

**TABLE 15**  
Distance by Vertical Angle  
Measured Between Sea Horizon and Top of Object Beyond Sea Horizon

Angle	Difference in feet between height of object and height of eye of observer										Angle
	25	30	35	40	45	50	60	70	80	90	
° ' /	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	° ' /
-0 04	12.4	12.8	13.2	13.6	14.0	14.4	15.0	15.7	16.3	16.9	-0 04
-0 03	10.5	10.9	11.4	11.8	12.2	12.6	13.3	14.0	14.6	15.2	-0 03
-0 02	8.7	9.2	9.7	10.2	10.6	11.0	11.8	12.5	13.1	13.7	-0 02
-0 01	7.2	7.7	8.2	8.7	9.1	9.5	10.3	11.0	11.7	12.3	-0 01
0 00	5.8	6.4	6.9	7.4	7.8	8.2	9.0	9.7	10.4	11.1	0 00
0 01	4.8	5.3	5.8	6.3	6.7	7.1	7.9	8.6	9.3	9.9	0 01
0 02	3.9	4.4	4.9	5.4	5.8	6.2	6.9	7.6	8.3	8.9	0 02
0 03	3.3	3.7	4.2	4.6	5.0	5.4	6.1	6.8	7.4	8.0	0 03
0 04	2.8	3.2	3.6	4.0	4.4	4.7	5.4	6.1	6.7	7.3	0 04
0 05	2.4	2.8	3.1	3.5	3.9	4.2	4.8	5.5	6.0	6.6	0 05
0 06	2.1	2.4	2.8	3.1	3.4	3.7	4.3	4.9	5.5	6.0	0 06
0 07	1.8	2.2	2.5	2.8	3.1	3.4	3.9	4.5	5.0	5.5	0 07
0 08	1.6	1.9	2.2	2.5	2.8	3.1	3.6	4.1	4.6	5.0	0 08
0 09	1.5	1.7	2.0	2.3	2.5	2.8	3.3	3.8	4.2	4.7	0 09
0 10	1.3	1.6	1.8	2.1	2.3	2.6	3.0	3.5	3.9	4.3	0 10
0 15	0.9	1.1	1.3	1.5	1.6	1.8	2.1	2.5	2.8	3.1	0 15
0 20	0.7	0.8	1.0	1.1	1.2	1.4	1.6	1.9	2.2	2.4	0 20
0 25	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.0	0 25
0 30	0.5	0.6	0.7	0.7	0.8	0.9	1.1	1.3	1.5	1.7	0 30
0 35		0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.4	0 35
0 40			0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	0 40
0 45				0.5	0.6	0.6	0.7	0.9	1.0	1.1	0 45
0 50				0.5	0.5	0.6	0.7	0.8	0.9	1.0	0 50
0 55				0.5	0.5	0.6	0.7	0.8	0.9	0.9	0 55
1 00						0.5	0.6	0.7	0.8	0.8	1 00
1 10							0.5	0.6	0.6	0.7	1 10
1 20								0.5	0.6	0.6	1 20
1 30									0.5	0.6	1 30
1 40									0.5	0.5	1 40
1 50										0.5	1 50

**TABLE 15**  
Distance by Vertical Angle  
Measured Between Sea Horizon and Top of Object Beyond Sea Horizon

Angle	Difference in feet between height of object and height of eye of observer											Angle
	100	120	140	160	180	200	250	300	350	400	450	
° ' /	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	° ' /
0 00	11.7	12.8	13.8	14.8	15.7	16.5	18.4	20.2	21.8	23.3	24.7	0 00
0 01	10.5	11.6	12.7	13.6	14.5	15.3	17.3	19.0	20.7	22.2	23.6	0 01
0 02	9.5	10.6	11.6	12.5	13.4	14.3	16.2	17.9	19.6	21.0	22.5	0 02
0 03	8.6	9.7	10.7	11.6	12.5	13.3	15.2	16.9	18.5	20.0	21.4	0 03
0 04	7.8	8.8	9.8	10.7	11.6	12.4	14.3	16.0	17.5	19.0	20.4	0 04
0 05	7.1	8.1	9.0	9.9	10.8	11.5	13.4	15.1	16.6	18.1	19.5	0 05
0 06	6.5	7.5	8.4	9.2	10.0	10.8	12.6	14.2	15.8	17.2	18.6	0 06
0 07	6.0	6.9	7.7	8.6	9.4	10.1	11.9	13.5	15.0	16.4	17.7	0 07
0 08	5.5	6.4	7.2	8.0	8.8	9.5	11.2	12.8	14.2	15.6	16.9	0 08
0 09	5.1	5.9	6.7	7.5	8.2	8.9	10.6	12.1	13.5	14.9	16.2	0 09
0 10	4.7	5.5	6.3	7.0	7.7	8.4	10.0	11.5	12.9	14.2	15.5	0 10
0 11	4.4	5.2	5.9	6.6	7.3	7.9	9.5	10.9	12.3	13.6	14.8	0 11
0 12	4.1	4.8	5.5	6.2	6.9	7.5	9.0	10.4	11.7	13.0	14.2	0 12
0 13	3.9	4.6	5.2	5.9	6.5	7.1	8.5	9.9	11.2	12.5	13.6	0 13
0 14	3.6	4.3	4.9	5.6	6.2	6.7	8.1	9.5	10.7	11.9	13.1	0 14
0 15	3.4	4.1	4.7	5.3	5.8	6.4	7.8	9.0	10.3	11.5	12.6	0 15
0 20	2.7	3.2	3.7	4.2	4.6	5.1	6.3	7.4	8.4	9.5	10.5	0 20
0 25	2.2	2.6	3.0	3.4	3.8	4.2	5.2	6.2	7.1	8.0	8.9	0 25
0 30	1.8	2.2	2.6	2.9	3.2	3.6	4.4	5.3	6.1	6.9	7.7	0 30
0 35	1.6	1.9	2.2	2.5	2.8	3.1	3.9	4.6	5.3	6.0	6.7	0 35
0 40	1.4	1.7	1.9	2.2	2.5	2.8	3.4	4.1	4.7	5.4	6.0	0 40
0 45	1.2	1.5	1.7	2.0	2.2	2.5	3.1	3.6	4.2	4.8	5.4	0 45
0 50	1.1	1.3	1.6	1.8	2.0	2.2	2.8	3.3	3.8	4.4	4.9	0 50
0 55	1.0	1.2	1.4	1.6	1.8	2.0	2.5	3.0	3.5	4.0	4.5	0 55
1 00	0.9	1.1	1.3	1.5	1.7	1.9	2.3	2.8	3.2	3.7	4.1	1 00
1 10	0.8	1.0	1.1	1.3	1.4	1.6	2.0	2.4	2.8	3.2	3.6	1 10
1 20	0.7	0.8	1.0	1.1	1.3	1.4	1.8	2.1	2.4	2.8	3.1	1 20
1 30	0.6	0.8	0.9	1.0	1.1	1.2	1.6	1.9	2.2	2.5	2.8	1 30
1 40	0.6	0.7	0.8	0.9	1.0	1.1	1.4	1.7	2.0	2.2	2.5	1 40
1 50	0.5	0.6	0.7	0.8	0.9	1.0	1.3	1.5	1.8	2.0	2.3	1 50
2 00	0.5	0.6	0.7	0.8	0.8	0.9	1.2	1.4	1.6	1.9	2.1	2 00
2 30		0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.7	2 30
3 00				0.5	0.6	0.6	0.8	0.9	1.1	1.3	1.4	3 00
3 30					0.5	0.5	0.7	0.8	0.9	1.1	1.2	3 30
4 00						0.5	0.6	0.7	0.8	0.9	1.1	4 00
4 30							0.5	0.6	0.7	0.8	0.9	4 30
5 00								0.5	0.6	0.7	0.8	5 00
6 00									0.5	0.5	0.6	6 00
7 00										0.5	0.5	7 00
8 00											0.5	8 00
10 00												10 00

**TABLE 15**  
Distance by Vertical Angle  
Measured Between Sea Horizon and Top of Object Beyond Sea Horizon

Angle ° ' /	Difference in feet between height of object and height of eye of observer											Angle ° ' /
	500 <i>Miles</i>	600 <i>Miles</i>	700 <i>Miles</i>	800 <i>Miles</i>	900 <i>Miles</i>	1000 <i>Miles</i>	1200 <i>Miles</i>	1400 <i>Miles</i>	1600 <i>Miles</i>	1800 <i>Miles</i>	2000 <i>Miles</i>	
0 05	20.8	23.2	25.4	27.5	29.5	31.4	34.8	38.0	41.0	43.8	46.5	0 05
0 06	19.8	22.3	24.5	26.6	28.5	30.4	33.8	37.0	40.0	42.8	45.4	0 06
0 07	19.0	21.4	23.6	25.6	27.6	29.4	32.9	36.0	39.0	41.8	44.4	0 07
0 08	18.2	20.5	22.7	24.7	26.7	28.5	31.9	35.1	38.0	40.8	43.4	0 08
0 09	17.4	19.7	21.9	23.9	25.8	27.6	31.0	34.1	37.0	39.8	42.5	0 09
0 10	16.7	19.0	21.1	23.1	25.0	26.8	30.1	33.2	36.2	38.9	41.5	0 10
0 11	16.0	18.3	20.4	22.3	24.2	26.0	29.3	32.4	35.3	38.0	40.6	0 11
0 12	15.4	17.6	19.6	21.6	23.4	25.2	28.5	31.5	34.4	37.1	39.7	0 12
0 13	14.8	16.9	19.0	20.9	22.7	24.4	27.7	30.7	33.6	36.3	38.8	0 13
0 14	14.2	16.3	18.3	20.2	22.0	23.7	26.9	30.0	32.8	35.4	38.0	0 14
0 15	13.7	15.8	17.7	19.6	21.3	23.0	26.2	29.2	32.0	34.6	37.2	0 15
0 17	12.7	14.7	16.6	18.4	20.1	21.7	24.8	27.8	30.5	33.1	35.6	0 17
0 20	11.4	13.3	15.1	16.8	18.4	20.0	23.0	25.8	28.4	31.0	33.4	0 20
0 25	9.7	11.4	13.0	14.6	16.1	17.5	20.3	22.9	25.4	27.8	30.1	0 25
0 30	8.4	9.9	11.4	12.8	14.2	15.5	18.1	20.5	22.9	25.2	27.4	0 30
0 35	7.4	8.8	10.1	11.4	12.6	13.9	16.3	18.5	20.7	22.9	24.9	0 35
0 40	6.6	7.8	9.0	10.2	11.4	12.5	14.7	16.9	18.9	20.9	22.9	0 40
0 45	6.0	7.1	8.2	9.3	10.3	11.4	13.4	15.4	17.3	19.2	21.1	0 45
0 50	5.4	6.4	7.5	8.5	9.4	10.4	12.3	14.2	16.0	17.7	19.5	0 50
0 55	5.0	5.9	6.8	7.8	8.7	9.6	11.4	13.1	14.8	16.5	18.1	0 55
1 00	4.6	5.5	6.3	7.2	8.0	8.9	10.5	12.2	13.8	15.3	16.9	1 00
1 10	3.9	4.7	5.5	6.2	7.0	7.7	9.2	10.6	12.1	13.5	14.9	1 10
1 20	3.5	4.2	4.8	5.5	6.2	6.8	8.1	9.4	10.7	12.0	13.2	1 20
1 30	3.1	3.7	4.3	4.9	5.5	6.1	7.3	8.5	9.6	10.8	11.9	1 30
1 40	2.8	3.3	3.9	4.4	5.0	5.5	6.6	7.7	8.7	9.8	10.8	1 40
1 50	2.5	3.0	3.6	4.1	4.5	5.0	6.0	7.0	8.0	9.0	9.9	1 50
2 00	2.3	2.8	3.3	3.7	4.2	4.6	5.5	6.5	7.4	8.2	9.1	2 00
2 30	1.9	2.2	2.6	3.0	3.4	3.7	4.5	5.2	5.9	6.7	7.4	2 30
3 00	1.6	1.9	2.2	2.5	2.8	3.1	3.7	4.4	5.0	5.6	6.2	3 00
3 30	1.3	1.6	1.9	2.1	2.4	2.7	3.2	3.7	4.3	4.8	5.3	3 30
4 00	1.2	1.4	1.6	1.9	2.1	2.3	2.8	3.3	3.7	4.2	4.7	4 00
5 00	0.9	1.1	1.3	1.5	1.7	1.9	2.3	2.6	3.0	3.4	3.7	5 00
6 00	0.8	0.9	1.1	1.3	1.4	1.6	1.9	2.2	2.5	2.8	3.1	6 00
7 00	0.7	0.8	0.9	1.1	1.2	1.3	1.6	1.9	2.1	2.4	2.7	7 00
8 00	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.1	2.3	8 00
10 00	0.5	0.6	0.7	0.7	0.8	0.9	1.1	1.3	1.5	1.7	1.9	10 00
12 00		0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.5	12 00
15 00				0.5	0.6	0.6	0.7	0.9	1.0	1.1	1.2	15 00
20 00						0.5	0.5	0.6	0.7	0.8	0.9	20 00
25 00								0.5	0.6	0.6	0.7	25 00
30 00									0.5	0.5	0.6	30 00