Table 1-1. ICAO standard atmosphere

Alt ft	Pressure Ratio δ	Temp Ratio θ	Density Ratio σ	σ 1/2	q /m² lb/ft²	Pressure lb/ft²	Temp °F	Density ρ slugs/ft³	Speed of Sound ft/sec	Speed of Sound mph	Speed of Sound knots	Alt ft
0	1.000000	1.0000	1.00000	1.0000	1482.524	2116.216	59.00	0.00237690	1116.9	761.5	661.7	0
1000	0.964387	0.9931	0.97106	0.9854	1429.727	2040.852	55.43	0.00230812	1113.0	758.9	659.5	1000
2000	0.929809	0.9862	0.94277	0.9710	1378.464	1967.676	51.87	0.00224087	1109.2	756.3	657.2	2000
3000	0.896241	0.9794	0.91512	0.9566	1328.698	1896.639	48.30	0.00217514	1105.3	753.6	654.9	3000
4000	0.863661	0.9725	0.88808	0.9424	1280.398	1827.693	44.74	0.00211088	1101.4	751.0	652.6	4000
5000	0.832047	0.9656	0.86167	0.9283	1233.530	1760.791	41.17	0.00204810	1097.5	748.3	640.3	5000
6000	0.801377	0.9587	0.83586	0.9143	1188.060	1695.886	37.60	0.00198675	1093.6	745.6	647.9	6000
7000	0.771628	0.9519	0.81064	0.9004	1143.957	1632.932	34.04	0.00192681	1089.7	743.0	645.6	7000
8000	0.742780	0.9450	0.78601	0.8866	1101.190	1571.884	30.47	0.00186827	1085.7	740.3	643.3	8000
9000	0.714812	0.9381	0.76196	0.8729	1059.726	1512.697	26.90	0.00181110	1081.8	737.6	640.9	9000
10000	0.687703	0.9312	0.73848	0.8593	1019.536	1455.328	23.34	0.00175528	1077.8	734.9	638.6	10000
11000	0.661432	0.9244	0.71555	0.8459	980.589	1399.733	19.77	0.00170078	1073.8	732.2	636.2	11000
12000	0.635980	0.9175	0.69317	0.8326	942.855	1345.871	16.21	0.00164759	1069.8	729.4	633.8	12000
13000	0.611327	0.9106	0.67133	0.8193	906.307	1293.699	12.64	0.00159568	1065.8	726.7	631.5	13000
14000	0.587453	0.9037	0.65002	0.8062	870.913	1243.178	9.07	0.00154503	1061.8	723.9	629.1	14000
15000	0.564340	0.8969	0.62923	0.7932	836.648	1194.266	5.51	0.00149562	1057.7	721.2	626.7	15000
16000	0.541969	0.8900	0.60896	0.7804	803.482	1146.924	1.94	0.00144743	1053.7	718.4	624.3	16000
17000	0.520322	0.8831	0.58919	0.7676	771.389	1101.113	-1.62	0.00140043	1049.6	715.6	621.9	17000
18000	0.499380	0.8762	0.56991	0.7549	740.342	1056.795	-5.19	0.00135461	1045.5	712.8	619.4	18000
19000	0.479126	0.8694	0.55112	0.7424	710.315	1013.933	-8.76	0.00130995	1041.4	710.0	617.0	19000
+25%						-7.42%	-22.97%	-6.05%				

Calculation

Density altitude can be calculated from atmospheric pressure and temperature (assuming dry air).

$$\mathrm{DA} = 144745,11628\left[1-\left(\frac{P_0/P_{SL}}{\mathrm{T}/T_{SL}}\right)^b\right]$$

where

DA = density altitude in feet

P_0 = atmospheric (static) pressure

P_{SL} = standard sea level atmospheric pressure (1013.25 hPa)

T = true (static) air temperature in kelvins (K) [add 273.15 to the Celsius (°C)] figure

T_{SL} = standard sea level air temperature (288.15 K)

b = 0.235

The density of dry air can be calculated using the ideal gas law, expressed as a function of temperature and pressure:

$$\rho = \frac{p}{R \cdot T}$$

where ρ is the air density, p is absolute pressure, R is the specific gas constant for dry air, and T is absolute temperature.

°F	°C
0	-18
20	-7
40	4
60	16
80	27
100	38
120	49

THIS CHART BASED ON:
- Full Throttle at 2700 RPM.
- Mixture Leaned
- Carburetor Heat Off.
- 2-Foot Skid Height
- Upstack Exhaust Pipe Installed
- No M/R Blade Abrasion Tape.

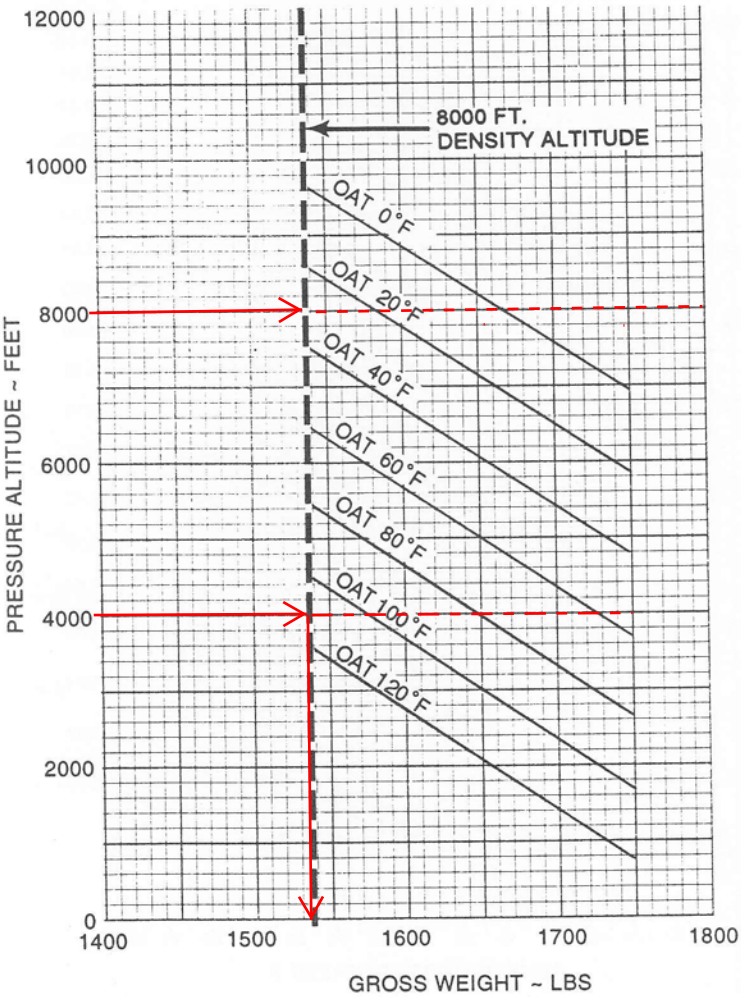

Figure 5-4. In Ground Effect Hover Ceiling Versus Gross Weight

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