98.0	98.4
5	90.4	91.7	93.2	93.9	94.5	94.8	95.2	95.6	95.9	96.3	96.7	97.2	97.6
-4	89.6	90.9	92.4	93.0	93.7	94.0	94.4	94.8	95.2	95.6	95.9	96.4	96.8
-13	88.7	90.1	91.6	92.2	92.9	93.2	93.6	94.0	94.4	94.8	85.2	85.6	96.0
-22	87.9	89.2	90.7	81.4	82.0	92.4	92.8	93.2	93.6	94.0	94.3	94.8	95.2
-31	87.0	88.4	89.9	90.5	91.2	91.6	91.9	92.4	92.8	93.1	93.5	94.0	94.4
-40	86.1	87.5	89.0	89.7	90.3	90.7	91.1	91.5	91.9	92.3	92.7	93.1	93.6
-49	85.3	86.6	88.2	88.8	89.5	89.9	90.3	90.7	91.1	91.5	91.9	92.3	92.7

This table provides an estimated full power N1 thrust setting for takeoff.

To use this table: Determine temperature at the runway. Enter the table in the far left column at the expected temperature. Move to the right until reaching the pressure altitude of the departure airport. Resulting number is the approximate N1 percentage that will be achieved on a full power takeoff.

Required Takeoff Field Length (737-900)

Runway	Wind Component (minus equals a HEAD WIND)							
Length	-15	-10	-5	0	10	20	30	40
4,200	3,050	3,430	3,820	4,200	4,460	4,730	5,000	5,280
4,600	3,390	3,790	4,200	4,600	4,870	5,160	5,440	5,740
5,000	3,730	4,150	4,580	5,000	5,290	5,580	5,890	6,190
5,400	4,070	4,520	4,960	5,400	5,700	6,010	6,330	6,650
5,800	4,410	4,880	5,340	5,800	6,120	6,440	6,770	7,110
6,200	4,750	5,240	5,720	6,200	6,530	6,870	7,220	7,570
6,600	5,100	5,600	6,100	6,600	6,940	7,300	7,660	8,030
7,000	5,440	5,960	6,480	7,000	7,360	7,730	8,100	8,490
7,400	5,780	6,320	6,860	7,400	7,770	8,150	8,550	8,950
7,800	6,120	6,680	7,240	7,800	8,190	8,580	8,990	9,410
8,200	6,460	7,040	7,620	8,200	8,600	9,010	9,430	9,870
8,600	6,800	7,400	8,000	8,600	9,010	9,440	9,880	10,320
9,000	7,140	7,760	8,380	9,000	9,430	9,870	10,320	10,780
9,400	7,480	8,120	8,760	9,400	9,840	10,300	10,760	11,240
9,800	7,820	8,480	9,140	9,800	10,260	10,720	11,210	11,700
10,200	8,160	8,840	8,520	10,200	10,670	11,150	11,650	12,160
10,600	8,500	9,200	9,900	10,600	11,080	11,580	12,090	12,620
11,000	8,840	9,560	10,280	11,000	11,500	12,010	12,540	13,080
11,400	9,180	9,920	10,660	11,400	11,910	12,440	12,980	13,540

This table is used to determine the expected length of runway needed when adjusted for headwind or tailwinds on the takeoff runway.

To use the table: Determine the length of the runway that will be used. Enter the table in the far left column using the runway length, then move right until reaching the column that most closely approximates the current headwind or tailwind conditions on the runway. (Note that in this table, a headwind is a negative number while a tailwind is a positive number.) Resulting figure is approximately the amount of runway that will be needed for a dry runway full power takeoff.

For wet runway conditions, add 5% to the needed runway length.

Runway Length Limit Weight (737-900)

Field Length	OAT										
	<13	14	18	22	24	26	28	30	42	46	50
4,000	124.0	115.5	113.2	112.6	111.8	111.0	110.2	109.4	106.1	103.0	96.8
4,200	127.6	118.8	116.4	115.8	114.9	114.1	113.3	112.5	109.2	105.9	99.5
4,600	134.6	125.3	122.8	122.1	121.2	120.3	119.5	118.6	115.1	111.6	104.8
5,000	141.2	131.4	128.8	128.1	127.1	126.2	125.3	124.4	120.7	117.0	109.9
5,400	147.5	137.2	134.5	133.7	132.7	131.8	130.8	129.9	126.0	122.2	114.7
5,800	153.5	142.8	139.9	139.1	138.1	137.1	136.1	135.1	131.1	127.1	119.3
6,200	159.1	148.0	145.0	144.2	143.2	142.1	141.1	140.1	135.9	131.7	123.6
6,600	164.6	153.1	150.0	149.1	148.0	147.0	145.9	144.8	140.5	136.2	127.8
7,000	169.9	157.9	154.7	153.9	152.8	151.6	150.6	149.4	144.9	140.5	131.8
7,400	175.0	162.7	159.4	158.5	157.3	156.2	155.1	153.9	149.3	144.7	135.8
7,800	179.9	167.3	163.9	163.0	161.8	160.6	159.4	158.2	153.4	148.7	139.5
8,200	184.8	171.7	168.2	167.3	166.7	164.9	163.7	162.4	157.5	152.7	143.2
8,600	189.4	176.0	172.4	171.5	170.2	169.0	167.7	166.5	161.4	156.5	146.7
9,000	189.9	180.0	176.3	175.3	174.0	172.8	171.5	170.2	165.0	160.0	150.0
9,400	189.9	183.7	180.0	179.0	177.6	176.3	175.0	173.7	168.4	163.2	153.0
9,800	189.9	187.4	183.5	182.5	181.1	179.8	178.5	177.2	171.7	166.4	156.0
10,200	189.9	189.9	187.0	185.9	184.5	183.2	181.8	180.5	174.9	169.5	158.8
10,600	189.9	189.9	189.9	189.2	187.8	186.4	185.1	183.7	178.0	172.4	161.6
CLIMB	Compare above figure to yellow line below. USE LOWER NUMBER										
LIMIT	188.1	187.4	186.6	186.4	186.1	186.1	185.8	185.4	177.7	170.3	155.9

This table is designed to determine the maximum takeoff weight that is achievable from a runway of a specific length. The table will provide TWO numbers that need to be compared, with the lowest number being the deciding "Limit Weight."

To use this table: (STEP ONE) Determine the length of runway that will be used for takeoff. Enter the table using the far left column at the row that most closely matches the runway length available for takeoff. Move right along the column until reaching the temperature (OAT Celsius) that most closely matches the field temperature. The resulting number is the highest gross weight that can be used for takeoff from that specific runway.

(STEP TWO): Using the temperature column for the current temperature at the departure field, move down to the bottom of the chart. The figure contained in the yellow highlighted CLIMB LIMIT row represents the highest weight figure that the aircraft can carry and be expected to safely climb away from the field after a single engine failure.

USE THE LOWEST OF THE TWO NUMBERS AS YOUR LIMIT WEIGHT

TAKEOFF SPEEDS (B737-900)

Takeoff Speeds – Dry Runway
V1, VR, V2 for Max Takeoff Thrust

Weight	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
190	171	173	179	163	166	172	163	164	168						
180	166	168	175	158	161	168	158	159	164	154	156	161	152	152	158
170	161	163	171	153	156	164	153	154	131	149	151	157	147	148	154
160	155	158	166	148	150	168	148	149	157	144	146	153	142	143	150
150	150	152	162	143	145	155	142	144	152	139	140	149	136	137	146
140	144	146	157	137	139	151	136	138	148	133	135	145	131	132	142
130	138	139	152	131	133	146	130	131	143	127	128	140	125	126	138
120	131	132	146	125	126	141	124	125	138	121	122	135	119	120	133
110	124	125	141	118	119	135	117	118	133	114	116	130	112	113	128
100	117	118	135	112	112	129	111	111	128	108	109	125	106	106	122

Takeoff Speeds – Wet Runway
V1, VR, V2 for Max Takeoff Thrust

Weight (1000 KG)	FLAPS 1			FLAPS 5			FLAPS 10			FLAPS 15			FLAPS 25		
	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
190	165	173	179	157	166	173	158	164	168						
180	159	168	175	151	161	168	152	159	164	148	156	161	145	152	158
170	154	163	171	146	156	164	146	154	161	142	151	157	140	148	154
160	148	158	166	140	150	160	140	149	157	136	146	153	134	143	150
150	141	152	162	134	145	155	134	144	152	131	140	149	128	137	146
140	135	146	157	128	139	151	128	138	148	125	135	145	123	132	142
130	128	139	152	122	133	146	121	131	143	119	128	140	116	126	138
120	121	132	146	115	126	141	115	125	138	112	122	135	110	120	133
110	114	125	141	108	119	135	108	118	133	105	116	130	103	113	128
100	107	118	135	101	112	129	101	111	128	98	109	125	96	106	122

V1, VR, V2 Adjustments

TEMP		V1						VR						V2					
		PRESS ALT (1000 FT)						PRESS ALT (1000 FT)						PRESS ALT (1000 FT)					
°C	°F	-2	0	2	4	6	8	-2	0	2	4	6	8	-2	0	2	4	6	8
70	158	5	6					5	6					-2	-3				
60	140	4	5	6	7			3	4	5	6			-2	-2	-2	-3		
50	122	2	3	4	5	6	9	2	3	4	5	6	8	-1	-1	-2	-2	-3	-3
40	104	1	2	3	4	5	7	1	2	3	4	5	6	-1	-1	-1	-2	-2	-3
30	86	0	0	1	3	4	6	0	0	1	3	4	5	0	0	-1	-1	-2	-3
20	68	0	0	1	2	4	5	0	0	1	2	3	4	0	0	0	-1	-1	-3
-60	-76	0	0	1	2	3	5	0	0	1	2	3	4	0	0	0	-1	-1	-2

TAKEOFF THRUST SETTING (737-900)

140	94.8	95.4	95.8	95.9	96.0	96.1	96.2	96.3	96.2	95.9	95.8	95.7	95.7
131	95.4	96.0	96.5	96.6	96.7	96.8	96.9	97.1	96.9	96.6	96.3	95.7	95.0
122	96.0	96.6	97.1	97.3	97.4	97.6	97.7	97.8	97.7	97.4	97.1	96.6	96.1
113	96.8	97.4	97.8	98.0	98.1	98.3	98.4	98.5	98.4	98.1	97.8	97.5	97.1
104	97.4	98.1	98.6	98.7	98.8	98.9	99.0	99.2	99.1	98.8	98.5	98.4	98.1
102	98.0	98.7	99.4	99.5	99.6	99.7	99.8	99.9	99.9	99.5	99.2	99.1	99.0
86	97.6	98.8	100.3	100.3	100.4	100.4	100.5	100.5	100.4	100.3	100.0	99.9	99.9
77	96.8	98.1	99.5	100.1	100.7	100.8	100.7	100.7	100.7	100.7	100.6	100.6	100.7
68	96.0	97.3	98.8	99.3	99.9	100.2	100.5	100.8	100.8	100.9	100.8	100.8	100.8
59	95.2	96.5	98.0	98.6	99.2	99.5	99.8	100.1	100.5	100.9	101.1	101.1	101.1
50	94.5	95.8	97.2	97.8	98.4	98.7	99.0	99.4	99.7	100.1	100.5	101.0	101.5
41	93.7	95.0	96.4	97.0	97.6	98.0	98.3	98.6	99.0	99.4	99.8	100.3	100.7
0	92.9	94.2	95.6	96.3	96.9	97.2	97.5	97.9	98.2	98.6	99.0	99.5	100.0
23	92.0	93.4	94.8	95.5	96.1	96.4	96.7	97.1	97.5	97.9	98.3	98.7	99.2
14	91.2	92.6	94.1	94.7	95.3	95.6	96.0	96.3	96.7	97.1	97.5	98.0	98.4
5	90.4	91.7	93.2	93.9	94.5	94.8	95.2	95.6	95.9	96.3	96.7	97.2	97.6
-4	89.6	90.9	92.4	93.0	93.7	94.0	94.4	94.8	95.2	95.6	95.9	96.4	96.8
-13	88.7	90.1	91.6	92.2	92.9	93.2	93.6	94.0	94.4	94.8	85.2	85.6	96.0
-22	87.9	89.2	90.7	81.4	82.0	92.4	92.8	93.2	93.6	94.0	94.3	94.8	95.2
-31	87.0	88.4	89.9	90.5	91.2	91.6	91.9	92.4	92.8	93.1	93.5	94.0	94.4
-40	86.1	87.5	89.0	89.7	90.3	90.7	91.1	91.5	91.9	92.3	92.7	93.1	93.6
-49	85.3	86.6	88.2	88.8	89.5	89.9	90.3	90.7	91.1	91.5	91.9	92.3	92.7

This table provides an estimated full power N1 thrust setting for takeoff.

To use this table: Determine temperature at the runway. Enter the table in the far left column at the expected temperature. Move to the right until reaching the pressure altitude of the departure airport. Resulting number is the approximate N1 percentage that will be achieved on a full power takeoff.

Reduced N1 Takeoff Thrust Settings (737-ALL)

Whenever possible, crews should conduct takeoffs using a derated takeoff N1 thrust setting as selected via the THRUST LIM page in the FMC.

There are a number of benefits to conducting a reduced thrust takeoff:

- Reduced thrust normalizes acceleration loads during takeoff, reducing passenger anxiety.
- Reduced thrust reduces rate of acceleration, resulting in more time for crewmember scan of instruments during takeoff.
- Significantly reduced wear on engines and components.
- Reduced +/- G loads during rotation, and during level off from initial climb at low altitude increase passenger comfort and reduce passenger anxiety.
- Reduced fuel burn.

Reduced Takeoff N1 should <u>not</u> be used when:

- Braking action is reported to be less than 'Good.'
- The probability of windshear exists.
- Runway is wet or cluttered.
- Takeoff is to be made with a tailwind.
- Antiskid system is inoperative.
- Any brake is deactivated

In situations where the crew enters an **Assumed Temperature** into the THRUST LIM page and the crew-entered temperature exceeds the ambient temperature, the FMC will automatically compute the reduced takeoff thrust required.

TAKEOFF PERFORMANCE / SAFETY VERIFICATION (737-ALL)

<u>How to plan a takeoff:</u> Determine runway to be used based on current ATIS information and airport information. Determine current OAT at departure airport.

Using the *Runway Limit* Weight chart, determine the maximum allowable takeoff weight for the runway to be used. Be careful to compare the runway limit weight and the yellow performance limit weight along the bottom of the chart. Choose the lowest of these two numbers and use this as your maximum allowable takeoff weight.

Using the *Required Field Takeoff Length* chart, ensure that the runway is long enough to accommodate the departure takeoff roll given current wind conditions. Be careful to note that a negative number at the top of the chart indicates a headwind while a negative number indicates a tail wind.

Once you are confident that your takeoff weight will not exceed your limit weight, and you are confident that the runway in use is long enough to accommodate the departure, use the *Takeoff Thrust Setting* chart to verify the maximum available thrust for your takeoff.

Now that thrust, weight and runway length have been determined, you should make a decision as to whether or not to conduct a reduced thrust takeoff. If possible, a derated takeoff is always a good idea. Use the FMC to establish the N1 settings for your takeoff thrust.

<u>V Speed Determination:</u>

Determine runway condition, N1 setting and flap setting to be used for takeoff. Use V speeds for associated Aircraft Takeoff Gross Weight (ATOG). These speeds will normally be displayed by

the FMC after correct weights and runway conditions have been verified in the PERF INIT page. (They do not display automatically, you can click on the 1R, 2R and 3R LSKs to make the speed appear!)

Adjusted V Speed Conditions:
For some high temperature, high altitude conditions or tailwind takeoffs, it may be necessary to adjust the V1/Vr speeds calculated by the FMC and V Speed Tables in order to ensure a proper safety margin. Use the **V1/V2 Temperature and Altitude Adjustment Table** to make such adjustments.

Engine N1% Safety Check:
The FMC will normally provide the crew with accurate target N1 settings for the takeoff regime of flight. Crews should cross reference the FMC calculated N1 takeoff setting displayed on the THRUST LIM page against the **Takeoff Thrust N1** table to ensure safe N1 settings are used.

Takeoff Safety Considerations:
The “Eighty Knots” PNF callout is designed to alert the crew that they are entering the high speed phase of the takeoff roll. Once this has occurred, the Captain’s should only elect to reject a takeoff in a situation where the failure involved may prevent the aircraft from being safely flown. A minor, or non critical failure does not constitute a valid reason to reject a takeoff while in the high speed regime, as it may place the aircraft in greater danger than a continuance of the takeoff roll.

Conditions which warrant a decision to reject the takeoff include, but are not limited to, engine failures, engine or onboard fires, flight control failures or any other failure which calls into question the aircraft’s ability to fly. Crews should not assume that a ‘Go’ decision has been made upon passing 80 knots, however, as a decision relative to the nature of a failure and it’s proximity to V1 must still be made.

Warning Regarding Over-Rotation: It is possible to over-rotate the 737-800 and the 737-900 models due to the length of the fuselage and the low profile of the landing gear. Extraordinary care should be taken to avoid striking the tail on the ground during rotation, as this can lead to excessive wear on the ground contact strut, damage the aft fuselage and increase maintenance costs.

It is also important to note that depending upon your user settings in MSFS, if you strike the tail on the ground, Microsoft may disable engines and/or crash the airplane. (Not exactly realistic, but that is how contact points are modeled in MSFS!)