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# TM 11-2410

WAR DEPARTMENT TECHNICAL MANUAL

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# PILOT BALLOON TABLES (30-GRAM)

WAR DEPARTMENT • 15 MARCH 1944

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WAR DEPARTMENT TECHNICAL MANUAL  
TM 11-2410

*This manual supersedes TM 11-420, 7 August 1941, Tables of  
Vertical and Horizontal Components of Distances of Pilot Balloons*

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PILOT  
BALLOON  
TABLES  
(30-GRAM)

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BY ORDER OF THE SECRETARY OF WAR:

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*Chief of Staff.*

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# PILOT BALLOON TABLES

MAY 22 '44

(30-GRAM)

**1. PURPOSE.** a. The tables in this manual provide a simple means of determining the horizontal distances traveled by a 30-gram balloon from an observation point. The distances given are for the end of each minute of flight from the first minute through the 60th minute.

b. The tables apply only to 30-gram balloons (Balloon ML-50, ML-51, ML-64, ML-155, and ML-156) which are inflated with hydrogen sufficiently to support the weight of Cock ML-56 in addition to the weight of the balloon. When Lantern ML-91 or some other equipment is used in flight, such equipment should be hung on the small hook on Cock ML-56 while the balloon is being inflated.

c. The position of a pilot balloon in space at any instant, with reference to the observation point, may be represented by plotting the altitude of the balloon above the starting point, the azimuth (horizontal) angle from the starting point, and the horizontal distance of the balloon from the starting point.

**2. ALTITUDE.** a. The altitude of a balloon which has been inflated in accordance with paragraph 1b and has been released in the free atmosphere, is determined by timing. During the first few minutes of flight, the balloon ascends more rapidly because of air turbulence prevailing near the earth's surface. The average rate of ascent (usually correct to within 10 percent) is as follows:

	Yards
First minute.....	240
Second minute.....	220
Third minute.....	220
Fourth minute.....	210
Fifth minute.....	210
Each subsequent minute.....	200

b. The altitude at the end of each minute is indicated both in the altitude column on Form SC #201, and in the tables in this manual.

**3. HORIZONTAL DISTANCES.** a. **Computation of distances.** The horizontal distance at the end of each minute is computed by trigonometric solution of a triangle constructed as shown in figure 1. *A* represents the observation point and *B*, a balloon. Line *AB* is the line of sight from the theodolite to the balloon. Line *BC* indicates the altitude of the balloon. The horizontal distance is represented by line *AC*. The angle at *A* is the angle which is read from the elevation circle of the theodolite. Horizontal distance is obtained by multiplying the altitude by the cotangent of the elevation angle. (See par. 4.)

b. **Observations of 60 minutes or less.** The tables on the following pages eliminate the necessity of computing the horizontal distances for an observation of 60 minutes or less. Turn to the page showing distances for the minute under consideration. Locate the elevation angle reading in the column on the left, for whole degrees, and the line across the top, for tenths of a degree. The horizontal distance in yards is the figure immediately to the right of the degree angle, for whole degrees, or on a horizontal line to the right for tenths of a degree.

c. **Observations of more than 60 minutes.** To find the horizontal distance in case of an ascension continuous for more than 60 minutes, it will be necessary to multiply the altitude of the balloon in yards by the cotangent of the elevation angle. For example, at the end of the 65th minute, the altitude is 13,100 yards and the elevation angle is 37.8°. From the table in paragraph 4, the cotangent of 37.8° is 1.2892. Thus, 13,100 × 1.2892 is 16,888.5200. The horizontal distance is recorded to the nearest 10 yards, for example 16,890.

d. **Slide rule.** Computation of horizontal distance may also be made by means of Slide Rule ML-59, as follows:

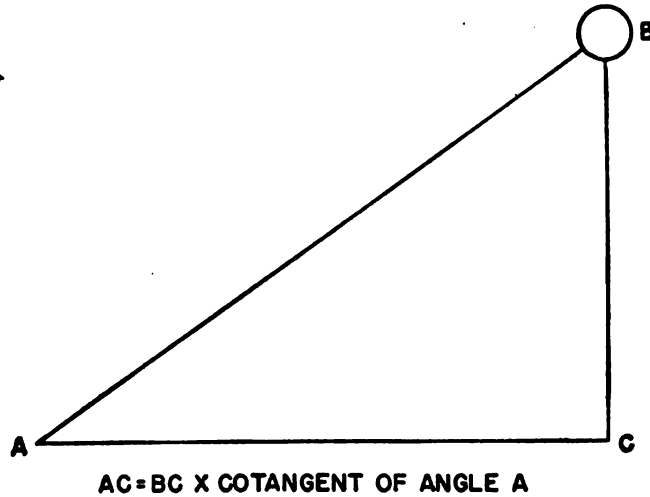
(1) For an elevation angle 45° or less, set the slide

rule indicator at the value of the balloon altitude on D scale. Move T scale so that the value of the elevation angle on T scale coincides with the indicator. The horizontal distance is then read on D scale in line with either end of T scale.

(2) For an elevation angle more than  $45^\circ$ , set the slide so that one end of T scale coincides with the value of the balloon altitude on D scale. Set the

indicator on the complement of the angle of elevation (that is,  $90^\circ$  minus the elevation angle) on the T scale. The horizontal distance is read at the indicator on D scale.

**e. Tables.** The tables on the following pages indicate horizontal distances for pilot balloon flights for periods extending from 1 minute through 60 minutes.



TL-6808

Figure 1. Trigonometric determination of horizontal distance.

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

1 MINUTE AFTER RELEASE  
240 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	2,740	2,690	2,640	2,590	2,540	2,490	2,450	2,400	2,360	2,320
6	2,280	2,250	2,210	2,170	2,140	2,110	2,070	2,040	2,010	1,980
7	1,950	1,930	1,900	1,870	1,850	1,820	1,800	1,780	1,750	1,730
8	1,710	1,690	1,670	1,650	1,630	1,610	1,590	1,570	1,550	1,530
9	1,520	1,500	1,480	1,470	1,450	1,430	1,420	1,400	1,390	1,380
10	1,360	1,350	1,330	1,320	1,310	1,290	1,280	1,270	1,260	1,250
11	1,230	1,220	1,210	1,200	1,190	1,180	1,170	1,160	1,150	1,140
12	1,130	1,120	1,110	1,100	1,090	1,080	1,070	1,060	1,060	1,050
13	1,040	1,030	1,020	1,020	1,010	1,000	990	980	980	970
14	960	960	950	940	930	930	920	910	910	900
15	900	890	880	880	870	870	860	850	850	840
16	840	830	830	820	820	810	810	800	790	790
17	790	780	780	770	770	760	760	750	750	740
18	740	730	730	730	720	720	710	710	700	700
19	700	690	690	690	680	680	670	670	670	660
20	660	660	650	650	650	640	640	640	630	630
21	630	620	620	620	610	610	610	600	600	600
22	590	590	590	590	580	580	580	570	570	570
23	570	560	560	560	550	550	550	550	540	540
24	540	540	530	530	530	530	520	520	520	520
25	510	510	510	510	510	500	500	500	500	490
26	490	490	490	490	480	480	480	480	480	470
27	470	470	470	460	460	460	460	460	460	450
28	450	450	450	450	440	440	440	440	440	430
29	430	430	430	430	430	420	420	420	420	420
30	420	410	410	410	410	410	410	400	400	400
31	400	400	400	390	390	390	390	390	390	390
32	380	380	380	380	380	380	380	370	370	370
33	370	370	370	370	360	360	360	360	360	360
34	360	350	350	350	350	350	350	350	350	340
35	340	340	340	340	340	340	340	330	330	330
36	330	330	330	330	330	320	320	320	320	320
37	320	320	320	320	310	310	310	310	310	310
38	310	310	300	300	300	300	300	300	300	300
39	300	300	290	290	290	290	290	290	290	290
40	290	280	280	280	280	280	280	280	280	280
41	280	280	270	270	270	270	270	270	270	270
42	270	270	260	260	260	260	260	260	260	260
43	260	260	260	250	250	250	250	250	250	250
44	250	250	250	250	250	240	240	240	240	240

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	240	240	240	240	240	240	240	230	230	230
46	230	230	230	230	230	230	230	230	230	220
47	220	220	220	220	220	220	220	220	220	220
48	220	220	210	210	210	210	210	210	210	210
49	210	210	210	210	210	200	200	200	200	200
50	200	200	200	200	200	200	200	200	200	200
51	190	190	190	190	190	190	190	190	190	190
52	190	190	190	190	180	180	180	180	180	180
53	180	180	180	180	180	180	180	180	180	180
54	170	170	170	170	170	170	170	170	170	170
55	170	170	170	170	170	160	160	160	160	160
56	160	160	160	160	160	160	160	160	160	160
57	160	160	150	150	150	150	150	150	150	150
58	150	150	150	150	150	150	150	150	150	140
59	140	140	140	140	140	140	140	140	140	140
60	140	140	140	140	140	140	140	130	130	130
61	130	130	130	130	130	130	130	130	130	130
62	130	130	130	130	130	120	120	120	120	120
63	120	120	120	120	120	120	120	120	120	120
64	120	120	120	120	110	110	110	110	110	110
65	110	110	110	110	110	110	110	110	110	110
66	110	110	110	110	100	100	100	100	100	100
67	100	100	100	100	100	100	100	100	100	100
68	100	100	100	100	100	90	90	90	90	90
69	90	90	90	90	90	90	90	90	90	90
70	90	90	90	90	90	80	80	80	80	80
71	80	80	80	80	80	80	80	80	80	80
72	80	80	80	80	80	80	80	70	70	70
73	70	70	70	70	70	70	70	70	70	70
74	70	70	70	70	70	70	70	70	70	60
75	60	60	60	60	60	60	60	60	60	60
76	60	60	60	60	60	60	60	60	60	60
77	60	50	50	50	50	50	50	50	50	50
78	50	50	50	50	50	50	50	50	50	50
79	50	50	50	50	40	40	40	40	40	40
80	40	40	40	40	40	40	40	40	40	40
81	40	40	40	40	40	40	40	40	30	30
82	30	30	30	30	30	30	30	30	30	30
83	30	30	30	30	30	30	30	30	30	30
84	30	20	20	20	20	20	20	20	20	20
85	20	20	20	20	20	20	20	20	20	20
86	20	20	20	20	20	10	10	10	10	10
87	10	10	10	10	10	10	10	10	10	10
88	10	10	10	10	10	10	10	10	10	10
89	0	0	0	0	0	0	0	0	0	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

2 MINUTES AFTER RELEASE

460 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	5,260	5,150	5,060	4,960	4,870	4,780	4,690	4,610	4,530	4,450
6	4,380	4,300	4,230	4,170	4,100	4,040	3,980	3,920	3,860	3,800
7	3,750	3,690	3,640	3,590	3,540	3,490	3,450	3,400	3,360	3,320
8	3,270	3,230	3,190	3,150	3,120	3,080	3,040	3,010	2,970	2,940
9	2,900	2,870	2,840	2,810	2,780	2,750	2,720	2,690	2,660	2,640
10	2,610	2,580	2,560	2,530	2,510	2,480	2,460	2,430	2,410	2,390
11	2,370	2,340	2,320	2,300	2,280	2,260	2,240	2,220	2,200	2,180
12	2,160	2,150	2,130	2,110	2,090	2,070	2,060	2,040	2,020	2,010
13	1,990	1,980	1,960	1,950	1,930	1,920	1,900	1,890	1,870	1,860
14	1,840	1,830	1,820	1,800	1,790	1,780	1,770	1,750	1,740	1,730
15	1,720	1,700	1,690	1,680	1,670	1,660	1,650	1,640	1,630	1,610
16	1,600	1,590	1,580	1,570	1,560	1,550	1,540	1,530	1,520	1,510
17	1,500	1,500	1,490	1,480	1,470	1,460	1,450	1,440	1,430	1,420
18	1,420	1,410	1,400	1,390	1,380	1,370	1,370	1,360	1,350	1,340
19	1,340	1,330	1,320	1,310	1,310	1,300	1,290	1,280	1,280	1,270
20	1,260	1,260	1,250	1,240	1,240	1,230	1,220	1,220	1,210	1,200
21	1,200	1,190	1,190	1,180	1,170	1,170	1,160	1,160	1,150	1,140
22	1,140	1,130	1,130	1,120	1,120	1,110	1,110	1,100	1,090	1,090
23	1,080	1,080	1,070	1,070	1,060	1,060	1,050	1,050	1,040	1,040
24	1,030	1,030	1,020	1,020	1,010	1,010	1,000	1,000	1,000	990
25	990	980	980	970	970	960	960	960	950	950
26	940	940	930	930	930	920	920	910	910	910
27	900	900	900	890	890	880	880	880	870	870
28	870	860	860	850	850	850	840	840	840	830
29	830	830	820	820	820	810	810	810	800	800
30	800	790	790	790	780	780	780	770	770	770
31	770	760	760	760	750	750	750	740	740	740
32	740	730	730	730	720	720	720	720	710	710
33	710	710	700	700	700	690	690	690	690	680
34	680	680	680	670	670	670	670	660	660	660
35	660	650	650	650	650	640	640	640	640	640
36	630	630	630	630	620	620	620	620	610	610
37	610	610	610	600	600	600	600	600	590	590
38	590	590	580	580	580	580	580	570	570	570
39	570	570	560	560	560	560	560	550	550	550
40	550	550	540	540	540	540	540	530	530	530
41	530	530	530	520	520	520	520	520	510	510
42	510	510	510	510	500	500	500	500	500	500
43	490	490	490	490	490	480	480	480	480	480
44	480	470	470	470	470	470	470	460	460	460



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	680	680	680	670	670	670	670	660	660	660
46	660	650	650	650	650	650	640	640	640	640
47	630	630	630	630	630	620	620	620	620	610
48	610	610	610	610	600	600	600	600	600	590
49	590	590	590	580	580	580	580	580	570	570
50	570	570	570	560	560	560	560	560	550	550
51	550	550	550	540	540	540	540	540	540	530
52	530	530	530	530	520	520	520	520	520	510
53	510	510	510	510	510	500	500	500	500	500
54	490	490	490	490	490	490	480	480	480	480
55	480	470	470	470	470	470	470	460	460	460
56	460	460	460	450	450	450	450	450	440	440
57	440	440	440	440	430	430	430	430	430	430
58	420	420	420	420	420	420	420	410	410	410
59	410	410	410	400	400	400	400	400	400	390
60	390	390	390	390	390	380	380	380	380	380
61	380	380	370	370	370	370	370	370	360	360
62	360	360	360	360	360	350	350	350	350	350
63	350	340	340	340	340	340	340	340	330	330
64	330	330	330	330	330	320	320	320	320	320
65	320	320	310	310	310	310	310	310	310	300
66	300	300	300	300	300	300	290	290	290	290
67	290	290	290	280	280	280	280	280	280	280
68	270	270	270	270	270	270	270	270	260	260
69	260	260	260	260	260	250	250	250	250	250
70	250	250	240	240	240	240	240	240	240	240
71	230	230	230	230	230	230	230	220	220	220
72	220	220	220	220	220	210	210	210	210	210
73	210	210	210	200	200	200	200	200	200	200
74	190	190	190	190	190	190	190	190	180	180
75	180	180	180	180	180	180	170	170	170	170
76	170	170	170	170	160	160	160	160	160	160
77	160	160	150	150	150	150	150	150	150	150
78	140	140	140	140	140	140	140	140	130	130
79	130	130	130	130	130	130	120	120	120	120
80	120	120	120	120	110	110	110	110	110	110
81	110	110	100	100	100	100	100	100	100	100
82	100	90	90	90	90	90	90	90	90	80
83	80	80	80	80	80	80	80	80	70	70
84	70	70	70	70	70	70	60	60	60	60
85	60	60	60	60	50	50	50	50	50	50
86	50	50	50	40	40	40	40	40	40	40
87	40	30	30	30	30	30	30	30	30	20
88	20	20	20	20	20	20	20	20	10	10
89	10	10	10	10	10	10	0	0	0	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

4 MINUTES AFTER RELEASE  
890 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	10,170	9,970	9,780	9,590	9,420	9,250	9,080	8,920	8,760	8,610
6	8,470	8,330	8,190	8,060	7,930	7,810	7,690	7,580	7,460	7,350
7	7,250	7,150	7,050	6,950	6,850	6,760	6,670	6,580	6,500	6,410
8	6,330	6,250	6,180	6,100	6,030	5,960	5,880	5,820	5,750	5,680
9	5,620	5,560	5,500	5,430	5,380	5,320	5,260	5,210	5,150	5,100
10	5,050	5,000	4,950	4,900	4,850	4,800	4,760	4,710	4,670	4,620
11	4,580	4,540	4,490	4,450	4,410	4,370	4,340	4,300	4,260	4,220
12	4,190	4,150	4,120	4,080	4,050	4,010	3,980	3,950	3,920	3,890
13	3,860	3,820	3,790	3,760	3,740	3,710	3,680	3,650	3,620	3,600
14	3,570	3,540	3,520	3,490	3,470	3,440	3,420	3,390	3,370	3,340
15	3,320	3,300	3,280	3,250	3,230	3,210	3,190	3,170	3,150	3,120
16	3,100	3,080	3,060	3,040	3,020	3,000	2,990	2,970	2,950	2,930
17	2,910	2,890	2,880	2,860	2,840	2,820	2,810	2,790	2,770	2,760
18	2,740	2,720	2,710	2,690	2,680	2,660	2,640	2,630	2,610	2,600
19	2,580	2,570	2,560	2,540	2,530	2,510	2,500	2,490	2,470	2,460
20	2,450	2,430	2,420	2,410	2,390	2,380	2,370	2,360	2,340	2,330
21	2,320	2,310	2,290	2,280	2,270	2,260	2,250	2,240	2,230	2,210
22	2,200	2,190	2,180	2,170	2,160	2,150	2,140	2,130	2,120	2,110
23	2,100	2,090	2,080	2,070	2,060	2,050	2,040	2,030	2,020	2,010
24	2,000	1,990	1,980	1,970	1,960	1,950	1,940	1,940	1,930	1,920
25	1,910	1,900	1,890	1,880	1,870	1,870	1,860	1,850	1,840	1,830
26	1,820	1,820	1,810	1,800	1,790	1,790	1,780	1,770	1,760	1,750
27	1,750	1,740	1,730	1,720	1,720	1,710	1,700	1,700	1,690	1,680
28	1,670	1,670	1,660	1,650	1,650	1,640	1,630	1,630	1,620	1,610
29	1,610	1,600	1,590	1,590	1,580	1,570	1,570	1,560	1,550	1,550
30	1,540	1,540	1,530	1,520	1,520	1,510	1,500	1,500	1,490	1,490
31	1,480	1,480	1,470	1,460	1,460	1,450	1,450	1,440	1,440	1,430
32	1,420	1,420	1,410	1,410	1,400	1,400	1,390	1,390	1,380	1,380
33	1,370	1,370	1,360	1,350	1,350	1,340	1,340	1,330	1,330	1,320
34	1,320	1,310	1,310	1,300	1,300	1,290	1,290	1,290	1,280	1,280
35	1,270	1,270	1,260	1,260	1,250	1,250	1,240	1,240	1,230	1,230
36	1,220	1,220	1,220	1,210	1,210	1,200	1,200	1,190	1,190	1,190
37	1,180	1,180	1,170	1,170	1,160	1,160	1,160	1,150	1,150	1,140
38	1,140	1,140	1,130	1,130	1,120	1,120	1,110	1,110	1,110	1,100
39	1,100	1,100	1,090	1,090	1,080	1,080	1,080	1,070	1,070	1,060
40	1,060	1,060	1,050	1,050	1,050	1,040	1,040	1,030	1,030	1,030
41	1,020	1,020	1,020	1,010	1,010	1,010	1,000	1,000	1,000	990
42	990	980	980	980	970	970	970	960	960	960
43	950	950	950	940	940	940	930	930	930	920
44	920	920	920	910	910	910	900	900	900	890

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	890	890	880	880	880	870	870	870	870	860
46	860	860	850	850	850	840	840	840	840	830
47	830	830	820	820	820	820	810	810	810	800
48	800	800	800	790	790	790	780	780	780	780
49	770	770	770	770	760	760	760	750	750	750
50	750	740	740	740	740	730	730	730	730	720
51	720	720	720	710	710	710	710	700	700	700
52	700	690	690	690	690	680	680	680	680	670
53	670	670	670	660	660	660	660	650	650	650
54	650	640	640	640	640	630	630	630	630	630
55	620	620	620	620	610	610	610	610	600	600
56	600	600	600	590	590	590	590	580	580	580
57	580	580	570	570	570	570	560	560	560	560
58	560	550	550	550	550	550	540	540	540	540
59	530	530	530	530	530	520	520	520	520	520
60	510	510	510	510	510	500	500	500	500	500
61	490	490	490	490	490	480	480	480	480	480
62	470	470	470	470	470	460	460	460	460	460
63	450	450	450	450	450	440	440	440	440	440
64	430	430	430	430	430	420	420	420	420	420
65	420	410	410	410	410	410	400	400	400	400
66	400	390	390	390	390	390	390	380	380	380
67	380	380	370	370	370	370	370	360	360	360
68	360	360	360	350	350	350	350	350	350	340
69	340	340	340	340	330	330	330	330	330	330
70	320	320	320	320	320	320	310	310	310	310
71	310	300	300	300	300	300	300	290	290	290
72	290	290	290	280	280	280	280	280	280	270
73	270	270	270	270	270	260	260	260	260	260
74	260	250	250	250	250	250	250	240	240	240
75	240	240	240	230	230	230	230	230	230	220
76	220	220	220	220	220	210	210	210	210	210
77	210	200	200	200	200	200	200	190	190	190
78	190	190	190	180	180	180	180	180	180	170
79	170	170	170	170	170	160	160	160	160	160
80	160	160	150	150	150	150	150	150	140	140
81	140	140	140	140	130	130	130	130	130	130
82	130	120	120	120	120	120	120	110	110	110
83	110	110	110	100	100	100	100	100	100	100
84	90	90	90	90	90	90	80	80	80	80
85	80	80	70	70	70	70	70	70	70	60
86	60	60	60	60	60	50	50	50	50	50
87	50	50	40	40	40	40	40	40	30	30
88	30	30	30	30	20	20	20	20	20	20
89	20	10	10	10	10	10	10	0	0	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

5 MINUTES AFTER RELEASE  
1,100 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5	12,570	12,320	12,090	11,860	11,640	11,430	11,220	11,020	10,830	10,640
6	10,470	10,290	10,130	9,960	9,810	9,650	9,510	9,360	9,220	9,090
7	8,960	8,830	8,710	8,590	8,470	8,360	8,240	8,140	8,030	7,930
8	7,830	7,730	7,630	7,540	7,450	7,360	7,270	7,190	7,110	7,020
9	6,950	6,870	6,790	6,720	6,640	6,570	6,500	6,440	6,370	6,300
10	6,240	6,180	6,110	6,050	5,990	5,940	5,880	5,820	5,770	5,710
11	5,660	5,610	5,560	5,500	5,460	5,410	5,360	5,310	5,270	5,220
12	5,180	5,130	5,090	5,050	5,000	4,960	4,920	4,880	4,840	4,800
13	4,760	4,730	4,690	4,650	4,620	4,580	4,550	4,510	4,480	4,440
14	4,410	4,380	4,350	4,320	4,280	4,250	4,220	4,190	4,160	4,130
15	4,110	4,080	4,050	4,020	3,990	3,970	3,940	3,910	3,890	3,860
16	3,840	3,810	3,790	3,760	3,740	3,710	3,690	3,670	3,640	3,620
17	3,600	3,580	3,550	3,530	3,510	3,490	3,470	3,450	3,430	3,410
18	3,390	3,370	3,350	3,330	3,310	3,290	3,270	3,250	3,230	3,210
19	3,190	3,180	3,160	3,140	3,120	3,110	3,090	3,070	3,060	3,040
20	3,020	3,010	2,990	2,970	2,960	2,940	2,930	2,910	2,900	2,880
21	2,870	2,850	2,840	2,820	2,810	2,790	2,780	2,760	2,750	2,740
22	2,720	2,710	2,700	2,680	2,670	2,660	2,640	2,630	2,620	2,600
23	2,590	2,580	2,570	2,550	2,540	2,530	2,520	2,510	2,490	2,480
24	2,470	2,460	2,450	2,440	2,420	2,410	2,400	2,390	2,380	2,370
25	2,360	2,350	2,340	2,330	2,320	2,310	2,300	2,290	2,280	2,270
26	2,260	2,250	2,240	2,230	2,220	2,210	2,200	2,190	2,180	2,170
27	2,160	2,150	2,140	2,130	2,120	2,110	2,100	2,100	2,090	2,080
28	2,070	2,060	2,050	2,040	2,030	2,030	2,020	2,010	2,000	1,990
29	1,980	1,980	1,970	1,960	1,950	1,940	1,940	1,930	1,920	1,910
30	1,910	1,900	1,890	1,880	1,870	1,870	1,860	1,850	1,850	1,840
31	1,830	1,820	1,820	1,810	1,800	1,800	1,790	1,780	1,770	1,770
32	1,760	1,750	1,750	1,740	1,730	1,730	1,720	1,710	1,710	1,700
33	1,690	1,690	1,680	1,670	1,670	1,660	1,660	1,650	1,640	1,640
34	1,630	1,620	1,620	1,610	1,610	1,600	1,590	1,590	1,580	1,580
35	1,570	1,570	1,560	1,550	1,550	1,540	1,540	1,530	1,530	1,520
36	1,510	1,510	1,500	1,500	1,490	1,490	1,480	1,480	1,470	1,470
37	1,460	1,450	1,450	1,440	1,440	1,430	1,430	1,420	1,420	1,410
38	1,410	1,400	1,400	1,390	1,390	1,380	1,380	1,370	1,370	1,360
39	1,360	1,350	1,350	1,340	1,340	1,330	1,330	1,320	1,320	1,320
40	1,310	1,310	1,300	1,300	1,290	1,290	1,280	1,280	1,270	1,270
41	1,270	1,260	1,260	1,250	1,250	1,240	1,240	1,230	1,230	1,230
42	1,220	1,220	1,210	1,210	1,200	1,200	1,200	1,190	1,190	1,180
43	1,180	1,180	1,170	1,170	1,160	1,160	1,160	1,150	1,150	1,140
44	1,140	1,140	1,130	1,130	1,120	1,120	1,120	1,110	1,110	1,100

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	1,100	1,100	1,090	1,090	1,080	1,080	1,080	1,070	1,070	1,070
46	1,060	1,060	1,050	1,050	1,050	1,040	1,040	1,040	1,030	1,030
47	1,030	1,020	1,020	1,020	1,010	1,010	1,000	1,000	1,000	990
48	990	990	980	980	980	970	970	970	960	960
49	960	950	950	950	940	940	940	930	930	930
50	920	920	920	910	910	910	900	900	900	890
51	890	890	880	880	880	870	870	870	870	860
52	860	860	850	850	850	840	840	840	830	830
53	830	830	820	820	820	810	810	810	810	800
54	800	800	790	790	790	780	780	780	780	770
55	770	770	760	760	760	760	750	750	750	740
56	740	740	740	730	730	730	730	720	720	720
57	710	710	710	710	700	700	700	700	690	690
58	690	680	680	680	680	670	670	670	670	660
59	660	660	660	650	650	650	650	640	640	640
60	640	630	630	630	620	620	620	620	610	610
61	610	610	600	600	600	600	590	590	590	590
62	580	580	580	580	580	570	570	570	570	560
63	560	560	560	550	550	550	550	540	540	540
64	540	530	530	530	530	520	520	520	520	520
65	510	510	510	510	500	500	500	500	490	490
66	490	490	490	480	480	480	480	470	470	470
67	470	460	460	460	460	460	450	450	450	450
68	440	440	440	440	440	430	430	430	430	420
69	420	420	420	420	410	410	410	410	400	400
70	400	400	400	390	390	390	390	390	380	380
71	380	380	370	370	370	370	370	360	360	360
72	360	360	350	350	350	350	340	340	340	340
73	340	330	330	330	330	330	320	320	320	320
74	320	310	310	310	310	310	300	300	300	300
75	290	290	290	290	290	280	280	280	280	280
76	270	270	270	270	270	260	260	260	260	260
77	250	250	250	250	250	240	240	240	240	240
78	230	230	230	230	230	220	220	220	220	220
79	210	210	210	210	210	200	200	200	200	200
80	190	190	190	190	190	180	180	180	180	180
81	170	170	170	170	170	160	160	160	160	160
82	150	150	150	150	150	140	140	140	140	140
83	140	130	130	130	130	130	120	120	120	120
84	120	110	110	110	110	110	100	100	100	100
85	100	90	90	90	90	90	80	80	80	80
86	80	80	70	70	70	70	70	60	60	60
87	60	60	50	50	50	50	50	40	40	40
88	40	40	30	30	30	30	30	20	20	20
89	20	20	20	10	10	10	10	10	0	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

6 MINUTES AFTER RELEASE  
1,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5	14,860	14,560	14,290	14,010	13,750	13,510	13,260	13,030	12,800	12,580
6	12,370	12,160	11,970	11,780	11,590	11,410	11,240	11,070	10,900	10,740
7	10,590	10,440	10,290	10,150	10,010	9,870	9,740	9,620	9,490	9,370
8	9,250	9,130	9,020	8,910	8,800	8,700	8,600	8,500	8,400	8,300
9	8,210	8,120	8,030	7,940	7,850	7,770	7,690	7,610	7,530	7,450
10	7,370	7,300	7,230	7,150	7,080	7,010	6,950	6,880	6,810	6,750
11	6,690	6,630	6,570	6,510	6,450	6,390	6,330	6,280	6,220	6,170
12	6,120	6,060	6,010	5,960	5,910	5,860	5,820	5,770	5,720	5,680
13	5,630	5,590	5,540	5,500	5,460	5,410	5,370	5,330	5,290	5,250
14	5,210	5,180	5,140	5,100	5,060	5,030	4,990	4,960	4,920	4,890
15	4,850	4,820	4,780	4,750	4,720	4,690	4,660	4,620	4,590	4,560
16	4,530	4,500	4,470	4,450	4,420	4,390	4,360	4,330	4,310	4,280
17	4,250	4,230	4,200	4,170	4,150	4,120	4,100	4,070	4,050	4,020
18	4,000	3,980	3,950	3,930	3,910	3,890	3,860	3,840	3,820	3,800
19	3,780	3,750	3,730	3,710	3,690	3,670	3,650	3,630	3,610	3,590
20	3,570	3,550	3,530	3,510	3,500	3,480	3,460	3,440	3,420	3,400
21	3,390	3,370	3,350	3,330	3,320	3,300	3,280	3,270	3,250	3,230
22	3,220	3,200	3,190	3,170	3,150	3,140	3,120	3,110	3,090	3,080
23	3,060	3,050	3,030	3,020	3,000	2,990	2,980	2,960	2,950	2,930
24	2,920	2,910	2,890	2,880	2,870	2,850	2,840	2,830	2,810	2,800
25	2,790	2,780	2,760	2,750	2,740	2,730	2,710	2,700	2,690	2,680
26	2,670	2,650	2,640	2,630	2,620	2,610	2,600	2,580	2,570	2,560
27	2,550	2,540	2,530	2,520	2,510	2,500	2,490	2,480	2,470	2,460
28	2,440	2,430	2,420	2,410	2,400	2,390	2,380	2,370	2,360	2,350
29	2,350	2,340	2,330	2,320	2,310	2,300	2,290	2,280	2,270	2,260
30	2,250	2,240	2,230	2,220	2,220	2,210	2,200	2,190	2,180	2,170
31	2,160	2,160	2,150	2,140	2,130	2,120	2,110	2,100	2,100	2,090
32	2,080	2,070	2,060	2,060	2,050	2,040	2,030	2,030	2,020	2,010
33	2,000	1,990	1,990	1,980	1,970	1,960	1,960	1,950	1,940	1,930
34	1,930	1,920	1,910	1,910	1,900	1,890	1,880	1,880	1,870	1,860
35	1,860	1,850	1,840	1,840	1,830	1,820	1,820	1,810	1,800	1,800
36	1,790	1,780	1,780	1,770	1,760	1,760	1,750	1,740	1,740	1,730
37	1,730	1,720	1,710	1,710	1,700	1,690	1,690	1,680	1,680	1,670
38	1,660	1,660	1,650	1,650	1,640	1,630	1,630	1,620	1,620	1,610
39	1,610	1,600	1,590	1,590	1,580	1,580	1,570	1,570	1,560	1,550
40	1,550	1,540	1,540	1,530	1,530	1,520	1,520	1,510	1,510	1,500
41	1,500	1,490	1,480	1,480	1,470	1,470	1,460	1,460	1,450	1,450
42	1,440	1,440	1,430	1,430	1,420	1,420	1,410	1,410	1,400	1,400
43	1,390	1,390	1,380	1,380	1,370	1,370	1,370	1,360	1,360	1,350
44	1,350	1,340	1,340	1,330	1,330	1,320	1,320	1,310	1,310	1,300

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	1,300	1,300	1,290	1,290	1,280	1,280	1,270	1,270	1,260	1,260
46	1,260	1,250	1,250	1,240	1,240	1,230	1,230	1,230	1,220	1,220
47	1,210	1,210	1,200	1,200	1,200	1,190	1,190	1,180	1,180	1,170
48	1,170	1,170	1,160	1,160	1,150	1,150	1,150	1,140	1,140	1,130
49	1,130	1,130	1,120	1,120	1,110	1,110	1,110	1,100	1,100	1,090
50	1,090	1,090	1,080	1,080	1,080	1,070	1,070	1,060	1,060	1,060
51	1,050	1,050	1,050	1,040	1,040	1,030	1,030	1,030	1,020	1,020
52	1,020	1,010	1,010	1,000	1,000	1,000	990	990	990	980
53	980	980	970	970	970	960	960	950	950	950
54	940	940	940	930	930	930	920	920	920	910
55	910	910	900	900	900	890	890	890	880	880
56	880	870	870	870	860	860	860	850	850	850
57	840	840	840	830	830	830	820	820	820	820
58	810	810	810	800	800	800	790	790	790	780
59	780	780	770	770	770	770	760	760	760	750
60	750	750	740	740	740	740	730	730	730	720
61	720	720	710	710	710	710	700	700	700	690
62	690	690	690	680	680	680	670	670	670	670
63	660	660	660	650	650	650	650	640	640	640
64	630	630	630	630	620	620	620	610	610	610
65	610	600	600	600	600	590	590	590	580	580
66	580	580	570	570	570	570	560	560	560	550
67	550	550	550	540	540	540	540	530	530	530
68	530	520	520	520	510	510	510	510	500	500
69	500	500	490	490	490	490	480	480	480	480
70	470	470	470	470	460	460	460	460	450	450
71	450	450	440	440	440	430	430	430	430	420
72	420	420	420	410	410	410	410	400	400	400
73	400	390	390	390	390	390	380	380	380	380
74	370	370	370	370	360	360	360	360	350	350
75	350	350	340	340	340	340	330	330	330	330
76	320	320	320	320	310	310	310	310	300	300
77	300	300	300	290	290	290	290	280	280	280
78	280	270	270	270	270	260	260	260	260	260
79	250	250	250	250	240	240	240	240	230	230
80	230	230	220	220	220	220	220	210	210	210
81	210	200	200	200	200	190	190	190	190	180
82	180	180	180	180	170	170	170	170	160	160
83	160	160	150	150	150	150	150	140	140	140
84	140	130	130	130	130	130	120	120	120	120
85	110	110	110	110	100	100	100	100	100	90
86	90	90	90	80	80	80	80	80	70	70
87	70	70	60	60	60	60	50	50	50	50
88	50	40	40	40	40	30	30	30	30	20
89	20	20	20	20	10	10	10	10	0	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

7 MINUTES AFTER RELEASE  
1,500 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	17,140	16,800	16,480	16,170	15,870	15,580	15,300	15,030	14,770	14,520
6	14,270	14,040	13,810	13,590	13,370	13,170	12,960	12,770	12,580	12,400
7	12,220	12,040	11,870	11,710	11,550	11,390	11,240	11,090	10,950	10,810
8	10,670	10,540	10,410	10,280	10,160	10,040	9,920	9,800	9,690	9,580
9	9,470	9,360	9,260	9,160	9,060	8,960	8,870	8,780	8,680	8,590
10	8,510	8,420	8,340	8,250	8,170	8,090	8,020	7,940	7,860	7,790
11	7,720	7,650	7,580	7,510	7,440	7,370	7,310	7,240	7,180	7,120
12	7,070	7,000	6,940	6,880	6,820	6,770	6,710	6,660	6,600	6,550
13	6,500	6,450	6,400	6,350	6,300	6,250	6,200	6,150	6,110	6,060
14	6,020	5,970	5,930	5,880	5,840	5,800	5,760	5,720	5,680	5,640
15	5,600	5,560	5,520	5,480	5,450	5,410	5,370	5,340	5,300	5,270
16	5,230	5,200	5,160	5,130	5,100	5,060	5,030	5,000	4,970	4,940
17	4,910	4,880	4,850	4,820	4,790	4,760	4,730	4,700	4,670	4,640
18	4,620	4,590	4,560	4,540	4,510	4,480	4,460	4,430	4,410	4,380
19	4,360	4,330	4,310	4,280	4,260	4,240	4,210	4,190	4,170	4,140
20	4,120	4,100	4,080	4,060	4,030	4,010	3,990	3,970	3,950	3,930
21	3,910	3,890	3,870	3,850	3,830	3,810	3,790	3,770	3,750	3,730
22	3,710	3,690	3,680	3,660	3,640	3,620	3,600	3,590	3,570	3,550
23	3,530	3,520	3,500	3,480	3,470	3,450	3,430	3,420	3,400	3,380
24	3,370	3,350	3,340	3,320	3,310	3,290	3,280	3,260	3,250	3,230
25	3,220	3,200	3,190	3,170	3,160	3,140	3,130	3,120	3,100	3,090
26	3,080	3,060	3,050	3,030	3,020	3,010	3,000	2,980	2,970	2,960
27	2,940	2,930	2,920	2,910	2,890	2,880	2,870	2,860	2,850	2,830
28	2,820	2,810	2,800	2,790	2,770	2,760	2,750	2,740	2,730	2,720
29	2,710	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620	2,610
30	2,600	2,590	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510
31	2,500	2,490	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,410
32	2,400	2,390	2,380	2,370	2,360	2,350	2,350	2,340	2,330	2,320
33	2,310	2,300	2,290	2,280	2,270	2,270	2,260	2,250	2,240	2,230
34	2,220	2,220	2,210	2,200	2,190	2,180	2,170	2,170	2,160	2,150
35	2,140	2,130	2,130	2,120	2,110	2,100	2,100	2,090	2,080	2,070
36	2,060	2,060	2,050	2,040	2,030	2,030	2,020	2,010	2,010	2,000
37	1,990	1,980	1,980	1,970	1,960	1,950	1,950	1,940	1,930	1,930
38	1,920	1,910	1,910	1,900	1,890	1,890	1,880	1,870	1,870	1,860
39	1,850	1,850	1,840	1,830	1,830	1,820	1,810	1,810	1,800	1,790
40	1,790	1,780	1,770	1,770	1,760	1,760	1,750	1,740	1,740	1,730
41	1,730	1,720	1,710	1,710	1,700	1,700	1,690	1,680	1,680	1,670
42	1,670	1,660	1,650	1,650	1,640	1,640	1,630	1,630	1,620	1,610
43	1,610	1,600	1,600	1,590	1,590	1,580	1,580	1,570	1,560	1,560
44	1,550	1,550	1,540	1,540	1,530	1,530	1,520	1,520	1,510	1,510



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	1,500	1,490	1,490	1,480	1,480	1,470	1,470	1,460	1,460	1,450
46	1,450	1,440	1,440	1,430	1,430	1,420	1,420	1,410	1,410	1,400
47	1,400	1,390	1,390	1,380	1,380	1,370	1,370	1,360	1,360	1,360
48	1,350	1,350	1,340	1,340	1,330	1,330	1,320	1,320	1,310	1,310
49	1,300	1,300	1,290	1,290	1,290	1,280	1,280	1,270	1,270	1,260
50	1,260	1,250	1,250	1,250	1,240	1,240	1,230	1,230	1,220	1,220
51	1,210	1,210	1,210	1,200	1,200	1,190	1,190	1,180	1,180	1,180
52	1,170	1,170	1,160	1,160	1,160	1,150	1,150	1,140	1,140	1,130
53	1,130	1,130	1,120	1,120	1,110	1,110	1,110	1,100	1,100	1,090
54	1,090	1,090	1,080	1,080	1,070	1,070	1,070	1,060	1,060	1,050
55	1,050	1,050	1,040	1,040	1,030	1,030	1,030	1,020	1,020	1,020
56	1,010	1,010	1,000	1,000	1,000	990	990	990	980	980
57	970	970	970	960	960	960	950	950	940	940
58	940	930	930	930	920	920	920	910	910	900
59	900	900	890	890	890	880	880	880	870	870
60	870	860	860	860	850	850	850	840	840	830
61	830	830	820	820	820	810	810	810	800	800
62	800	790	790	790	780	780	780	770	770	770
63	760	760	760	750	750	750	740	740	740	730
64	730	730	730	720	720	720	710	710	710	700
65	700	700	690	690	690	680	680	680	670	670
66	670	660	660	660	660	650	650	650	640	640
67	640	630	630	630	620	620	620	620	610	610
68	610	600	600	600	590	590	590	580	580	580
69	580	570	570	570	560	560	560	550	550	550
70	550	540	540	540	530	530	530	530	520	520
71	520	510	510	510	500	500	500	500	490	490
72	490	480	480	480	480	470	470	470	460	460
73	460	460	450	450	450	440	440	440	440	430
74	430	430	420	420	420	420	410	410	410	400
75	400	400	400	390	390	390	390	380	380	380
76	370	370	370	370	360	360	360	350	350	350
77	350	340	340	340	340	330	330	330	320	320
78	320	320	310	310	310	310	300	300	300	290
79	290	290	290	280	280	280	280	270	270	270
80	260	260	260	260	250	250	250	250	240	240
81	240	230	230	230	230	220	220	220	220	210
82	210	210	210	200	200	200	190	190	190	190
83	180	180	180	180	170	170	170	170	160	160
84	160	150	150	150	150	140	140	140	140	130
85	130	130	130	120	120	120	120	110	110	110
86	100	100	100	100	90	90	90	90	80	80
87	80	80	70	70	70	70	60	60	60	60
88	50	50	50	40	40	40	40	30	30	30
89	30	20	20	20	20	10	10	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

8 MINUTES AFTER RELEASE  
1,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	19,430	19,040	18,680	18,330	17,990	17,660	17,340	17,030	16,740	16,450
6	16,170	15,910	15,650	15,400	15,160	14,920	14,690	14,470	14,260	14,050
7	13,850	13,650	13,460	13,270	13,090	12,910	12,740	12,570	12,410	12,250
8	12,100	11,940	11,800	11,650	11,510	11,380	11,240	11,110	10,980	10,860
9	10,730	10,610	10,500	10,380	10,270	10,160	10,050	9,950	9,840	9,740
10	9,640	9,540	9,450	9,350	9,260	9,170	9,080	9,000	8,910	8,830
11	8,750	8,660	8,590	8,510	8,430	8,360	8,280	8,210	8,140	8,070
12	8,000	7,930	7,860	7,800	7,730	7,670	7,610	7,540	7,480	7,420
13	7,360	7,310	7,250	7,190	7,140	7,080	7,030	6,970	6,920	6,870
14	6,820	6,770	6,720	6,670	6,620	6,570	6,530	6,480	6,430	6,390
15	6,340	6,300	6,260	6,210	6,170	6,130	6,090	6,050	6,010	5,970
16	5,930	5,890	5,850	5,810	5,780	5,740	5,700	5,670	5,630	5,600
17	5,560	5,530	5,490	5,460	5,420	5,390	5,360	5,330	5,290	5,260
18	5,230	5,200	5,170	5,140	5,110	5,080	5,050	5,020	4,990	4,970
19	4,940	4,910	4,880	4,850	4,830	4,800	4,770	4,750	4,720	4,700
20	4,670	4,650	4,620	4,600	4,570	4,550	4,520	4,500	4,480	4,450
21	4,430	4,410	4,380	4,360	4,340	4,320	4,290	4,270	4,250	4,230
22	4,210	4,190	4,170	4,150	4,120	4,100	4,080	4,060	4,040	4,020
23	4,010	3,990	3,970	3,950	3,930	3,910	3,890	3,870	3,850	3,840
24	3,820	3,800	3,780	3,770	3,750	3,730	3,710	3,700	3,680	3,660
25	3,650	3,630	3,610	3,600	3,580	3,560	3,550	3,530	3,520	3,500
26	3,490	3,470	3,450	3,440	3,420	3,410	3,390	3,380	3,370	3,350
27	3,340	3,320	3,310	3,290	3,280	3,270	3,250	3,240	3,220	3,210
28	3,200	3,180	3,170	3,160	3,140	3,130	3,120	3,110	3,090	3,080
29	3,070	3,050	3,040	3,030	3,020	3,000	2,990	2,980	2,970	2,960
30	2,940	2,930	2,920	2,910	2,900	2,890	2,870	2,860	2,850	2,840
31	2,830	2,820	2,810	2,800	2,790	2,770	2,760	2,750	2,740	2,730
32	2,720	2,710	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630
33	2,620	2,610	2,600	2,590	2,580	2,570	2,560	2,550	2,540	2,530
34	2,520	2,510	2,500	2,490	2,480	2,470	2,460	2,460	2,450	2,440
35	2,430	2,420	2,410	2,400	2,390	2,380	2,370	2,370	2,360	2,350
36	2,340	2,330	2,320	2,310	2,310	2,300	2,290	2,280	2,270	2,260
37	2,260	2,250	2,240	2,230	2,220	2,220	2,210	2,200	2,190	2,180
38	2,180	2,170	2,160	2,150	2,140	2,140	2,130	2,120	2,110	2,110
39	2,100	2,090	2,080	2,080	2,070	2,060	2,050	2,050	2,040	2,030
40	2,030	2,020	2,010	2,000	2,000	1,990	1,980	1,980	1,970	1,960
41	1,960	1,950	1,940	1,940	1,930	1,920	1,910	1,910	1,900	1,890
42	1,890	1,880	1,870	1,870	1,860	1,860	1,850	1,840	1,840	1,830
43	1,820	1,820	1,810	1,800	1,800	1,790	1,790	1,780	1,770	1,770
44	1,760	1,750	1,750	1,740	1,740	1,730	1,720	1,720	1,710	1,710

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	1,700	1,690	1,690	1,680	1,680	1,670	1,660	1,660	1,650	1,650
46	1,640	1,640	1,630	1,620	1,620	1,610	1,610	1,600	1,600	1,590
47	1,590	1,580	1,570	1,570	1,560	1,560	1,550	1,550	1,540	1,540
48	1,530	1,530	1,520	1,510	1,510	1,500	1,500	1,490	1,490	1,480
49	1,480	1,470	1,470	1,460	1,460	1,450	1,450	1,440	1,440	1,430
50	1,430	1,420	1,420	1,410	1,410	1,400	1,400	1,390	1,390	1,380
51	1,380	1,370	1,370	1,360	1,360	1,350	1,350	1,340	1,340	1,330
52	1,330	1,320	1,320	1,310	1,310	1,300	1,300	1,300	1,290	1,290
53	1,280	1,280	1,270	1,270	1,260	1,260	1,250	1,250	1,240	1,240
54	1,240	1,230	1,230	1,220	1,220	1,210	1,210	1,200	1,200	1,190
55	1,190	1,190	1,180	1,180	1,170	1,170	1,160	1,160	1,160	1,150
56	1,150	1,140	1,140	1,130	1,130	1,130	1,120	1,120	1,110	1,110
57	1,100	1,100	1,100	1,090	1,090	1,080	1,080	1,070	1,070	1,070
58	1,060	1,060	1,050	1,050	1,050	1,040	1,040	1,030	1,030	1,030
59	1,020	1,020	1,010	1,010	1,010	1,000	1,000	990	990	990
60	980	980	970	970	970	960	960	950	950	950
61	940	940	930	930	930	920	920	920	910	910
62	900	900	900	890	890	890	880	880	870	870
63	870	860	860	850	850	850	840	840	840	830
64	830	830	820	820	810	810	810	800	800	800
65	790	790	790	780	780	770	770	770	760	760
66	760	750	750	750	740	740	740	730	730	730
67	720	720	710	710	710	700	700	700	690	690
68	690	680	680	680	670	670	670	660	660	660
69	650	650	650	640	640	640	630	630	630	620
70	620	620	610	610	610	600	600	600	590	590
71	590	580	580	580	570	570	570	560	560	560
72	550	550	550	540	540	540	530	530	530	520
73	520	520	510	510	510	500	500	500	490	490
74	490	480	480	480	470	470	470	470	460	460
75	460	450	450	450	440	440	440	430	430	430
76	420	420	420	410	410	410	400	400	400	400
77	390	390	390	380	380	380	370	370	370	360
78	360	360	360	350	350	350	340	340	340	330
79	330	330	320	320	320	320	310	310	310	300
80	300	300	290	290	290	280	280	280	280	270
81	270	270	260	260	260	250	250	250	240	240
82	240	240	230	230	230	220	220	220	210	210
83	210	210	200	200	200	190	190	190	180	180
84	180	180	170	170	170	160	160	160	150	150
85	150	150	140	140	140	130	130	130	120	120
86	120	120	110	110	110	100	100	100	100	90
87	90	90	80	80	80	70	70	70	70	60
88	60	60	50	50	50	40	40	40	40	30
89	30	30	20	20	20	10	10	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

9 MINUTES AFTER RELEASE  
1,900 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	21,720	21,280	20,880	20,480	20,100	19,740	19,380	19,040	18,710	18,390
6	18,080	17,780	17,490	17,210	16,940	16,680	16,420	16,170	15,930	15,700
7	15,470	15,250	15,040	14,830	14,630	14,430	14,240	14,050	13,870	13,690
8	13,520	13,350	13,190	13,020	12,870	12,710	12,560	12,420	12,270	12,130
9	12,000	11,860	11,730	11,600	11,480	11,350	11,230	11,120	11,000	10,890
10	10,780	10,670	10,560	10,450	10,350	10,250	10,150	10,060	9,960	9,870
11	9,770	9,680	9,600	9,510	9,420	9,340	9,260	9,170	9,090	9,020
12	8,940	8,860	8,790	8,710	8,640	8,570	8,500	8,430	8,360	8,300
13	8,230	8,160	8,100	8,040	7,980	7,910	7,850	7,790	7,740	7,680
14	7,620	7,560	7,510	7,450	7,400	7,350	7,290	7,240	7,190	7,140
15	7,090	7,040	6,990	6,950	6,900	6,850	6,810	6,760	6,710	6,670
16	6,630	6,580	6,540	6,500	6,460	6,410	6,370	6,330	6,290	6,250
17	6,210	6,180	6,140	6,100	6,060	6,030	5,990	5,950	5,920	5,880
18	5,850	5,810	5,780	5,750	5,710	5,680	5,650	5,610	5,580	5,550
19	5,520	5,490	5,460	5,430	5,400	5,370	5,340	5,310	5,280	5,250
20	5,220	5,190	5,160	5,140	5,110	5,080	5,050	5,030	5,000	4,980
21	4,950	4,920	4,900	4,870	4,850	4,820	4,800	4,770	4,750	4,730
22	4,700	4,680	4,660	4,630	4,610	4,590	4,560	4,540	4,520	4,500
23	4,480	4,450	4,430	4,410	4,390	4,370	4,350	4,330	4,310	4,290
24	4,270	4,250	4,230	4,210	4,190	4,170	4,150	4,130	4,110	4,090
25	4,070	4,060	4,040	4,020	4,000	3,980	3,970	3,950	3,930	3,910
26	3,900	3,880	3,860	3,840	3,830	3,810	3,790	3,780	3,760	3,750
27	3,730	3,710	3,700	3,680	3,670	3,650	3,630	3,620	3,600	3,590
28	3,570	3,560	3,540	3,530	3,510	3,500	3,480	3,470	3,460	3,440
29	3,430	3,410	3,400	3,390	3,370	3,360	3,340	3,330	3,320	3,300
30	3,290	3,280	3,260	3,250	3,240	3,230	3,210	3,200	3,190	3,170
31	3,160	3,150	3,140	3,120	3,110	3,100	3,090	3,080	3,060	3,050
32	3,040	3,030	3,020	3,010	2,990	2,980	2,970	2,960	2,950	2,940
33	2,930	2,910	2,900	2,890	2,880	2,870	2,860	2,850	2,840	2,830
34	2,820	2,810	2,800	2,790	2,770	2,760	2,750	2,740	2,730	2,720
35	2,710	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620
36	2,620	2,610	2,600	2,590	2,580	2,570	2,560	2,550	2,540	2,530
37	2,520	2,510	2,500	2,490	2,490	2,480	2,470	2,460	2,450	2,440
38	2,430	2,420	2,410	2,410	2,400	2,390	2,380	2,370	2,360	2,350
39	2,350	2,340	2,330	2,320	2,310	2,300	2,300	2,290	2,280	2,270
40	2,260	2,260	2,250	2,240	2,230	2,220	2,220	2,210	2,200	2,190
41	2,190	2,180	2,170	2,160	2,160	2,150	2,140	2,130	2,120	2,120
42	2,110	2,100	2,100	2,090	2,080	2,070	2,070	2,060	2,050	2,040
43	2,040	2,030	2,020	2,020	2,010	2,000	2,000	1,990	1,980	1,970
44	1,970	1,960	1,950	1,950	1,940	1,930	1,930	1,920	1,910	1,910

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	1,900	1,890	1,890	1,880	1,870	1,870	1,860	1,850	1,850	1,840
46	1,830	1,830	1,820	1,820	1,810	1,800	1,800	1,790	1,780	1,780
47	1,770	1,770	1,760	1,750	1,750	1,740	1,730	1,730	1,720	1,720
48	1,710	1,700	1,700	1,690	1,690	1,680	1,680	1,670	1,660	1,660
49	1,650	1,650	1,640	1,630	1,630	1,620	1,620	1,610	1,610	1,600
50	1,590	1,590	1,580	1,580	1,570	1,570	1,560	1,560	1,550	1,540
51	1,540	1,530	1,530	1,520	1,520	1,510	1,510	1,500	1,500	1,490
52	1,480	1,480	1,470	1,470	1,460	1,460	1,450	1,450	1,440	1,440
53	1,430	1,430	1,420	1,420	1,410	1,410	1,400	1,400	1,390	1,390
54	1,380	1,380	1,370	1,370	1,360	1,360	1,350	1,350	1,340	1,340
55	1,330	1,330	1,320	1,320	1,310	1,310	1,300	1,300	1,290	1,290
56	1,280	1,280	1,270	1,270	1,260	1,260	1,250	1,250	1,240	1,240
57	1,230	1,230	1,220	1,220	1,220	1,210	1,210	1,200	1,200	1,190
58	1,190	1,180	1,180	1,170	1,170	1,160	1,160	1,160	1,150	1,150
59	1,140	1,140	1,130	1,130	1,120	1,120	1,110	1,110	1,110	1,100
60	1,100	1,090	1,090	1,080	1,080	1,080	1,070	1,070	1,060	1,060
61	1,050	1,050	1,040	1,040	1,040	1,030	1,030	1,020	1,020	1,010
62	1,010	1,010	1,000	1,000	990	990	980	980	980	970
63	970	960	960	960	950	950	940	940	930	930
64	930	920	920	910	910	910	900	900	890	890
65	890	880	880	870	870	870	860	860	850	850
66	850	840	840	830	830	830	820	820	810	810
67	810	800	800	790	790	790	780	780	780	770
68	770	760	760	760	750	750	740	740	740	730
69	730	730	720	720	710	710	710	700	700	700
70	690	690	680	680	680	670	670	670	660	660
71	650	650	650	640	640	640	630	630	620	620
72	620	610	610	610	600	600	600	590	590	580
73	580	580	570	570	570	560	560	560	550	550
74	540	540	540	530	530	530	520	520	520	510
75	510	510	500	500	490	490	490	480	480	480
76	470	470	470	460	460	460	450	450	450	440
77	440	440	430	430	420	420	420	410	410	410
78	400	400	400	390	390	390	380	380	380	370
79	370	370	360	360	360	350	350	350	340	340
80	330	330	330	320	320	320	310	310	310	300
81	300	300	290	290	290	280	280	280	270	270
82	270	260	260	260	250	250	250	240	240	240
83	230	230	230	220	220	220	210	210	210	200
84	200	200	190	190	190	180	180	180	170	170
85	170	160	160	160	150	150	150	140	140	140
86	130	130	130	120	120	120	110	110	110	100
87	100	100	90	90	90	80	80	80	70	70
88	70	60	60	60	50	50	50	40	40	40
89	30	30	30	20	20	20	10	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

10 MINUTES AFTER RELEASE

2,100 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5-----	24,000	23,520	23,080	22,640	22,220	21,820	21,420	21,040	20,670	20,320
6-----	19,980	19,650	19,330	19,020	18,720	18,430	18,150	17,880	17,610	17,350
7-----	17,100	16,860	16,620	16,390	16,170	15,950	15,740	15,530	15,330	15,130
8-----	14,940	14,760	14,570	14,400	14,220	14,050	13,890	13,720	13,570	13,410
9-----	13,260	13,110	12,970	12,820	12,690	12,550	12,420	12,290	12,160	12,030
10-----	11,910	11,790	11,670	11,560	11,440	11,330	11,220	11,110	11,010	10,910
11-----	10,800	10,700	10,610	10,510	10,410	10,320	10,230	10,140	10,050	9,970
12-----	9,880	9,800	9,710	9,630	9,550	9,470	9,390	9,320	9,240	9,170
13-----	9,100	9,020	8,950	8,880	8,810	8,750	8,680	8,610	8,550	8,490
14-----	8,420	8,360	8,300	8,240	8,180	8,120	8,060	8,000	7,950	7,890
15-----	7,840	7,780	7,730	7,680	7,620	7,570	7,520	7,470	7,420	7,370
16-----	7,320	7,280	7,230	7,180	7,140	7,090	7,040	7,000	6,960	6,910
17-----	6,870	6,830	6,780	6,740	6,700	6,660	6,620	6,580	6,540	6,500
18-----	6,460	6,420	6,390	6,350	6,310	6,280	6,240	6,200	6,170	6,130
19-----	6,100	6,060	6,030	6,000	5,960	5,930	5,900	5,870	5,830	5,800
20-----	5,770	5,740	5,710	5,680	5,650	5,620	5,590	5,560	5,530	5,500
21-----	5,470	5,440	5,410	5,390	5,360	5,330	5,300	5,280	5,250	5,220
22-----	5,200	5,170	5,150	5,120	5,100	5,070	5,040	5,020	5,000	4,970
23-----	4,950	4,920	4,900	4,880	4,850	4,830	4,810	4,780	4,760	4,740
24-----	4,720	4,690	4,670	4,650	4,630	4,610	4,590	4,570	4,540	4,520
25-----	4,500	4,480	4,460	4,440	4,420	4,400	4,380	4,360	4,340	4,320
26-----	4,310	4,290	4,270	4,250	4,230	4,210	4,190	4,180	4,160	4,140
27-----	4,120	4,100	4,090	4,070	4,050	4,030	4,020	4,000	3,980	3,970
28-----	3,950	3,930	3,920	3,900	3,880	3,870	3,850	3,840	3,820	3,800
29-----	3,790	3,770	3,760	3,740	3,730	3,710	3,700	3,680	3,670	3,650
30-----	3,640	3,620	3,610	3,590	3,580	3,570	3,550	3,540	3,520	3,510
31-----	3,500	3,480	3,470	3,450	3,440	3,430	3,410	3,400	3,390	3,370
32-----	3,360	3,350	3,330	3,320	3,310	3,300	3,280	3,270	3,260	3,250
33-----	3,230	3,220	3,210	3,200	3,180	3,170	3,160	3,150	3,140	3,130
34-----	3,110	3,100	3,090	3,080	3,070	3,060	3,040	3,030	3,020	3,010
35-----	3,000	2,990	2,980	2,970	2,950	2,940	2,930	2,920	2,910	2,900
36-----	2,890	2,880	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800
37-----	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700
38-----	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620	2,610	2,600
39-----	2,590	2,580	2,570	2,570	2,560	2,550	2,540	2,530	2,520	2,510
40-----	2,500	2,490	2,480	2,480	2,470	2,460	2,450	2,440	2,430	2,420
41-----	2,420	2,410	2,400	2,390	2,380	2,370	2,370	2,360	2,350	2,340
42-----	2,330	2,320	2,320	2,310	2,300	2,290	2,280	2,280	2,270	2,260
43-----	2,250	2,240	2,240	2,230	2,220	2,210	2,210	2,200	2,190	2,180
44-----	2,170	2,170	2,160	2,150	2,140	2,140	2,130	2,120	2,110	2,110

Elevation angle of balloon in degrees and tenths of a degree

Degrees	Horizontal distance of balloon in yards from observing point									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
45	2,100	2,090	2,090	2,080	2,070	2,060	2,060	2,050	2,040	2,040
46	2,030	2,020	2,010	2,010	2,000	1,990	1,990	1,980	1,970	1,970
47	1,960	1,950	1,940	1,940	1,930	1,920	1,920	1,910	1,900	1,900
48	1,890	1,880	1,880	1,870	1,860	1,860	1,850	1,840	1,840	1,830
49	1,830	1,820	1,810	1,810	1,800	1,790	1,790	1,780	1,770	1,770
50	1,760	1,760	1,750	1,740	1,740	1,730	1,720	1,720	1,710	1,710
51	1,700	1,690	1,690	1,680	1,680	1,670	1,660	1,660	1,650	1,650
52	1,640	1,630	1,630	1,620	1,620	1,610	1,610	1,600	1,590	1,590
53	1,580	1,580	1,570	1,570	1,560	1,550	1,550	1,540	1,540	1,530
54	1,530	1,520	1,510	1,510	1,500	1,500	1,490	1,490	1,480	1,480
55	1,470	1,460	1,460	1,450	1,450	1,440	1,440	1,430	1,430	1,420
56	1,420	1,410	1,410	1,400	1,400	1,390	1,380	1,380	1,370	1,370
57	1,360	1,360	1,350	1,350	1,340	1,340	1,330	1,330	1,320	1,320
58	1,310	1,310	1,300	1,300	1,290	1,290	1,280	1,280	1,270	1,270
59	1,260	1,260	1,250	1,250	1,240	1,240	1,230	1,230	1,220	1,220
60	1,210	1,210	1,200	1,200	1,190	1,190	1,180	1,180	1,170	1,170
61	1,160	1,160	1,150	1,150	1,140	1,140	1,140	1,130	1,130	1,120
62	1,120	1,110	1,110	1,100	1,100	1,090	1,090	1,080	1,080	1,070
63	1,070	1,070	1,060	1,060	1,050	1,050	1,040	1,040	1,030	1,030
64	1,020	1,020	1,020	1,010	1,010	1,000	1,000	990	990	980
65	980	970	970	970	960	960	950	950	940	940
66	930	930	930	920	920	910	910	900	900	900
67	890	890	880	880	870	870	870	860	860	850
68	850	840	840	840	830	830	820	820	810	810
69	810	800	800	790	790	790	780	780	770	770
70	760	760	760	750	750	740	740	740	730	730
71	720	720	710	710	710	700	700	690	690	690
72	680	680	670	670	670	660	660	650	650	650
73	640	640	630	630	630	620	620	610	610	610
74	600	600	590	590	590	580	580	570	570	570
75	560	560	550	550	550	540	540	540	530	530
76	520	520	520	510	510	500	500	500	490	490
77	480	480	480	470	470	470	460	460	450	450
78	450	440	440	430	430	430	420	420	420	410
79	410	400	400	400	390	390	390	380	380	370
80	370	370	360	360	360	350	350	340	340	340
81	330	330	330	320	320	310	310	310	300	300
82	300	290	290	280	280	280	270	270	270	260
83	260	250	250	250	240	240	240	230	230	220
84	220	220	210	210	210	200	200	190	190	190
85	180	180	180	170	170	170	160	160	150	150
86	150	140	140	140	130	130	120	120	120	110
87	110	110	100	100	100	90	90	80	80	80
88	70	70	70	60	60	60	50	50	40	40
89	40	30	30	30	20	20	10	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

11 MINUTES AFTER RELEASE  
2,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	26,290	25,760	25,280	24,790	24,330	23,900	23,460	23,050	22,640	22,260
6	21,880	21,520	21,170	20,830	20,500	20,190	19,880	19,580	19,290	19,010
7	18,730	18,470	18,210	17,950	17,710	17,470	17,240	17,010	16,790	16,580
8	16,370	16,160	15,960	15,770	15,580	15,390	15,210	15,030	14,860	14,690
9	14,520	14,360	14,200	14,050	13,890	13,740	13,600	13,460	13,320	13,180
10	13,040	12,910	12,780	12,660	12,530	12,410	12,290	12,170	12,060	11,940
11	11,830	11,720	11,620	11,510	11,410	11,300	11,200	11,110	11,010	10,910
12	10,820	10,730	10,640	10,550	10,460	10,370	10,290	10,210	10,120	10,040
13	9,960	9,880	9,810	9,730	9,650	9,580	9,510	9,440	9,360	9,290
14	9,220	9,160	9,090	9,020	8,960	8,890	8,830	8,770	8,710	8,640
15	8,580	8,520	8,470	8,410	8,350	8,290	8,240	8,180	8,130	8,070
16	8,020	7,970	7,920	7,870	7,810	7,760	7,720	7,670	7,620	7,570
17	7,520	7,480	7,430	7,380	7,340	7,290	7,250	7,210	7,160	7,120
18	7,080	7,040	7,000	6,950	6,910	6,870	6,830	6,800	6,760	6,720
19	6,680	6,640	6,600	6,570	6,530	6,490	6,460	6,420	6,390	6,350
20	6,320	6,280	6,250	6,220	6,180	6,150	6,120	6,090	6,050	6,020
21	5,990	5,960	5,930	5,900	5,870	5,840	5,810	5,780	5,750	5,720
22	5,690	5,660	5,640	5,610	5,580	5,550	5,530	5,500	5,470	5,440
23	5,420	5,390	5,370	5,340	5,320	5,290	5,260	5,240	5,210	5,190
24	5,170	5,140	5,120	5,090	5,070	5,050	5,020	5,000	4,980	4,950
25	4,930	4,910	4,890	4,870	4,840	4,820	4,800	4,780	4,760	4,740
26	4,720	4,690	4,670	4,650	4,630	4,610	4,590	4,570	4,550	4,530
27	4,510	4,490	4,480	4,460	4,440	4,420	4,400	4,380	4,360	4,340
28	4,330	4,310	4,290	4,270	4,250	4,240	4,220	4,200	4,180	4,170
29	4,150	4,130	4,120	4,100	4,080	4,070	4,050	4,030	4,020	4,000
30	3,980	3,970	3,950	3,940	3,920	3,900	3,890	3,870	3,860	3,840
31	3,830	3,810	3,800	3,780	3,770	3,750	3,740	3,720	3,710	3,700
32	3,680	3,670	3,650	3,640	3,620	3,610	3,600	3,580	3,570	3,560
33	3,540	3,530	3,510	3,500	3,490	3,470	3,460	3,450	3,440	3,420
34	3,410	3,400	3,380	3,370	3,360	3,350	3,330	3,320	3,310	3,300
35	3,280	3,270	3,260	3,250	3,240	3,220	3,210	3,200	3,190	3,180
36	3,170	3,150	3,140	3,130	3,120	3,110	3,100	3,090	3,070	3,060
37	3,050	3,040	3,030	3,020	3,010	3,000	2,990	2,980	2,970	2,950
38	2,940	2,930	2,920	2,910	2,900	2,890	2,880	2,870	2,860	2,850
39	2,840	2,830	2,820	2,810	2,800	2,790	2,780	2,770	2,760	2,750
40	2,740	2,730	2,720	2,710	2,700	2,690	2,680	2,670	2,660	2,660
41	2,650	2,640	2,630	2,620	2,610	2,600	2,590	2,580	2,570	2,560
42	2,550	2,550	2,540	2,530	2,520	2,510	2,500	2,490	2,480	2,480
43	2,470	2,460	2,450	2,440	2,430	2,420	2,420	2,410	2,400	2,390
44	2,380	2,370	2,370	2,360	2,350	2,340	2,330	2,320	2,320	2,310



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	2,300	2,290	2,280	2,280	2,270	2,260	2,250	2,240	2,240	2,230
46	2,220	2,210	2,210	2,200	2,190	2,180	2,180	2,170	2,160	2,150
47	2,140	2,140	2,130	2,120	2,110	2,110	2,100	2,090	2,090	2,080
48	2,070	2,060	2,060	2,050	2,040	2,030	2,030	2,020	2,010	2,010
49	2,000	1,990	1,990	1,980	1,970	1,960	1,960	1,950	1,940	1,940
50	1,930	1,920	1,920	1,910	1,900	1,900	1,890	1,880	1,880	1,870
51	1,860	1,860	1,850	1,840	1,840	1,830	1,820	1,820	1,810	1,800
52	1,800	1,790	1,780	1,780	1,770	1,760	1,760	1,750	1,750	1,740
53	1,730	1,730	1,720	1,710	1,710	1,700	1,700	1,690	1,680	1,680
54	1,670	1,660	1,660	1,650	1,650	1,640	1,630	1,630	1,620	1,620
55	1,610	1,600	1,600	1,590	1,590	1,580	1,570	1,570	1,560	1,560
56	1,550	1,550	1,540	1,530	1,530	1,520	1,520	1,510	1,510	1,500
57	1,490	1,490	1,480	1,480	1,470	1,470	1,460	1,450	1,450	1,440
58	1,440	1,430	1,430	1,420	1,410	1,410	1,400	1,400	1,390	1,390
59	1,380	1,380	1,370	1,370	1,360	1,350	1,350	1,340	1,340	1,330
60	1,330	1,320	1,320	1,310	1,310	1,300	1,300	1,290	1,290	1,280
61	1,270	1,270	1,260	1,260	1,250	1,250	1,240	1,240	1,230	1,230
62	1,220	1,220	1,210	1,210	1,200	1,200	1,190	1,190	1,180	1,180
63	1,170	1,170	1,160	1,160	1,150	1,150	1,140	1,140	1,130	1,130
64	1,120	1,120	1,110	1,110	1,100	1,100	1,090	1,090	1,080	1,080
65	1,070	1,070	1,060	1,060	1,050	1,050	1,040	1,040	1,030	1,030
66	1,020	1,020	1,010	1,010	1,000	1,000	1,000	990	990	980
67	980	970	970	960	960	950	950	940	940	930
68	930	920	920	920	910	910	900	900	890	890
69	880	880	870	870	860	860	860	850	850	840
70	840	830	830	820	820	810	810	810	800	800
71	790	790	780	780	770	770	770	760	760	750
72	750	740	740	730	730	730	720	720	710	710
73	700	700	690	690	690	680	680	670	670	660
74	660	660	650	650	640	640	630	630	620	620
75	620	610	610	600	600	590	590	590	580	580
76	570	570	560	560	560	550	550	540	540	540
77	530	530	520	520	510	510	510	500	500	490
78	490	480	480	480	470	470	460	460	460	450
79	450	440	440	430	430	430	420	420	410	410
80	410	400	400	390	390	380	380	380	370	370
81	360	360	360	350	350	340	340	340	330	330
82	320	320	320	310	310	300	300	290	290	290
83	280	280	270	270	270	260	260	250	250	250
84	240	240	230	230	230	220	220	210	210	210
85	200	200	190	190	190	180	180	170	170	160
86	160	160	150	150	140	140	140	130	130	120
87	120	120	110	110	100	100	100	90	90	80
88	80	80	70	70	60	60	60	50	50	40
89	40	40	30	30	20	20	20	10	10	0

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**12 MINUTES AFTER RELEASE  
2,500 YARDS ALTITUDE**

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	28,580	28,000	27,480	26,950	26,450	25,980	25,500	25,050	24,610	24,190
6	23,790	23,390	23,010	22,640	22,290	21,940	21,610	21,280	20,970	20,660
7	20,360	20,070	19,790	19,520	19,250	18,990	18,740	18,490	18,250	18,020
8	17,790	17,570	17,350	17,140	16,930	16,730	16,530	16,340	16,150	15,960
9	15,780	15,610	15,440	15,270	15,100	14,940	14,780	14,630	14,470	14,320
10	14,180	14,040	13,890	13,760	13,620	13,490	13,360	13,230	13,110	12,980
11	12,860	12,740	12,630	12,510	12,400	12,290	12,180	12,070	11,970	11,860
12	11,760	11,660	11,560	11,470	11,370	11,280	11,180	11,090	11,000	10,920
13	10,830	10,740	10,660	10,580	10,490	10,410	10,330	10,260	10,180	10,100
14	10,030	9,950	9,880	9,810	9,740	9,670	9,600	9,530	9,460	9,400
15	9,330	9,270	9,200	9,140	9,080	9,010	8,950	8,890	8,830	8,780
16	8,720	8,660	8,610	8,550	8,490	8,440	8,390	8,330	8,280	8,230
17	8,180	8,130	8,080	8,030	7,980	7,930	7,880	7,830	7,790	7,740
18	7,690	7,650	7,600	7,560	7,520	7,470	7,430	7,390	7,340	7,300
19	7,260	7,220	7,180	7,140	7,100	7,060	7,020	6,980	6,940	6,910
20	6,870	6,830	6,790	6,760	6,720	6,690	6,650	6,620	6,580	6,550
21	6,510	6,480	6,450	6,410	6,380	6,350	6,310	6,280	6,250	6,220
22	6,190	6,160	6,130	6,100	6,070	6,040	6,010	5,980	5,950	5,920
23	5,890	5,860	5,830	5,810	5,780	5,750	5,720	5,700	5,670	5,640
24	5,620	5,590	5,560	5,540	5,510	5,490	5,460	5,440	5,410	5,390
25	5,360	5,340	5,310	5,290	5,260	5,240	5,220	5,190	5,170	5,150
26	5,130	5,100	5,080	5,060	5,040	5,010	4,990	4,970	4,950	4,930
27	4,910	4,890	4,860	4,840	4,820	4,800	4,780	4,760	4,740	4,720
28	4,700	4,680	4,660	4,640	4,620	4,600	4,590	4,570	4,550	4,530
29	4,510	4,490	4,470	4,460	4,440	4,420	4,400	4,380	4,370	4,350
30	4,330	4,310	4,300	4,280	4,260	4,240	4,230	4,210	4,190	4,180
31	4,160	4,140	4,130	4,110	4,100	4,080	4,060	4,050	4,030	4,020
32	4,000	3,990	3,970	3,950	3,940	3,920	3,910	3,890	3,880	3,860
33	3,850	3,840	3,820	3,810	3,790	3,780	3,760	3,750	3,730	3,720
34	3,710	3,690	3,680	3,660	3,650	3,640	3,620	3,610	3,600	3,580
35	3,570	3,560	3,540	3,530	3,520	3,500	3,490	3,480	3,470	3,450
36	3,440	3,430	3,420	3,400	3,390	3,380	3,370	3,350	3,340	3,330
37	3,320	3,310	3,290	3,280	3,270	3,260	3,250	3,230	3,220	3,210
38	3,200	3,190	3,180	3,170	3,150	3,140	3,130	3,120	3,110	3,100
39	3,090	3,080	3,070	3,050	3,040	3,030	3,020	3,010	3,000	2,990
40	2,980	2,970	2,960	2,950	2,940	2,930	2,920	2,910	2,900	2,890
41	2,880	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800	2,790
42	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700	2,690
43	2,680	2,670	2,660	2,650	2,640	2,630	2,630	2,620	2,610	2,600
44	2,590	2,580	2,570	2,560	2,550	2,540	2,540	2,530	2,520	2,510

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	2,500	2,490	2,480	2,470	2,470	2,460	2,450	2,440	2,430	2,420
46	2,410	2,410	2,400	2,390	2,380	2,370	2,360	2,360	2,350	2,340
47	2,330	2,320	2,320	2,310	2,300	2,290	2,280	2,270	2,270	2,260
48	2,250	2,240	2,240	2,230	2,220	2,210	2,200	2,200	2,190	2,180
49	2,170	2,170	2,160	2,150	2,140	2,140	2,130	2,120	2,110	2,110
50	2,100	2,090	2,080	2,080	2,070	2,060	2,050	2,050	2,040	2,030
51	2,020	2,020	2,010	2,000	2,000	1,990	1,980	1,970	1,970	1,960
52	1,950	1,950	1,940	1,930	1,930	1,920	1,910	1,900	1,900	1,890
53	1,880	1,880	1,870	1,860	1,860	1,850	1,840	1,840	1,830	1,820
54	1,820	1,810	1,800	1,800	1,790	1,780	1,780	1,770	1,760	1,760
55	1,750	1,740	1,740	1,730	1,720	1,720	1,710	1,710	1,700	1,690
56	1,690	1,680	1,670	1,670	1,660	1,650	1,650	1,640	1,640	1,630
57	1,620	1,620	1,610	1,600	1,600	1,590	1,590	1,580	1,570	1,570
58	1,560	1,560	1,550	1,540	1,540	1,530	1,530	1,520	1,510	1,510
59	1,500	1,500	1,490	1,480	1,480	1,470	1,470	1,460	1,460	1,450
60	1,440	1,440	1,430	1,430	1,420	1,410	1,410	1,400	1,400	1,390
61	1,390	1,380	1,370	1,370	1,360	1,360	1,350	1,350	1,340	1,340
62	1,330	1,320	1,320	1,310	1,310	1,300	1,300	1,290	1,280	1,280
63	1,270	1,270	1,260	1,260	1,250	1,250	1,240	1,240	1,230	1,220
64	1,220	1,210	1,210	1,200	1,200	1,190	1,190	1,180	1,180	1,170
65	1,170	1,160	1,160	1,150	1,140	1,140	1,130	1,130	1,120	1,120
66	1,110	1,110	1,100	1,100	1,090	1,090	1,080	1,080	1,070	1,070
67	1,060	1,060	1,050	1,050	1,040	1,040	1,030	1,030	1,020	1,020
68	1,010	1,000	1,000	990	990	980	980	970	970	960
69	960	950	950	940	940	930	930	920	920	910
70	910	900	900	900	890	890	880	880	870	870
71	860	860	850	850	840	840	830	830	820	820
72	810	810	800	800	790	790	780	780	770	770
73	760	760	750	750	750	740	740	730	730	720
74	720	710	710	700	700	690	690	680	680	670
75	670	670	660	660	650	650	640	640	630	630
76	620	620	610	610	600	600	600	590	590	580
77	580	570	570	560	560	550	550	540	540	540
78	530	530	520	520	510	510	500	500	500	490
79	490	480	480	470	470	460	460	450	450	450
80	440	440	430	430	420	420	410	410	400	400
81	400	390	390	380	380	370	370	360	360	360
82	350	350	340	340	330	330	320	320	320	310
83	310	300	300	290	290	280	280	280	270	270
84	260	260	250	250	250	240	240	230	230	220
85	220	210	210	210	200	200	190	190	180	180
86	170	170	170	160	160	150	150	140	140	140
87	130	130	120	120	110	110	100	100	100	90
88	90	80	80	70	70	70	60	60	50	50
89	40	40	40	30	30	20	20	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

13 MINUTES AFTER RELEASE  
2,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	30,860	30,240	29,670	29,110	28,570	28,050	27,540	27,050	26,580	26,130
6	25,690	25,260	24,850	24,460	24,070	23,700	23,340	22,980	22,640	22,310
7	21,990	21,680	21,370	21,080	20,790	20,510	20,240	19,970	19,710	19,460
8	19,210	18,970	18,740	18,510	18,280	18,070	17,850	17,640	17,440	17,240
9	17,050	16,860	16,670	16,490	16,310	16,130	15,960	15,800	15,630	15,470
10	15,310	15,160	15,010	14,860	14,710	14,570	14,430	14,290	14,150	14,020
11	13,890	13,760	13,640	13,510	13,390	13,270	13,150	13,040	12,920	12,810
12	12,700	12,590	12,490	12,380	12,280	12,180	12,080	11,980	11,880	11,790
13	11,700	11,600	11,510	11,420	11,330	11,250	11,160	11,080	10,990	10,910
14	10,830	10,750	10,670	10,590	10,520	10,440	10,370	10,290	10,220	10,150
15	10,080	10,010	9,940	9,870	9,800	9,740	9,670	9,610	9,540	9,480
16	9,420	9,350	9,290	9,230	9,170	9,110	9,060	9,000	8,940	8,890
17	8,830	8,780	8,720	8,670	8,620	8,560	8,510	8,460	8,410	8,360
18	8,310	8,260	8,210	8,160	8,120	8,070	8,020	7,980	7,930	7,890
19	7,840	7,800	7,750	7,710	7,670	7,620	7,580	7,540	7,500	7,460
20	7,420	7,380	7,340	7,300	7,260	7,220	7,180	7,150	7,110	7,070
21	7,030	7,000	6,960	6,930	6,890	6,850	6,820	6,780	6,750	6,720
22	6,680	6,650	6,620	6,580	6,550	6,520	6,490	6,450	6,420	6,390
23	6,360	6,330	6,300	6,270	6,240	6,210	6,180	6,150	6,120	6,090
24	6,060	6,040	6,010	5,980	5,950	5,920	5,900	5,870	5,840	5,820
25	5,790	5,760	5,740	5,710	5,690	5,660	5,640	5,610	5,590	5,560
26	5,540	5,510	5,490	5,460	5,440	5,420	5,390	5,370	5,350	5,320
27	5,300	5,280	5,250	5,230	5,210	5,190	5,160	5,140	5,120	5,100
28	5,080	5,060	5,040	5,010	4,990	4,970	4,950	4,930	4,910	4,890
29	4,870	4,850	4,830	4,810	4,790	4,770	4,750	4,730	4,710	4,700
30	4,680	4,660	4,640	4,620	4,600	4,580	4,570	4,550	4,530	4,510
31	4,490	4,480	4,460	4,440	4,420	4,410	4,390	4,370	4,350	4,340
32	4,320	4,300	4,290	4,270	4,250	4,240	4,220	4,210	4,190	4,170
33	4,160	4,140	4,130	4,110	4,090	4,080	4,060	4,050	4,030	4,020
34	4,000	3,990	3,970	3,960	3,940	3,930	3,910	3,900	3,880	3,870
35	3,860	3,840	3,830	3,810	3,800	3,790	3,770	3,760	3,740	3,730
36	3,720	3,700	3,690	3,680	3,660	3,650	3,640	3,620	3,610	3,600
37	3,580	3,570	3,560	3,540	3,530	3,520	3,510	3,490	3,480	3,470
38	3,460	3,440	3,430	3,420	3,410	3,390	3,380	3,370	3,360	3,350
39	3,330	3,320	3,310	3,300	3,290	3,280	3,260	3,250	3,240	3,230
40	3,220	3,210	3,190	3,180	3,170	3,160	3,150	3,140	3,130	3,120
41	3,110	3,100	3,080	3,070	3,060	3,050	3,040	3,030	3,020	3,010
42	3,000	2,990	2,980	2,970	2,960	2,950	2,940	2,930	2,920	2,910
43	2,900	2,890	2,880	2,870	2,860	2,850	2,840	2,830	2,820	2,810
44	2,800	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710

Elevation angle of balloon in degrees and tenths of a degree

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,630	2,620
46	2,610	2,600	2,590	2,580	2,570	2,560	2,550	2,540	2,540	2,530
47	2,520	2,510	2,500	2,490	2,480	2,470	2,470	2,460	2,450	2,440
48	2,430	2,420	2,410	2,410	2,400	2,390	2,380	2,370	2,360	2,360
49	2,350	2,340	2,330	2,320	2,310	2,310	2,300	2,290	2,280	2,270
50	2,270	2,260	2,250	2,240	2,230	2,230	2,220	2,210	2,200	2,190
51	2,190	2,180	2,170	2,160	2,160	2,150	2,140	2,130	2,120	2,120
52	2,110	2,100	2,090	2,090	2,080	2,070	2,060	2,060	2,050	2,040
53	2,030	2,030	2,020	2,010	2,010	2,000	1,990	1,980	1,980	1,970
54	1,960	1,950	1,950	1,940	1,930	1,930	1,920	1,910	1,900	1,900
55	1,890	1,880	1,880	1,870	1,860	1,860	1,850	1,840	1,830	1,830
56	1,820	1,810	1,810	1,800	1,790	1,790	1,780	1,770	1,770	1,760
57	1,750	1,750	1,740	1,730	1,730	1,720	1,710	1,710	1,700	1,690
58	1,690	1,680	1,670	1,670	1,660	1,650	1,650	1,640	1,640	1,630
59	1,620	1,620	1,610	1,600	1,600	1,590	1,580	1,580	1,570	1,570
60	1,560	1,550	1,550	1,540	1,530	1,530	1,520	1,520	1,510	1,500
61	1,500	1,490	1,480	1,480	1,470	1,470	1,460	1,450	1,450	1,440
62	1,440	1,430	1,420	1,420	1,410	1,410	1,400	1,390	1,390	1,380
63	1,380	1,370	1,360	1,360	1,350	1,350	1,340	1,330	1,330	1,320
64	1,320	1,310	1,310	1,300	1,290	1,290	1,280	1,280	1,270	1,260
65	1,260	1,250	1,250	1,240	1,240	1,230	1,220	1,220	1,210	1,210
66	1,200	1,200	1,190	1,190	1,180	1,170	1,170	1,160	1,160	1,150
67	1,150	1,140	1,140	1,130	1,120	1,120	1,110	1,110	1,100	1,100
68	1,090	1,090	1,080	1,070	1,070	1,060	1,060	1,050	1,050	1,040
69	1,040	1,030	1,030	1,020	1,010	1,010	1,000	1,000	990	990
70	980	980	970	970	960	960	950	950	940	940
71	930	920	920	910	910	900	900	890	890	880
72	880	870	870	860	860	850	850	840	840	830
73	830	820	820	810	800	800	790	790	780	780
74	770	770	760	760	750	750	740	740	730	730
75	720	720	710	710	700	700	690	690	680	680
76	670	670	660	660	650	650	640	640	630	630
77	620	620	610	610	600	600	590	590	580	580
78	570	570	560	560	550	550	540	540	530	530
79	520	520	520	510	510	500	500	490	490	480
80	480	470	470	460	460	450	450	440	440	430
81	430	420	420	410	410	400	400	390	390	380
82	380	370	370	370	360	360	350	350	340	340
83	330	330	320	320	310	310	300	300	290	290
84	280	280	270	270	260	260	260	250	250	240
85	240	230	230	220	220	210	210	200	200	190
86	190	180	180	170	170	170	160	160	150	150
87	140	140	130	130	120	120	110	110	100	100
88	90	90	80	80	80	70	70	60	60	50
89	50	40	40	30	30	20	20	10	10	0

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

14 MINUTES AFTER RELEASE

2,900 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	33,150	32,480	31,870	31,260	30,680	30,130	29,580	29,060	28,550	28,060
6	27,590	27,140	26,700	26,270	25,850	25,450	25,060	24,690	24,320	23,960
7	23,620	23,280	22,960	22,640	22,330	22,030	21,730	21,450	21,170	20,900
8	20,630	20,380	20,120	19,880	19,640	19,400	19,180	18,950	18,730	18,520
9	18,310	18,110	17,910	17,710	17,520	17,330	17,150	16,970	16,790	16,620
10	16,450	16,280	16,120	15,960	15,800	15,650	15,500	15,350	15,200	15,060
11	14,920	14,780	14,650	14,510	14,380	14,250	14,130	14,000	13,880	13,760
12	13,640	13,530	13,410	13,300	13,190	13,080	12,970	12,870	12,760	12,660
13	12,560	12,460	12,360	12,270	12,170	12,080	11,990	11,900	11,810	11,720
14	11,630	11,550	11,460	11,380	11,290	11,210	11,130	11,050	10,980	10,900
15	10,820	10,750	10,670	10,600	10,530	10,460	10,390	10,320	10,250	10,180
16	10,110	10,050	9,980	9,920	9,850	9,790	9,730	9,670	9,610	9,550
17	9,490	9,430	9,370	9,310	9,250	9,200	9,140	9,090	9,030	8,980
18	8,930	8,870	8,820	8,770	8,720	8,670	8,620	8,570	8,520	8,470
19	8,420	8,370	8,330	8,280	8,240	8,190	8,140	8,100	8,060	8,010
20	7,970	7,920	7,880	7,840	7,800	7,760	7,720	7,670	7,630	7,590
21	7,550	7,520	7,480	7,440	7,400	7,360	7,320	7,290	7,250	7,210
22	7,180	7,140	7,110	7,070	7,040	7,000	6,970	6,930	6,900	6,870
23	6,830	6,800	6,770	6,730	6,700	6,670	6,640	6,610	6,580	6,540
24	6,510	6,480	6,450	6,420	6,390	6,360	6,330	6,310	6,280	6,250
25	6,220	6,190	6,160	6,130	6,110	6,080	6,050	6,030	6,000	5,970
26	5,950	5,920	5,890	5,870	5,840	5,820	5,790	5,770	5,740	5,720
27	5,690	5,670	5,640	5,620	5,590	5,570	5,550	5,520	5,500	5,480
28	5,450	5,430	5,410	5,390	5,360	5,340	5,320	5,300	5,280	5,250
29	5,230	5,210	5,190	5,170	5,150	5,130	5,100	5,080	5,060	5,040
30	5,020	5,000	4,980	4,960	4,940	4,920	4,900	4,880	4,860	4,850
31	4,830	4,810	4,790	4,770	4,750	4,730	4,710	4,700	4,680	4,660
32	4,640	4,620	4,610	4,590	4,570	4,550	4,530	4,520	4,500	4,480
33	4,470	4,450	4,430	4,410	4,400	4,380	4,360	4,350	4,330	4,320
34	4,300	4,280	4,270	4,250	4,240	4,220	4,200	4,190	4,170	4,160
35	4,140	4,130	4,110	4,100	4,080	4,070	4,050	4,040	4,020	4,010
36	3,990	3,980	3,960	3,950	3,930	3,920	3,900	3,890	3,880	3,860
37	3,850	3,830	3,820	3,810	3,790	3,780	3,770	3,750	3,740	3,730
38	3,710	3,700	3,690	3,670	3,660	3,650	3,630	3,620	3,610	3,590
39	3,580	3,570	3,560	3,540	3,530	3,520	3,510	3,490	3,480	3,470
40	3,460	3,440	3,430	3,420	3,410	3,400	3,380	3,370	3,360	3,350
41	3,340	3,320	3,310	3,300	3,290	3,280	3,270	3,250	3,240	3,230
42	3,220	3,210	3,200	3,190	3,180	3,160	3,150	3,140	3,130	3,120
43	3,110	3,100	3,090	3,080	3,070	3,060	3,050	3,030	3,020	3,010
44	3,000	2,990	2,980	2,970	2,960	2,950	2,940	2,930	2,920	2,910

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	3,100	3,090	3,080	3,070	3,060	3,050	3,040	3,030	3,010	3,000
46	2,990	2,980	2,970	2,960	2,950	2,940	2,930	2,920	2,910	2,900
47	2,890	2,880	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800
48	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700
49	2,690	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620	2,610
50	2,600	2,590	2,580	2,570	2,560	2,560	2,550	2,540	2,530	2,520
51	2,510	2,500	2,490	2,480	2,470	2,470	2,460	2,450	2,440	2,430
52	2,420	2,410	2,400	2,400	2,390	2,380	2,370	2,360	2,350	2,340
53	2,340	2,330	2,320	2,310	2,300	2,290	2,290	2,280	2,270	2,260
54	2,250	2,240	2,240	2,230	2,220	2,210	2,200	2,190	2,190	2,180
55	2,170	2,160	2,150	2,150	2,140	2,130	2,120	2,110	2,110	2,100
56	2,090	2,080	2,080	2,070	2,060	2,050	2,040	2,040	2,030	2,020
57	2,010	2,010	2,000	1,990	1,980	1,980	1,970	1,960	1,950	1,940
58	1,940	1,930	1,920	1,910	1,910	1,900	1,890	1,880	1,880	1,870
59	1,860	1,860	1,850	1,840	1,830	1,830	1,820	1,810	1,800	1,800
60	1,790	1,780	1,780	1,770	1,760	1,750	1,750	1,740	1,730	1,730
61	1,720	1,710	1,700	1,700	1,690	1,680	1,680	1,670	1,660	1,660
62	1,650	1,640	1,630	1,630	1,620	1,610	1,610	1,600	1,590	1,590
63	1,580	1,570	1,570	1,560	1,550	1,550	1,540	1,530	1,530	1,520
64	1,510	1,510	1,500	1,490	1,490	1,480	1,470	1,470	1,460	1,450
65	1,450	1,440	1,430	1,430	1,420	1,410	1,410	1,400	1,390	1,390
66	1,380	1,370	1,370	1,360	1,350	1,350	1,340	1,340	1,330	1,320
67	1,320	1,310	1,300	1,300	1,290	1,280	1,280	1,270	1,270	1,260
68	1,250	1,250	1,240	1,230	1,230	1,220	1,210	1,210	1,200	1,200
69	1,190	1,180	1,180	1,170	1,170	1,160	1,150	1,150	1,140	1,130
70	1,130	1,120	1,120	1,110	1,100	1,100	1,090	1,090	1,080	1,070
71	1,070	1,060	1,060	1,050	1,040	1,040	1,030	1,030	1,020	1,020
72	1,010	1,000	1,000	990	980	980	970	970	950	950
73	950	940	940	930	920	920	910	910	900	890
74	890	880	880	870	870	860	850	850	840	840
75	830	820	820	810	810	800	800	790	780	780
76	770	770	760	760	750	740	740	730	730	720
77	720	710	700	700	690	690	680	680	670	660
78	660	650	650	640	640	630	620	620	610	610
79	600	600	590	590	580	570	570	560	560	550
80	550	540	540	530	520	520	510	510	500	500
81	490	490	480	470	470	460	460	450	450	440
82	440	430	420	420	410	410	400	400	390	390
83	380	380	370	360	360	350	350	340	340	330
84	330	320	310	310	300	300	290	290	280	280
85	270	270	260	250	250	240	240	230	230	220
86	220	210	210	200	190	190	180	180	170	170
87	160	160	150	150	140	140	130	120	120	110
88	110	110	100	90	90	80	80	70	60	60
89	50	50	40	40	30	30	20	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

16 MINUTES AFTER RELEASE  
3,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	37,720	36,960	36,270	35,570	34,910	34,290	33,660	33,070	32,490	31,930
6	31,400	30,880	30,380	29,890	29,420	28,960	28,520	28,090	27,670	27,270
7	26,880	26,490	26,120	25,760	25,410	25,070	24,730	24,410	24,090	23,780
8	23,480	23,190	22,900	22,620	22,350	22,080	21,820	21,570	21,320	21,070
9	20,840	20,600	20,370	20,150	19,930	19,720	19,510	19,310	19,110	18,910
10	18,720	18,530	18,340	18,160	17,980	17,810	17,630	17,460	17,300	17,140
11	16,980	16,820	16,670	16,510	16,370	16,220	16,080	15,940	15,800	15,660
12	15,530	15,390	15,260	15,140	15,010	14,890	14,760	14,640	14,520	14,410
13	14,290	14,180	14,070	13,960	13,850	13,750	13,640	13,540	13,440	13,330
14	13,240	13,140	13,040	12,950	12,850	12,760	12,670	12,580	12,490	12,400
15	12,320	12,230	12,150	12,060	11,980	11,900	11,820	11,740	11,660	11,580
16	11,510	11,430	11,360	11,290	11,210	11,140	11,070	11,000	10,930	10,860
17	10,790	10,730	10,660	10,590	10,530	10,470	10,400	10,340	10,280	10,220
18	10,160	10,100	10,040	9,980	9,920	9,860	9,810	9,750	9,690	9,640
19	9,580	9,530	9,480	9,420	9,370	9,320	9,270	9,220	9,170	9,120
20	9,070	9,020	8,970	8,920	8,870	8,830	8,780	8,730	8,690	8,640
21	8,600	8,550	8,510	8,460	8,420	8,380	8,330	8,290	8,250	8,210
22	8,170	8,130	8,090	8,050	8,010	7,970	7,930	7,890	7,850	7,810
23	7,770	7,740	7,700	7,660	7,630	7,590	7,550	7,520	7,480	7,450
24	7,410	7,380	7,340	7,310	7,270	7,240	7,210	7,170	7,140	7,110
25	7,080	7,040	7,010	6,980	6,950	6,920	6,890	6,860	6,830	6,800
26	6,770	6,740	6,710	6,680	6,650	6,620	6,590	6,560	6,530	6,500
27	6,480	6,450	6,420	6,390	6,370	6,340	6,310	6,290	6,260	6,230
28	6,210	6,180	6,150	6,130	6,100	6,080	6,050	6,030	6,000	5,980
29	5,950	5,930	5,900	5,880	5,860	5,830	5,810	5,790	5,760	5,740
30	5,720	5,690	5,670	5,650	5,620	5,600	5,580	5,560	5,540	5,510
31	5,490	5,470	5,450	5,430	5,410	5,390	5,360	5,340	5,320	5,300
32	5,280	5,260	5,240	5,220	5,200	5,180	5,160	5,140	5,120	5,100
33	5,080	5,060	5,040	5,020	5,000	4,990	4,970	4,950	4,930	4,910
34	4,890	4,870	4,860	4,840	4,820	4,800	4,780	4,770	4,750	4,730
35	4,710	4,700	4,680	4,660	4,640	4,630	4,610	4,590	4,580	4,560
36	4,540	4,530	4,510	4,490	4,480	4,460	4,440	4,430	4,410	4,400
37	4,380	4,360	4,350	4,330	4,320	4,300	4,290	4,270	4,250	4,240
38	4,220	4,210	4,190	4,180	4,160	4,150	4,130	4,120	4,100	4,090
39	4,080	4,060	4,050	4,030	4,020	4,000	3,990	3,970	3,960	3,950
40	3,930	3,920	3,900	3,890	3,880	3,860	3,850	3,840	3,820	3,810
41	3,800	3,780	3,770	3,760	3,740	3,730	3,720	3,700	3,690	3,680
42	3,660	3,650	3,640	3,630	3,610	3,600	3,590	3,580	3,560	3,550
43	3,540	3,530	3,510	3,500	3,490	3,480	3,470	3,450	3,440	3,430
44	3,420	3,410	3,390	3,380	3,370	3,360	3,350	3,330	3,320	3,310



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	3,300	3,290	3,280	3,270	3,250	3,240	3,230	3,220	3,210	3,200
46	3,190	3,180	3,160	3,150	3,140	3,130	3,120	3,110	3,100	3,090
47	8,080	3,070	3,060	3,050	3,030	3,020	3,010	3,000	2,990	2,980
48	2,970	2,960	2,950	2,940	2,930	2,920	2,910	2,900	2,890	2,880
49	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800	2,790	2,780
50	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700	2,690	2,680
51	2,670	2,660	2,650	2,640	2,630	2,620	2,620	2,610	2,600	2,590
52	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510	2,500	2,500
53	2,490	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,420	2,410
54	2,400	2,390	2,380	2,370	2,360	2,350	2,350	2,340	2,330	2,320
55	2,310	2,300	2,290	2,280	2,280	2,270	2,260	2,250	2,240	2,230
56	2,230	2,220	2,210	2,200	2,190	2,180	2,180	2,170	2,160	2,150
57	2,140	2,130	2,130	2,120	2,110	2,100	2,090	2,090	2,080	2,070
58	2,060	2,050	2,050	2,040	2,030	2,020	2,010	2,010	2,000	1,990
59	1,980	1,980	1,970	1,960	1,950	1,940	1,940	1,930	1,920	1,910
60	1,910	1,900	1,890	1,880	1,870	1,870	1,860	1,850	1,840	1,840
61	1,830	1,820	1,810	1,810	1,800	1,790	1,780	1,780	1,770	1,760
62	1,750	1,750	1,740	1,730	1,730	1,720	1,710	1,700	1,700	1,690
63	1,680	1,670	1,670	1,660	1,650	1,650	1,640	1,630	1,620	1,620
64	1,610	1,600	1,600	1,590	1,580	1,570	1,570	1,560	1,550	1,550
65	1,540	1,530	1,520	1,520	1,510	1,500	1,500	1,490	1,480	1,480
66	1,470	1,460	1,460	1,450	1,440	1,430	1,430	1,420	1,410	1,410
67	1,400	1,390	1,390	1,380	1,370	1,370	1,360	1,350	1,350	1,340
68	1,330	1,330	1,320	1,310	1,310	1,300	1,290	1,290	1,280	1,270
69	1,270	1,260	1,250	1,250	1,240	1,230	1,230	1,220	1,210	1,210
70	1,200	1,190	1,190	1,180	1,180	1,170	1,160	1,160	1,150	1,140
71	1,140	1,130	1,120	1,120	1,110	1,100	1,100	1,090	1,090	1,080
72	1,070	1,070	1,060	1,050	1,050	1,040	1,030	1,030	1,020	1,020
73	1,010	1,000	1,000	990	980	980	970	960	960	950
74	950	940	930	930	920	920	910	900	900	890
75	880	880	870	870	860	850	850	840	830	830
76	820	820	810	800	800	790	790	780	770	770
77	760	760	750	740	740	730	730	720	710	710
78	700	700	690	680	680	670	670	660	650	650
79	640	640	630	620	620	610	610	600	590	590
80	580	580	570	560	560	550	550	540	530	530
81	520	520	510	500	500	490	490	480	480	470
82	460	460	450	450	440	430	430	420	420	410
83	410	400	390	390	380	380	370	360	360	350
84	350	340	340	330	320	320	310	310	300	290
85	290	280	280	270	270	260	250	250	240	240
86	230	230	220	210	210	200	200	190	180	180
87	170	170	160	160	150	140	140	130	130	120
88	120	110	100	100	90	90	80	70	70	60
89	60	50	50	40	30	30	20	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

17 MINUTES AFTER RELEASE  
3,500 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	40,000	39,200	38,460	37,730	37,030	36,360	35,700	35,070	34,460	33,870
6	33,300	32,750	32,220	31,700	31,200	30,720	30,250	29,790	29,350	28,920
7	28,510	28,100	27,710	27,320	26,950	26,590	26,230	25,890	25,550	25,220
8	24,900	24,590	24,290	23,990	23,700	23,420	23,140	22,870	22,610	22,350
9	22,100	21,850	21,610	21,370	21,140	20,920	20,690	20,480	20,260	20,050
10	19,850	19,650	19,450	19,260	19,070	18,880	18,700	18,520	18,350	18,180
11	18,010	17,840	17,680	17,520	17,360	17,200	17,050	16,900	16,750	16,610
12	16,470	16,330	16,190	16,050	15,920	15,790	15,660	15,530	15,410	15,280
13	15,160	15,040	14,920	14,810	14,690	14,580	14,470	14,360	14,250	14,140
14	14,040	13,930	13,830	13,730	13,630	13,530	13,440	13,340	13,250	13,150
15	13,060	12,970	12,880	12,790	12,710	12,620	12,540	12,450	12,370	12,290
16	12,210	12,130	12,050	11,970	11,890	11,820	11,740	11,670	11,590	11,520
17	11,450	11,380	11,310	11,240	11,170	11,100	11,030	10,970	10,900	10,840
18	10,770	10,710	10,650	10,580	10,520	10,460	10,400	10,340	10,280	10,220
19	10,160	10,110	10,050	9,990	9,940	9,880	9,830	9,780	9,720	9,670
20	9,620	9,560	9,510	9,460	9,410	9,360	9,310	9,260	9,210	9,170
21	9,120	9,070	9,020	8,980	8,930	8,890	8,840	8,800	8,750	8,710
22	8,660	8,620	8,580	8,530	8,490	8,450	8,410	8,370	8,330	8,290
23	8,250	8,210	8,170	8,130	8,090	8,050	8,010	7,970	7,940	7,900
24	7,860	7,820	7,790	7,750	7,720	7,680	7,640	7,610	7,570	7,540
25	7,510	7,470	7,440	7,400	7,370	7,340	7,310	7,270	7,240	7,210
26	7,180	7,140	7,110	7,080	7,050	7,020	6,990	6,960	6,930	6,900
27	6,870	6,840	6,810	6,780	6,750	6,720	6,690	6,670	6,640	6,610
28	6,580	6,550	6,530	6,500	6,470	6,450	6,420	6,390	6,370	6,340
29	6,310	6,290	6,260	6,240	6,210	6,190	6,160	6,140	6,110	6,090
30	6,060	6,040	6,010	5,990	5,970	5,940	5,920	5,890	5,870	5,850
31	5,830	5,800	5,780	5,760	5,730	5,710	5,690	5,670	5,640	5,620
32	5,600	5,580	5,560	5,540	5,510	5,490	5,470	5,450	5,430	5,410
33	5,390	5,370	5,350	5,330	5,310	5,290	5,270	5,250	5,230	5,210
34	5,190	5,170	5,150	5,130	5,110	5,090	5,070	5,050	5,040	5,020
35	5,000	4,980	4,960	4,940	4,920	4,910	4,890	4,870	4,850	4,830
36	4,820	4,800	4,780	4,760	4,750	4,730	4,710	4,700	4,680	4,660
37	4,640	4,630	4,610	4,590	4,580	4,560	4,540	4,530	4,510	4,500
38	4,480	4,460	4,450	4,430	4,420	4,400	4,380	4,370	4,350	4,340
39	4,320	4,310	4,290	4,280	4,260	4,250	4,230	4,220	4,200	4,190
40	4,170	4,160	4,140	4,130	4,110	4,100	4,080	4,070	4,050	4,040
41	4,030	4,010	4,000	3,980	3,970	3,960	3,940	3,930	3,910	3,900
42	3,890	3,870	3,860	3,850	3,830	3,820	3,810	3,790	3,780	3,770
43	3,750	3,740	3,730	3,710	3,700	3,690	3,680	3,660	3,650	3,640
44	3,620	3,610	3,600	3,590	3,570	3,560	3,550	3,540	3,520	3,510

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	3,500	3,490	3,480	3,460	3,450	3,440	3,430	3,420	3,400	3,390
46	3,380	3,370	3,360	3,340	3,330	3,320	3,310	3,300	3,290	3,280
47	3,260	3,250	3,240	3,230	3,220	3,210	3,200	3,180	3,170	3,160
48	3,150	3,140	3,130	3,120	3,110	3,100	3,090	3,070	3,060	3,050
49	3,040	3,030	3,020	3,010	3,000	2,990	2,980	2,970	2,960	2,950
50	2,940	2,930	2,920	2,910	2,900	2,890	2,870	2,860	2,850	2,840
51	2,830	2,820	2,810	2,800	2,790	2,780	2,770	2,760	2,750	2,740
52	2,730	2,720	2,710	2,710	2,700	2,690	2,680	2,670	2,660	2,650
53	2,640	2,630	2,620	2,610	2,600	2,590	2,580	2,570	2,560	2,550
54	2,540	2,530	2,520	2,520	2,510	2,500	2,490	2,480	2,470	2,460
55	2,450	2,440	2,430	2,420	2,410	2,410	2,400	2,390	2,380	2,370
56	2,360	2,350	2,340	2,330	2,330	2,320	2,310	2,300	2,290	2,280
57	2,270	2,260	2,260	2,250	2,240	2,230	2,220	2,210	2,200	2,200
58	2,190	2,180	2,170	2,160	2,150	2,140	2,140	2,130	2,120	2,110
59	2,100	2,090	2,090	2,080	2,070	2,060	2,050	2,050	2,040	2,030
60	2,020	2,010	2,000	2,000	1,990	1,980	1,970	1,960	1,960	1,950
61	1,940	1,930	1,920	1,920	1,910	1,900	1,890	1,880	1,880	1,870
62	1,860	1,850	1,850	1,840	1,830	1,820	1,810	1,810	1,800	1,790
63	1,780	1,780	1,770	1,760	1,750	1,750	1,740	1,730	1,720	1,710
64	1,710	1,700	1,690	1,680	1,680	1,670	1,660	1,650	1,650	1,640
65	1,630	1,620	1,620	1,610	1,600	1,590	1,590	1,580	1,570	1,570
66	1,560	1,550	1,540	1,540	1,530	1,520	1,510	1,510	1,500	1,490
67	1,490	1,480	1,470	1,460	1,460	1,450	1,440	1,440	1,430	1,420
68	1,410	1,410	1,400	1,390	1,390	1,380	1,370	1,360	1,360	1,350
69	1,340	1,340	1,330	1,320	1,320	1,310	1,300	1,290	1,290	1,280
70	1,270	1,270	1,260	1,250	1,250	1,240	1,230	1,230	1,220	1,210
71	1,210	1,200	1,190	1,180	1,180	1,170	1,160	1,160	1,150	1,140
72	1,140	1,130	1,120	1,120	1,110	1,100	1,100	1,090	1,080	1,080
73	1,070	1,060	1,060	1,050	1,040	1,040	1,030	1,020	1,020	1,010
74	1,000	1,000	990	980	980	970	960	960	950	940
75	940	930	920	920	910	910	900	890	890	880
76	870	870	860	850	850	840	830	830	820	810
77	810	800	800	790	780	780	770	760	760	750
78	740	740	730	720	720	710	710	700	690	690
79	680	670	670	660	650	650	640	640	630	620
80	620	610	600	600	590	590	580	570	570	560
81	550	550	540	540	530	520	520	510	500	500
82	490	490	480	470	470	460	450	450	440	440
83	430	420	420	410	400	400	390	390	380	370
84	370	360	360	350	340	340	330	320	320	310
85	310	300	290	290	280	280	270	260	260	250
86	240	240	230	230	220	210	210	200	200	190
87	180	180	170	170	160	150	150	140	130	130
88	120	120	110	100	100	90	90	80	70	70
89	60	50	50	40	40	30	20	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

18 MINUTES AFTER RELEASE  
3,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5	42,290	41,440	40,660	39,890	39,150	38,440	37,740	37,070	36,430	35,800
6	35,200	34,620	34,060	33,510	32,990	32,470	31,980	31,500	31,030	30,580
7	30,130	29,710	29,290	28,880	28,490	28,100	27,730	27,370	27,010	26,660
8	26,330	26,000	25,680	25,360	25,060	24,760	24,470	24,180	23,900	23,630
9	23,360	23,100	22,840	22,590	22,350	22,110	21,880	21,650	21,420	21,200
10	20,980	20,770	20,560	20,360	20,160	19,960	19,770	19,580	19,400	19,210
11	19,040	18,860	18,690	18,520	18,350	18,190	18,020	17,870	17,710	17,560
12	17,410	17,260	17,110	16,970	16,830	16,690	16,550	16,420	16,290	16,150
13	16,030	15,900	15,770	15,650	15,530	15,410	15,290	15,180	15,060	14,950
14	14,840	14,730	14,620	14,520	14,410	14,310	14,200	14,100	14,000	13,910
15	13,810	13,710	13,620	13,520	13,430	13,340	13,250	13,160	13,080	12,990
16	12,900	12,820	12,740	12,650	12,570	12,490	12,410	12,330	12,260	12,180
17	12,100	12,030	11,950	11,880	11,810	11,730	11,660	11,590	11,520	11,460
18	11,390	11,320	11,250	11,190	11,120	11,060	10,990	10,930	10,870	10,810
19	10,750	10,680	10,620	10,570	10,510	10,450	10,390	10,330	10,280	10,220
20	10,170	10,110	10,060	10,000	9,950	9,900	9,840	9,790	9,740	9,690
21	9,640	9,590	9,540	9,490	9,440	9,390	9,350	9,300	9,250	9,200
22	9,160	9,110	9,070	9,020	8,980	8,930	8,890	8,850	8,800	8,760
23	8,720	8,670	8,630	8,590	8,550	8,510	8,470	8,430	8,390	8,350
24	8,310	8,270	8,230	8,190	8,160	8,120	8,080	8,040	8,010	7,970
25	7,930	7,900	7,860	7,830	7,790	7,760	7,720	7,690	7,650	7,620
26	7,590	7,550	7,520	7,490	7,450	7,420	7,390	7,360	7,320	7,290
27	7,260	7,230	7,200	7,170	7,140	7,110	7,080	7,050	7,020	6,990
28	6,960	6,930	6,900	6,870	6,840	6,810	6,790	6,760	6,730	6,700
29	6,670	6,650	6,620	6,590	6,570	6,540	6,510	6,490	6,460	6,430
30	6,410	6,380	6,360	6,330	6,310	6,280	6,260	6,230	6,210	6,180
31	6,160	6,130	6,110	6,090	6,060	6,040	6,010	5,990	5,970	5,940
32	5,920	5,900	5,880	5,850	5,830	5,810	5,790	5,760	5,740	5,720
33	5,700	5,680	5,650	5,630	5,610	5,590	5,570	5,550	5,530	5,510
34	5,490	5,460	5,440	5,420	5,400	5,380	5,360	5,340	5,320	5,300
35	5,280	5,260	5,250	5,230	5,210	5,190	5,170	5,150	5,130	5,110
36	5,090	5,070	5,060	5,040	5,020	5,000	4,980	4,960	4,950	4,930
37	4,910	4,890	4,870	4,860	4,840	4,820	4,800	4,790	4,770	4,750
38	4,740	4,720	4,700	4,680	4,670	4,650	4,630	4,620	4,600	4,590
39	4,570	4,550	4,540	4,520	4,500	4,490	4,470	4,460	4,440	4,430
40	4,410	4,390	4,380	4,360	4,350	4,330	4,320	4,300	4,290	4,270
41	4,260	4,240	4,230	4,210	4,200	4,180	4,170	4,150	4,140	4,120
42	4,110	4,090	4,080	4,070	4,050	4,040	4,020	4,010	4,000	3,980
43	3,970	3,950	3,940	3,930	3,910	3,900	3,890	3,870	3,860	3,850
44	3,830	3,820	3,800	3,790	3,780	3,770	3,750	3,740	3,730	3,710

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	3,700	3,690	3,670	3,660	3,650	3,640	3,620	3,610	3,600	3,590
46	3,570	3,560	3,550	3,540	3,520	3,510	3,500	3,490	3,470	3,460
47	3,450	3,440	3,430	3,410	3,400	3,390	3,380	3,370	3,350	3,340
48	3,330	3,320	3,310	3,300	3,280	3,270	3,260	3,250	3,240	3,230
49	3,220	3,200	3,190	3,180	3,170	3,160	3,150	3,140	3,130	3,120
50	3,100	3,090	3,080	3,070	3,060	3,050	3,040	3,030	3,020	3,010
51	3,000	2,990	2,970	2,960	2,950	2,940	2,930	2,920	2,910	2,900
52	2,890	2,880	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800
53	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700
54	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620	2,610	2,600
55	2,590	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510	2,510
56	2,500	2,490	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,410
57	2,400	2,390	2,380	2,380	2,370	2,360	2,350	2,340	2,330	2,320
58	2,310	2,300	2,290	2,290	2,280	2,270	2,260	2,250	2,240	2,230
59	2,220	2,210	2,210	2,200	2,190	2,180	2,170	2,160	2,150	2,140
60	2,140	2,130	2,120	2,110	2,100	2,090	2,080	2,080	2,070	2,060
61	2,050	2,040	2,030	2,030	2,020	2,010	2,000	1,990	1,980	1,980
62	1,970	1,960	1,950	1,940	1,930	1,930	1,920	1,910	1,900	1,890
63	1,890	1,880	1,870	1,860	1,850	1,840	1,840	1,830	1,820	1,810
64	1,800	1,800	1,790	1,780	1,770	1,760	1,760	1,750	1,740	1,730
65	1,730	1,720	1,710	1,700	1,690	1,690	1,680	1,670	1,660	1,660
66	1,650	1,640	1,630	1,620	1,620	1,610	1,600	1,590	1,590	1,580
67	1,570	1,560	1,560	1,550	1,540	1,530	1,530	1,520	1,510	1,500
68	1,490	1,490	1,480	1,470	1,460	1,460	1,450	1,440	1,440	1,430
69	1,420	1,410	1,410	1,400	1,390	1,380	1,380	1,370	1,360	1,350
70	1,350	1,340	1,330	1,320	1,320	1,310	1,300	1,300	1,290	1,280
71	1,270	1,270	1,260	1,250	1,250	1,240	1,230	1,220	1,220	1,210
72	1,200	1,200	1,190	1,180	1,170	1,170	1,160	1,150	1,150	1,140
73	1,130	1,120	1,120	1,110	1,100	1,100	1,090	1,080	1,070	1,070
74	1,060	1,050	1,050	1,040	1,030	1,030	1,020	1,010	1,010	1,000
75	990	980	980	970	960	960	950	940	940	930
76	920	920	910	900	900	890	880	870	870	860
77	850	850	840	830	830	820	810	810	800	790
78	790	780	770	770	760	750	750	740	730	730
79	720	710	710	700	690	690	680	670	670	660
80	650	650	640	630	630	620	610	610	600	590
81	590	580	570	570	560	550	550	540	530	530
82	520	510	510	500	490	490	480	470	470	460
83	450	450	440	430	430	420	420	410	400	400
84	390	380	380	370	360	360	350	340	340	330
85	320	320	310	300	300	290	280	280	270	270
86	260	250	250	240	230	230	220	210	210	200
87	190	190	180	170	170	160	160	150	140	140
88	130	120	120	110	100	100	90	80	80	70
89	60	60	50	50	40	30	30	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

19 MINUTES AFTER RELEASE  
3,900 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	44,580	43,680	42,860	42,040	41,260	40,520	39,780	39,080	38,400	37,740
6	37,110	36,490	35,900	35,330	34,770	34,230	33,710	33,200	32,710	32,230
7	31,760	31,310	30,870	30,440	30,030	29,620	29,230	28,850	28,470	28,110
8	27,750	27,400	27,060	26,730	26,410	26,100	25,790	25,490	25,190	24,910
9	24,620	24,350	24,080	23,820	23,560	23,310	23,060	22,820	22,580	22,350
10	22,120	21,890	21,680	21,460	21,250	21,040	20,840	20,640	20,440	20,250
11	20,060	19,880	19,700	19,520	19,340	19,170	19,000	18,830	18,670	18,510
12	18,350	18,190	18,040	17,890	17,740	17,590	17,450	17,310	17,170	17,030
13	16,890	16,760	16,630	16,500	16,370	16,240	16,120	16,000	15,880	15,760
14	15,640	15,530	15,410	15,300	15,190	15,080	14,970	14,870	14,760	14,660
15	14,560	14,450	14,350	14,260	14,160	14,060	13,970	13,870	13,780	13,690
16	13,600	13,510	13,420	13,340	13,250	13,170	13,080	13,000	12,920	12,840
17	12,760	12,680	12,600	12,520	12,440	12,370	12,290	12,220	12,150	12,070
18	12,000	11,930	11,860	11,790	11,720	11,660	11,590	11,520	11,460	11,390
19	11,330	11,260	11,200	11,140	11,070	11,010	10,950	10,890	10,830	10,770
20	10,720	10,660	10,600	10,540	10,490	10,430	10,380	10,320	10,270	10,210
21	10,160	10,110	10,050	10,000	9,950	9,900	9,850	9,800	9,750	9,700
22	9,650	9,600	9,560	9,510	9,460	9,420	9,370	9,320	9,280	9,230
23	9,190	9,140	9,100	9,060	9,010	8,970	8,930	8,880	8,840	8,800
24	8,760	8,720	8,680	8,640	8,600	8,560	8,520	8,480	8,440	8,400
25	8,360	8,330	8,290	8,250	8,210	8,180	8,140	8,100	8,070	8,030
26	8,000	7,960	7,930	7,890	7,860	7,820	7,790	7,750	7,720	7,690
27	7,650	7,620	7,590	7,560	7,520	7,490	7,460	7,430	7,400	7,370
28	7,330	7,300	7,270	7,240	7,210	7,180	7,150	7,120	7,090	7,060
29	7,040	7,010	6,980	6,950	6,920	6,890	6,870	6,840	6,810	6,780
30	6,760	6,730	6,700	6,670	6,650	6,620	6,590	6,570	6,540	6,520
31	6,490	6,470	6,440	6,410	6,390	6,360	6,340	6,310	6,290	6,270
32	6,240	6,220	6,190	6,170	6,150	6,120	6,100	6,080	6,050	6,030
33	6,010	5,980	5,960	5,940	5,910	5,890	5,870	5,850	5,830	5,800
34	5,780	5,760	5,740	5,720	5,700	5,670	5,650	5,630	5,610	5,590
35	5,570	5,550	5,530	5,510	5,490	5,470	5,450	5,430	5,410	5,390
36	5,370	5,350	5,330	5,310	5,290	5,270	5,250	5,230	5,210	5,190
37	5,180	5,160	5,140	5,120	5,100	5,080	5,060	5,050	5,030	5,010
38	4,990	4,970	4,960	4,940	4,920	4,900	4,890	4,870	4,850	4,830
39	4,820	4,800	4,780	4,770	4,750	4,730	4,710	4,700	4,680	4,660
40	4,650	4,630	4,610	4,600	4,580	4,570	4,550	4,530	4,520	4,500
41	4,490	4,470	4,450	4,440	4,420	4,410	4,390	4,380	4,360	4,350
42	4,330	4,320	4,300	4,290	4,270	4,260	4,240	4,230	4,210	4,200
43	4,180	4,170	4,150	4,140	4,120	4,110	4,100	4,080	4,070	4,050
44	4,040	4,020	4,010	4,000	3,980	3,970	3,950	3,940	3,930	3,910

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	3,900	3,890	3,870	3,860	3,850	3,830	3,820	3,810	3,790	3,780
46	3,770	3,750	3,740	3,730	3,710	3,700	3,690	3,680	3,660	3,650
47	3,640	3,620	3,610	3,600	3,590	3,570	3,560	3,550	3,540	3,520
48	3,510	3,500	3,490	3,470	3,460	3,450	3,440	3,430	3,410	3,400
49	3,390	3,380	3,370	3,350	3,340	3,330	3,320	3,310	3,300	3,280
50	3,270	3,260	3,250	3,240	3,230	3,210	3,200	3,190	3,180	3,170
51	3,160	3,150	3,140	3,120	3,110	3,100	3,090	3,080	3,070	3,060
52	3,050	3,040	3,030	3,010	3,000	2,990	2,980	2,970	2,960	2,950
53	2,940	2,930	2,920	2,910	2,900	2,890	2,880	2,860	2,850	2,840
54	2,830	2,820	2,810	2,800	2,790	2,780	2,770	2,760	2,750	2,740
55	2,730	2,720	2,710	2,700	2,690	2,680	2,670	2,660	2,650	2,640
56	2,630	2,620	2,610	2,600	2,590	2,580	2,570	2,560	2,550	2,540
57	2,530	2,520	2,510	2,500	2,490	2,480	2,470	2,470	2,460	2,450
58	2,440	2,430	2,420	2,410	2,400	2,390	2,380	2,370	2,360	2,350
59	2,340	2,330	2,320	2,320	2,310	2,300	2,290	2,280	2,270	2,260
60	2,250	2,240	2,230	2,220	2,220	2,210	2,200	2,190	2,180	2,170
61	2,160	2,150	2,140	2,140	2,130	2,120	2,110	2,100	2,090	2,080
62	2,070	2,070	2,060	2,050	2,040	2,030	2,020	2,010	2,000	2,000
63	1,990	1,980	1,970	1,960	1,950	1,940	1,940	1,930	1,920	1,910
64	1,900	1,890	1,890	1,880	1,870	1,860	1,850	1,840	1,840	1,830
65	1,820	1,810	1,800	1,790	1,790	1,780	1,770	1,760	1,750	1,740
66	1,740	1,730	1,720	1,710	1,700	1,700	1,690	1,680	1,670	1,660
67	1,660	1,650	1,640	1,630	1,620	1,620	1,610	1,600	1,590	1,580
68	1,580	1,570	1,560	1,550	1,540	1,540	1,530	1,520	1,510	1,510
69	1,500	1,490	1,480	1,470	1,470	1,460	1,450	1,440	1,430	1,430
70	1,420	1,410	1,400	1,400	1,390	1,380	1,370	1,370	1,360	1,350
71	1,340	1,340	1,330	1,320	1,310	1,300	1,300	1,290	1,280	1,270
72	1,270	1,260	1,250	1,240	1,240	1,230	1,220	1,210	1,210	1,200
73	1,190	1,180	1,180	1,170	1,160	1,160	1,150	1,140	1,130	1,130
74	1,120	1,110	1,100	1,100	1,090	1,080	1,070	1,070	1,060	1,050
75	1,040	1,040	1,030	1,020	1,020	1,010	1,000	990	990	980
76	970	970	960	950	940	940	930	920	910	910
77	900	890	890	880	870	860	860	850	840	840
78	830	820	810	810	800	790	790	780	770	770
79	760	750	740	740	730	720	720	710	700	690
80	690	680	670	670	660	650	650	640	630	620
81	620	610	600	600	590	580	580	570	560	550
82	550	540	530	530	520	510	510	500	490	490
83	480	470	460	460	450	440	440	430	420	420
84	410	400	400	390	380	380	370	360	350	350
85	340	330	330	320	310	310	300	290	290	280
86	270	270	260	250	250	240	230	230	220	210
87	200	200	190	180	180	170	160	160	150	140
88	140	130	120	120	110	100	100	90	80	70
89	70	60	50	50	40	30	30	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

20 MINUTES AFTER RELEASE  
4,100 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	46,860	45,920	45,060	44,200	43,380	42,600	41,820	41,080	40,360	39,680
6	39,010	38,360	37,740	37,140	36,550	35,990	35,440	34,900	34,380	33,880
7	33,390	32,920	32,450	32,010	31,570	31,140	30,730	30,320	29,930	29,550
8	29,170	28,810	28,450	28,100	27,770	27,430	27,110	26,790	26,480	26,180
9	25,890	25,600	25,310	25,040	24,770	24,500	24,240	23,990	23,740	23,490
10	23,250	23,020	22,790	22,560	22,340	22,120	21,910	21,700	21,490	21,290
11	21,090	20,900	20,710	20,520	20,330	20,150	19,970	19,800	19,630	19,460
12	19,290	19,120	18,960	18,800	18,650	18,490	18,340	18,190	18,050	17,900
13	17,760	17,620	17,480	17,340	17,210	17,080	16,950	16,820	16,690	16,570
14	16,440	16,320	16,200	16,090	15,970	15,850	15,740	15,630	15,520	15,410
15	15,300	15,200	15,090	14,990	14,890	14,780	14,680	14,590	14,490	14,390
16	14,300	14,200	14,110	14,020	13,930	13,840	13,750	13,670	13,580	13,490
17	13,410	13,330	13,250	13,160	13,080	13,000	12,920	12,850	12,770	12,690
18	12,620	12,540	12,470	12,400	12,330	12,250	12,180	12,110	12,040	11,980
19	11,910	11,840	11,770	11,710	11,640	11,580	11,510	11,450	11,390	11,330
20	11,260	11,200	11,140	11,080	11,020	10,970	10,910	10,850	10,790	10,740
21	10,680	10,630	10,570	10,520	10,460	10,410	10,360	10,300	10,250	10,200
22	10,150	10,100	10,050	10,000	9,950	9,900	9,850	9,800	9,750	9,710
23	9,660	9,610	9,570	9,520	9,470	9,430	9,380	9,340	9,300	9,250
24	9,210	9,170	9,120	9,080	9,040	9,000	8,960	8,910	8,870	8,830
25	8,790	8,750	8,710	8,670	8,630	8,600	8,560	8,520	8,480	8,440
26	8,410	8,370	8,330	8,300	8,260	8,220	8,190	8,150	8,120	8,080
27	8,050	8,010	7,980	7,940	7,910	7,880	7,840	7,810	7,780	7,740
28	7,710	7,680	7,650	7,610	7,580	7,550	7,520	7,490	7,460	7,430
29	7,400	7,370	7,340	7,310	7,280	7,250	7,220	7,190	7,160	7,130
30	7,100	7,070	7,040	7,020	6,990	6,960	6,930	6,910	6,880	6,850
31	6,820	6,800	6,770	6,740	6,720	6,690	6,660	6,640	6,610	6,590
32	6,560	6,540	6,510	6,490	6,460	6,440	6,410	6,390	6,360	6,340
33	6,310	6,290	6,270	6,240	6,220	6,190	6,170	6,150	6,120	6,100
34	6,080	6,060	6,030	6,010	5,990	5,970	5,940	5,920	5,900	5,880
35	5,860	5,830	5,810	5,790	5,770	5,750	5,730	5,710	5,680	5,660
36	5,640	5,620	5,600	5,580	5,560	5,540	5,520	5,500	5,480	5,460
37	5,440	5,420	5,400	5,380	5,360	5,340	5,320	5,300	5,290	5,270
38	5,250	5,230	5,210	5,190	5,170	5,150	5,140	5,120	5,100	5,080
39	5,060	5,050	5,030	5,010	4,990	4,970	4,960	4,940	4,920	4,900
40	4,890	4,870	4,850	4,830	4,820	4,800	4,780	4,770	4,750	4,730
41	4,720	4,700	4,680	4,670	4,650	4,630	4,620	4,600	4,590	4,570
42	4,550	4,540	4,520	4,510	4,490	4,470	4,460	4,440	4,430	4,410
43	4,400	4,380	4,370	4,350	4,340	4,320	4,310	4,290	4,280	4,260
44	4,250	4,230	4,220	4,200	4,190	4,170	4,160	4,140	4,130	4,110



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	4,100	4,090	4,070	4,060	4,040	4,030	4,020	4,000	3,990	3,970
46	3,960	3,950	3,930	3,920	3,900	3,890	3,880	3,860	3,850	3,840
47	3,820	3,810	3,800	3,780	3,770	3,760	3,740	3,730	3,720	3,700
48	3,690	3,680	3,670	3,650	3,640	3,630	3,610	3,600	3,590	3,580
49	3,560	3,550	3,540	3,530	3,510	3,500	3,490	3,480	3,460	3,450
50	3,440	3,430	3,420	3,400	3,390	3,380	3,370	3,360	3,340	3,330
51	3,320	3,310	3,300	3,280	3,270	3,260	3,250	3,240	3,230	3,210
52	3,200	3,190	3,180	3,170	3,160	3,150	3,130	3,120	3,110	3,100
53	3,090	3,080	3,070	3,060	3,050	3,030	3,020	3,010	3,000	2,990
54	2,980	2,970	2,960	2,950	2,940	2,920	2,910	2,900	2,890	2,880
55	2,870	2,860	2,850	2,840	2,830	2,820	2,810	2,800	2,790	2,780
56	2,770	2,760	2,740	2,730	2,720	2,710	2,700	2,690	2,680	2,670
57	2,660	2,650	2,640	2,630	2,620	2,610	2,600	2,590	2,580	2,570
58	2,560	2,550	2,540	2,530	2,520	2,510	2,500	2,490	2,480	2,470
59	2,460	2,450	2,440	2,430	2,420	2,410	2,410	2,400	2,390	2,380
60	2,370	2,360	2,350	2,340	2,330	2,320	2,310	2,300	2,290	2,280
61	2,270	2,260	2,250	2,240	2,240	2,230	2,220	2,210	2,200	2,190
62	2,180	2,170	2,160	2,150	2,140	2,130	2,130	2,120	2,110	2,100
63	2,090	2,080	2,070	2,060	2,050	2,040	2,040	2,030	2,020	2,010
64	2,000	1,990	1,980	1,970	1,960	1,960	1,950	1,940	1,930	1,920
65	1,910	1,900	1,890	1,890	1,880	1,870	1,860	1,850	1,840	1,830
66	1,830	1,820	1,810	1,800	1,790	1,780	1,770	1,770	1,760	1,750
67	1,740	1,730	1,720	1,720	1,710	1,700	1,690	1,680	1,670	1,670
68	1,660	1,650	1,640	1,630	1,620	1,610	1,610	1,600	1,590	1,580
69	1,570	1,570	1,560	1,550	1,540	1,530	1,520	1,520	1,510	1,500
70	1,490	1,480	1,480	1,470	1,460	1,450	1,440	1,440	1,430	1,420
71	1,410	1,400	1,400	1,390	1,380	1,370	1,360	1,360	1,350	1,340
72	1,330	1,320	1,320	1,310	1,300	1,290	1,280	1,280	1,270	1,260
73	1,250	1,250	1,240	1,230	1,220	1,210	1,210	1,200	1,190	1,180
74	1,180	1,170	1,160	1,150	1,140	1,140	1,130	1,120	1,110	1,110
75	1,100	1,090	1,080	1,080	1,070	1,060	1,050	1,050	1,040	1,030
76	1,020	1,010	1,010	1,000	990	980	980	970	960	950
77	950	940	930	920	920	910	900	890	890	880
78	870	860	860	850	840	830	830	820	810	800
79	800	790	780	770	770	760	750	740	740	730
80	720	720	710	700	690	690	680	670	660	660
81	650	640	630	630	620	610	610	600	590	580
82	580	570	560	550	550	540	530	530	520	510
83	500	500	490	480	470	470	460	450	450	440
84	430	420	420	410	400	390	390	380	370	370
85	360	350	340	340	330	320	320	310	300	290
86	290	280	270	270	260	250	240	240	230	220
87	210	210	200	190	190	180	170	160	160	150
88	140	140	130	120	110	110	100	90	90	80
89	70	60	60	50	40	40	30	20	10	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

21 MINUTES AFTER RELEASE  
4,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5	49,150	48,160	47,260	46,350	45,490	44,680	43,860	43,090	42,330	41,610
6	40,910	40,240	39,580	38,950	38,340	37,740	37,160	36,600	36,060	35,530
7	35,020	34,520	34,040	33,570	33,110	32,660	32,230	31,800	31,390	30,990
8	30,600	30,210	29,840	29,480	29,120	28,770	28,430	28,100	27,780	27,460
9	27,150	26,850	26,550	26,260	25,970	25,700	25,420	25,160	24,890	24,640
10	24,390	24,140	23,900	23,660	23,430	23,200	22,980	22,760	22,540	22,330
11	22,120	21,920	21,720	21,520	21,330	21,140	20,950	20,760	20,580	20,400
12	20,230	20,060	19,890	19,720	19,560	19,400	19,240	19,080	18,930	18,770
13	18,630	18,480	18,330	18,190	18,050	17,910	17,770	17,640	17,510	17,380
14	17,250	17,120	16,990	16,870	16,750	16,630	16,510	16,390	16,270	16,160
15	16,050	15,940	15,830	15,720	15,610	15,510	15,400	15,300	15,200	15,100
16	15,000	14,900	14,800	14,700	14,610	14,520	14,420	14,330	14,240	14,150
17	14,060	13,980	13,890	13,810	13,720	13,640	13,560	13,470	13,390	13,310
18	13,230	13,160	13,080	13,000	12,930	12,850	12,780	12,700	12,630	12,560
19	12,490	12,420	12,350	12,280	12,210	12,140	12,080	12,010	11,940	11,880
20	11,810	11,750	11,690	11,620	11,560	11,500	11,440	11,380	11,320	11,260
21	11,200	11,140	11,090	11,030	10,970	10,920	10,860	10,810	10,750	10,700
22	10,640	10,590	10,540	10,480	10,430	10,380	10,330	10,280	10,230	10,180
23	10,130	10,080	10,030	9,980	9,940	9,890	9,840	9,800	9,750	9,700
24	9,660	9,610	9,570	9,520	9,480	9,440	9,390	9,350	9,310	9,260
25	9,220	9,180	9,140	9,100	9,060	9,010	8,970	8,930	8,890	8,860
26	8,820	8,780	8,740	8,700	8,660	8,620	8,590	8,550	8,510	8,480
27	8,440	8,400	8,370	8,330	8,300	8,260	8,230	8,190	8,160	8,120
28	8,090	8,050	8,020	7,990	7,950	7,920	7,890	7,850	7,820	7,790
29	7,760	7,730	7,690	7,660	7,630	7,600	7,570	7,540	7,510	7,480
30	7,450	7,420	7,390	7,360	7,330	7,300	7,270	7,240	7,210	7,180
31	7,160	7,130	7,100	7,070	7,040	7,020	6,990	6,960	6,940	6,910
32	6,880	6,850	6,830	6,800	6,780	6,750	6,720	6,700	6,670	6,650
33	6,620	6,600	6,570	6,550	6,520	6,500	6,470	6,450	6,420	6,400
34	6,380	6,350	6,330	6,300	6,280	6,260	6,230	6,210	6,190	6,160
35	6,140	6,120	6,100	6,070	6,050	6,030	6,010	5,980	5,960	5,940
36	5,920	5,900	5,880	5,850	5,830	5,810	5,790	5,770	5,750	5,730
37	5,710	5,690	5,670	5,640	5,620	5,600	5,580	5,560	5,540	5,520
38	5,500	5,480	5,460	5,440	5,430	5,410	5,390	5,370	5,350	5,330
39	5,310	5,290	5,270	5,250	5,230	5,220	5,200	5,180	5,160	5,140
40	5,120	5,110	5,090	5,070	5,050	5,030	5,020	5,000	4,980	4,960
41	4,950	4,930	4,910	4,890	4,880	4,860	4,840	4,830	4,810	4,790
42	4,780	4,760	4,740	4,730	4,710	4,690	4,680	4,660	4,640	4,630
43	4,610	4,590	4,580	4,560	4,550	4,530	4,520	4,500	4,480	4,470
44	4,450	4,440	4,420	4,410	4,390	4,380	4,360	4,350	4,330	4,320

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	4,300	4,280	4,270	4,260	4,240	4,230	4,210	4,200	4,180	4,170
46	4,150	4,140	4,120	4,110	4,090	4,080	4,070	4,050	4,040	4,020
47	4,010	4,000	3,980	3,970	3,950	3,940	3,930	3,910	3,900	3,890
48	3,870	3,860	3,840	3,830	3,820	3,800	3,790	3,780	3,760	3,750
49	3,740	3,720	3,710	3,700	3,690	3,670	3,660	3,650	3,630	3,620
50	3,610	3,600	3,580	3,570	3,560	3,540	3,530	3,520	3,510	3,490
51	3,480	3,470	3,460	3,450	3,430	3,420	3,410	3,400	3,380	3,370
52	3,360	3,350	3,340	3,320	3,310	3,300	3,290	3,280	3,260	3,250
53	3,240	3,230	3,220	3,210	3,190	3,180	3,170	3,160	3,150	3,140
54	3,120	3,110	3,100	3,090	3,080	3,070	3,060	3,040	3,030	3,020
55	3,010	3,000	2,990	2,980	2,970	2,960	2,940	2,930	2,920	2,910
56	2,900	2,890	2,880	2,870	2,860	2,850	2,840	2,820	2,810	2,800
57	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,720	2,710	2,700
58	2,690	2,680	2,670	2,660	2,650	2,640	2,620	2,610	2,600	2,590
59	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510	2,500	2,490
60	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,410	2,400	2,390
61	2,380	2,370	2,360	2,350	2,340	2,330	2,330	2,320	2,310	2,300
62	2,290	2,280	2,270	2,260	2,250	2,240	2,230	2,220	2,210	2,200
63	2,190	2,180	2,170	2,160	2,150	2,140	2,130	2,130	2,120	2,110
64	2,100	2,090	2,080	2,070	2,060	2,050	2,040	2,030	2,020	2,010
65	2,010	2,000	1,990	1,980	1,970	1,960	1,950	1,940	1,930	1,920
66	1,910	1,910	1,900	1,890	1,880	1,870	1,860	1,850	1,840	1,830
67	1,830	1,820	1,810	1,800	1,790	1,780	1,770	1,760	1,750	1,750
68	1,740	1,730	1,720	1,710	1,700	1,690	1,690	1,680	1,670	1,660
69	1,650	1,640	1,630	1,620	1,620	1,610	1,600	1,590	1,580	1,570
70	1,570	1,560	1,550	1,540	1,530	1,520	1,510	1,510	1,500	1,490
71	1,480	1,470	1,460	1,460	1,450	1,440	1,430	1,420	1,410	1,410
72	1,400	1,390	1,380	1,370	1,360	1,360	1,350	1,340	1,330	1,320
73	1,310	1,310	1,300	1,290	1,280	1,270	1,270	1,260	1,250	1,240
74	1,230	1,230	1,220	1,210	1,200	1,190	1,180	1,180	1,170	1,160
75	1,150	1,140	1,140	1,130	1,120	1,110	1,100	1,100	1,090	1,080
76	1,070	1,060	1,060	1,050	1,040	1,030	1,020	1,020	1,010	1,000
77	990	980	980	970	960	950	950	940	930	920
78	910	910	900	890	880	880	870	860	850	840
79	840	830	820	810	800	800	790	780	770	770
80	760	750	740	730	730	720	710	700	700	690
81	680	670	670	660	650	640	640	630	620	610
82	600	600	590	580	570	570	560	550	540	540
83	530	520	510	510	500	490	480	470	470	460
84	450	440	440	430	420	410	410	400	390	380
85	380	370	360	350	350	340	330	320	320	310
86	300	290	290	280	270	260	260	250	240	230
87	230	220	210	200	200	190	180	170	170	160
88	150	140	140	130	120	110	100	100	90	80
89	80	70	60	50	50	40	30	20	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

22 MINUTES AFTER RELEASE  
4,500 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	51,440	50,400	49,450	48,510	47,610	46,760	45,900	45,090	44,300	43,550
6	42,810	42,110	41,420	40,760	40,120	39,500	38,890	38,310	37,740	37,190
7	36,650	36,130	35,620	35,130	34,650	34,180	33,730	33,280	32,850	32,430
8	32,020	31,620	31,230	30,850	30,470	30,110	29,750	29,410	29,070	28,740
9	28,410	28,090	27,780	27,480	27,180	26,890	26,610	26,330	26,050	25,780
10	25,520	25,260	25,010	24,760	24,520	24,280	24,050	23,820	23,590	23,370
11	23,150	22,940	22,730	22,520	22,320	22,120	21,920	21,730	21,540	21,350
12	21,170	20,990	20,810	20,640	20,470	20,300	20,130	19,970	19,810	19,650
13	19,490	19,340	19,190	19,040	18,890	18,740	18,600	18,460	18,320	18,180
14	18,050	17,920	17,780	17,650	17,530	17,400	17,280	17,150	17,030	16,910
15	16,790	16,680	16,560	16,450	16,340	16,230	16,120	16,010	15,900	15,800
16	15,690	15,590	15,490	15,390	15,290	15,190	15,090	15,000	14,900	14,810
17	14,720	14,630	14,540	14,450	14,360	14,270	14,190	14,100	14,020	13,930
18	13,850	13,770	13,690	13,610	13,530	13,450	13,370	13,290	13,220	13,140
19	13,070	13,000	12,920	12,850	12,780	12,710	12,640	12,570	12,500	12,430
20	12,360	12,300	12,230	12,170	12,100	12,040	11,970	11,910	11,850	11,780
21	11,720	11,660	11,600	11,540	11,480	11,420	11,370	11,310	11,250	11,190
22	11,140	11,080	11,030	10,970	10,920	11,860	10,810	10,760	10,710	10,650
23	10,600	10,550	10,500	10,450	10,400	10,350	10,300	10,250	10,200	10,150
24	10,110	10,060	10,010	9,970	9,920	9,870	9,830	9,780	9,740	9,690
25	9,650	9,610	9,560	9,520	9,480	9,430	9,390	9,350	9,310	9,270
26	9,230	9,190	9,150	9,100	9,070	9,030	8,990	8,950	8,910	8,870
27	8,830	8,790	8,760	8,720	8,680	8,640	8,610	8,570	8,540	8,500
28	8,460	8,430	8,390	8,360	8,320	8,290	8,250	8,220	8,190	8,150
29	8,120	8,080	8,050	8,020	7,990	7,950	7,920	7,890	7,860	7,830
30	7,790	7,760	7,730	7,700	7,670	7,640	7,610	7,580	7,550	7,520
31	7,490	7,460	7,430	7,400	7,370	7,340	7,310	7,290	7,260	7,230
32	7,200	7,170	7,150	7,120	7,090	7,060	7,040	7,010	6,980	6,960
33	6,930	6,900	6,880	6,850	6,820	6,800	6,770	6,750	6,720	6,700
34	6,670	6,650	6,620	6,600	6,570	6,550	6,520	6,500	6,470	6,450
35	6,430	6,400	6,380	6,360	6,330	6,310	6,290	6,260	6,240	6,220
36	6,190	6,170	6,150	6,130	6,100	6,080	6,060	6,040	6,020	5,990
37	5,970	5,950	5,930	5,910	5,890	5,860	5,840	5,820	5,800	5,780
38	5,760	5,740	5,720	5,700	5,680	5,660	5,640	5,620	5,600	5,580
39	5,560	5,540	5,520	5,500	5,480	5,460	5,440	5,420	5,400	5,380
40	5,360	5,340	5,320	5,310	5,290	5,270	5,250	5,230	5,210	5,190
41	5,180	5,160	5,140	5,120	5,100	5,090	5,070	5,050	5,030	5,020
42	5,000	4,980	4,960	4,950	4,930	4,910	4,890	4,880	4,860	4,840
43	4,830	4,810	4,790	4,780	4,760	4,740	4,730	4,710	4,690	4,680
44	4,660	4,640	4,630	4,610	4,600	4,580	4,560	4,550	4,530	4,520

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	4,500	4,480	4,470	4,450	4,440	4,420	4,410	4,390	4,380	4,360
46	4,350	4,330	4,320	4,300	4,290	4,270	4,260	4,240	4,230	4,210
47	4,200	4,180	4,170	4,150	4,140	4,120	4,110	4,090	4,080	4,070
48	4,050	4,040	4,020	4,010	4,000	3,980	3,970	3,950	3,940	3,930
49	3,910	3,900	3,880	3,870	3,860	3,840	3,830	3,820	3,800	3,790
50	3,780	3,760	3,750	3,740	3,720	3,710	3,700	3,680	3,670	3,660
51	3,640	3,630	3,620	3,610	3,590	3,580	3,570	3,550	3,540	3,530
52	3,520	3,500	3,490	3,480	3,470	3,450	3,440	3,430	3,420	3,400
53	3,390	3,380	3,370	3,350	3,340	3,330	3,320	3,310	3,290	3,280
54	3,270	3,260	3,250	3,230	3,220	3,210	3,200	3,190	3,170	3,160
55	3,150	3,140	3,130	3,120	3,100	3,090	3,080	3,070	3,060	3,050
56	3,040	3,020	3,010	3,000	2,990	2,980	2,970	2,960	2,940	2,930
57	2,920	2,910	2,900	2,890	2,880	2,870	2,860	2,840	2,830	2,820
58	2,810	2,800	2,790	2,780	2,770	2,760	2,750	2,740	2,730	2,710
59	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620	2,610
60	2,600	2,590	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,500
61	2,490	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,410	2,400
62	2,390	2,380	2,370	2,360	2,350	2,340	2,330	2,320	2,310	2,300
63	2,290	2,280	2,270	2,260	2,250	2,240	2,230	2,220	2,210	2,200
64	2,190	2,190	2,180	2,170	2,160	2,150	2,140	2,130	2,120	2,110
65	2,100	2,090	2,080	2,070	2,060	2,050	2,040	2,030	2,020	2,010
66	2,000	1,990	1,980	1,980	1,970	1,960	1,950	1,940	1,930	1,920
67	1,910	1,900	1,890	1,880	1,870	1,860	1,850	1,850	1,840	1,830
68	1,820	1,810	1,800	1,790	1,780	1,770	1,760	1,750	1,750	1,740
69	1,730	1,720	1,710	1,700	1,690	1,680	1,670	1,660	1,660	1,650
70	1,640	1,630	1,620	1,610	1,600	1,590	1,580	1,580	1,570	1,560
71	1,550	1,540	1,530	1,520	1,510	1,510	1,500	1,490	1,480	1,470
72	1,460	1,450	1,440	1,440	1,430	1,420	1,410	1,400	1,390	1,380
73	1,380	1,370	1,360	1,350	1,340	1,330	1,320	1,320	1,310	1,300
74	1,290	1,280	1,270	1,260	1,260	1,250	1,240	1,230	1,220	1,210
75	1,210	1,200	1,190	1,180	1,170	1,160	1,160	1,150	1,140	1,130
76	1,120	1,110	1,110	1,100	1,090	1,080	1,070	1,060	1,060	1,050
77	1,040	1,030	1,020	1,010	1,010	1,000	990	980	970	960
78	960	950	940	930	920	920	910	900	890	880
79	870	870	860	850	840	830	830	820	810	800
80	790	790	780	770	760	750	740	740	730	720
81	710	700	700	690	680	670	660	660	650	640
82	630	620	620	610	600	590	580	580	570	560
83	550	540	540	530	520	510	500	500	490	480
84	470	460	460	450	440	430	430	420	410	400
85	390	390	380	370	360	350	350	340	330	320
86	310	310	300	290	280	280	270	260	250	240
87	240	230	220	210	200	200	190	180	170	170
88	160	150	140	130	130	120	110	100	90	90
89	80	70	60	50	50	40	30	20	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

23 MINUTES AFTER RELEASE

4,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	53,720	52,640	51,650	50,670	49,730	48,830	47,940	47,090	46,270	45,480
6	44,720	43,980	43,260	42,570	41,900	41,250	40,620	40,010	39,420	38,840
7	38,280	37,730	37,200	36,690	36,190	35,700	35,230	34,760	34,310	33,870
8	33,440	33,020	32,620	32,220	31,830	31,450	31,080	30,710	30,360	30,010
9	29,670	29,340	29,020	28,700	28,390	28,090	27,790	27,500	27,210	26,930
10	26,660	26,390	26,120	25,860	25,610	25,360	25,110	24,870	24,640	24,410
11	24,180	23,960	23,740	23,520	23,310	23,100	22,900	22,700	22,500	22,300
12	22,110	21,920	21,740	21,560	21,380	21,200	21,030	20,860	20,690	20,520
13	20,360	20,200	20,040	19,880	19,730	19,580	19,430	19,280	19,140	18,990
14	18,850	18,710	18,570	18,440	18,310	18,170	18,040	17,920	17,790	17,660
15	17,540	17,420	17,300	17,180	17,060	16,950	16,830	16,720	16,610	16,500
16	16,390	16,280	16,180	16,070	15,970	15,870	15,770	15,670	15,570	15,470
17	15,370	15,280	15,180	15,090	15,000	14,910	14,820	14,730	14,640	14,550
18	14,470	14,380	14,300	14,210	14,130	14,050	13,970	13,890	13,810	13,730
19	13,650	13,570	13,500	13,420	13,350	13,270	13,200	13,130	13,050	12,980
20	12,910	12,840	12,770	12,710	12,640	12,570	12,500	12,440	12,370	12,310
21	12,240	12,180	12,120	12,060	11,990	11,930	11,870	11,810	11,750	11,690
22	11,630	11,570	11,520	11,460	11,400	11,350	11,290	11,240	11,180	11,130
23	11,070	11,020	10,970	10,910	10,860	10,810	10,760	10,710	10,660	10,610
24	10,560	10,510	10,460	10,410	10,360	10,310	10,270	10,220	10,170	10,130
25	10,080	10,030	9,990	9,940	9,900	9,850	9,810	9,770	9,720	9,680
26	9,640	9,590	9,550	9,510	9,470	9,430	9,390	9,350	9,300	9,260
27	9,220	9,180	9,150	9,110	9,070	9,030	8,990	8,950	8,910	8,880
28	8,840	8,800	8,770	8,730	8,690	8,660	8,620	8,580	8,550	8,510
29	8,480	8,440	8,410	8,380	8,340	8,310	8,270	8,240	8,210	8,170
30	8,140	8,110	8,080	8,040	8,010	7,980	7,950	7,920	7,880	7,850
31	7,820	7,790	7,760	7,730	7,700	7,670	7,640	7,610	7,580	7,550
32	7,520	7,490	7,460	7,430	7,410	7,380	7,350	7,320	7,290	7,270
33	7,240	7,210	7,180	7,160	7,130	7,100	7,070	7,050	7,020	6,990
34	6,970	6,940	6,920	6,890	6,860	6,840	6,810	6,790	6,760	6,740
35	6,710	6,690	6,660	6,640	6,610	6,590	6,560	6,540	6,520	6,490
36	6,470	6,450	6,420	6,400	6,380	6,350	6,330	6,310	6,280	6,260
37	6,240	6,210	6,190	6,170	6,150	6,130	6,100	6,080	6,060	6,040
38	6,020	5,990	5,970	5,950	5,930	5,910	5,890	5,870	5,850	5,820
39	5,800	5,780	5,760	5,740	5,720	5,700	5,680	5,660	5,640	5,620
40	5,600	5,580	5,560	5,540	5,520	5,500	5,480	5,460	5,440	5,430
41	5,410	5,390	5,370	5,350	5,330	5,310	5,290	5,280	5,260	5,240
42	5,220	5,200	5,180	5,170	5,150	5,130	5,110	5,090	5,080	5,060
43	5,040	5,020	5,010	4,990	4,970	4,950	4,940	4,920	4,900	4,880
44	4,870	4,850	4,830	4,820	4,800	4,780	4,770	4,750	4,730	4,720

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	4,700	4,680	4,670	4,650	4,630	4,620	4,600	4,590	4,570	4,550
46	4,540	4,520	4,510	4,490	4,480	4,460	4,440	4,430	4,410	4,400
47	4,380	4,370	4,350	4,340	4,320	4,310	4,290	4,280	4,260	4,250
48	4,230	4,220	4,200	4,190	4,170	4,160	4,140	4,130	4,110	4,100
49	4,090	4,070	4,060	4,040	4,030	4,010	4,000	3,990	3,970	3,960
50	3,940	3,930	3,920	3,900	3,890	3,870	3,860	3,850	3,830	3,820
51	3,810	3,790	3,780	3,770	3,750	3,740	3,730	3,710	3,700	3,690
52	3,670	3,660	3,650	3,630	3,620	3,610	3,590	3,580	3,570	3,550
53	3,540	3,530	3,520	3,500	3,490	3,480	3,470	3,450	3,440	3,430
54	3,410	3,400	3,390	3,380	3,360	3,350	3,340	3,330	3,320	3,300
55	3,290	3,280	3,270	3,250	3,240	3,230	3,220	3,210	3,190	3,180
56	3,170	3,160	3,150	3,130	3,120	3,110	3,100	3,090	3,080	3,060
57	3,050	3,040	3,030	3,020	3,010	2,990	2,980	2,970	2,960	2,950
58	2,940	2,930	2,910	2,900	2,890	2,880	2,870	2,860	2,850	2,840
59	2,820	2,810	2,800	2,790	2,780	2,770	2,760	2,750	2,740	2,720
60	2,710	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620
61	2,610	2,590	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510
62	2,500	2,490	2,480	2,470	2,460	2,450	2,440	2,430	2,420	2,400
63	2,390	2,380	2,370	2,360	2,350	2,340	2,330	2,320	2,310	2,300
64	2,290	2,280	2,270	2,260	2,250	2,240	2,230	2,220	2,210	2,200
65	2,190	2,180	2,170	2,160	2,150	2,140	2,130	2,120	2,110	2,100
66	2,090	2,080	2,070	2,060	2,050	2,040	2,030	2,020	2,010	2,000
67	2,000	1,990	1,980	1,970	1,960	1,950	1,940	1,930	1,920	1,910
68	1,900	1,890	1,880	1,870	1,860	1,850	1,840	1,830	1,820	1,810
69	1,800	1,790	1,790	1,780	1,770	1,760	1,750	1,740	1,730	1,720
70	1,710	1,700	1,690	1,680	1,670	1,660	1,660	1,650	1,640	1,630
71	1,620	1,610	1,600	1,590	1,580	1,570	1,560	1,550	1,550	1,540
72	1,530	1,520	1,510	1,500	1,490	1,480	1,470	1,460	1,460	1,450
73	1,440	1,430	1,420	1,410	1,400	1,390	1,380	1,370	1,370	1,360
74	1,350	1,340	1,330	1,320	1,310	1,300	1,290	1,290	1,280	1,270
75	1,260	1,250	1,240	1,230	1,220	1,220	1,210	1,200	1,190	1,180
76	1,170	1,160	1,150	1,150	1,140	1,130	1,120	1,110	1,100	1,090
77	1,090	1,080	1,070	1,060	1,050	1,040	1,030	1,020	1,020	1,010
78	1,000	990	980	970	960	960	950	940	930	920
79	910	910	900	890	880	870	860	850	850	840
80	830	820	810	800	790	790	780	770	760	750
81	740	740	730	720	710	700	690	690	680	670
82	660	650	640	640	630	620	610	600	590	590
83	580	570	560	550	540	540	530	520	510	500
84	490	490	480	470	460	450	440	440	430	420
85	410	400	390	390	380	370	360	350	340	340
86	330	320	310	300	300	290	280	270	260	250
87	250	240	230	220	210	210	200	190	180	170
88	160	160	150	140	130	120	110	110	100	90
89	80	70	70	60	50	40	30	20	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

24 MINUTES AFTER RELEASE

4,900 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	56,010	54,880	53,850	52,820	51,840	50,910	49,980	49,100	48,240	47,420
6	46,620	45,850	45,110	44,380	43,680	43,010	42,350	41,710	41,090	40,490
7	39,910	39,340	38,790	38,250	37,730	37,220	36,720	36,240	35,770	35,310
8	34,870	34,430	34,000	33,590	33,180	32,790	32,400	32,020	31,650	31,290
9	30,940	30,590	30,250	29,920	29,600	29,280	28,970	28,670	28,370	28,080
10	27,790	27,510	27,230	26,960	26,700	26,440	26,180	25,930	25,690	25,450
11	25,210	24,980	24,750	24,520	24,300	24,080	23,870	23,660	23,450	23,250
12	23,050	22,860	22,660	22,470	22,290	22,100	21,920	21,740	21,570	21,390
13	21,220	21,060	20,890	20,730	20,570	20,410	20,250	20,100	19,950	19,800
14	19,650	19,510	19,360	19,220	19,080	18,950	18,810	18,680	18,550	18,420
15	18,290	18,160	18,030	17,910	17,790	17,670	17,550	17,430	17,320	17,200
16	17,090	16,980	16,870	16,760	16,650	16,540	16,440	16,330	16,230	16,130
17	16,030	15,930	15,830	15,730	15,640	15,540	15,450	15,350	15,260	15,170
18	15,080	14,990	14,900	14,820	14,730	14,640	14,560	14,480	14,390	14,310
19	14,230	14,150	14,070	13,990	13,910	13,840	13,760	13,690	13,610	13,540
20	13,460	13,390	13,320	13,250	13,180	13,110	13,040	12,970	12,900	12,830
21	12,760	12,700	12,630	12,570	12,500	12,440	12,380	12,310	12,250	12,190
22	12,130	12,070	12,010	11,950	11,890	11,830	11,770	11,710	11,660	11,600
23	11,540	11,490	11,430	11,380	11,320	11,270	11,220	11,160	11,110	11,060
24	11,010	10,950	10,900	10,850	10,800	10,750	10,700	10,650	10,600	10,560
25	10,510	10,460	10,410	10,370	10,320	10,270	10,230	10,180	10,140	10,090
26	10,050	10,000	9,960	9,910	9,870	9,830	9,790	9,740	9,700	9,660
27	9,620	9,580	9,530	9,490	9,450	9,410	9,370	9,330	9,290	9,250
28	9,220	9,180	9,140	9,100	9,060	9,020	8,990	8,950	8,910	8,880
29	8,840	8,800	8,770	8,730	8,700	8,660	8,630	8,590	8,560	8,520
30	8,490	8,450	8,420	8,390	8,350	8,320	8,290	8,250	8,220	8,190
31	8,160	8,120	8,090	8,060	8,030	8,000	7,960	7,930	7,900	7,870
32	7,840	7,810	7,780	7,750	7,720	7,690	7,660	7,630	7,600	7,570
33	7,550	7,520	7,490	7,460	7,430	7,400	7,370	7,350	7,320	7,290
34	7,260	7,240	7,210	7,180	7,160	7,130	7,100	7,080	7,050	7,020
35	7,000	6,970	6,950	6,920	6,890	6,870	6,840	6,820	6,790	6,770
36	6,740	6,720	6,690	6,670	6,650	6,620	6,600	6,570	6,550	6,530
37	6,500	6,480	6,460	6,430	6,410	6,390	6,360	6,340	6,320	6,290
38	6,270	6,250	6,230	6,200	6,180	6,160	6,140	6,120	6,090	6,070
39	6,050	6,030	6,010	5,990	5,970	5,940	5,920	5,900	5,880	5,860
40	5,840	5,820	5,800	5,780	5,760	5,740	5,720	5,700	5,680	5,660
41	5,640	5,620	5,600	5,580	5,560	5,540	5,520	5,500	5,480	5,460
42	5,440	5,420	5,400	5,390	5,370	5,350	5,330	5,310	5,290	5,270
43	5,250	5,240	5,220	5,200	5,180	5,160	5,150	5,130	5,110	5,090
44	5,070	5,060	5,040	5,020	5,000	4,990	4,970	4,950	4,930	4,920



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	4,900	4,880	4,870	4,850	4,830	4,820	4,800	4,780	4,770	4,750
46	4,730	4,720	4,700	4,680	4,670	4,650	4,630	4,620	4,600	4,590
47	4,570	4,550	4,540	4,520	4,510	4,490	4,470	4,460	4,440	4,430
48	4,410	4,400	4,380	4,370	4,350	4,340	4,320	4,300	4,290	4,270
49	4,260	4,240	4,230	4,210	4,200	4,190	4,170	4,160	4,140	4,130
50	4,110	4,100	4,080	4,070	4,050	4,040	4,020	4,010	4,000	3,980
51	3,970	3,950	3,940	3,930	3,910	3,900	3,880	3,870	3,860	3,840
52	3,830	3,810	3,800	3,790	3,770	3,760	3,750	3,730	3,720	3,710
53	3,690	3,680	3,670	3,650	3,640	3,630	3,610	3,600	3,590	3,570
54	3,560	3,550	3,530	3,520	3,510	3,500	3,480	3,470	3,460	3,440
55	3,430	3,420	3,410	3,390	3,380	3,370	3,360	3,340	3,330	3,320
56	3,310	3,290	3,280	3,270	3,260	3,240	3,230	3,220	3,210	3,190
57	3,180	3,170	3,160	3,150	3,130	3,120	3,110	3,100	3,090	3,070
58	3,060	3,050	3,040	3,030	3,010	3,000	2,990	2,980	2,970	2,960
59	2,940	2,930	2,920	2,910	2,900	2,890	2,870	2,860	2,850	2,840
60	2,830	2,820	2,810	2,790	2,780	2,770	2,760	2,750	2,740	2,730
61	2,720	2,700	2,690	2,680	2,670	2,660	2,650	2,640	2,630	2,620
62	2,610	2,590	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510
63	2,500	2,490	2,470	2,460	2,450	2,440	2,430	2,420	2,410	2,400
64	2,390	2,380	2,370	2,360	2,350	2,340	2,330	2,320	2,310	2,300
65	2,280	2,270	2,260	2,250	2,240	2,230	2,220	2,210	2,200	2,190
66	2,180	2,170	2,160	2,150	2,140	2,130	2,120	2,110	2,100	2,090
67	2,080	2,070	2,060	2,050	2,040	2,030	2,020	2,010	2,000	1,990
68	1,980	1,970	1,960	1,950	1,940	1,930	1,920	1,910	1,900	1,890
69	1,880	1,870	1,860	1,850	1,840	1,830	1,820	1,810	1,800	1,790
70	1,780	1,770	1,760	1,750	1,740	1,740	1,730	1,720	1,710	1,700
71	1,690	1,680	1,670	1,660	1,650	1,640	1,630	1,620	1,610	1,600
72	1,590	1,580	1,570	1,560	1,550	1,540	1,540	1,530	1,520	1,510
73	1,500	1,490	1,480	1,470	1,460	1,450	1,440	1,430	1,420	1,410
74	1,400	1,400	1,390	1,380	1,370	1,360	1,350	1,340	1,330	1,320
75	1,310	1,300	1,290	1,290	1,280	2,270	1,260	1,250	1,240	1,230
76	1,220	1,210	1,200	1,190	1,190	1,180	1,170	1,160	1,150	1,140
77	1,130	1,120	1,110	1,100	1,100	1,090	1,080	1,070	1,060	1,050
78	1,040	1,030	1,020	1,010	1,010	1,000	990	980	970	960
79	950	940	930	930	920	910	900	890	880	870
80	860	860	850	840	830	820	810	800	790	780
81	780	770	760	750	740	730	720	710	710	700
82	690	680	670	660	650	650	640	630	620	610
83	600	590	580	580	570	560	550	540	530	520
84	510	510	500	490	480	470	460	450	450	440
85	430	420	410	400	390	390	380	370	360	350
86	340	330	330	320	310	300	290	280	270	270
87	260	250	240	230	220	210	210	200	190	180
88	170	160	150	150	140	130	120	110	100	90
89	90	80	70	60	50	40	30	30	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

25 MINUTES AFTER RELEASE  
5,100 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	58,290	57,120	56,050	54,980	53,960	52,990	52,020	51,100	50,210	49,350
6	48,520	47,720	46,950	46,200	45,470	44,760	44,080	43,410	42,770	42,140
7	41,540	40,950	40,370	39,810	39,270	38,740	38,220	37,720	37,230	36,750
8	36,290	35,830	35,390	34,960	34,540	34,130	33,720	33,330	32,940	32,570
9	32,200	31,840	31,490	31,140	30,810	30,480	30,150	29,840	29,530	29,220
10	28,920	28,630	28,340	28,060	27,790	27,520	27,250	26,990	26,740	26,480
11	26,240	25,990	25,760	25,520	25,290	25,070	24,850	24,630	24,410	24,200
12	23,990	23,790	23,590	23,390	23,200	23,000	22,820	22,630	22,450	22,270
13	22,090	21,920	21,740	21,570	21,410	21,240	21,080	20,920	20,760	20,610
14	20,460	20,300	20,160	20,010	19,860	19,720	19,580	19,440	19,300	19,170
15	19,030	18,900	18,770	18,640	18,520	18,390	18,270	18,140	18,020	17,900
16	17,790	17,670	17,550	17,440	17,330	17,220	17,110	17,000	16,890	16,790
17	16,680	16,580	16,480	16,370	16,270	16,180	16,080	15,980	15,880	15,790
18	15,700	15,600	15,510	15,420	15,330	15,240	15,150	15,070	14,980	14,900
19	14,810	14,730	14,650	14,560	14,480	14,400	14,320	14,240	14,170	14,090
20	14,010	13,940	13,860	13,790	13,710	13,640	13,570	13,500	13,430	13,360
21	13,290	13,220	13,150	13,080	13,010	12,950	12,880	12,820	12,750	12,690
22	12,620	12,560	12,500	12,440	12,370	12,310	12,250	12,190	12,130	12,070
23	12,020	11,960	11,900	11,840	11,790	11,730	11,670	11,620	11,560	11,510
24	11,450	11,400	11,350	11,300	11,240	11,190	11,140	11,090	11,040	10,990
25	10,940	10,890	10,840	10,790	10,740	10,690	10,640	10,600	10,550	10,500
26	10,460	10,410	10,360	10,320	10,270	10,230	10,180	10,140	10,100	10,050
27	10,010	9,970	9,920	9,880	9,840	9,800	9,760	9,710	9,670	9,630
28	9,590	9,550	9,510	9,470	9,430	9,390	9,350	9,320	9,280	9,240
29	9,200	9,160	9,130	9,090	9,050	9,010	8,980	8,940	8,910	8,870
30	8,830	8,800	8,760	8,730	8,690	8,660	8,620	8,590	8,560	8,520
31	8,490	8,450	8,420	8,390	8,360	8,320	8,290	8,260	8,230	8,190
32	8,160	8,130	8,100	8,070	8,040	8,010	7,970	7,940	7,910	7,880
33	7,850	7,820	7,790	7,760	7,730	7,710	7,680	7,650	7,620	7,590
34	7,560	7,530	7,500	7,480	7,450	7,420	7,390	7,370	7,340	7,310
35	7,280	7,260	7,230	7,200	7,180	7,150	7,120	7,100	7,070	7,050
36	7,020	6,990	6,970	6,940	6,920	6,890	6,870	6,840	6,820	6,790
37	6,770	6,740	6,720	6,690	6,670	6,650	6,620	6,600	6,570	6,550
38	6,530	6,500	6,480	6,460	6,430	6,410	6,390	6,370	6,340	6,320
39	6,300	6,280	6,250	6,230	6,210	6,190	6,160	6,140	6,120	6,100
40	6,080	6,060	6,030	6,010	5,990	5,970	5,950	5,930	5,910	5,890
41	5,870	5,850	5,830	5,810	5,780	5,760	5,740	5,720	5,700	5,680
42	5,660	5,640	5,620	5,600	5,590	5,570	5,550	5,530	5,510	5,490
43	5,470	5,450	5,430	5,410	5,390	5,370	5,360	5,340	5,320	5,300
44	5,280	5,260	5,240	5,230	5,210	5,190	5,170	5,150	5,140	5,120

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	5,100	5,080	5,060	5,050	5,030	5,010	4,990	4,980	4,960	4,940
46	4,930	4,910	4,890	4,870	4,860	4,840	4,820	4,810	4,790	4,770
47	4,760	4,740	4,720	4,710	4,690	4,670	4,660	4,640	4,620	4,610
48	4,590	4,580	4,560	4,540	4,530	4,510	4,500	4,480	4,460	4,450
49	4,430	4,420	4,400	4,390	4,370	4,360	4,340	4,330	4,310	4,290
50	4,280	4,260	4,250	4,230	4,220	4,200	4,190	4,170	4,160	4,140
51	4,130	4,120	4,100	4,090	4,070	4,060	4,040	4,030	4,010	4,000
52	3,980	3,970	3,960	3,940	3,930	3,910	3,900	3,890	3,870	3,860
53	3,840	3,830	3,820	3,800	3,790	3,770	3,760	3,750	3,730	3,720
54	3,710	3,690	3,680	3,660	3,650	3,640	3,620	3,610	3,600	3,580
55	3,570	3,560	3,540	3,530	3,520	3,510	3,490	3,480	3,470	3,450
56	3,440	3,430	3,410	3,400	3,390	3,380	3,360	3,350	3,340	3,320
57	3,310	3,300	3,290	3,270	3,260	3,250	3,240	3,220	3,210	3,200
58	3,190	3,170	3,160	3,150	3,140	3,130	3,110	3,100	3,090	3,080
59	3,060	3,050	3,040	3,030	3,020	3,000	2,990	2,980	2,970	2,960
60	2,940	2,930	2,920	2,910	2,900	2,890	2,870	2,860	2,850	2,840
61	2,830	2,820	2,800	2,790	2,780	2,770	2,760	2,750	2,730	2,720
62	2,710	2,700	2,690	2,680	2,670	2,660	2,640	2,630	2,620	2,610
63	2,600	2,590	2,580	2,560	2,550	2,540	2,530	2,520	2,510	2,500
64	2,490	2,480	2,470	2,450	2,440	2,430	2,420	2,410	2,400	2,390
65	2,380	2,370	2,360	2,350	2,330	2,320	2,310	2,300	2,290	2,280
66	2,270	2,260	2,250	2,240	2,230	2,220	2,210	2,200	2,190	2,180
67	2,160	2,150	2,140	2,130	2,120	2,110	2,100	2,090	2,080	2,070
68	2,060	2,050	2,040	2,030	2,020	2,010	2,000	1,990	1,980	1,970
69	1,960	1,950	1,940	1,930	1,920	1,910	1,900	1,890	1,880	1,870
70	1,860	1,850	1,840	1,830	1,820	1,810	1,800	1,790	1,780	1,770
71	1,760	1,750	1,740	1,730	1,720	1,710	1,700	1,690	1,680	1,670
72	1,660	1,650	1,640	1,630	1,620	1,610	1,600	1,590	1,580	1,570
73	1,560	1,550	1,540	1,530	1,520	1,510	1,500	1,490	1,480	1,470
74	1,460	1,450	1,440	1,430	1,420	1,410	1,400	1,400	1,390	1,380
75	1,370	1,360	1,350	1,340	1,330	1,320	1,310	1,300	1,290	1,280
76	1,270	1,260	1,250	1,240	1,230	1,220	1,210	1,210	1,200	1,190
77	1,180	1,170	1,160	1,150	1,140	1,130	1,120	1,110	1,100	1,090
78	1,080	1,070	1,070	1,060	1,050	1,040	1,030	1,020	1,010	1,000
79	990	980	970	960	950	950	940	930	920	910
80	900	890	880	870	860	850	840	840	830	820
81	810	800	790	780	770	760	750	740	730	730
82	720	710	700	690	680	670	660	650	640	640
83	630	620	610	600	590	580	570	560	550	550
84	540	530	520	510	500	490	480	470	460	450
85	450	440	430	420	410	400	390	380	370	370
86	360	350	340	330	320	310	300	290	290	280
87	270	260	250	240	230	220	210	210	200	190
88	180	170	160	150	140	130	120	120	110	100
89	90	80	70	60	50	40	40	30	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

26 MINUTES AFTER RELEASE  
5,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	60,580	59,360	58,250	57,130	56,070	55,070	54,060	53,110	52,180	51,290
6	50,430	49,590	48,790	48,010	47,260	46,520	45,810	45,120	44,450	43,800
7	43,160	42,550	41,950	41,370	40,810	40,260	39,720	39,200	38,690	38,190
8	37,710	37,240	36,780	36,330	35,890	35,460	35,040	34,640	34,240	33,850
9	33,460	33,090	32,720	32,360	32,010	31,670	31,340	31,010	30,680	30,370
10	30,060	29,750	29,460	29,160	28,880	28,600	28,320	28,050	27,780	27,520
11	27,270	27,010	26,770	26,520	26,280	26,050	25,820	25,590	25,370	25,150
12	24,930	24,720	24,510	24,310	24,110	23,910	23,710	23,520	23,330	23,140
13	22,960	22,780	22,600	22,420	22,250	22,080	21,910	21,740	21,580	21,420
14	21,260	21,100	20,950	20,790	20,640	20,490	20,350	20,200	20,060	19,920
15	19,780	19,640	19,510	19,370	19,240	19,110	18,980	18,860	18,730	18,610
16	18,480	18,360	18,240	18,120	18,010	17,890	17,780	17,670	17,550	17,440
17	17,340	17,230	17,120	17,020	16,910	16,810	16,710	16,610	16,510	16,410
18	16,310	16,220	16,120	16,030	15,930	15,840	15,750	15,660	15,570	15,480
19	15,390	15,310	15,220	15,130	15,050	14,970	14,880	14,800	14,720	14,640
20	14,560	14,480	14,400	14,330	14,250	14,180	14,100	14,030	13,950	13,880
21	13,810	13,740	13,660	13,590	13,520	13,450	13,390	13,320	13,250	13,180
22	13,120	13,050	12,990	12,920	12,860	12,800	12,730	12,670	12,610	12,550
23	12,490	12,430	12,370	12,310	12,250	12,190	12,130	12,070	12,020	11,960
24	11,900	11,850	11,790	11,740	11,680	11,630	11,580	11,520	11,470	11,420
25	11,370	11,310	11,260	11,210	11,160	11,110	11,060	11,010	10,960	10,910
26	10,870	10,820	10,770	10,720	10,680	10,630	10,580	10,540	10,490	10,450
27	10,400	10,360	10,310	10,270	10,220	10,180	10,140	10,090	10,050	10,010
28	9,970	9,930	9,880	9,840	9,800	9,760	9,720	9,680	9,640	9,600
29	9,560	9,520	9,480	9,440	9,410	9,370	9,330	9,290	9,250	9,220
30	9,180	9,140	9,110	9,070	9,030	9,000	8,960	8,930	8,890	8,860
31	8,820	8,790	8,750	8,720	8,680	8,650	8,620	8,580	8,550	8,510
32	8,480	8,450	8,420	8,380	8,350	8,320	8,290	8,260	8,220	8,190
33	8,160	8,130	8,100	8,070	8,040	8,010	7,980	7,950	7,920	7,890
34	7,860	7,830	7,800	7,770	7,740	7,710	7,680	7,650	7,630	7,600
35	7,570	7,540	7,510	7,490	7,460	7,430	7,400	7,380	7,350	7,320
36	7,290	7,270	7,240	7,210	7,190	7,160	7,140	7,110	7,080	7,060
37	7,030	7,010	6,980	6,960	6,930	6,910	6,880	6,860	6,830	6,810
38	6,780	6,760	6,740	6,710	6,690	6,660	6,640	6,620	6,590	6,570
39	6,540	6,520	6,500	6,480	6,450	6,430	6,410	6,380	6,360	6,340
40	6,320	6,290	6,270	6,250	6,230	6,210	6,180	6,160	6,140	6,120
41	6,100	6,080	6,050	6,030	6,010	5,990	5,970	5,950	5,930	5,910
42	5,890	5,870	5,840	5,820	5,800	5,780	5,760	5,740	5,720	5,700
43	5,680	5,660	5,640	5,620	5,600	5,590	5,570	5,550	5,530	5,510
44	5,490	5,470	5,450	5,430	5,410	5,390	5,370	5,360	5,340	5,320

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	5,300	5,280	5,260	5,240	5,230	5,210	5,190	5,170	5,150	5,140
46	5,120	5,100	5,080	5,060	5,050	5,030	5,010	4,990	4,980	4,960
47	4,940	4,930	4,910	4,890	4,870	4,860	4,840	4,820	4,810	4,790
48	4,770	4,760	4,740	4,720	4,710	4,690	4,670	4,660	4,640	4,620
49	4,610	4,590	4,570	4,560	4,540	4,530	4,510	4,490	4,480	4,460
50	4,450	4,430	4,420	4,400	4,380	4,370	4,350	4,340	4,320	4,310
51	4,290	4,280	4,260	4,250	4,230	4,220	4,200	4,190	4,170	4,160
52	4,140	4,130	4,110	4,100	4,080	4,070	4,050	4,040	4,020	4,010
53	3,990	3,980	3,960	3,950	3,940	3,920	3,910	3,890	3,880	3,860
54	3,850	3,840	3,820	3,810	3,790	3,780	3,770	3,750	3,740	3,720
55	3,710	3,700	3,680	3,670	3,660	3,640	3,630	3,620	3,600	3,590
56	3,570	3,560	3,550	3,530	3,520	3,510	3,490	3,480	3,470	3,460
57	3,440	3,430	3,420	3,400	3,390	3,380	3,360	3,350	3,340	3,320
58	3,310	3,300	3,290	3,270	3,260	3,250	3,240	3,220	3,210	3,200
59	3,180	3,170	3,160	3,150	3,130	3,120	3,110	3,100	3,080	3,070
60	3,060	3,050	3,040	3,020	3,010	3,000	2,990	2,970	2,960	2,950
61	2,940	2,930	2,910	2,900	2,890	2,880	2,870	2,850	2,840	2,830
62	2,820	2,810	2,790	2,780	2,770	2,760	2,750	2,740	2,720	2,710
63	2,700	2,690	2,680	2,670	2,650	2,640	2,630	2,620	2,610	2,600
64	2,580	2,570	2,560	2,550	2,540	2,530	2,520	2,510	2,490	2,480
65	2,470	2,460	2,450	2,440	2,430	2,420	2,400	2,390	2,380	2,370
66	2,360	2,350	2,340	2,330	2,320	2,300	2,290	2,280	2,270	2,260
67	2,250	2,240	2,230	2,220	2,210	2,200	2,180	2,170	2,160	2,150
68	2,140	2,130	2,120	2,110	2,100	2,090	2,080	2,070	2,060	2,050
69	2,030	2,020	2,010	2,000	1,990	1,980	1,970	1,960	1,950	1,940
70	1,930	1,920	1,910	1,900	1,890	1,880	1,870	1,860	1,850	1,840
71	1,820	1,810	1,800	1,790	1,780	1,770	1,760	1,750	1,740	1,730
72	1,720	1,710	1,700	1,690	1,680	1,670	1,660	1,650	1,640	1,630
73	1,620	1,610	1,600	1,590	1,580	1,570	1,560	1,550	1,540	1,530
74	1,520	1,510	1,500	1,490	1,480	1,470	1,460	1,450	1,440	1,430
75	1,420	1,410	1,400	1,390	1,380	1,370	1,360	1,350	1,340	1,330
76	1,320	1,310	1,300	1,290	1,280	1,270	1,260	1,250	1,240	1,230
77	1,220	1,210	1,200	1,190	1,180	1,180	1,170	1,160	1,150	1,140
78	1,130	1,120	1,110	1,100	1,090	1,080	1,070	1,060	1,050	1,040
79	1,030	1,020	1,010	1,000	990	980	970	960	950	940
80	930	920	920	910	900	890	880	870	860	850
81	840	830	820	810	800	790	780	770	760	750
82	740	740	730	720	710	700	690	680	670	660
83	650	640	630	620	610	600	590	590	580	570
84	560	550	540	530	520	510	500	490	480	470
85	460	450	450	440	430	420	410	400	390	380
86	370	360	350	340	330	320	310	310	300	290
87	280	270	260	250	240	230	220	210	200	190
88	180	180	170	160	150	140	130	120	110	100
89	90	80	70	60	60	50	40	30	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

27 MINUTES AFTER RELEASE

5,500 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	62,870	61,600	60,440	59,290	58,190	57,140	56,100	55,110	54,150	53,220
6	52,330	51,460	50,630	49,820	49,030	48,270	47,530	46,820	46,120	45,450
7	44,790	44,160	43,540	42,930	42,350	41,780	41,220	40,680	40,150	39,640
8	39,130	38,650	38,170	37,700	37,250	36,800	36,370	35,940	35,530	35,120
9	34,730	34,340	33,960	33,590	33,220	32,870	32,520	32,180	31,840	31,510
10	31,190	30,880	30,570	30,260	29,970	29,680	29,390	29,110	28,830	28,560
11	28,300	28,030	27,780	27,520	27,280	27,030	26,790	26,560	26,330	26,100
12	25,880	25,660	25,440	25,230	25,020	24,810	24,610	24,410	24,210	24,010
13	23,820	23,630	23,450	23,270	23,090	22,910	22,730	22,560	22,390	22,220
14	22,060	21,900	21,740	21,580	21,420	21,270	21,120	20,960	20,820	20,670
15	20,530	20,380	20,240	20,100	19,970	19,830	19,700	19,570	19,440	19,310
16	19,180	19,060	18,930	18,810	18,690	18,570	18,450	18,330	18,220	18,100
17	17,990	17,880	17,770	17,660	17,550	17,440	17,340	17,230	17,130	17,030
18	16,930	16,830	16,730	16,630	16,530	16,440	16,340	16,250	16,160	16,060
19	15,970	15,880	15,790	15,710	15,620	15,530	15,450	15,360	15,280	15,190
20	15,110	15,030	14,950	14,870	14,790	14,710	14,630	14,560	14,480	14,400
21	14,330	14,250	14,180	14,110	14,030	13,960	13,890	13,820	13,750	13,680
22	13,610	13,540	13,480	13,410	13,340	13,280	13,210	13,150	13,080	13,020
23	12,960	12,890	12,830	12,770	12,710	12,650	12,590	12,530	12,470	12,410
24	12,350	12,300	12,240	12,180	12,120	12,070	12,010	11,960	11,900	11,850
25	11,790	11,740	11,690	11,640	11,580	11,530	11,480	11,430	11,380	11,330
26	11,280	11,230	11,180	11,130	11,080	11,030	10,980	10,940	10,890	10,840
27	10,790	10,750	10,700	10,660	10,610	10,570	10,520	10,480	10,430	10,390
28	10,340	10,300	10,260	10,210	10,170	10,130	10,090	10,050	10,000	9,960
29	9,920	9,880	9,840	9,800	9,760	9,720	9,680	9,640	9,600	9,570
30	9,530	9,490	9,450	9,410	9,370	9,340	9,300	9,260	9,230	9,190
31	9,150	9,120	9,080	9,050	9,010	8,980	8,940	8,910	8,870	8,840
32	8,800	8,770	8,730	8,700	8,670	8,630	8,600	8,570	8,530	8,500
33	8,470	8,440	8,410	8,370	8,340	8,310	8,280	8,250	8,220	8,190
34	8,150	8,120	8,090	8,060	8,030	8,000	7,970	7,940	7,910	7,880
35	7,850	7,830	7,800	7,770	7,740	7,710	7,680	7,650	7,630	7,600
36	7,570	7,540	7,510	7,490	7,460	7,430	7,410	7,380	7,350	7,330
37	7,300	7,270	7,250	7,220	7,190	7,170	7,140	7,120	7,090	7,070
38	7,040	7,010	6,990	6,960	6,940	6,910	6,890	6,870	6,840	6,820
39	6,790	6,770	6,740	6,720	6,700	6,670	6,650	6,620	6,600	6,580
40	6,550	6,530	6,510	6,490	6,460	6,440	6,420	6,390	6,370	6,350
41	6,330	6,300	6,280	6,260	6,240	6,220	6,190	6,170	6,150	6,130
42	6,110	6,090	6,070	6,040	6,020	6,000	5,980	5,960	5,940	5,920
43	5,900	5,880	5,860	5,840	5,820	5,800	5,780	5,760	5,740	5,720
44	5,700	5,680	5,660	5,640	5,620	5,600	5,580	5,560	5,540	5,520

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	5,500	5,480	5,460	5,440	5,420	5,400	5,390	5,370	5,350	5,330
46	5,310	5,290	5,270	5,260	5,240	5,220	5,200	5,180	5,170	5,150
47	5,130	5,110	5,090	5,080	5,060	5,040	5,020	5,000	4,990	4,970
48	4,950	4,930	4,920	4,900	4,880	4,870	4,850	4,830	4,810	4,800
49	4,780	4,760	4,750	4,730	4,710	4,700	4,680	4,660	4,650	4,630
50	4,620	4,600	4,580	4,570	4,550	4,530	4,520	4,500	4,490	4,470
51	4,450	4,440	4,420	4,410	4,390	4,370	4,360	4,340	4,330	4,310
52	4,300	4,280	4,270	4,250	4,240	4,220	4,210	4,190	4,170	4,160
53	4,140	4,130	4,110	4,100	4,080	4,070	4,060	4,040	4,030	4,010
54	4,000	3,980	3,970	3,950	3,940	3,920	3,910	3,890	3,880	3,870
55	3,850	3,840	3,820	3,810	3,790	3,780	3,770	3,750	3,740	3,720
56	3,710	3,700	3,680	3,670	3,650	3,640	3,630	3,610	3,600	3,590
57	3,570	3,560	3,540	3,530	3,520	3,500	3,490	3,480	3,460	3,450
58	3,440	3,420	3,410	3,400	3,380	3,370	3,360	3,340	3,330	3,320
59	3,300	3,290	3,280	3,270	3,250	3,240	3,230	3,210	3,200	3,190
60	3,180	3,160	3,150	3,140	3,120	3,110	3,100	3,090	3,070	3,060
61	3,050	3,040	3,020	3,010	3,000	2,990	2,970	2,960	2,950	2,940
62	2,920	2,910	2,900	2,890	2,880	2,860	2,850	2,840	2,830	2,810
63	2,800	2,790	2,780	2,770	2,750	2,740	2,730	2,720	2,710	2,690
64	2,680	2,670	2,660	2,650	2,640	2,620	2,610	2,600	2,590	2,580
65	2,560	2,550	2,540	2,530	2,520	2,510	2,490	2,480	2,470	2,460
66	2,450	2,440	2,430	2,410	2,400	2,390	2,380	2,370	2,360	2,350
67	2,330	2,320	2,310	2,300	2,290	2,280	2,270	2,260	2,240	2,230
68	2,220	2,210	2,200	2,190	2,180	2,170	2,160	2,140	2,130	2,120
69	2,110	2,100	2,090	2,080	2,070	2,060	2,050	2,030	2,020	2,010
70	2,000	1,990	1,980	1,970	1,960	1,950	1,940	1,930	1,920	1,900
71	1,890	1,880	1,870	1,860	1,850	1,840	1,830	1,820	1,810	1,800
72	1,790	1,780	1,770	1,760	1,740	1,730	1,720	1,710	1,700	1,690
73	1,680	1,670	1,660	1,650	1,640	1,630	1,620	1,610	1,600	1,590
74	1,580	1,570	1,560	1,550	1,540	1,530	1,510	1,500	1,490	1,480
75	1,470	1,460	1,450	1,440	1,430	1,420	1,410	1,400	1,390	1,380
76	1,370	1,360	1,350	1,340	1,330	1,320	1,310	1,300	1,290	1,280
77	1,270	1,260	1,250	1,240	1,230	1,220	1,210	1,200	1,190	1,180
78	1,170	1,160	1,150	1,140	1,130	1,120	1,110	1,100	1,090	1,080
79	1,070	1,060	1,050	1,040	1,030	1,020	1,010	1,000	990	980
80	970	960	950	940	930	920	910	900	890	880
81	870	860	850	840	830	820	810	800	790	780
82	770	760	750	740	730	720	710	700	690	690
83	680	670	660	650	640	630	620	610	600	590
84	580	570	560	550	540	530	520	510	500	490
85	480	470	460	450	440	430	420	410	400	390
86	380	380	370	360	350	340	330	320	310	300
87	290	280	270	260	250	240	230	220	210	200
88	190	180	170	160	150	140	130	120	110	110
89	100	90	80	70	60	50	40	30	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

28 MINUTES AFTER RELEASE

5,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	65,150	63,840	62,640	61,450	60,310	59,220	58,140	57,110	56,120	55,160
6	54,230	53,340	52,470	51,630	50,820	50,030	49,260	48,520	47,800	47,100
7	46,420	45,760	45,120	44,500	43,890	43,300	42,720	42,160	41,610	41,080
8	40,560	40,050	39,560	39,070	38,600	38,140	37,690	37,250	36,820	36,400
9	35,990	35,590	35,190	34,810	34,430	34,060	33,700	33,350	33,000	32,660
10	32,330	32,000	31,680	31,360	31,060	30,750	30,460	30,170	29,880	29,600
11	29,320	29,050	28,790	28,530	28,270	28,020	27,770	27,520	27,280	27,050
12	26,820	26,590	26,360	26,140	25,930	25,710	25,500	25,290	25,090	24,890
13	24,690	24,490	24,300	24,110	23,930	23,740	23,560	23,380	23,210	23,030
14	22,860	22,690	22,530	22,360	22,200	22,040	21,880	21,730	21,570	21,420
15	21,270	21,130	20,980	20,840	20,690	20,550	20,420	20,280	20,140	19,010
16	19,880	19,750	19,620	19,490	19,370	19,240	19,120	19,000	18,880	18,760
17	18,640	18,530	18,410	18,300	18,190	18,080	17,970	17,860	17,750	17,650
18	17,540	17,440	17,340	17,240	17,130	17,040	16,940	16,840	16,740	16,650
19	16,550	16,460	16,370	16,280	16,190	16,100	16,010	15,920	15,830	15,750
20	15,660	15,580	15,490	15,410	15,330	15,250	15,160	15,080	15,010	14,930
21	14,850	14,770	14,700	14,620	14,540	14,470	14,400	14,320	14,250	14,180
22	14,110	14,040	13,970	13,900	13,830	13,760	13,690	13,630	13,560	13,490
23	13,430	13,360	13,300	13,240	13,170	13,110	13,050	12,990	12,920	12,860
24	12,800	12,740	12,680	12,620	12,570	12,510	12,450	12,390	12,340	12,280
25	12,220	12,170	12,110	12,060	12,000	11,950	11,900	11,840	11,790	11,740
26	11,690	11,640	11,580	11,530	11,480	11,430	11,380	11,330	11,280	11,240
27	11,190	11,140	11,090	11,040	11,000	10,950	10,900	10,860	10,810	10,770
28	10,720	10,670	10,630	10,590	10,540	10,500	10,450	10,410	10,370	10,330
29	10,280	10,240	10,200	10,160	10,120	10,070	10,030	9,990	9,950	9,910
30	9,870	9,830	9,790	9,750	9,720	9,680	9,640	9,600	9,560	9,520
31	9,490	9,450	9,410	9,380	9,340	9,300	9,270	9,230	9,190	9,160
32	9,120	9,090	9,050	9,020	8,980	8,950	8,910	8,880	8,840	8,810
33	8,780	8,740	8,710	8,680	8,640	8,610	8,580	8,550	8,510	8,480
34	8,450	8,420	8,390	8,360	8,320	8,290	8,260	8,230	8,200	8,170
35	8,140	8,110	8,080	8,050	8,020	7,990	7,960	7,930	7,900	7,870
36	7,850	7,820	7,790	7,760	7,730	7,700	7,680	7,650	7,620	7,590
37	7,560	7,540	7,510	7,480	7,460	7,430	7,400	7,370	7,350	7,320
38	7,300	7,270	7,240	7,220	7,190	7,170	7,140	7,110	7,090	7,060
39	7,040	7,010	6,990	6,960	6,940	6,910	6,890	6,870	6,840	6,820
40	6,790	6,770	6,740	6,720	6,700	6,670	6,650	6,630	6,600	6,580
41	6,560	6,530	6,510	6,490	6,470	6,440	6,420	6,400	6,370	6,350
42	6,330	6,310	6,290	6,260	6,240	6,220	6,200	6,180	6,160	6,130
43	6,110	6,090	6,070	6,050	6,030	6,010	5,990	5,960	5,940	5,920
44	5,900	5,880	5,860	5,840	5,820	5,800	5,780	5,760	5,740	5,720



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	5,700	5,680	5,660	5,640	5,620	5,600	5,580	5,560	5,540	5,520
46	5,500	5,490	5,470	5,450	5,430	5,410	5,390	5,370	5,350	5,330
47	5,320	5,300	5,280	5,260	5,240	5,220	5,200	5,190	5,170	5,150
48	5,130	5,110	5,100	5,080	5,060	5,040	5,030	5,010	4,990	4,970
49	4,960	4,940	4,920	4,900	4,890	4,870	4,850	4,830	4,820	4,800
50	4,780	4,770	4,750	4,730	4,720	4,700	4,680	4,670	4,650	4,630
51	4,620	4,600	4,580	4,570	4,550	4,530	4,520	4,500	4,490	4,470
52	4,450	4,440	4,420	4,410	4,390	4,370	4,360	4,340	4,330	4,310
53	4,300	4,280	4,260	4,250	4,230	4,220	4,200	4,190	4,170	4,160
54	4,140	4,130	4,110	4,100	4,080	4,070	4,050	4,040	4,020	4,010
55	3,990	3,980	3,960	3,950	3,930	3,920	3,900	3,890	3,870	3,860
56	3,840	3,830	3,820	3,800	3,790	3,770	3,760	3,740	3,730	3,720
57	3,700	3,690	3,670	3,660	3,650	3,630	3,620	3,600	3,590	3,580
58	3,560	3,550	3,530	3,520	3,510	3,490	3,480	3,470	3,450	3,440
59	3,430	3,410	3,400	3,380	3,370	3,360	3,340	3,330	3,320	3,300
60	3,290	3,280	3,260	3,250	3,240	3,230	3,210	3,200	3,190	3,170
61	3,160	3,150	3,130	3,120	3,110	3,100	3,080	3,070	3,060	3,040
62	3,030	3,020	3,010	2,990	2,980	2,970	2,950	2,940	2,930	2,920
63	2,900	2,890	2,880	2,870	2,850	2,840	2,830	2,820	2,800	2,790
64	2,780	2,770	2,760	2,740	2,730	2,720	2,710	2,690	2,680	2,670
65	2,660	2,650	2,630	2,620	2,610	2,600	2,590	2,570	2,560	2,550
66	2,540	2,530	2,510	2,500	2,490	2,480	2,470	2,450	2,440	2,430
67	2,420	2,410	2,400	2,380	2,370	2,360	2,350	2,340	2,330	2,310
68	2,300	2,290	2,280	2,270	2,260	2,250	2,230	2,220	2,210	2,200
69	2,190	2,180	2,170	2,150	2,140	2,130	2,120	2,110	2,100	2,090
70	2,070	2,060	2,050	2,040	2,030	2,020	2,010	2,000	1,980	1,970
71	1,960	1,950	1,940	1,930	1,920	1,910	1,900	1,880	1,870	1,860
72	1,850	1,840	1,830	1,820	1,810	1,800	1,790	1,780	1,760	1,750
73	1,740	1,730	1,720	1,710	1,700	1,690	1,680	1,670	1,660	1,650
74	1,630	1,620	1,610	1,600	1,590	1,580	1,570	1,560	1,550	1,540
75	1,530	1,520	1,510	1,500	1,480	1,470	1,460	1,450	1,440	1,430
76	1,420	1,410	1,400	1,390	1,380	1,370	1,360	1,350	1,340	1,330
77	1,320	1,310	1,300	1,280	1,270	1,260	1,250	1,240	1,230	1,220
78	1,210	1,200	1,190	1,180	1,170	1,160	1,150	1,140	1,130	1,120
79	1,110	1,100	1,090	1,080	1,070	1,060	1,050	1,040	1,030	1,020
80	1,000	990	980	970	960	950	940	930	920	910
81	900	890	880	870	860	850	840	830	820	810
82	800	790	780	770	760	750	740	730	720	710
83	700	690	680	670	660	650	640	630	620	610
84	600	590	580	570	560	550	540	530	520	510
85	500	490	480	470	460	450	440	430	420	410
86	400	390	380	370	360	350	340	330	320	310
87	300	290	280	270	260	250	240	230	220	210
88	200	190	180	170	160	150	140	130	120	110
89	100	90	80	70	60	50	40	30	20	10







Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	6,100	6,080	6,060	6,040	6,020	5,990	5,970	5,950	5,930	5,910
46	5,890	5,870	5,850	5,830	5,810	5,790	5,770	5,750	5,730	5,710
47	5,690	5,670	5,650	5,630	5,610	5,590	5,570	5,550	5,530	5,510
48	5,490	5,470	5,450	5,440	5,420	5,400	5,380	5,360	5,340	5,320
49	5,300	5,280	5,270	5,250	5,230	5,210	5,190	5,170	5,160	5,140
50	5,120	5,100	5,080	5,060	5,050	5,030	5,010	4,990	4,980	4,960
51	4,940	4,920	4,900	4,890	4,870	4,850	4,830	4,820	4,800	4,780
52	4,770	4,750	4,730	4,710	4,700	4,680	4,660	4,650	4,630	4,610
53	4,600	4,580	4,560	4,550	4,530	4,510	4,500	4,480	4,460	4,450
54	4,430	4,420	4,400	4,380	4,370	4,350	4,340	4,320	4,300	4,290
55	4,270	4,260	4,240	4,220	4,210	4,190	4,180	4,160	4,150	4,130
56	4,110	4,100	4,080	4,070	4,050	4,040	4,020	4,010	3,990	3,980
57	3,960	3,950	3,930	3,920	3,900	3,890	3,870	3,860	3,840	3,830
58	3,810	3,800	3,780	3,770	3,750	3,740	3,720	3,710	3,690	3,680
59	3,670	3,650	3,640	3,620	3,610	3,590	3,580	3,560	3,550	3,540
60	3,520	3,510	3,490	3,480	3,470	3,450	3,440	3,420	3,410	3,400
61	3,380	3,370	3,350	3,340	3,330	3,310	3,300	3,280	3,270	3,260
62	3,240	3,230	3,220	3,200	3,190	3,180	3,160	3,150	3,130	3,120
63	3,110	3,090	3,080	3,070	3,050	3,040	3,030	3,010	3,000	2,990
64	2,970	2,960	2,950	2,940	2,920	2,910	2,900	2,880	2,870	2,860
65	2,840	2,830	2,820	2,810	2,790	2,780	2,770	2,750	2,740	2,730
66	2,720	2,700	2,690	2,680	2,670	2,650	2,640	2,630	2,610	2,600
67	2,590	2,580	2,560	2,550	2,540	2,530	2,510	2,500	2,490	2,480
68	2,460	2,450	2,440	2,430	2,410	2,400	2,390	2,380	2,370	2,350
69	2,340	2,330	2,320	2,310	2,290	2,280	2,270	2,260	2,240	2,230
70	2,220	2,210	2,200	2,180	2,170	2,160	2,150	2,140	2,120	2,110
71	2,100	2,090	2,080	2,060	2,050	2,040	2,030	2,020	2,010	1,990
72	1,980	1,970	1,960	1,950	1,930	1,920	1,910	1,900	1,890	1,880
73	1,860	1,850	1,840	1,830	1,820	1,810	1,800	1,780	1,770	1,760
74	1,750	1,740	1,730	1,710	1,700	1,690	1,680	1,670	1,660	1,650
75	1,630	1,620	1,610	1,600	1,590	1,580	1,570	1,550	1,540	1,530
76	1,520	1,510	1,500	1,490	1,480	1,460	1,450	1,440	1,430	1,420
77	1,410	1,400	1,390	1,370	1,360	1,350	1,340	1,330	1,320	1,310
78	1,300	1,290	1,270	1,260	1,250	1,240	1,230	1,220	1,210	1,200
79	1,190	1,170	1,160	1,150	1,140	1,130	1,120	1,110	1,100	1,090
80	1,080	1,060	1,050	1,040	1,030	1,020	1,010	1,000	990	980
81	970	960	940	930	920	910	900	890	880	870
82	860	850	840	820	810	800	790	780	770	760
83	750	740	730	720	710	690	680	670	660	650
84	640	630	620	610	600	590	580	570	560	540
85	530	520	510	500	490	480	470	460	450	440
86	430	420	410	390	380	370	360	350	340	330
87	320	310	300	290	280	270	260	250	230	220
88	210	200	190	180	170	160	150	140	130	120
89	110	100	90	70	60	50	40	30	20	10









Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	6,300	6,280	6,260	6,230	6,210	6,190	6,170	6,150	6,130	6,110
46	6,080	6,060	6,040	6,020	6,000	5,980	5,960	5,940	5,920	5,900
47	5,870	5,850	5,830	5,810	5,790	5,770	5,750	5,730	5,710	5,690
48	5,670	5,650	5,630	5,610	5,590	5,570	5,550	5,530	5,520	5,500
49	5,480	5,460	5,440	5,420	5,400	5,380	5,360	5,340	5,320	5,310
50	5,290	5,270	5,250	5,230	5,210	5,190	5,170	5,160	5,140	5,120
51	5,100	5,080	5,070	5,050	5,030	5,010	4,990	4,980	4,960	4,940
52	4,920	4,900	4,890	4,870	4,850	4,830	4,820	4,800	4,780	4,760
53	4,750	4,730	4,710	4,700	4,680	4,660	4,640	4,630	4,610	4,590
54	4,580	4,560	4,540	4,530	4,510	4,490	4,480	4,460	4,440	4,430
55	4,410	4,390	4,380	4,360	4,350	4,330	4,310	4,300	4,280	4,270
56	4,250	4,230	4,220	4,200	4,190	4,170	4,150	4,140	4,120	4,110
57	4,090	4,080	4,060	4,040	4,030	4,010	4,000	3,980	3,970	3,950
58	3,940	3,920	3,910	3,890	3,880	3,860	3,850	3,830	3,820	3,800
59	3,790	3,770	3,760	3,740	3,730	3,710	3,700	3,680	3,670	3,650
60	3,640	3,620	3,610	3,590	3,580	3,560	3,550	3,540	3,520	3,510
61	3,490	3,480	3,460	3,450	3,430	3,420	3,410	3,390	3,380	3,360
62	3,350	3,340	3,320	3,310	3,290	3,280	3,270	3,250	3,240	3,220
63	3,210	3,200	3,180	3,170	3,150	3,140	3,130	3,110	3,100	3,090
64	3,070	3,060	3,050	3,030	3,020	3,000	2,990	2,980	2,960	2,950
65	2,940	2,920	2,910	2,900	2,880	2,870	2,860	2,840	2,830	2,820
66	2,800	2,790	2,780	2,770	2,750	2,740	2,730	2,710	2,700	2,690
67	2,670	2,660	2,650	2,640	2,620	2,610	2,600	2,580	2,570	2,560
68	2,550	2,530	2,520	2,510	2,490	2,480	2,470	2,460	2,440	2,430
69	2,420	2,410	2,390	2,380	2,370	2,360	2,340	2,330	2,320	2,310
70	2,290	2,280	2,270	2,260	2,240	2,230	2,220	2,210	2,190	2,180
71	2,170	2,160	2,140	2,130	2,120	2,110	2,100	2,080	2,070	2,060
72	2,050	2,030	2,020	2,010	2,000	1,990	1,970	1,960	1,950	1,940
73	1,930	1,910	1,900	1,890	1,880	1,870	1,850	1,840	1,830	1,820
74	1,810	1,790	1,780	1,770	1,760	1,750	1,740	1,720	1,710	1,700
75	1,690	1,680	1,660	1,650	1,640	1,630	1,620	1,610	1,590	1,580
76	1,570	1,560	1,550	1,540	1,520	1,510	1,500	1,490	1,480	1,470
77	1,450	1,440	1,430	1,420	1,410	1,400	1,390	1,370	1,360	1,350
78	1,340	1,330	1,320	1,300	1,290	1,280	1,270	1,260	1,250	1,240
79	1,220	1,210	1,200	1,190	1,180	1,170	1,160	1,140	1,130	1,120
80	1,110	1,100	1,090	1,080	1,070	1,050	1,040	1,030	1,020	1,010
81	1,000	990	980	960	950	940	930	920	910	900
82	890	870	860	850	840	830	820	810	800	780
83	770	760	750	740	730	720	710	700	680	670
84	660	650	640	630	620	610	600	580	570	560
85	550	540	530	520	510	500	480	470	460	450
86	440	430	420	410	400	390	370	360	350	340
87	330	320	310	300	290	280	260	250	240	230
88	220	210	200	190	180	160	150	140	130	120
89	110	100	90	80	70	50	40	30	20	10

















Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	7, 100	7, 080	7, 050	7, 030	7, 000	6, 980	6, 950	6, 930	6, 900	6, 880
46	6, 860	6, 830	6, 810	6, 780	6, 760	6, 740	6, 710	6, 690	6, 670	6, 640
47	6, 620	6, 600	6, 570	6, 550	6, 530	6, 510	6, 480	6, 460	6, 440	6, 420
48	6, 390	6, 370	6, 350	6, 330	6, 300	6, 280	6, 260	6, 240	6, 220	6, 190
49	6, 170	6, 150	6, 130	6, 110	6, 090	6, 060	6, 040	6, 020	6, 000	5, 980
50	5, 960	5, 940	5, 920	5, 890	5, 870	5, 850	5, 830	5, 810	5, 790	5, 770
51	5, 750	5, 730	5, 710	5, 690	5, 670	5, 650	5, 630	5, 610	5, 590	5, 570
52	5, 550	5, 530	5, 510	5, 490	5, 470	5, 450	5, 430	5, 410	5, 390	5, 370
53	5, 350	5, 330	5, 310	5, 290	5, 270	5, 250	5, 230	5, 220	5, 200	5, 180
54	5, 160	5, 140	5, 120	5, 100	5, 080	5, 060	5, 050	5, 030	5, 010	4, 990
55	4, 970	4, 950	4, 930	4, 920	4, 900	4, 880	4, 860	4, 840	4, 830	4, 810
56	4, 790	4, 770	4, 750	4, 740	4, 720	4, 700	4, 680	4, 660	4, 650	4, 630
57	4, 610	4, 590	4, 580	4, 560	4, 540	4, 520	4, 510	4, 490	4, 470	4, 450
58	4, 440	4, 420	4, 400	4, 390	4, 370	4, 350	4, 330	4, 320	4, 300	4, 280
59	4, 270	4, 250	4, 230	4, 220	4, 200	4, 180	4, 170	4, 150	4, 130	4, 120
60	4, 100	4, 080	4, 070	4, 050	4, 030	4, 020	4, 000	3, 980	3, 970	3, 950
61	3, 940	3, 920	3, 900	3, 890	3, 870	3, 860	3, 840	3, 820	3, 810	3, 790
62	3, 780	3, 760	3, 740	3, 730	3, 710	3, 700	3, 680	3, 660	3, 650	3, 630
63	3, 620	3, 600	3, 590	3, 570	3, 560	3, 540	3, 520	3, 510	3, 490	3, 480
64	3, 460	3, 450	3, 430	3, 420	3, 400	3, 390	3, 370	3, 360	3, 340	3, 330
65	3, 310	3, 300	3, 280	3, 270	3, 250	3, 240	3, 220	3, 210	3, 190	3, 180
66	3, 160	3, 150	3, 130	3, 120	3, 100	3, 090	3, 070	3, 060	3, 040	3, 030
67	3, 010	3, 000	2, 980	2, 970	2, 960	2, 940	2, 930	2, 910	2, 900	2, 880
68	2, 870	2, 850	2, 840	2, 830	2, 810	2, 800	2, 780	2, 770	2, 750	2, 740
69	2, 730	2, 710	2, 700	2, 680	2, 670	2, 650	2, 640	2, 630	2, 610	2, 600
70	2, 580	2, 570	2, 560	2, 540	2, 530	2, 510	2, 500	2, 490	2, 470	2, 460
71	2, 440	2, 430	2, 420	2, 400	2, 390	2, 380	2, 360	2, 350	2, 330	2, 320
72	2, 310	2, 290	2, 280	2, 270	2, 250	2, 240	2, 220	2, 210	2, 200	2, 180
73	2, 170	2, 160	2, 140	2, 130	2, 120	2, 100	2, 090	2, 080	2, 060	2, 050
74	2, 040	2, 020	2, 010	2, 000	1, 980	1, 970	1, 960	1, 940	1, 930	1, 920
75	1, 900	1, 890	1, 880	1, 860	1, 850	1, 840	1, 820	1, 810	1, 800	1, 780
76	1, 770	1, 760	1, 740	1, 730	1, 720	1, 700	1, 690	1, 680	1, 670	1, 650
77	1, 640	1, 630	1, 610	1, 600	1, 590	1, 570	1, 560	1, 550	1, 540	1, 520
78	1, 510	1, 500	1, 480	1, 470	1, 460	1, 440	1, 430	1, 420	1, 410	1, 390
79	1, 380	1, 370	1, 350	1, 340	1, 330	1, 320	1, 300	1, 290	1, 280	1, 260
80	1, 250	1, 240	1, 230	1, 210	1, 200	1, 190	1, 180	1, 160	1, 150	1, 140
81	1, 120	1, 110	1, 100	1, 090	1, 070	1, 060	1, 050	1, 040	1, 020	1, 010
82	1, 000	990	970	960	950	930	920	910	900	880
83	870	860	850	830	820	810	800	780	770	760
84	750	730	720	710	700	680	670	660	650	630
85	620	610	600	580	570	560	550	530	520	510
86	500	480	470	460	450	430	420	410	400	380
87	370	360	350	330	320	310	300	290	270	260
88	250	240	220	210	200	190	170	160	150	140
89	120	110	100	90	70	60	50	40	20	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

36 MINUTES AFTER RELEASE

7,300 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	83,440	81,800	80,210	78,690	77,230	75,810	74,450	73,140	71,870	70,640
6	69,460	68,310	67,200	66,120	65,080	64,070	63,090	62,140	61,220	60,320
7	59,450	58,610	57,790	56,990	56,210	55,450	54,710	53,990	53,290	52,610
8	51,940	51,290	50,660	50,040	49,440	48,850	48,270	47,710	47,160	46,620
9	46,090	45,580	45,070	44,580	44,100	43,620	43,160	42,710	42,260	41,830
10	41,400	40,980	40,570	40,170	39,770	39,390	39,010	38,630	38,270	37,910
11	37,560	37,210	36,870	36,530	36,200	35,880	35,560	35,250	34,940	34,640
12	34,340	34,050	33,760	33,480	33,200	32,930	32,660	32,390	32,130	31,870
13	31,620	31,370	31,120	30,880	30,640	30,410	30,170	29,950	29,720	29,500
14	29,280	29,060	28,850	28,640	28,430	28,230	28,030	27,830	27,630	27,440
15	27,240	27,060	26,870	26,680	26,500	26,320	26,150	25,970	25,800	25,630
16	25,460	25,290	25,130	24,960	24,800	24,640	24,490	24,330	24,180	24,030
17	23,880	23,730	23,580	23,440	23,290	23,150	23,010	22,870	22,740	22,600
18	22,470	22,330	22,200	22,070	21,940	21,820	21,690	21,570	21,440	21,320
19	21,200	21,080	20,960	20,850	20,730	20,610	20,500	20,390	20,280	20,170
20	20,060	19,950	19,840	19,730	19,630	19,520	19,420	19,320	19,220	19,120
21	19,020	18,920	18,820	18,720	18,630	18,530	18,440	18,340	18,250	18,160
22	18,070	17,980	17,890	17,800	17,710	17,620	17,540	17,450	17,370	17,280
23	17,200	17,110	17,030	16,950	16,870	16,790	16,710	16,630	16,550	16,470
24	16,400	16,320	16,240	16,170	16,090	16,020	15,940	15,870	15,800	15,730
25	15,650	15,580	15,510	15,440	15,370	15,300	15,240	15,170	15,100	15,030
26	14,970	14,900	14,840	14,770	14,710	14,640	14,580	14,510	14,450	14,390
27	14,330	14,270	14,200	14,140	14,080	14,020	13,960	13,900	13,850	13,790
28	13,730	13,670	13,610	13,560	13,500	13,450	13,390	13,330	13,280	13,220
29	13,170	13,120	13,060	13,010	12,960	12,900	12,850	12,800	12,750	12,700
30	12,640	12,590	12,540	12,490	12,440	12,390	12,340	12,290	12,250	12,200
31	12,150	12,100	12,050	12,010	11,960	11,910	11,870	11,820	11,770	11,730
32	11,680	11,640	11,590	11,550	11,500	11,460	11,420	11,370	11,330	11,280
33	11,240	11,200	11,160	11,110	11,070	11,030	10,990	10,950	10,900	10,860
34	10,820	10,780	10,740	10,700	10,660	10,620	10,580	10,540	10,500	10,460
35	10,430	10,390	10,350	10,310	10,270	10,230	10,200	10,160	10,120	10,080
36	10,050	10,010	9,970	9,940	9,900	9,870	9,830	9,790	9,760	9,720
37	9,690	9,650	9,620	9,580	9,550	9,510	9,480	9,440	9,410	9,380
38	9,340	9,310	9,280	9,240	9,210	9,180	9,140	9,110	9,080	9,050
39	9,010	8,980	8,950	8,920	8,890	8,860	8,820	8,790	8,760	8,730
40	8,700	8,670	8,640	8,610	8,580	8,550	8,520	8,490	8,460	8,430
41	8,400	8,370	8,340	8,310	8,280	8,250	8,220	8,190	8,160	8,140
42	8,110	8,080	8,050	8,020	7,990	7,970	7,940	7,910	7,880	7,860
43	7,830	7,800	7,770	7,750	7,720	7,690	7,670	7,640	7,610	7,590
44	7,560	7,530	7,510	7,480	7,450	7,430	7,400	7,380	7,350	7,330

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	7,300	7,270	7,250	7,220	7,200	7,170	7,150	7,120	7,100	7,070
46	7,050	7,020	7,000	6,980	6,950	6,930	6,900	6,880	6,860	6,830
47	6,810	6,780	6,760	6,740	6,710	6,690	6,670	6,640	6,620	6,600
48	6,570	6,550	6,530	6,500	6,480	6,460	6,440	6,410	6,390	6,370
49	6,350	6,320	6,300	6,280	6,260	6,230	6,210	6,190	6,170	6,150
50	6,130	6,100	6,080	6,060	6,040	6,020	6,000	5,970	5,950	5,930
51	5,910	5,890	5,870	5,850	5,830	5,810	5,790	5,770	5,740	5,720
52	5,700	5,680	5,660	5,640	5,620	5,600	5,580	5,560	5,540	5,520
53	5,500	5,480	5,460	5,440	5,420	5,400	5,380	5,360	5,340	5,320
54	5,300	5,280	5,260	5,250	5,230	5,210	5,190	5,170	5,150	5,130
55	5,110	5,090	5,070	5,050	5,040	5,020	5,000	4,980	4,960	4,940
56	4,920	4,910	4,890	4,870	4,850	4,830	4,810	4,800	4,780	4,760
57	4,740	4,720	4,700	4,690	4,670	4,650	4,630	4,610	4,600	4,580
58	4,560	4,540	4,530	4,510	4,490	4,470	4,460	4,440	4,420	4,400
59	4,390	4,370	4,350	4,330	4,320	4,300	4,280	4,270	4,250	4,230
60	4,210	4,200	4,180	4,160	4,150	4,130	4,110	4,100	4,080	4,060
61	4,050	4,030	4,010	4,000	3,980	3,960	3,950	3,930	3,910	3,900
62	3,880	3,870	3,850	3,830	3,820	3,800	3,780	3,770	3,750	3,740
63	3,720	3,700	3,690	3,670	3,660	3,640	3,620	3,610	3,590	3,580
64	3,560	3,540	3,530	3,510	3,500	3,480	3,470	3,450	3,440	3,420
65	3,400	3,390	3,370	3,360	3,340	3,330	3,310	3,300	3,280	3,270
66	3,250	3,230	3,220	3,200	3,190	3,170	3,160	3,140	3,130	3,110
67	3,100	3,080	3,070	3,050	3,040	3,020	3,010	2,990	2,980	2,960
68	2,950	2,930	2,920	2,910	2,890	2,880	2,860	2,850	2,830	2,820
69	2,800	2,790	2,770	2,760	2,740	2,730	2,710	2,700	2,690	2,670
70	2,660	2,640	2,630	2,610	2,600	2,590	2,570	2,560	2,540	2,530
71	2,510	2,500	2,490	2,470	2,460	2,440	2,430	2,410	2,400	2,390
72	2,370	2,360	2,340	2,330	2,320	2,300	2,290	2,270	2,260	2,250
73	2,230	2,220	2,200	2,190	2,180	2,160	2,150	2,130	2,120	2,110
74	2,090	2,080	2,070	2,050	2,040	2,020	2,010	2,000	1,980	1,970
75	1,960	1,940	1,930	1,920	1,900	1,890	1,870	1,860	1,850	1,830
76	1,820	1,810	1,790	1,780	1,770	1,750	1,740	1,730	1,710	1,700
77	1,690	1,670	1,660	1,650	1,630	1,620	1,600	1,590	1,580	1,560
78	1,550	1,540	1,530	1,510	1,500	1,490	1,470	1,460	1,450	1,430
79	1,420	1,410	1,390	1,380	1,370	1,350	1,340	1,330	1,310	1,300
80	1,290	1,270	1,260	1,250	1,230	1,220	1,210	1,200	1,180	1,170
81	1,160	1,140	1,130	1,120	1,100	1,090	1,080	1,060	1,050	1,040
82	1,030	1,010	1,000	990	970	960	950	940	920	910
83	900	880	870	860	840	830	820	810	790	780
84	770	750	740	730	720	700	690	680	660	650
85	640	630	610	600	590	570	560	550	540	520
86	510	500	480	470	460	450	430	420	410	400
87	380	370	360	340	330	320	310	290	280	270
88	250	240	230	220	200	190	180	170	150	140
89	130	110	100	90	80	60	50	40	30	10

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

**37 MINUTES AFTER RELEASE**  
**7,500 YARDS ALTITUDE**

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
5	85,730	84,040	82,410	80,850	79,340	77,890	76,490	75,140	73,840	72,580
6	71,360	70,180	69,040	67,930	66,860	65,830	64,820	63,840	62,900	61,980
7	61,080	60,210	59,370	58,550	57,750	56,970	56,210	55,470	54,750	54,050
8	53,370	52,700	52,050	51,410	50,790	50,180	49,590	49,010	48,450	47,890
9	47,350	46,820	46,310	45,800	45,300	44,820	44,340	43,880	43,420	42,970
10	42,530	42,110	41,680	41,270	40,860	40,470	40,080	39,690	39,320	38,950
11	38,580	38,230	37,880	37,530	37,200	36,860	36,540	36,220	35,900	35,590
12	35,280	34,980	34,690	34,400	34,110	33,830	33,550	33,280	33,010	32,750
13	32,490	32,230	31,980	31,730	31,480	31,240	31,000	30,770	30,530	30,310
14	30,080	29,860	29,640	29,420	29,210	29,000	28,790	28,590	28,390	28,190
15	27,990	27,800	27,600	27,420	27,230	27,040	26,860	26,680	26,500	26,330
16	26,160	25,980	25,820	25,650	25,480	25,320	25,160	25,000	24,840	24,690
17	24,530	24,380	24,230	24,080	23,930	23,790	23,640	23,500	23,360	23,220
18	23,080	22,950	22,810	22,680	22,550	22,420	22,290	22,160	22,030	21,910
19	21,780	21,660	21,540	21,420	21,300	21,180	21,060	20,950	20,830	20,720
20	20,610	20,490	20,380	20,280	20,170	20,060	19,950	19,850	19,740	19,640
21	19,540	19,440	19,340	19,240	19,140	19,040	18,940	18,850	18,750	18,660
22	18,560	18,470	18,380	18,290	18,200	18,110	18,020	17,930	17,840	17,750
23	17,670	17,580	17,500	17,420	17,330	17,250	17,170	17,090	17,000	16,920
24	16,850	16,770	16,690	16,610	16,530	16,460	16,380	16,310	16,230	16,160
25	16,080	16,010	15,940	15,870	15,800	15,720	15,650	15,580	15,510	15,450
26	15,380	15,310	15,240	15,170	15,110	15,040	14,980	14,910	14,850	14,780
27	14,720	14,660	14,590	14,530	14,470	14,410	14,350	14,290	14,230	14,170
28	14,110	14,050	13,990	13,930	13,870	13,810	13,760	13,700	13,640	13,590
29	13,530	13,470	13,420	13,370	13,310	13,260	13,200	13,150	13,100	13,040
30	12,990	12,940	12,890	12,830	12,780	12,730	12,680	12,630	12,580	12,530
31	12,480	12,430	12,380	12,340	12,290	12,240	12,190	12,140	12,100	12,050
32	12,000	11,960	11,910	11,860	11,820	11,770	11,730	11,680	11,640	11,590
33	11,550	11,510	11,460	11,420	11,370	11,330	11,290	11,250	11,200	11,160
34	11,120	11,080	11,040	10,990	10,950	10,910	10,870	10,830	10,790	10,750
35	10,710	10,670	10,630	10,590	10,550	10,510	10,480	10,440	10,400	10,360
36	10,320	10,280	10,250	10,210	10,170	10,140	10,100	10,060	10,030	9,990
37	9,950	9,920	9,880	9,850	9,810	9,770	9,740	9,700	9,670	9,630
38	9,600	9,560	9,530	9,500	9,460	9,430	9,400	9,360	9,330	9,290
39	9,260	9,230	9,200	9,160	9,130	9,100	9,070	9,030	9,000	8,970
40	8,940	8,910	8,870	8,840	8,810	8,780	8,750	8,720	8,690	8,660
41	8,630	8,600	8,570	8,540	8,510	8,480	8,450	8,420	8,390	8,360
42	8,330	8,300	8,270	8,240	8,210	8,180	8,160	8,130	8,100	8,070
43	8,040	8,010	7,990	7,960	7,930	7,900	7,880	7,850	7,820	7,790
44	7,770	7,740	7,710	7,690	7,660	7,630	7,610	7,580	7,550	7,530

<b>Degrees</b>	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.9</b>
<i>Horizontal distance of balloon in yards from observing point</i>										
45	7,500	7,470	7,450	7,420	7,400	7,370	7,340	7,320	7,290	7,270
46	7,240	7,220	7,190	7,170	7,140	7,120	7,090	7,070	7,040	7,020
47	6,990	6,970	6,950	6,920	6,900	6,870	6,850	6,820	6,800	6,780
48	6,750	6,730	6,710	6,680	6,660	6,640	6,610	6,590	6,570	6,540
49	6,520	6,500	6,470	6,450	6,430	6,410	6,380	6,360	6,340	6,320
50	6,290	6,270	6,250	6,230	6,200	6,180	6,160	6,140	6,120	6,100
51	6,070	6,050	6,030	6,010	5,990	5,970	5,940	5,920	5,900	5,880
52	5,860	5,840	5,820	5,800	5,780	5,750	5,730	5,710	5,690	5,670
53	5,650	5,630	5,610	5,590	5,570	5,550	5,530	5,510	5,490	5,470
54	5,450	5,430	5,410	5,390	5,370	5,350	5,330	5,310	5,290	5,270
55	5,250	5,230	5,210	5,190	5,170	5,150	5,140	5,120	5,100	5,080
56	5,060	5,040	5,020	5,000	4,980	4,960	4,950	4,930	4,910	4,890
57	4,870	4,850	4,830	4,810	4,800	4,780	4,760	4,740	4,720	4,700
58	4,690	4,670	4,650	4,630	4,610	4,600	4,580	4,560	4,540	4,520
59	4,510	4,490	4,470	4,450	4,440	4,420	4,400	4,380	4,370	4,350
60	4,330	4,310	4,300	4,280	4,260	4,240	4,230	4,210	4,190	4,170
61	4,160	4,140	4,120	4,110	4,090	4,070	4,060	4,040	4,020	4,000
62	3,990	3,970	3,950	3,940	3,920	3,900	3,890	3,870	3,850	3,840
63	3,820	3,800	3,790	3,770	3,760	3,740	3,720	3,710	3,690	3,670
64	3,660	3,640	3,630	3,610	3,590	3,580	3,560	3,550	3,530	3,510
65	3,500	3,480	3,470	3,450	3,430	3,420	3,400	3,390	3,370	3,350
66	3,340	3,320	3,310	3,290	3,280	3,260	3,250	3,230	3,210	3,200
67	3,180	3,170	3,150	3,140	3,120	3,110	3,090	3,080	3,060	3,050
68	3,030	3,020	3,000	2,980	2,970	2,950	2,940	2,920	2,910	2,890
69	2,880	2,860	2,850	2,830	2,820	2,800	2,790	2,770	2,760	2,740
70	2,730	2,710	2,700	2,690	2,670	2,660	2,640	2,630	2,610	2,600
71	2,580	2,570	2,550	2,540	2,520	2,510	2,490	2,480	2,470	2,450
72	2,440	2,420	2,410	2,390	2,380	2,360	2,350	2,340	2,320	2,310
73	2,290	2,280	2,260	2,250	2,240	2,220	2,210	2,190	2,180	2,160
74	2,150	2,140	2,120	2,110	2,090	2,080	2,070	2,050	2,040	2,020
75	2,010	2,000	1,980	1,970	1,950	1,940	1,930	1,910	1,900	1,880
76	1,870	1,860	1,840	1,830	1,810	1,800	1,790	1,770	1,760	1,750
77	1,730	1,720	1,700	1,690	1,680	1,660	1,650	1,640	1,620	1,610
78	1,590	1,580	1,570	1,550	1,540	1,530	1,510	1,500	1,490	1,470
79	1,460	1,440	1,430	1,420	1,400	1,390	1,380	1,360	1,350	1,340
80	1,320	1,310	1,300	1,280	1,270	1,260	1,240	1,230	1,210	1,200
81	1,190	1,170	1,160	1,150	1,130	1,120	1,110	1,090	1,080	1,070
82	1,050	1,040	1,030	1,010	1,000	990	970	960	950	930
83	920	910	890	880	870	850	840	830	810	800
84	790	780	760	750	740	720	710	700	680	670
85	660	640	630	620	600	590	580	560	550	540
86	520	510	500	490	470	460	450	430	420	410
87	390	380	370	350	340	330	310	300	290	280
88	260	250	240	220	210	200	180	170	160	140
89	130	120	100	90	80	70	50	40	30	10

# PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

## 38 MINUTES AFTER RELEASE 7,700 YARDS ALTITUDE

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
<b>5</b> -----	88,010	86,280	84,610	83,010	81,460	79,960	78,530	77,150	75,800	74,510
<b>6</b> -----	73,260	72,050	70,880	69,750	68,650	67,580	66,550	65,550	64,570	63,630
<b>7</b> -----	62,710	61,820	60,950	60,110	59,290	58,490	57,710	56,950	56,210	55,490
<b>8</b> -----	54,790	54,100	53,430	52,780	52,140	51,520	50,910	50,320	49,740	49,170
<b>9</b> -----	48,620	48,070	47,540	47,020	46,510	46,010	45,530	45,050	44,580	44,120
<b>10</b> -----	43,670	43,230	42,800	42,370	41,950	41,550	41,140	40,750	40,360	39,990
<b>11</b> -----	39,610	39,250	38,890	38,530	38,190	37,850	37,510	37,180	36,860	36,540
<b>12</b> -----	36,230	35,920	35,610	35,320	35,020	34,730	34,450	34,170	33,890	33,620
<b>13</b> -----	33,350	33,090	32,830	32,570	32,320	32,070	31,830	31,590	31,350	31,110
<b>14</b> -----	30,880	30,660	30,430	30,210	29,990	29,770	29,560	29,350	29,140	28,940
<b>15</b> -----	28,740	28,540	28,340	28,150	27,950	27,770	27,580	27,390	27,210	27,030
<b>16</b> -----	26,850	26,680	26,500	26,330	26,160	25,990	25,830	25,670	25,500	25,340
<b>17</b> -----	25,190	25,030	24,870	24,720	24,570	24,420	24,270	24,130	23,980	23,840
<b>18</b> -----	23,700	23,560	23,420	23,280	23,150	23,010	22,880	22,750	22,620	22,490
<b>19</b> -----	22,360	22,240	22,110	21,990	21,870	21,740	21,620	21,510	21,390	21,270
<b>20</b> -----	21,160	21,040	20,930	20,820	20,700	20,590	20,490	20,380	20,270	20,160
<b>21</b> -----	20,060	19,960	19,850	19,750	19,650	19,550	19,450	19,350	19,250	19,150
<b>22</b> -----	19,060	18,960	18,870	18,770	18,680	18,590	18,500	18,410	18,320	18,230
<b>23</b> -----	18,140	18,050	17,970	17,880	17,790	17,710	17,620	17,540	17,460	17,380
<b>24</b> -----	17,290	17,210	17,130	17,050	16,970	16,900	16,820	16,740	16,660	16,590
<b>25</b> -----	16,510	16,440	16,360	16,290	16,220	16,140	16,070	16,000	15,930	15,860
<b>26</b> -----	15,790	15,720	15,650	15,580	15,510	15,440	15,380	15,310	15,240	15,180
<b>27</b> -----	15,110	15,050	14,980	14,920	14,850	14,790	14,730	14,670	14,600	14,540
<b>28</b> -----	14,480	14,420	14,360	14,300	14,240	14,180	14,120	14,060	14,010	13,950
<b>29</b> -----	13,890	13,830	13,780	13,720	13,670	13,610	13,550	13,500	13,440	13,390
<b>30</b> -----	13,340	13,280	13,230	13,180	13,120	13,070	13,020	12,970	12,920	12,870
<b>31</b> -----	12,820	12,760	12,710	12,660	12,610	12,570	12,520	12,470	12,420	12,370
<b>32</b> -----	12,320	12,270	12,230	12,180	12,130	12,090	12,040	11,990	11,950	11,900
<b>33</b> -----	11,860	11,810	11,770	11,720	11,680	11,630	11,590	11,550	11,500	11,460
<b>34</b> -----	11,420	11,370	11,330	11,290	11,250	11,200	11,160	11,120	11,080	11,040
<b>35</b> -----	11,000	10,960	10,920	10,880	10,830	10,790	10,760	10,720	10,680	10,640
<b>36</b> -----	10,600	10,560	10,520	10,480	10,440	10,410	10,370	10,330	10,290	10,260
<b>37</b> -----	10,220	10,180	10,140	10,110	10,070	10,030	10,000	9,960	9,930	9,890
<b>38</b> -----	9,860	9,820	9,790	9,750	9,720	9,680	9,650	9,610	9,580	9,540
<b>39</b> -----	9,510	9,470	9,440	9,410	9,370	9,340	9,310	9,270	9,240	9,210
<b>40</b> -----	9,180	9,140	9,110	9,080	9,050	9,020	8,980	8,950	8,920	8,890
<b>41</b> -----	8,860	8,830	8,800	8,760	8,730	8,700	8,670	8,640	8,610	8,580
<b>42</b> -----	8,550	8,520	8,490	8,460	8,430	8,400	8,370	8,340	8,320	8,290
<b>43</b> -----	8,260	8,230	8,200	8,170	8,140	8,110	8,090	8,060	8,030	8,000
<b>44</b> -----	7,970	7,950	7,920	7,890	7,860	7,840	7,810	7,780	7,750	7,730

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	7,700	7,670	7,650	7,620	7,590	7,570	7,540	7,510	7,490	7,460
46	7,440	7,410	7,380	7,360	7,330	7,310	7,280	7,260	7,230	7,210
47	7,180	7,160	7,130	7,110	7,080	7,060	7,030	7,010	6,980	6,960
48	6,930	6,910	6,880	6,860	6,840	6,810	6,790	6,760	6,740	6,720
49	6,690	6,670	6,650	6,620	6,600	6,580	6,550	6,530	6,510	6,480
50	6,460	6,440	6,420	6,390	6,370	6,350	6,320	6,300	6,280	6,260
51	6,240	6,210	6,190	6,170	6,150	6,120	6,100	6,080	6,060	6,040
52	6,020	5,990	5,970	5,950	5,930	5,910	5,890	5,870	5,840	5,820
53	5,800	5,780	5,760	5,740	5,720	5,700	5,680	5,660	5,640	5,610
54	5,590	5,570	5,550	5,530	5,510	5,490	5,470	5,450	5,430	5,410
55	5,390	5,370	5,350	5,330	5,310	5,290	5,270	5,250	5,230	5,210
56	5,190	5,170	5,150	5,140	5,120	5,100	5,080	5,060	5,040	5,020
57	5,000	4,980	4,960	4,940	4,920	4,910	4,890	4,870	4,850	4,830
58	4,810	4,790	4,770	4,760	4,740	4,720	4,700	4,680	4,660	4,640
59	4,630	4,610	4,590	4,570	4,550	4,540	4,520	4,500	4,480	4,460
60	4,450	4,430	4,410	4,390	4,370	4,360	4,340	4,320	4,300	4,290
61	4,270	4,250	4,230	4,220	4,200	4,180	4,160	4,150	4,130	4,110
62	4,090	4,080	4,060	4,040	4,030	4,010	3,990	3,970	3,960	3,940
63	3,920	3,910	3,890	3,870	3,860	3,840	3,820	3,810	3,790	3,770
64	3,760	3,740	3,720	3,710	3,690	3,670	3,660	3,640	3,620	3,610
65	3,590	3,570	3,560	3,540	3,530	3,510	3,490	3,480	3,460	3,440
66	3,430	3,410	3,400	3,380	3,360	3,350	3,330	3,320	3,300	3,280
67	3,270	3,250	3,240	3,220	3,210	3,190	3,170	3,160	3,140	3,130
68	3,110	3,100	3,080	3,060	3,050	3,030	3,020	3,000	2,990	2,970
69	2,960	2,940	2,920	2,910	2,890	2,880	2,860	2,850	2,830	2,820
70	2,800	2,790	2,770	2,760	2,740	2,730	2,710	2,700	2,680	2,670
71	2,650	2,640	2,620	2,610	2,590	2,580	2,560	2,550	2,530	2,520
72	2,500	2,490	2,470	2,460	2,440	2,430	2,410	2,400	2,380	2,370
73	2,350	2,340	2,320	2,310	2,300	2,280	2,270	2,250	2,240	2,220
74	2,210	2,190	2,180	2,160	2,150	2,140	2,120	2,110	2,090	2,080
75	2,060	2,050	2,030	2,020	2,010	1,990	1,980	1,960	1,950	1,930
76	1,920	1,910	1,890	1,880	1,860	1,850	1,830	1,820	1,810	1,790
77	1,780	1,760	1,750	1,740	1,720	1,710	1,690	1,680	1,660	1,650
78	1,640	1,620	1,610	1,590	1,580	1,570	1,550	1,540	1,520	1,510
79	1,500	1,480	1,470	1,450	1,440	1,430	1,410	1,400	1,390	1,370
80	1,360	1,340	1,330	1,320	1,300	1,290	1,270	1,260	1,250	1,230
81	1,220	1,210	1,190	1,180	1,160	1,150	1,140	1,120	1,110	1,100
82	1,080	1,070	1,050	1,040	1,030	1,010	1,000	990	970	960
83	950	930	920	900	890	880	860	850	840	820
84	810	800	780	770	750	740	730	710	700	690
85	670	660	650	630	620	610	590	580	570	550
86	540	520	510	500	480	470	460	440	430	420
87	400	390	380	360	350	340	320	310	300	280
88	270	260	240	230	220	200	190	170	160	150
89	130	120	110	90	80	70	50	40	30	10

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**39 MINUTES AFTER RELEASE  
7,900 YARDS ALTITUDE**

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	90,300	88,520	86,810	85,160	83,570	82,040	80,570	79,150	77,770	76,450
6	75,160	73,920	72,720	71,560	70,430	69,340	68,280	67,250	66,250	65,280
7	64,340	63,430	62,530	61,670	60,830	60,010	59,210	58,430	57,670	56,930
8	56,210	55,510	54,820	54,150	53,500	52,860	52,240	51,630	51,030	50,450
9	49,880	49,320	48,780	48,240	47,720	47,210	46,710	46,220	45,740	45,260
10	44,800	44,350	43,910	43,470	43,040	42,620	42,210	41,810	41,410	41,020
11	40,640	40,270	39,900	39,540	39,180	38,830	38,490	38,150	37,810	37,490
12	37,170	36,850	36,540	36,230	35,930	35,630	35,340	35,060	34,770	34,490
13	34,220	33,950	33,680	33,420	33,160	32,910	32,650	32,410	32,160	31,920
14	31,690	31,450	31,220	30,990	30,770	30,550	30,330	30,110	29,900	29,690
15	29,480	29,280	29,080	28,880	28,680	28,490	28,290	28,110	27,920	27,730
16	27,550	27,370	27,190	27,020	26,840	26,670	26,500	26,330	26,170	26,000
17	25,840	25,680	25,520	25,360	25,210	25,060	24,900	24,750	24,610	24,460
18	24,310	24,170	24,030	23,890	23,750	23,610	23,470	23,340	23,210	23,070
19	22,940	22,810	22,690	22,560	22,430	22,310	22,190	22,060	21,940	21,820
20	21,710	21,590	21,470	21,360	21,240	21,130	21,020	20,910	20,800	20,690
21	20,580	20,470	20,370	20,260	20,160	20,050	19,950	19,850	19,750	19,650
22	19,550	19,460	19,360	19,260	19,170	19,070	18,980	18,890	18,790	18,700
23	18,610	18,520	18,430	18,340	18,260	18,170	18,080	18,000	17,910	17,830
24	17,740	17,660	17,580	17,500	17,420	17,330	17,260	17,180	17,100	17,020
25	16,940	16,860	16,790	16,710	16,640	16,560	16,490	16,410	16,340	16,270
26	16,200	16,130	16,060	15,980	15,910	15,850	15,780	15,710	15,640	15,570
27	15,500	15,440	15,370	15,310	15,240	15,180	15,110	15,050	14,980	14,920
28	14,860	14,800	14,730	14,670	14,610	14,550	14,490	14,430	14,370	14,310
29	14,250	14,190	14,140	14,080	14,020	13,960	13,910	13,850	13,790	13,740
30	13,680	13,630	13,570	13,520	13,470	13,410	13,360	13,310	13,250	13,200
31	13,150	13,100	13,040	12,990	12,940	12,890	12,840	12,790	12,740	12,690
32	12,640	12,590	12,550	12,500	12,450	12,400	12,350	12,310	12,260	12,210
33	12,170	12,120	12,070	12,030	11,980	11,940	11,890	11,850	11,800	11,760
34	11,710	11,670	11,620	11,580	11,540	11,490	11,450	11,410	11,370	11,320
35	11,280	11,240	11,200	11,160	11,120	11,080	11,030	10,990	10,950	10,910
36	10,870	10,830	10,790	10,750	10,720	10,680	10,640	10,600	10,560	10,520
37	10,480	10,450	10,410	10,370	10,330	10,300	10,260	10,220	10,180	10,150
38	10,110	10,070	10,040	10,000	9,970	9,930	9,900	9,860	9,830	9,790
39	9,760	9,720	9,690	9,650	9,620	9,580	9,550	9,520	9,480	9,450
40	9,420	9,380	9,350	9,320	9,280	9,250	9,220	9,180	9,150	9,120
41	9,090	9,060	9,020	8,990	8,960	8,930	8,900	8,870	8,840	8,800
42	8,770	8,740	8,710	8,680	8,650	8,620	8,590	8,560	8,530	8,500
43	8,470	8,440	8,410	8,380	8,350	8,330	8,300	8,270	8,240	8,210
44	8,180	8,150	8,120	8,100	8,070	8,040	8,010	7,980	7,960	7,930



Elevation angle of balloon in degrees and tenths of a degree

Degrees

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9

Horizontal distance of balloon in yards from observing point

Degrees	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
45	7,900	7,870	7,850	7,820	7,790	7,760	7,740	7,710	7,680	7,660
46	7,630	7,600	7,580	7,550	7,520	7,500	7,470	7,440	7,420	7,390
47	7,370	7,340	7,320	7,290	7,260	7,240	7,210	7,190	7,160	7,140
48	7,110	7,090	7,060	7,040	7,010	6,990	6,960	6,940	6,920	6,890
49	6,870	6,840	6,820	6,800	6,770	6,750	6,720	6,700	6,680	6,650
50	6,630	6,610	6,580	6,560	6,540	6,510	6,490	6,470	6,440	6,420
51	6,400	6,370	6,350	6,330	6,310	6,280	6,260	6,240	6,220	6,190
52	6,170	6,150	6,130	6,110	6,080	6,060	6,040	6,020	6,000	5,970
53	5,950	5,930	5,910	5,890	5,870	5,850	5,820	5,800	5,780	5,760
54	5,740	5,720	5,700	5,680	5,660	5,630	5,610	5,590	5,570	5,550
55	5,530	5,510	5,490	5,470	5,450	5,430	5,410	5,390	5,370	5,350
56	5,330	5,310	5,290	5,270	5,250	5,230	5,210	5,190	5,170	5,150
57	5,130	5,110	5,090	5,070	5,050	5,030	5,010	4,990	4,970	4,960
58	4,940	4,920	4,900	4,880	4,860	4,840	4,820	4,800	4,780	4,770
59	4,750	4,730	4,710	4,690	4,670	4,650	4,630	4,620	4,600	4,580
60	4,560	4,540	4,520	4,510	4,490	4,470	4,450	4,430	4,420	4,400
61	4,380	4,360	4,340	4,330	4,310	4,290	4,270	4,250	4,240	4,220
62	4,200	4,180	4,170	4,150	4,130	4,110	4,090	4,080	4,060	4,040
63	4,030	4,010	3,990	3,970	3,960	3,940	3,920	3,900	3,890	3,870
64	3,850	3,840	3,820	3,800	3,790	3,770	3,750	3,730	3,720	3,700
65	3,680	3,670	3,650	3,630	3,620	3,600	3,580	3,570	3,550	3,530
66	3,520	3,500	3,480	3,470	3,450	3,430	3,420	3,400	3,390	3,370
67	3,350	3,340	3,320	3,300	3,290	3,270	3,260	3,240	3,220	3,210
68	3,190	3,180	3,160	3,140	3,130	3,110	3,100	3,080	3,060	3,050
69	3,030	3,020	3,000	2,990	2,970	2,950	2,940	2,920	2,910	2,890
70	2,880	2,860	2,840	2,830	2,810	2,800	2,780	2,770	2,750	2,740
71	2,720	2,700	2,690	2,670	2,660	2,640	2,630	2,610	2,600	2,580
72	2,570	2,550	2,540	2,520	2,510	2,490	2,480	2,460	2,450	2,430
73	2,420	2,400	2,390	2,370	2,360	2,340	2,330	2,310	2,300	2,280
74	2,270	2,250	2,240	2,220	2,210	2,190	2,180	2,160	2,150	2,130
75	2,120	2,100	2,090	2,070	2,060	2,040	2,030	2,010	2,000	1,980
76	1,970	1,960	1,940	1,930	1,910	1,900	1,880	1,870	1,850	1,840
77	1,820	1,810	1,790	1,780	1,770	1,750	1,740	1,720	1,710	1,690
78	1,680	1,660	1,650	1,640	1,620	1,610	1,590	1,580	1,560	1,550
79	1,540	1,520	1,510	1,490	1,480	1,460	1,450	1,440	1,420	1,410
80	1,390	1,380	1,360	1,350	1,340	1,320	1,310	1,290	1,280	1,270
81	1,250	1,240	1,220	1,210	1,190	1,180	1,170	1,150	1,140	1,120
82	1,110	1,100	1,080	1,070	1,050	1,040	1,030	1,010	1,000	980
83	970	960	940	930	910	900	890	870	860	840
84	830	820	800	790	770	760	750	730	720	710
85	690	680	660	650	640	620	610	590	580	570
86	550	540	520	510	500	480	470	460	440	430
87	410	400	390	370	360	340	330	320	300	290
88	280	260	250	230	220	210	190	180	170	150
89	140	120	110	100	80	70	60	40	30	10



<b>Degrees</b>	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.9</b>
<i>Horizontal distance of balloon in yards from observing point</i>										
<b>45</b> -----	8,100	8,070	8,040	8,020	7,990	7,960	7,930	7,900	7,880	7,850
<b>46</b> -----	7,820	7,790	7,770	7,740	7,710	7,690	7,660	7,630	7,610	7,580
<b>47</b> -----	7,550	7,530	7,500	7,470	7,450	7,420	7,400	7,370	7,340	7,320
<b>48</b> -----	7,290	7,270	7,240	7,220	7,190	7,170	7,140	7,120	7,090	7,070
<b>49</b> -----	7,040	7,020	6,990	6,970	6,940	6,920	6,890	6,870	6,850	6,820
<b>50</b> -----	6,800	6,770	6,750	6,720	6,700	6,680	6,650	6,630	6,610	6,580
<b>51</b> -----	6,560	6,540	6,510	6,490	6,470	6,440	6,420	6,400	6,370	6,350
<b>52</b> -----	6,330	6,310	6,280	6,260	6,240	6,220	6,190	6,170	6,150	6,130
<b>53</b> -----	6,100	6,080	6,060	6,040	6,020	5,990	5,970	5,950	5,930	5,910
<b>54</b> -----	5,880	5,860	5,840	5,820	5,800	5,780	5,760	5,740	5,710	5,690
<b>55</b> -----	5,670	5,650	5,630	5,610	5,590	5,570	5,550	5,530	5,500	5,480
<b>56</b> -----	5,460	5,440	5,420	5,400	5,380	5,360	5,340	5,320	5,300	5,280
<b>57</b> -----	5,260	5,240	5,220	5,200	5,180	5,160	5,140	5,120	5,100	5,080
<b>58</b> -----	5,060	5,040	5,020	5,000	4,980	4,960	4,940	4,920	4,910	4,890
<b>59</b> -----	4,870	4,850	4,830	4,810	4,790	4,770	4,750	4,730	4,710	4,700
<b>60</b> -----	4,680	4,660	4,640	4,620	4,600	4,580	4,560	4,550	4,530	4,510
<b>61</b> -----	4,490	4,470	4,450	4,430	4,420	4,400	4,380	4,360	4,340	4,320
<b>62</b> -----	4,310	4,290	4,270	4,250	4,230	4,220	4,200	4,180	4,160	4,150
<b>63</b> -----	4,130	4,110	4,090	4,070	4,060	4,040	4,020	4,000	3,990	3,970
<b>64</b> -----	3,950	3,930	3,920	3,900	3,880	3,860	3,850	3,830	3,810	3,790
<b>65</b> -----	3,780	3,760	3,740	3,730	3,710	3,690	3,670	3,660	3,640	3,620
<b>66</b> -----	3,610	3,590	3,570	3,560	3,540	3,520	3,510	3,490	3,470	3,450
<b>67</b> -----	3,440	3,420	3,400	3,390	3,370	3,360	3,340	3,320	3,310	3,290
<b>68</b> -----	3,270	3,260	3,240	3,220	3,210	3,190	3,170	3,160	3,140	3,130
<b>69</b> -----	3,110	3,090	3,080	3,060	3,040	3,030	3,010	3,000	2,980	2,960
<b>70</b> -----	2,950	2,930	2,920	2,900	2,880	2,870	2,850	2,840	2,820	2,800
<b>71</b> -----	2,790	2,770	2,760	2,740	2,730	2,710	2,690	2,680	2,660	2,650
<b>72</b> -----	2,630	2,620	2,600	2,590	2,570	2,550	2,540	2,520	2,510	2,490
<b>73</b> -----	2,480	2,460	2,450	2,430	2,410	2,400	2,380	2,370	2,350	2,340
<b>74</b> -----	2,320	2,310	2,290	2,280	2,260	2,250	2,230	2,220	2,200	2,190
<b>75</b> -----	2,170	2,160	2,140	2,130	2,110	2,090	2,080	2,060	2,050	2,030
<b>76</b> -----	2,020	2,000	1,990	1,970	1,960	1,940	1,930	1,910	1,900	1,880
<b>77</b> -----	1,870	1,860	1,840	1,830	1,810	1,800	1,780	1,770	1,750	1,740
<b>78</b> -----	1,720	1,710	1,690	1,680	1,660	1,650	1,630	1,620	1,600	1,590
<b>79</b> -----	1,570	1,560	1,550	1,530	1,520	1,500	1,490	1,470	1,460	1,440
<b>80</b> -----	1,430	1,410	1,400	1,380	1,370	1,360	1,340	1,330	1,310	1,300
<b>81</b> -----	1,280	1,270	1,250	1,240	1,230	1,210	1,200	1,180	1,170	1,150
<b>82</b> -----	1,140	1,120	1,110	1,100	1,080	1,070	1,050	1,040	1,020	1,010
<b>83</b> -----	990	980	970	950	940	920	910	890	880	870
<b>84</b> -----	850	840	820	810	790	780	770	750	740	720
<b>85</b> -----	710	690	680	670	650	640	620	610	590	580
<b>86</b> -----	570	550	540	520	510	500	480	470	450	440
<b>87</b> -----	420	410	400	380	370	350	340	330	310	300
<b>88</b> -----	280	270	250	240	230	210	200	180	170	160
<b>89</b> -----	140	130	110	100	80	70	60	40	30	10













Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	8,700	8,670	8,640	8,610	8,580	8,550	8,520	8,490	8,460	8,430
46	8,400	8,370	8,340	8,310	8,280	8,260	8,230	8,200	8,170	8,140
47	8,110	8,080	8,060	8,030	8,000	7,970	7,940	7,920	7,890	7,860
48	7,830	7,810	7,780	7,750	7,720	7,700	7,670	7,640	7,620	7,590
49	7,560	7,540	7,510	7,480	7,460	7,430	7,400	7,380	7,350	7,330
50	7,300	7,270	7,250	7,220	7,200	7,170	7,150	7,120	7,100	7,070
51	7,050	7,020	6,990	6,970	6,950	6,920	6,900	6,870	6,850	6,820
52	6,800	6,770	6,750	6,720	6,700	6,680	6,650	6,630	6,600	6,580
53	6,560	6,530	6,510	6,480	6,460	6,440	6,410	6,390	6,370	6,340
54	6,320	6,300	6,270	6,250	6,230	6,210	6,180	6,160	6,140	6,110
55	6,090	6,070	6,050	6,020	6,000	5,980	5,960	5,930	5,910	5,890
56	5,870	5,850	5,820	5,800	5,780	5,760	5,740	5,710	5,690	5,670
57	5,650	5,630	5,610	5,590	5,560	5,540	5,520	5,500	5,480	5,460
58	5,440	5,420	5,390	5,370	5,350	5,330	5,310	5,290	5,270	5,250
59	5,230	5,210	5,190	5,170	5,150	5,120	5,100	5,080	5,060	5,040
60	5,020	5,000	4,980	4,960	4,940	4,920	4,900	4,880	4,860	4,840
61	4,820	4,800	4,780	4,760	4,740	4,720	4,700	4,680	4,660	4,650
62	4,630	4,610	4,590	4,570	4,550	4,530	4,510	4,490	4,470	4,450
63	4,430	4,410	4,390	4,380	4,360	4,340	4,320	4,300	4,280	4,260
64	4,240	4,220	4,210	4,190	4,170	4,150	4,130	4,110	4,090	4,080
65	4,060	4,040	4,020	4,000	3,980	3,960	3,950	3,930	3,910	3,890
66	3,870	3,860	3,840	3,820	3,800	3,780	3,760	3,750	3,730	3,710
67	3,690	3,680	3,660	3,640	3,620	3,600	3,590	3,570	3,550	3,530
68	3,520	3,500	3,480	3,460	3,440	3,430	3,410	3,390	3,370	3,360
69	3,340	3,320	3,300	3,290	3,270	3,250	3,240	3,220	3,200	3,180
70	3,170	3,150	3,130	3,120	3,100	3,080	3,060	3,050	3,030	3,010
71	3,000	2,980	2,960	2,940	2,930	2,910	2,890	2,880	2,860	2,840
72	2,830	2,810	2,790	2,780	2,760	2,740	2,730	2,710	2,690	2,680
73	2,660	2,640	2,630	2,610	2,590	2,580	2,560	2,540	2,530	2,510
74	2,510	2,480	2,460	2,450	2,430	2,410	2,400	2,380	2,360	2,350
75	2,330	2,310	2,300	2,280	2,270	2,250	2,230	2,220	2,200	2,190
76	2,170	2,150	2,140	2,120	2,100	2,090	2,070	2,060	2,040	2,020
77	2,010	1,990	1,980	1,960	1,940	1,930	1,910	1,900	1,880	1,870
78	1,850	1,830	1,820	1,800	1,790	1,770	1,750	1,740	1,720	1,710
79	1,690	1,680	1,660	1,640	1,630	1,610	1,600	1,580	1,570	1,550
80	1,530	1,520	1,500	1,490	1,470	1,460	1,440	1,420	1,410	1,390
81	1,380	1,360	1,350	1,330	1,320	1,300	1,280	1,270	1,250	1,240
82	1,220	1,210	1,190	1,180	1,160	1,150	1,130	1,110	1,100	1,080
83	1,070	1,050	1,040	1,020	1,010	990	980	960	950	930
84	910	900	880	870	850	840	820	810	790	780
85	760	750	730	720	700	680	670	650	640	620
86	610	590	580	560	550	530	520	500	490	470
87	460	440	430	410	400	380	360	350	330	320
88	300	290	270	260	240	230	210	200	180	170
89	150	140	120	110	90	80	60	50	30	20

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**44 MINUTES AFTER RELEASE**

**8,900 YARDS ALTITUDE**

<b>Degrees</b>	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.9</b>
	<i>Horizontal distance of balloon in yards from observing point</i>									
<b>5</b> -----	101,730	99,720	97,790	95,940	94,150	92,430	90,770	89,170	87,620	86,120
<b>6</b> -----	84,680	83,280	81,930	80,620	79,350	78,110	76,920	75,760	74,640	73,550
<b>7</b> -----	72,480	71,450	70,450	69,480	68,530	67,600	66,700	65,830	64,970	64,140
<b>8</b> -----	63,330	62,530	61,760	61,010	60,270	59,550	58,850	58,160	57,490	56,830
<b>9</b> -----	56,190	55,560	54,950	54,350	53,760	53,180	52,620	52,070	51,530	50,990
<b>10</b> -----	50,470	49,960	49,460	48,970	48,490	48,020	47,560	47,100	46,660	46,220
<b>11</b> -----	45,790	45,360	44,950	44,540	44,140	43,750	43,360	42,980	42,600	42,230
<b>12</b> -----	41,870	41,510	41,160	40,820	40,480	40,150	39,820	39,490	39,170	38,860
<b>13</b> -----	38,550	38,250	37,950	37,650	37,360	37,070	36,790	36,510	36,230	35,960
<b>14</b> -----	35,700	35,430	35,170	34,920	34,660	34,410	34,170	33,930	33,680	33,450
<b>15</b> -----	33,220	32,990	32,760	32,530	32,310	32,090	31,880	31,660	31,450	31,240
<b>16</b> -----	31,040	30,830	30,630	30,440	30,240	30,050	29,850	29,670	29,480	29,290
<b>17</b> -----	29,110	28,930	28,750	28,570	28,400	28,230	28,060	27,890	27,720	27,560
<b>18</b> -----	27,390	27,230	27,070	26,910	26,750	26,600	26,450	26,290	26,140	26,000
<b>19</b> -----	25,850	25,700	25,560	25,410	25,270	25,130	24,990	24,860	24,720	24,590
<b>20</b> -----	24,450	24,320	24,190	24,060	23,930	23,800	23,680	23,550	23,430	23,310
<b>21</b> -----	23,190	23,070	22,950	22,830	22,710	22,590	22,480	22,360	22,250	22,140
<b>22</b> -----	22,030	21,920	21,810	21,700	21,590	21,490	21,380	21,280	21,170	21,070
<b>23</b> -----	20,970	20,870	20,770	20,670	20,570	20,470	20,370	20,280	20,180	20,080
<b>24</b> -----	19,990	19,900	19,800	19,710	19,620	19,530	19,440	19,350	19,260	19,170
<b>25</b> -----	19,090	19,000	18,910	18,830	18,740	18,660	18,580	18,490	18,410	18,330
<b>26</b> -----	18,250	18,170	18,090	18,010	17,930	17,850	17,770	17,700	17,620	17,540
<b>27</b> -----	17,470	17,390	17,320	17,240	17,170	17,100	17,020	16,950	16,880	16,810
<b>28</b> -----	16,740	16,670	16,600	16,530	16,460	16,390	16,320	16,260	16,190	16,120
<b>29</b> -----	16,060	15,990	15,920	15,860	15,790	15,730	15,670	15,600	15,540	15,480
<b>30</b> -----	15,420	15,350	15,290	15,230	15,170	15,110	15,050	14,990	14,930	14,870
<b>31</b> -----	14,810	14,750	14,700	14,640	14,580	14,520	14,470	14,410	14,350	14,300
<b>32</b> -----	14,240	14,190	14,130	14,080	14,020	13,970	13,920	13,860	13,810	13,760
<b>33</b> -----	13,710	13,650	13,600	13,550	13,500	13,450	13,400	13,340	13,290	13,240
<b>34</b> -----	13,200	13,150	13,100	13,050	13,000	12,950	12,900	12,850	12,810	12,760
<b>35</b> -----	12,710	12,660	12,620	12,570	12,520	12,480	12,430	12,390	12,340	12,290
<b>36</b> -----	12,250	12,200	12,160	12,120	12,070	12,030	11,980	11,940	11,900	11,850
<b>37</b> -----	11,810	11,770	11,730	11,680	11,640	11,600	11,560	11,510	11,470	11,430
<b>38</b> -----	11,390	11,350	11,310	11,270	11,230	11,190	11,150	11,110	11,070	11,030
<b>39</b> -----	10,990	10,950	10,910	10,870	10,830	10,800	10,760	10,720	10,680	10,640
<b>40</b> -----	10,610	10,570	10,530	10,490	10,460	10,420	10,380	10,350	10,310	10,270
<b>41</b> -----	10,240	10,200	10,170	10,130	10,100	10,060	10,020	9,990	9,950	9,920
<b>42</b> -----	9,880	9,850	9,810	9,780	9,750	9,710	9,680	9,640	9,610	9,580
<b>43</b> -----	9,540	9,510	9,480	9,440	9,410	9,380	9,350	9,310	9,280	9,250
<b>44</b> -----	9,220	9,180	9,150	9,120	9,090	9,060	9,030	8,990	8,960	8,930

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	8,900	8,870	8,840	8,810	8,780	8,750	8,720	8,690	8,650	8,620
46	8,590	8,560	8,530	8,510	8,480	8,450	8,420	8,390	8,360	8,330
47	8,300	8,270	8,240	8,210	8,180	8,160	8,130	8,100	8,070	8,040
48	8,010	7,990	7,960	7,930	7,900	7,870	7,850	7,820	7,790	7,760
49	7,740	7,710	7,680	7,660	7,630	7,600	7,570	7,550	7,520	7,490
50	7,470	7,440	7,420	7,390	7,360	7,340	7,310	7,280	7,260	7,230
51	7,210	7,180	7,160	7,130	7,100	7,080	7,050	7,030	7,000	6,980
52	6,950	6,930	6,900	6,880	6,850	6,830	6,800	6,780	6,760	6,730
53	6,710	6,680	6,660	6,630	6,610	6,590	6,560	6,540	6,510	6,490
54	6,470	6,440	6,420	6,400	6,370	6,350	6,320	6,300	6,280	6,260
55	6,230	6,210	6,190	6,160	6,140	6,120	6,090	6,070	6,050	6,030
56	6,000	5,980	5,960	5,940	5,910	5,890	5,870	5,850	5,820	5,800
57	5,780	5,760	5,740	5,710	5,690	5,670	5,650	5,630	5,600	5,580
58	5,560	5,540	5,520	5,500	5,480	5,450	5,430	5,410	5,390	5,370
59	5,350	5,330	5,310	5,280	5,260	5,240	5,220	5,200	5,180	5,160
60	5,140	5,120	5,100	5,080	5,060	5,040	5,010	4,990	4,970	4,950
61	4,930	4,910	4,890	4,870	4,850	4,830	4,810	4,790	4,770	4,750
62	4,730	4,710	4,690	4,670	4,650	4,630	4,610	4,590	4,570	4,550
63	4,530	4,520	4,500	4,480	4,460	4,440	4,420	4,400	4,380	4,360
64	4,340	4,320	4,300	4,280	4,260	4,250	4,230	4,210	4,190	4,170
65	4,150	4,130	4,110	4,090	4,070	4,060	4,040	4,020	4,000	3,980
66	3,960	3,940	3,930	3,910	3,890	3,870	3,850	3,830	3,810	3,800
67	3,780	3,760	3,740	3,720	3,700	3,690	3,670	3,650	3,630	3,610
68	3,600	3,580	3,560	3,540	3,520	3,510	3,490	3,470	3,450	3,430
69	3,420	3,400	3,380	3,360	3,350	3,330	3,310	3,290	3,270	3,260
70	3,240	3,220	3,200	3,190	3,170	3,150	3,130	3,120	3,100	3,080
71	3,060	3,050	3,030	3,010	3,000	2,980	2,960	2,940	2,930	2,910
72	2,890	2,870	2,860	2,840	2,820	2,810	2,790	2,770	2,750	2,740
73	2,720	2,700	2,690	2,670	2,650	2,640	2,620	2,600	2,590	2,570
74	2,550	2,540	2,520	2,500	2,480	2,470	2,450	2,430	2,420	2,400
75	2,380	2,370	2,350	2,330	2,320	2,300	2,290	2,270	2,250	2,240
76	2,220	2,200	2,190	2,170	2,150	2,140	2,120	2,100	2,090	2,070
77	2,050	2,040	2,020	2,010	1,990	1,970	1,960	1,940	1,920	1,910
78	1,890	1,880	1,860	1,840	1,830	1,810	1,790	1,780	1,760	1,750
79	1,730	1,710	1,700	1,680	1,670	1,650	1,630	1,620	1,600	1,590
80	1,570	1,550	1,540	1,520	1,510	1,490	1,470	1,460	1,440	1,430
81	1,410	1,390	1,380	1,360	1,350	1,330	1,310	1,300	1,280	1,270
82	1,250	1,230	1,220	1,200	1,190	1,170	1,160	1,140	1,120	1,110
83	1,090	1,080	1,060	1,050	1,030	1,010	1,000	980	970	950
84	940	920	900	890	870	860	840	830	810	790
85	780	760	750	730	720	700	680	670	650	640
86	620	610	590	580	560	540	530	510	500	480
87	470	450	440	420	400	390	370	360	340	330
88	310	300	280	260	250	230	220	200	190	170
89	160	140	120	110	90	80	60	50	30	20

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**45 MINUTES AFTER RELEASE  
9,100 YARDS ALTITUDE**

<b>Degrees</b>	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.9</b>
	<i>Horizontal distance of balloon in yards from observing point</i>									
5.....	104,010	101,970	99,990	98,100	96,270	94,500	92,810	91,170	89,590	88,060
6.....	86,580	85,150	83,770	82,430	81,130	79,870	78,650	77,460	76,320	75,200
7.....	74,110	73,060	72,030	71,040	70,070	69,120	68,200	67,310	66,430	65,580
8.....	64,750	63,940	63,150	62,380	61,630	60,890	60,170	59,470	58,780	58,110
9.....	57,460	56,810	56,190	55,570	54,970	54,380	53,800	53,240	52,680	52,140
10.....	51,610	51,090	50,580	50,070	49,580	49,100	48,630	48,160	47,700	47,260
11.....	46,820	46,380	45,960	45,540	45,130	44,730	44,330	43,940	43,560	43,180
12.....	42,810	42,450	42,090	41,740	41,390	41,050	40,710	40,380	40,050	39,730
13.....	39,420	39,100	38,800	38,500	38,200	37,900	37,610	37,330	37,050	36,770
14.....	36,500	36,230	35,960	35,700	35,440	35,190	34,940	34,690	34,440	34,200
15.....	33,960	33,730	33,490	33,260	33,040	32,810	32,590	32,370	32,160	31,950
16.....	31,740	31,530	31,320	31,120	30,920	30,720	30,530	30,330	30,140	29,950
17.....	29,770	29,580	29,400	29,220	29,040	28,860	28,690	28,510	28,340	28,170
18.....	28,010	27,840	27,680	27,520	27,360	27,200	27,040	26,890	26,730	26,580
19.....	26,430	26,280	26,130	25,990	25,840	25,700	25,560	25,420	25,280	25,140
20.....	25,000	24,870	24,730	24,600	24,470	24,340	24,210	24,080	23,960	23,830
21.....	23,710	23,580	23,460	23,340	23,220	23,100	22,980	22,870	22,750	22,640
22.....	22,520	22,410	22,300	22,190	22,080	21,970	21,860	21,750	21,650	21,540
23.....	21,440	21,330	21,230	21,130	21,030	20,930	20,830	20,730	20,630	20,540
24.....	20,440	20,340	20,250	20,150	20,060	19,970	19,880	19,790	19,690	19,600
25.....	19,510	19,430	19,340	19,250	19,160	19,080	18,990	18,910	18,820	18,740
26.....	18,660	18,580	18,490	18,410	18,330	18,250	18,170	18,090	18,020	17,940
27.....	17,860	17,780	17,710	17,630	17,560	17,480	17,410	17,330	17,260	17,190
28.....	17,110	17,040	16,970	16,900	16,830	16,760	16,690	16,620	16,550	16,480
29.....	16,420	16,350	16,280	16,220	16,150	16,080	16,020	15,950	15,890	15,830
30.....	15,760	15,700	15,640	15,570	15,510	15,450	15,390	15,330	15,270	15,210
31.....	15,150	15,090	15,030	14,970	14,910	14,850	14,790	14,730	14,680	14,620
32.....	14,560	14,510	14,450	14,390	14,340	14,280	14,230	14,180	14,120	14,070
33.....	14,010	13,960	13,910	13,850	13,800	13,750	13,700	13,640	13,590	13,540
34.....	13,490	13,440	13,390	13,340	13,290	13,240	13,190	13,140	13,090	13,040
35.....	13,000	12,950	12,900	12,850	12,800	12,760	12,710	12,660	12,620	12,570
36.....	12,530	12,480	12,430	12,390	12,340	12,300	12,250	12,210	12,160	12,120
37.....	12,080	12,030	11,990	11,950	11,900	11,860	11,820	11,770	11,730	11,690
38.....	11,650	11,610	11,560	11,520	11,480	11,440	11,400	11,360	11,320	11,280
39.....	11,240	11,200	11,160	11,120	11,080	11,040	11,000	10,960	10,920	10,880
40.....	10,850	10,810	10,770	10,730	10,690	10,650	10,620	10,580	10,540	10,510
41.....	10,470	10,430	10,390	10,360	10,320	10,290	10,250	10,210	10,180	10,140
42.....	10,110	10,070	10,040	10,000	9,970	9,930	9,900	9,860	9,830	9,790
43.....	9,760	9,720	9,690	9,660	9,620	9,590	9,560	9,520	9,490	9,460
44.....	9,420	9,390	9,360	9,320	9,290	9,260	9,230	9,200	9,160	9,130



**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**46 MINUTES AFTER RELEASE  
9,300 YARDS ALTITUDE**

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
<b>5</b>	106,300	104,210	102,190	100,250	98,380	96,580	94,850	93,180	91,560	89,990
<b>6</b>	88,480	87,020	85,610	84,240	82,910	81,630	80,380	79,170	77,990	76,850
<b>7</b>	75,740	74,670	73,620	72,600	71,610	70,640	69,700	68,780	67,890	67,020
<b>8</b>	66,170	65,350	64,540	63,750	62,980	62,230	61,490	60,780	60,070	59,390
<b>9</b>	58,720	58,060	57,420	56,790	56,180	55,570	54,990	54,410	53,840	53,290
<b>10</b>	52,740	52,210	51,690	51,170	50,670	50,180	49,690	49,220	48,750	48,290
<b>11</b>	47,840	47,400	46,970	46,540	46,120	45,710	45,310	44,910	44,520	44,130
<b>12</b>	43,750	43,380	43,010	42,650	42,300	41,950	41,610	41,270	40,930	40,610
<b>13</b>	40,280	39,960	39,650	39,340	39,040	38,740	38,440	38,150	37,860	37,580
<b>14</b>	37,300	37,030	36,750	36,490	36,220	35,960	35,700	35,450	35,200	34,950
<b>15</b>	34,710	34,470	34,230	34,000	33,760	33,530	33,310	33,090	32,870	32,650
<b>16</b>	32,430	32,220	32,010	31,800	31,600	31,400	31,200	31,000	30,800	30,610
<b>17</b>	30,420	30,230	30,040	29,860	29,680	29,500	29,320	29,140	28,970	28,790
<b>18</b>	28,620	28,450	28,290	28,120	27,960	27,790	27,630	27,480	27,320	27,160
<b>19</b>	27,010	26,860	26,710	26,560	26,410	26,260	26,120	25,970	25,830	25,690
<b>20</b>	25,550	25,410	25,280	25,140	25,010	24,870	24,740	24,610	24,480	24,350
<b>21</b>	24,230	24,100	23,980	23,850	23,730	23,610	23,490	23,370	23,250	23,130
<b>22</b>	23,020	22,900	22,790	22,680	22,560	22,450	22,340	22,230	22,120	22,020
<b>23</b>	21,910	21,800	21,700	21,590	21,490	21,390	21,290	21,190	21,090	20,990
<b>24</b>	20,890	20,790	20,690	20,600	20,500	20,410	20,310	20,220	20,130	20,030
<b>25</b>	19,940	19,850	19,760	19,670	19,590	19,500	19,410	19,320	19,240	19,150
<b>26</b>	19,070	18,980	18,900	18,820	18,730	18,650	18,570	18,490	18,410	18,330
<b>27</b>	18,250	18,170	18,100	18,020	17,940	17,870	17,790	17,710	17,640	17,560
<b>28</b>	17,490	17,420	17,340	17,270	17,200	17,130	17,060	16,990	16,920	16,850
<b>29</b>	16,780	16,710	16,640	16,570	16,500	16,440	16,370	16,300	16,240	16,170
<b>30</b>	16,110	16,040	15,980	15,920	15,850	15,790	15,730	15,660	15,600	15,540
<b>31</b>	15,480	15,420	15,360	15,300	15,240	15,180	15,120	15,060	15,000	14,940
<b>32</b>	14,880	14,830	14,770	14,710	14,650	14,600	14,540	14,490	14,430	14,380
<b>33</b>	14,320	14,270	14,210	14,160	14,100	14,050	14,000	13,940	13,890	13,840
<b>34</b>	13,790	13,740	13,680	13,630	13,580	13,530	13,480	13,430	13,380	13,330
<b>35</b>	13,280	13,230	13,180	13,140	13,090	13,040	12,990	12,940	12,890	12,850
<b>36</b>	12,800	12,750	12,710	12,660	12,610	12,570	12,520	12,480	12,430	12,390
<b>37</b>	12,340	12,300	12,250	12,210	12,160	12,120	12,080	12,030	11,990	11,950
<b>38</b>	11,900	11,860	11,820	11,780	11,730	11,690	11,650	11,610	11,570	11,530
<b>39</b>	11,480	11,440	11,400	11,360	11,320	11,280	11,240	11,200	11,160	11,120
<b>40</b>	11,080	11,040	11,000	10,970	10,930	10,890	10,850	10,810	10,770	10,740
<b>41</b>	10,700	10,660	10,620	10,590	10,550	10,510	10,470	10,440	10,400	10,360
<b>42</b>	10,330	10,290	10,260	10,220	10,180	10,150	10,110	10,080	10,040	10,010
<b>43</b>	9,970	9,940	9,900	9,870	9,830	9,800	9,770	9,730	9,700	9,660
<b>44</b>	9,630	9,600	9,560	9,530	9,500	9,460	9,430	9,400	9,370	9,330

## Elevation angle of balloon in degrees and tenths of a degree

Degrees	<i>Horizontal distance of balloon in yards from observing point</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
45	9,300	9,270	9,240	9,200	9,170	9,140	9,110	9,080	9,040	9,010
46	8,980	8,950	8,920	8,890	8,860	8,830	8,790	8,760	8,730	8,700
47	8,670	8,640	8,610	8,580	8,550	8,520	8,490	8,460	8,430	8,400
48	8,370	8,340	8,320	8,290	8,260	8,230	8,200	8,170	8,140	8,110
49	8,080	8,060	8,030	8,000	7,970	7,940	7,910	7,890	7,860	7,830
50	7,800	7,780	7,750	7,720	7,690	7,670	7,640	7,610	7,580	7,560
51	7,530	7,500	7,480	7,450	7,420	7,400	7,370	7,340	7,320	7,290
52	7,270	7,240	7,210	7,190	7,160	7,140	7,110	7,080	7,060	7,030
53	7,010	6,980	6,960	6,930	6,910	6,880	6,860	6,830	6,810	6,780
54	6,760	6,730	6,710	6,680	6,660	6,630	6,610	6,580	6,560	6,540
55	6,510	6,490	6,460	6,440	6,420	6,390	6,370	6,340	6,320	6,300
56	6,270	6,250	6,230	6,200	6,180	6,160	6,130	6,110	6,090	6,060
57	6,040	6,020	5,990	5,970	5,950	5,920	5,900	5,880	5,860	5,830
58	5,810	5,790	5,770	5,740	5,720	5,700	5,680	5,650	5,630	5,610
59	5,590	5,570	5,540	5,520	5,500	5,480	5,460	5,430	5,410	5,390
60	5,370	5,350	5,330	5,300	5,280	5,260	5,240	5,220	5,200	5,180
61	5,160	5,130	5,110	5,090	5,070	5,050	5,030	5,010	4,990	4,970
62	4,940	4,920	4,900	4,880	4,860	4,840	4,820	4,800	4,780	4,760
63	4,740	4,720	4,700	4,680	4,660	4,640	4,620	4,600	4,580	4,560
64	4,540	4,520	4,500	4,480	4,460	4,440	4,420	4,400	4,380	4,360
65	4,340	4,320	4,300	4,280	4,260	4,240	4,220	4,200	4,180	4,160
66	4,140	4,120	4,100	4,080	4,060	4,040	4,020	4,010	3,990	3,970
67	3,950	3,930	3,910	3,890	3,870	3,850	3,830	3,810	3,800	3,780
68	3,760	3,740	3,720	3,700	3,680	3,660	3,640	3,630	3,610	3,590
69	3,570	3,550	3,530	3,510	3,500	3,480	3,460	3,440	3,420	3,400
70	3,380	3,370	3,350	3,330	3,310	3,290	3,280	3,260	3,240	3,220
71	3,200	3,180	3,170	3,150	3,130	3,110	3,090	3,080	3,060	3,040
72	3,020	3,000	2,990	2,970	2,950	2,930	2,910	2,900	2,880	2,860
73	2,840	2,830	2,810	2,790	2,770	2,750	2,740	2,720	2,700	2,680
74	2,670	2,650	2,630	2,610	2,600	2,580	2,560	2,540	2,530	2,510
75	2,490	2,470	2,460	2,440	2,420	2,410	2,390	2,370	2,350	2,340
76	2,320	2,300	2,280	2,270	2,250	2,230	2,220	2,200	2,180	2,160
77	2,150	2,130	2,110	2,100	2,080	2,060	2,040	2,030	2,010	1,990
78	1,980	1,960	1,940	1,930	1,910	1,890	1,880	1,860	1,840	1,820
79	1,810	1,790	1,770	1,760	1,740	1,720	1,710	1,690	1,670	1,660
80	1,640	1,620	1,610	1,590	1,570	1,560	1,540	1,520	1,510	1,490
81	1,470	1,460	1,440	1,420	1,410	1,390	1,370	1,360	1,340	1,320
82	1,310	1,290	1,270	1,260	1,240	1,220	1,210	1,190	1,170	1,160
83	1,140	1,130	1,110	1,090	1,080	1,060	1,040	1,030	1,010	990
84	980	960	940	930	910	900	880	860	850	830
85	810	800	780	760	750	730	720	700	680	670
86	650	630	620	600	590	570	550	540	520	500
87	490	470	450	440	420	410	390	370	360	340
88	320	310	290	280	260	240	230	210	190	180
89	160	150	130	110	100	80	60	50	30	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

47 MINUTES AFTER RELEASE

9,500 YARDS ALTITUDE

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<i>Horizontal distance of balloon in yards from observing point</i>										
5	108,590	106,450	104,390	102,410	100,500	98,660	96,890	95,180	93,530	91,930
6	90,390	88,890	87,450	86,050	84,690	83,380	82,110	80,870	79,670	78,500
7	77,370	76,270	75,200	74,160	73,150	72,160	71,200	70,260	69,350	68,460
8	67,600	66,750	65,930	65,120	64,330	63,570	62,820	62,080	61,370	60,670
9	59,980	59,310	58,650	58,010	57,380	56,770	56,170	55,580	55,000	54,430
10	53,880	53,330	52,800	52,270	51,760	51,260	50,760	50,280	49,800	49,330
11	48,870	48,420	47,980	47,540	47,110	46,690	46,280	45,870	45,470	45,080
12	44,690	44,310	43,940	43,570	43,210	42,850	42,500	42,160	41,810	41,480
13	41,150	40,820	40,500	40,190	39,880	39,570	39,270	38,970	38,680	38,390
14	38,100	37,820	37,540	37,270	37,000	36,730	36,470	36,210	35,960	35,700
15	35,450	35,210	34,970	34,730	34,490	34,260	34,030	33,800	33,570	33,350
16	33,130	32,910	32,700	32,490	32,280	32,070	31,870	31,670	31,470	31,270
17	31,070	30,880	30,690	30,500	30,310	30,130	29,950	29,770	29,590	29,410
18	29,240	29,070	28,890	28,730	28,560	28,390	28,230	28,070	27,910	27,750
19	27,590	27,430	27,280	27,130	26,980	26,830	26,680	26,530	26,390	26,240
20	26,100	25,960	25,820	25,680	25,540	25,410	25,270	25,140	25,010	24,880
21	24,750	24,620	24,490	24,370	24,240	24,120	23,990	23,870	23,750	23,630
22	23,510	23,400	23,280	23,160	23,050	22,930	22,820	22,710	22,600	22,490
23	22,380	22,270	22,170	22,060	21,950	21,850	21,740	21,640	21,540	21,440
24	21,340	21,240	21,140	21,040	20,940	20,850	20,750	20,650	20,560	20,470
25	20,370	20,280	20,190	20,100	20,010	19,920	19,830	19,740	19,650	19,560
26	19,480	19,390	19,310	19,220	19,140	19,050	18,970	18,890	18,810	18,730
27	18,640	18,560	18,490	18,410	18,330	18,250	18,170	18,090	18,020	17,940
28	17,870	17,790	17,720	17,640	17,570	17,500	17,420	17,350	17,280	17,210
29	17,140	17,070	17,000	16,930	16,860	16,790	16,720	16,660	16,590	16,520
30	16,450	16,390	16,320	16,260	16,190	16,130	16,060	16,000	15,940	15,870
31	15,810	15,750	15,690	15,620	15,560	15,500	15,440	15,380	15,320	15,260
32	15,200	15,140	15,090	15,030	14,970	14,910	14,860	14,800	14,740	14,690
33	14,630	14,570	14,520	14,460	14,410	14,350	14,300	14,240	14,190	14,140
34	14,080	14,030	13,980	13,930	13,870	13,820	13,770	13,720	13,670	13,620
35	13,570	13,520	13,470	13,420	13,370	13,320	13,270	13,220	13,170	13,120
36	13,080	13,030	12,980	12,930	12,890	12,840	12,790	12,750	12,700	12,650
37	12,610	12,560	12,520	12,470	12,430	12,380	12,340	12,290	12,250	12,200
38	12,160	12,120	12,070	12,030	11,990	11,940	11,900	11,860	11,820	11,770
39	11,730	11,690	11,650	11,610	11,570	11,520	11,480	11,440	11,400	11,360
40	11,320	11,280	11,240	11,200	11,160	11,120	11,080	11,040	11,010	10,970
41	10,930	10,890	10,850	10,810	10,780	10,740	10,700	10,660	10,620	10,590
42	10,550	10,510	10,480	10,440	10,400	10,370	10,330	10,300	10,260	10,220
43	10,190	10,150	10,120	10,080	10,050	10,010	9,980	9,940	9,910	9,870
44	9,840	9,800	9,770	9,730	9,700	9,670	9,630	9,600	9,570	9,530



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	9,500	9,470	9,430	9,400	9,370	9,340	9,300	9,270	9,240	9,210
46	9,170	9,140	9,110	9,080	9,050	9,020	8,980	8,950	8,920	8,890
47	8,860	8,830	8,800	8,770	8,740	8,710	8,670	8,640	8,610	8,580
48	8,550	8,520	8,490	8,460	8,430	8,400	8,380	8,350	8,320	8,290
49	8,260	8,230	8,200	8,170	8,140	8,110	8,090	8,060	8,030	8,000
50	7,970	7,940	7,920	7,890	7,860	7,830	7,800	7,780	7,750	7,720
51	7,690	7,670	7,640	7,610	7,580	7,560	7,530	7,500	7,480	7,450
52	7,420	7,400	7,370	7,340	7,320	7,290	7,260	7,240	7,210	7,180
53	7,160	7,130	7,110	7,080	7,060	7,030	7,000	6,980	6,950	6,930
54	6,900	6,880	6,850	6,830	6,800	6,780	6,750	6,730	6,700	6,680
55	6,650	6,630	6,600	6,580	6,550	6,530	6,500	6,480	6,460	6,430
56	6,410	6,380	6,360	6,340	6,310	6,290	6,260	6,240	6,220	6,190
57	6,170	6,150	6,120	6,100	6,080	6,050	6,030	6,010	5,980	5,960
58	5,940	5,910	5,890	5,870	5,840	5,820	5,800	5,780	5,750	5,730
59	5,710	5,690	5,660	5,640	5,620	5,600	5,570	5,550	5,530	5,510
60	5,480	5,460	5,440	5,420	5,400	5,370	5,350	5,330	5,310	5,290
61	5,270	5,240	5,220	5,200	5,180	5,160	5,140	5,120	5,090	5,070
62	5,050	5,030	5,010	4,990	4,970	4,950	4,920	4,900	4,880	4,860
63	4,840	4,820	4,800	4,780	4,760	4,740	4,720	4,700	4,670	4,650
64	4,630	4,610	4,590	4,570	4,550	4,530	4,510	4,490	4,470	4,450
65	4,430	4,410	4,390	4,370	4,350	4,330	4,310	4,290	4,470	4,250
66	4,230	4,210	4,190	4,170	4,150	4,130	4,110	4,090	4,070	4,050
67	4,030	4,010	3,990	3,970	3,950	3,930	3,920	3,900	3,880	3,860
68	3,840	3,820	3,800	3,780	3,760	3,740	3,720	3,700	3,680	3,670
69	3,650	3,630	3,610	3,590	3,570	3,550	3,530	3,510	3,500	3,480
70	3,460	3,440	3,420	3,400	3,380	3,360	3,350	3,330	3,310	3,290
71	3,270	3,250	3,230	3,220	3,200	3,180	3,160	3,140	3,120	3,110
72	3,090	3,070	3,050	3,030	3,010	3,000	2,980	2,960	2,940	2,920
73	2,900	2,890	2,870	2,850	2,830	2,810	2,800	2,780	2,760	2,740
74	2,720	2,710	2,690	2,670	2,650	2,630	2,620	2,600	2,580	2,560
75	2,550	2,530	2,510	2,490	2,470	2,460	2,440	2,420	2,400	2,390
76	2,370	2,350	2,330	2,320	2,300	2,280	2,260	2,250	2,230	2,210
77	2,190	2,180	2,160	2,140	2,120	2,110	2,090	2,070	2,050	2,040
78	2,020	2,000	1,980	1,970	1,950	1,930	1,920	1,900	1,880	1,860
79	1,850	1,830	1,810	1,800	1,780	1,760	1,740	1,730	1,710	1,690
80	1,680	1,660	1,640	1,620	1,610	1,590	1,570	1,560	1,540	1,520
81	1,500	1,490	1,470	1,450	1,440	1,420	1,400	1,390	1,370	1,350
82	1,340	1,320	1,300	1,280	1,270	1,250	1,230	1,220	1,200	1,180
83	1,170	1,150	1,130	1,120	1,100	1,080	1,070	1,050	1,030	1,020
84	1,000	980	970	950	930	910	900	880	860	850
85	830	810	800	780	760	750	730	710	700	680
86	660	650	630	610	600	580	560	550	530	510
87	500	480	460	450	430	410	400	380	360	350
88	330	320	300	280	270	250	230	220	200	180
89	170	150	130	120	100	80	70	50	30	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

48 MINUTES AFTER RELEASE  
9,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	110,870	108,690	106,580	104,570	102,620	100,730	98,930	97,180	95,490	93,860
6	92,290	90,760	89,290	87,860	86,480	85,140	83,830	82,570	81,350	80,160
7	79,000	77,880	76,780	75,720	74,690	73,680	72,700	71,740	70,810	69,900
8	69,020	68,160	67,310	66,490	65,690	64,900	64,140	63,390	62,660	61,940
9	61,240	60,560	59,890	59,230	58,590	57,970	57,350	56,750	56,160	55,580
10	55,010	54,460	53,910	53,380	52,850	52,340	51,830	51,340	50,850	50,370
11	49,900	49,440	48,990	48,540	48,110	47,680	47,250	46,840	46,430	46,030
12	45,630	45,250	44,860	44,490	44,120	43,750	43,390	43,040	42,690	42,350
13	42,020	41,680	41,360	41,030	40,720	40,400	40,090	39,790	39,490	39,200
14	38,900	38,620	38,330	38,060	37,780	37,510	37,240	36,970	36,710	36,460
15	36,200	35,950	35,700	35,460	35,220	34,980	34,740	34,510	34,280	34,050
16	33,830	33,610	33,390	33,170	32,960	32,750	32,540	32,330	32,130	31,930
17	31,730	31,530	31,340	31,140	30,950	30,760	30,580	30,390	30,210	30,030
18	29,850	29,680	29,500	29,330	29,160	28,990	28,820	28,660	28,490	28,330
19	28,170	28,010	27,850	27,700	27,550	27,390	27,240	27,090	26,940	26,800
20	26,650	26,510	26,360	26,220	26,080	25,940	25,810	25,670	25,540	25,400
21	25,270	25,140	25,010	24,880	24,750	24,620	24,500	24,380	24,250	24,130
22	24,010	23,890	23,770	23,650	23,530	23,420	23,300	23,190	23,080	22,960
23	22,850	22,740	22,630	22,520	22,420	22,310	22,200	22,100	21,990	21,890
24	21,790	21,680	21,580	21,480	21,380	21,280	21,190	21,090	20,990	20,900
25	20,800	20,710	20,610	20,520	20,430	20,340	20,250	20,150	20,070	19,980
26	19,890	19,800	19,710	19,630	19,540	19,460	19,370	19,290	19,200	19,120
27	19,040	18,960	18,870	18,790	18,710	18,630	18,550	18,480	18,400	18,320
28	18,240	18,170	18,090	18,010	17,940	17,870	17,790	17,720	17,640	17,570
29	17,500	17,430	17,360	17,290	17,210	17,140	17,070	17,010	16,940	16,870
30	16,800	16,730	16,670	16,600	16,530	16,470	16,400	16,340	16,270	16,210
31	16,140	16,080	16,020	15,950	15,890	15,830	15,770	15,710	15,640	15,580
32	15,520	15,460	15,400	15,340	15,280	15,230	15,170	15,110	15,050	14,990
33	14,940	14,880	14,820	14,770	14,710	14,650	14,600	14,540	14,490	14,440
34	14,380	14,330	14,270	14,220	14,170	14,110	14,060	14,010	13,960	13,900
35	13,850	13,800	13,750	13,700	13,650	13,600	13,550	13,500	13,450	13,400
36	13,350	13,300	13,250	13,200	13,160	13,110	13,060	13,010	12,970	12,920
37	12,870	12,830	12,780	12,730	12,690	12,640	12,600	12,550	12,510	12,460
38	12,420	12,370	12,330	12,280	12,240	12,190	12,150	12,110	12,060	12,020
39	11,980	11,940	11,890	11,850	11,810	11,770	11,730	11,680	11,640	11,600
40	11,560	11,520	11,480	11,440	11,400	11,360	11,320	11,280	11,240	11,200
41	11,160	11,120	11,080	11,040	11,000	10,960	10,930	10,890	10,850	10,810
42	10,770	10,730	10,700	10,660	10,620	10,590	10,550	10,510	10,480	10,440
43	10,400	10,370	10,330	10,290	10,260	10,220	10,190	10,150	10,120	10,080
44	10,040	10,010	9,970	9,940	9,910	9,870	9,840	9,800	9,770	9,730

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	9,700	9,670	9,630	9,600	9,570	9,530	9,500	9,470	9,430	9,400
46	9,370	9,330	9,300	9,270	9,240	9,200	9,170	9,140	9,110	9,080
47	9,050	9,010	8,980	8,950	8,920	8,890	8,860	8,830	8,800	8,760
48	8,730	8,700	8,670	8,640	8,610	8,580	8,550	8,520	8,490	8,460
49	8,430	8,400	8,370	8,340	8,310	8,280	8,260	8,230	8,200	8,170
50	8,140	8,110	8,080	8,050	8,020	8,000	7,970	7,940	7,910	7,880
51	7,850	7,830	7,800	7,770	7,740	7,720	7,690	7,660	7,630	7,610
52	7,580	7,550	7,520	7,500	7,470	7,440	7,420	7,390	7,360	7,340
53	7,310	7,280	7,260	7,230	7,200	7,180	7,150	7,130	7,100	7,070
54	7,050	7,020	7,000	6,970	6,940	6,920	6,890	6,870	6,840	6,820
55	6,790	6,770	6,740	6,720	6,690	6,670	6,640	6,620	6,590	6,570
56	6,540	6,520	6,490	6,470	6,440	6,420	6,400	6,370	6,350	6,320
57	6,300	6,280	6,250	6,230	6,200	6,180	6,160	6,130	6,110	6,080
58	6,060	6,040	6,010	5,990	5,970	5,940	5,920	5,900	5,870	5,850
59	5,830	5,810	5,780	5,760	5,740	5,710	5,690	5,670	5,650	5,620
60	5,600	5,580	5,560	5,530	5,510	5,490	5,470	5,440	5,420	5,400
61	5,380	5,350	5,330	5,310	5,290	5,270	5,240	5,220	5,200	5,180
62	5,160	5,140	5,110	5,090	5,070	5,050	5,030	5,010	4,990	4,960
63	4,940	4,920	4,900	4,880	4,860	4,840	4,820	4,790	4,770	4,750
64	4,730	4,710	4,690	4,670	4,650	4,630	4,610	4,590	4,560	4,540
65	4,520	4,500	4,480	4,460	4,440	4,420	4,400	4,380	4,360	4,340
66	4,320	4,300	4,280	4,260	4,240	4,220	4,200	4,180	4,160	4,140
67	4,120	4,100	4,080	4,060	4,040	4,020	4,000	3,980	3,960	3,940
68	3,920	3,900	3,880	3,860	3,840	3,820	3,800	3,780	3,760	3,740
69	3,720	3,700	3,680	3,670	3,650	3,630	3,610	3,590	3,570	3,550
70	3,530	3,510	3,490	3,470	3,450	3,430	3,420	3,400	3,380	3,360
71	3,340	3,320	3,300	3,280	3,260	3,250	3,230	3,210	3,190	3,170
72	3,150	3,130	3,110	3,100	3,080	3,060	3,040	3,020	3,000	2,980
73	2,970	2,950	2,930	2,910	2,890	2,870	2,850	2,840	2,820	2,800
74	2,780	2,760	2,740	2,730	2,710	2,690	2,670	2,650	2,640	2,620
75	2,600	2,580	2,560	2,540	2,530	2,510	2,490	2,470	2,450	2,440
76	2,420	2,400	2,380	2,360	2,350	2,330	2,310	2,290	2,280	2,260
77	2,240	2,220	2,200	2,190	2,170	2,150	2,130	2,110	2,100	2,080
78	2,060	2,040	2,030	2,010	1,990	1,970	1,960	1,940	1,920	1,900
79	1,890	1,870	1,850	1,830	1,820	1,800	1,780	1,760	1,750	1,730
80	1,710	1,690	1,680	1,660	1,640	1,620	1,610	1,590	1,570	1,550
81	1,540	1,520	1,500	1,480	1,470	1,450	1,430	1,420	1,400	1,380
82	1,360	1,350	1,330	1,310	1,290	1,280	1,260	1,240	1,230	1,210
83	1,190	1,170	1,160	1,140	1,120	1,110	1,090	1,070	1,050	1,040
84	1,020	1,000	990	970	950	930	920	900	880	870
85	850	830	810	800	780	760	750	730	710	700
86	680	660	640	630	610	590	580	560	540	530
87	510	490	470	460	440	420	410	390	370	360
88	340	320	300	290	270	250	240	220	200	190
89	170	150	140	120	100	80	70	50	30	20

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**49 MINUTES AFTER RELEASE  
9,900 YARDS ALTITUDE**

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	113,160	110,930	108,780	106,720	104,730	102,810	100,970	99,190	97,460	95,800
6	94,190	92,640	91,130	89,670	88,260	86,890	85,560	84,270	83,020	81,810
7	80,630	79,480	78,370	77,280	76,230	75,200	74,200	73,220	72,270	71,350
8	70,440	69,560	68,700	67,860	67,040	66,240	65,460	64,700	63,950	63,220
9	62,510	61,810	61,120	60,460	59,800	59,160	58,530	57,920	57,320	56,720
10	56,150	55,580	55,020	54,480	53,940	53,420	52,900	52,390	51,900	51,410
11	50,930	50,460	50,000	49,540	49,100	48,660	48,230	47,810	47,390	46,980
12	46,580	46,180	45,790	45,410	45,030	44,660	44,290	43,930	43,570	43,230
13	42,880	42,540	42,210	41,880	41,560	41,240	40,920	40,610	40,310	40,000
14	39,710	39,410	39,120	38,840	38,560	38,280	38,010	37,740	37,470	37,210
15	36,950	36,690	36,440	36,190	35,940	35,700	35,460	35,220	34,990	34,750
16	34,530	34,300	34,080	33,860	33,640	33,420	33,210	33,000	32,790	32,580
17	32,380	32,180	31,980	31,780	31,590	31,400	31,210	31,020	30,830	30,650
18	30,470	30,290	30,110	29,930	29,760	29,590	29,420	29,250	29,080	28,920
19	28,750	28,590	28,430	28,270	28,110	27,960	27,800	27,650	27,500	27,350
20	27,200	27,050	26,910	26,760	26,620	26,480	26,340	26,200	26,060	25,930
21	25,790	25,660	25,520	25,390	25,260	25,130	25,000	24,880	24,750	24,630
22	24,500	24,380	24,260	24,140	24,020	23,900	23,780	23,670	23,550	23,440
23	23,320	23,210	23,100	22,990	22,880	22,770	22,660	22,550	22,450	22,340
24	22,240	22,130	22,030	21,930	21,820	21,720	21,620	21,520	21,430	21,330
25	21,230	21,130	21,040	20,940	20,850	20,760	20,660	20,570	20,480	20,390
26	20,300	20,210	20,120	20,030	19,940	19,860	19,770	19,680	19,600	19,510
27	19,430	19,350	19,260	19,180	19,100	19,020	18,940	18,860	18,780	18,700
28	18,620	18,540	18,460	18,390	18,310	18,230	18,160	18,080	18,010	17,930
29	17,860	17,790	17,710	17,640	17,570	17,500	17,430	17,360	17,290	17,220
30	17,150	17,080	17,010	16,940	16,870	16,810	16,740	16,670	16,610	16,540
31	16,480	16,410	16,350	16,280	16,220	16,160	16,090	16,030	15,970	15,910
32	15,840	15,780	15,720	15,660	15,600	15,540	15,480	15,420	15,360	15,300
33	15,250	15,190	15,130	15,070	15,010	14,960	14,900	14,840	14,790	14,730
34	14,680	14,620	14,570	14,510	14,460	14,400	14,350	14,300	14,240	14,190
35	14,140	14,090	14,030	13,980	13,930	13,880	13,830	13,780	13,730	13,680
36	13,630	13,580	13,530	13,480	13,430	13,380	13,330	13,280	13,230	13,190
37	13,140	13,090	13,040	13,000	12,950	12,900	12,860	12,810	12,760	12,720
38	12,670	12,630	12,580	12,540	12,490	12,450	12,400	12,360	12,310	12,270
39	12,230	12,180	12,140	12,100	12,050	12,010	11,970	11,920	11,880	11,840
40	11,800	11,760	11,710	11,670	11,630	11,590	11,550	11,510	11,470	11,430
41	11,390	11,350	11,310	11,270	11,230	11,190	11,150	11,110	11,070	11,030
42	10,990	10,960	10,920	10,880	10,840	10,800	10,770	10,730	10,690	10,650
43	10,620	10,580	10,540	10,510	10,470	10,430	10,400	10,360	10,320	10,290
44	10,250	10,220	10,180	10,140	10,110	10,070	10,040	10,000	9,970	9,930

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	9,900	9,870	9,830	9,800	9,760	9,730	9,690	9,660	9,630	9,590
46	9,560	9,550	9,490	9,460	9,430	9,390	9,360	9,330	9,300	9,260
47	9,230	9,200	9,170	9,140	9,100	9,070	9,040	9,010	8,980	8,950
48	8,910	8,880	8,850	8,820	8,790	8,760	8,730	8,700	8,670	8,640
49	8,610	8,580	8,550	8,520	8,490	8,460	8,430	8,400	8,370	8,340
50	8,310	8,280	8,250	8,220	8,190	8,160	8,130	8,100	8,070	8,050
51	8,020	7,990	7,960	7,930	7,900	7,870	7,850	7,820	7,790	7,760
52	7,730	7,710	7,680	7,650	7,620	7,600	7,570	7,540	7,510	7,490
53	7,460	7,430	7,410	7,380	7,350	7,330	7,300	7,270	7,250	7,220
54	7,190	7,170	7,140	7,110	7,090	7,060	7,040	7,010	6,980	6,960
55	6,930	6,910	6,880	6,860	6,830	6,800	6,780	6,750	6,730	6,700
56	6,680	6,650	6,630	6,600	6,580	6,550	6,530	6,500	6,480	6,450
57	6,430	6,400	6,380	6,360	6,330	6,310	6,280	6,260	6,230	6,210
58	6,190	6,160	6,140	6,110	6,090	6,070	6,040	6,020	6,000	5,970
59	5,950	5,930	5,900	5,880	5,850	5,830	5,810	5,790	5,760	5,740
60	5,730	5,690	5,670	5,650	5,620	5,600	5,580	5,560	5,530	5,510
61	5,490	5,470	5,440	5,420	5,400	5,380	5,350	5,330	5,310	5,290
62	5,250	5,240	5,220	5,200	5,180	5,150	5,130	5,110	5,090	5,070
63	5,040	5,020	5,000	4,980	4,960	4,940	4,910	4,890	4,870	4,850
64	4,830	4,810	4,790	4,760	4,740	4,720	4,700	4,680	4,660	4,640
65	4,620	4,600	4,570	4,550	4,530	4,510	4,490	4,470	4,450	4,430
66	4,410	4,390	4,370	4,350	4,330	4,300	4,280	4,260	4,240	4,220
67	4,200	4,180	4,160	4,140	4,120	4,100	4,080	4,060	4,040	4,020
68	4,000	3,980	3,960	3,940	3,920	3,900	3,880	3,860	3,840	3,820
69	3,800	3,780	3,760	3,740	3,720	3,700	3,680	3,660	3,640	3,620
70	3,600	3,580	3,560	3,540	3,530	3,510	3,490	3,470	3,450	3,430
71	3,410	3,390	3,370	3,350	3,330	3,310	3,290	3,270	3,250	3,240
72	3,220	3,200	3,180	3,160	3,140	3,120	3,100	3,080	3,060	3,050
73	3,030	3,010	2,990	2,970	2,950	2,930	2,910	2,890	2,880	2,860
74	2,840	2,820	2,800	2,780	2,760	2,750	2,730	2,710	2,690	2,670
75	2,650	2,630	2,620	2,600	2,580	2,560	2,540	2,520	2,510	2,490
76	2,470	2,450	2,430	2,410	2,400	2,380	2,360	2,340	2,320	2,300
77	2,290	2,270	2,250	2,230	2,210	2,190	2,180	2,160	2,140	2,120
78	2,100	2,090	2,070	2,050	2,030	2,010	2,000	1,980	1,960	1,940
79	1,920	1,910	1,890	1,870	1,850	1,830	1,820	1,800	1,780	1,760
80	1,750	1,730	1,710	1,690	1,670	1,660	1,640	1,620	1,600	1,590
81	1,570	1,550	1,530	1,510	1,500	1,480	1,460	1,440	1,430	1,410
82	1,390	1,370	1,360	1,340	1,320	1,300	1,290	1,270	1,250	1,230
83	1,220	1,200	1,180	1,160	1,150	1,130	1,110	1,090	1,080	1,060
84	1,040	1,020	1,010	990	970	950	940	920	900	880
85	870	850	830	810	800	780	760	740	730	710
86	690	670	660	640	620	610	590	570	550	540
87	520	500	480	470	450	430	410	400	380	360
88	350	330	310	290	280	260	240	220	210	190
89	170	160	140	120	100	90	70	50	30	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

50 MINUTES AFTER RELEASE  
10,100 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	115,440	113,170	110,980	108,880	106,850	104,890	103,010	101,190	99,430	97,740
6	96,100	94,510	92,970	91,480	90,040	88,650	87,290	85,980	84,700	83,460
7	82,260	81,090	79,950	78,840	77,770	76,720	75,700	74,700	73,730	72,790
8	71,870	70,970	70,090	69,230	68,400	67,580	66,780	66,000	65,240	64,500
9	63,770	63,060	62,360	61,680	61,010	60,360	59,720	59,090	58,470	57,870
10	57,280	56,700	56,130	55,580	55,030	54,490	53,970	53,450	52,950	52,450
11	51,960	51,480	51,010	50,550	50,090	49,640	49,200	48,770	48,350	47,930
12	47,520	47,110	46,710	46,320	45,940	45,560	45,180	44,820	44,460	44,100
13	43,750	43,400	43,060	42,730	42,400	42,070	41,750	41,430	41,120	40,810
14	40,510	40,210	39,920	39,620	39,340	39,050	38,770	38,500	38,230	37,960
15	37,690	37,430	37,170	36,920	36,670	36,420	36,170	35,930	35,690	35,460
16	35,220	34,990	34,760	34,540	34,320	34,100	33,880	33,670	33,450	33,240
17	33,040	32,830	32,630	32,430	32,230	32,030	31,840	31,650	31,460	31,270
18	31,080	30,900	30,720	30,540	30,360	30,190	30,010	29,840	29,670	29,500
19	29,330	29,170	29,000	28,840	28,680	28,520	28,360	28,210	28,050	27,900
20	27,750	27,600	27,450	27,300	27,160	27,010	26,870	26,730	26,590	26,450
21	26,310	26,180	26,040	25,910	25,770	25,640	25,510	25,380	25,250	25,120
22	25,000	24,870	24,750	24,630	24,500	24,380	24,260	24,150	24,030	23,910
23	23,790	23,680	23,570	23,450	23,340	23,230	23,120	23,010	22,900	22,790
24	22,680	22,580	22,470	22,370	22,270	22,160	22,060	21,960	21,860	21,760
25	21,660	21,560	21,460	21,370	21,270	21,170	21,080	20,990	20,890	20,800
26	20,710	20,620	20,530	20,440	20,350	20,260	20,170	20,080	19,990	19,910
27	19,820	19,740	19,650	19,570	19,480	19,400	19,320	19,240	19,160	19,080
28	19,000	18,920	18,840	18,760	18,680	18,600	18,520	18,450	18,370	18,300
29	18,220	18,150	18,070	18,000	17,920	17,850	17,780	17,710	17,640	17,560
30	17,490	17,420	17,350	17,280	17,220	17,150	17,080	17,010	16,940	16,880
31	16,810	16,740	16,680	16,610	16,550	16,480	16,420	16,350	16,290	16,230
32	16,160	16,100	16,040	15,980	15,910	15,850	15,790	15,730	15,670	15,610
33	15,550	15,490	15,430	15,380	15,320	15,260	15,200	15,140	15,090	15,030
34	14,970	14,920	14,860	14,810	14,750	14,700	14,640	14,590	14,530	14,480
35	14,420	14,370	14,320	14,270	14,210	14,160	14,110	14,060	14,000	13,950
36	13,900	13,850	13,800	13,750	13,700	13,650	13,600	13,550	13,500	13,450
37	13,400	13,350	13,310	13,260	13,210	13,160	13,110	13,070	13,020	12,970
38	12,930	12,880	12,840	12,790	12,740	12,700	12,650	12,610	12,560	12,520
39	12,470	12,430	12,380	12,340	12,300	12,250	12,210	12,170	12,120	12,080
40	12,040	11,990	11,950	11,910	11,870	11,830	11,780	11,740	11,700	11,660
41	11,620	11,580	11,540	11,500	11,460	11,420	11,380	11,340	11,300	11,260
42	11,220	11,180	11,140	11,100	11,060	11,020	10,980	10,950	10,910	10,870
43	10,830	10,790	10,760	10,720	10,680	10,640	10,610	10,570	10,530	10,500
44	10,460	10,420	10,390	10,350	10,310	10,280	10,240	10,210	10,170	10,140

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	10,100	10,060	10,030	9,990	9,960	9,930	9,890	9,860	9,820	9,790
46	9,750	9,720	9,690	9,650	9,620	9,580	9,550	9,520	9,480	9,450
47	9,420	9,390	9,350	9,320	9,290	9,250	9,220	9,190	9,160	9,130
48	9,090	9,060	9,030	9,000	8,970	8,940	8,900	8,870	8,840	8,810
49	8,780	8,750	8,720	8,690	8,660	8,630	8,600	8,570	8,540	8,510
50	8,470	8,440	8,420	8,390	8,360	8,330	8,300	8,270	8,240	8,210
51	8,180	8,150	8,120	8,090	8,060	8,030	8,010	7,980	7,950	7,920
52	7,890	7,860	7,830	7,810	7,780	7,750	7,720	7,690	7,670	7,640
53	7,610	7,580	7,560	7,530	7,500	7,470	7,450	7,420	7,390	7,370
54	7,340	7,310	7,280	7,260	7,230	7,200	7,180	7,150	7,120	7,100
55	7,070	7,050	7,020	6,990	6,970	6,940	6,920	6,890	6,860	6,840
56	6,810	6,790	6,760	6,740	6,710	6,690	6,660	6,630	6,610	6,580
57	6,560	6,530	6,510	6,480	6,460	6,430	6,410	6,380	6,360	6,340
58	6,310	6,290	6,260	6,240	6,210	6,190	6,170	6,140	6,120	6,090
59	6,070	6,040	6,020	6,000	5,970	5,950	5,930	5,900	5,880	5,850
60	5,830	5,810	5,780	5,760	5,740	5,710	5,690	5,670	5,640	5,620
61	5,600	5,580	5,550	5,530	5,510	5,480	5,460	5,440	5,420	5,390
62	5,370	5,350	5,330	5,300	5,280	5,260	5,240	5,210	5,190	5,170
63	5,150	5,120	5,100	5,080	5,060	5,040	5,010	4,990	4,970	4,950
64	4,930	4,900	4,880	4,860	4,840	4,820	4,800	4,770	4,750	4,730
65	4,710	4,690	4,670	4,650	4,620	4,600	4,580	4,560	4,540	4,520
66	4,500	4,480	4,450	4,430	4,410	4,390	4,370	4,350	4,330	4,310
67	4,290	4,270	4,250	4,220	4,200	4,180	4,160	4,140	4,120	4,100
68	4,080	4,060	4,040	4,020	4,000	3,980	3,960	3,940	3,920	3,900
69	3,880	3,860	3,840	3,820	3,800	3,780	3,760	3,740	3,720	3,700
70	3,680	3,660	3,640	3,620	3,600	3,580	3,560	3,540	3,520	3,500
71	3,480	3,460	3,440	3,420	3,400	3,380	3,360	3,340	3,320	3,300
72	3,280	3,260	3,240	3,220	3,200	3,180	3,170	3,150	3,130	3,110
73	3,090	3,070	3,050	3,030	3,010	2,990	2,970	2,950	2,930	2,920
74	2,900	2,880	2,860	2,840	2,820	2,800	2,780	2,760	2,740	2,730
75	2,710	2,690	2,670	2,650	2,630	2,610	2,590	2,570	2,560	2,540
76	2,520	2,500	2,480	2,460	2,440	2,420	2,410	2,390	2,370	2,350
77	2,330	2,310	2,290	2,280	2,260	2,240	2,220	2,200	2,180	2,170
78	2,150	2,130	2,110	2,090	2,070	2,050	2,040	2,020	2,000	1,980
79	1,960	1,940	1,930	1,910	1,890	1,870	1,850	1,840	1,820	1,800
80	1,780	1,760	1,740	1,730	1,710	1,690	1,670	1,650	1,640	1,620
81	1,600	1,580	1,560	1,550	1,530	1,510	1,490	1,470	1,460	1,440
82	1,420	1,400	1,380	1,370	1,350	1,330	1,310	1,290	1,280	1,260
83	1,240	1,220	1,200	1,190	1,170	1,150	1,130	1,120	1,100	1,080
84	1,060	1,040	1,030	1,010	990	970	950	940	920	900
85	880	870	850	830	810	790	780	760	740	720
86	710	690	670	650	640	620	600	580	560	550
87	530	510	490	480	460	440	420	410	390	370
88	350	340	320	300	280	260	250	230	210	190
89	180	160	140	120	110	90	70	50	40	20

**PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE**

**51 MINUTES AFTER RELEASE**

**10,300 YARDS ALTITUDE**

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<i>Horizontal distance of balloon in yards from observing point</i>										
<b>5</b> -----	117,730	115,410	113,180	111,030	108,960	106,970	105,050	103,200	101,400	99,670
<b>6</b> -----	98,000	96,380	94,810	93,300	91,830	90,400	89,020	87,680	86,380	85,120
<b>7</b> -----	83,890	82,690	81,530	80,400	79,310	78,240	77,200	76,180	75,190	74,230
<b>8</b> -----	73,290	72,370	71,480	70,600	69,750	68,920	68,110	67,310	66,530	65,770
<b>9</b> -----	65,030	64,300	63,590	62,900	62,220	61,550	60,900	60,260	59,630	59,020
<b>10</b> -----	58,410	57,820	57,250	56,680	56,120	55,570	55,040	54,510	53,990	53,490
<b>11</b> -----	52,990	52,500	52,020	51,550	51,080	50,630	50,180	49,740	49,300	48,880
<b>12</b> -----	48,460	48,050	47,640	47,240	46,850	46,460	46,080	45,710	45,340	44,970
<b>13</b> -----	44,610	44,260	43,910	43,570	43,240	42,900	42,580	42,250	41,930	41,620
<b>14</b> -----	41,310	41,010	40,710	40,410	40,120	39,830	39,540	39,260	38,980	38,710
<b>15</b> -----	38,440	38,170	37,910	37,650	37,390	37,140	36,890	36,640	36,400	36,160
<b>16</b> -----	35,920	35,690	35,450	35,220	35,000	34,770	34,550	34,330	34,120	33,900
<b>17</b> -----	33,690	33,480	33,270	33,070	32,870	32,670	32,470	32,270	32,080	31,890
<b>18</b> -----	31,700	31,510	31,330	31,140	30,960	30,780	30,610	30,430	30,260	30,080
<b>19</b> -----	29,910	29,740	29,580	29,410	29,250	29,090	28,930	28,770	28,610	28,450
<b>20</b> -----	28,300	28,150	27,990	27,850	27,700	27,550	27,400	27,260	27,110	26,970
<b>21</b> -----	26,830	26,690	26,560	26,420	26,280	26,150	26,010	25,880	25,750	25,620
<b>22</b> -----	25,490	25,370	25,240	25,110	24,990	24,870	24,740	24,620	24,500	24,380
<b>23</b> -----	24,270	24,150	24,030	23,920	23,800	23,690	23,580	23,460	23,350	23,240
<b>24</b> -----	23,130	23,030	22,920	22,810	22,710	22,600	22,500	22,390	22,290	22,190
<b>25</b> -----	22,090	21,990	21,890	21,790	21,690	21,590	21,500	21,400	21,310	21,210
<b>26</b> -----	21,120	21,030	20,930	20,840	20,750	20,660	20,570	20,480	20,390	20,300
<b>27</b> -----	20,210	20,130	20,040	19,960	19,870	19,790	19,700	19,620	19,540	19,450
<b>28</b> -----	19,370	19,290	19,210	19,130	19,050	18,970	18,890	18,810	18,740	18,660
<b>29</b> -----	18,580	18,500	18,430	18,350	18,280	18,210	18,130	18,060	17,980	17,910
<b>30</b> -----	17,840	17,770	17,700	17,630	17,560	17,490	17,420	17,350	17,280	17,210
<b>31</b> -----	17,140	17,070	17,010	16,940	16,870	16,810	16,740	16,680	16,610	16,550
<b>32</b> -----	16,480	16,420	16,360	16,290	16,230	16,170	16,110	16,040	15,980	15,920
<b>33</b> -----	15,860	15,800	15,740	15,680	15,620	15,560	15,500	15,440	15,390	15,330
<b>34</b> -----	15,270	15,210	15,160	15,100	15,040	14,990	14,930	14,880	14,820	14,770
<b>35</b> -----	14,710	14,660	14,600	14,550	14,490	14,440	14,390	14,330	14,280	14,230
<b>36</b> -----	14,180	14,120	14,070	14,020	13,970	13,920	13,870	13,820	13,770	13,720
<b>37</b> -----	13,670	13,620	13,570	13,520	13,470	13,420	13,370	13,330	13,280	13,230
<b>38</b> -----	13,180	13,140	13,090	13,040	13,000	12,950	12,900	12,860	12,810	12,760
<b>39</b> -----	12,720	12,670	12,630	12,580	12,540	12,490	12,450	12,410	12,360	12,320
<b>40</b> -----	12,280	12,230	12,190	12,150	12,100	12,060	12,020	11,970	11,930	11,890
<b>41</b> -----	11,850	11,810	11,770	11,720	11,680	11,640	11,600	11,560	11,520	11,480
<b>42</b> -----	11,440	11,400	11,360	11,320	11,280	11,240	11,200	11,160	11,120	11,080
<b>43</b> -----	11,050	11,010	10,970	10,930	10,890	10,850	10,820	10,780	10,740	10,700
<b>44</b> -----	10,670	10,630	10,590	10,550	10,520	10,480	10,450	10,410	10,370	10,340



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	10,300	10,260	10,230	10,190	10,160	10,120	10,090	10,050	10,020	9,980
46	9,950	9,910	9,880	9,840	9,810	9,770	9,740	9,710	9,670	9,640
47	9,600	9,570	9,540	9,500	9,470	9,440	9,410	9,370	9,340	9,310
48	9,270	9,240	9,210	9,180	9,140	9,110	9,080	9,050	9,020	8,990
49	8,950	8,920	8,890	8,860	8,830	8,800	8,770	8,740	8,700	8,670
50	8,640	8,610	8,580	8,550	8,520	8,490	8,460	8,430	8,400	8,370
51	8,340	8,310	8,280	8,250	8,220	8,190	8,160	8,130	8,110	8,080
52	8,050	8,020	7,990	7,960	7,930	7,900	7,870	7,850	7,820	7,790
53	7,760	7,730	7,710	7,680	7,650	7,620	7,590	7,570	7,540	7,510
54	7,480	7,460	7,430	7,400	7,370	7,350	7,320	7,290	7,270	7,240
55	7,210	7,190	7,160	7,130	7,110	7,080	7,050	7,030	7,000	6,970
56	6,950	6,920	6,900	6,870	6,840	6,820	6,790	6,770	6,740	6,710
57	6,690	6,660	6,640	6,610	6,590	6,560	6,540	6,510	6,490	6,460
58	6,440	6,410	6,390	6,360	6,340	6,310	6,290	6,260	6,240	6,210
59	6,190	6,160	6,140	6,120	6,090	6,070	6,040	6,020	5,990	5,970
60	5,950	5,920	5,900	5,880	5,850	5,830	5,800	5,780	5,760	5,730
61	5,710	5,690	5,660	5,640	5,620	5,590	5,570	5,550	5,520	5,500
62	5,480	5,450	5,430	5,410	5,380	5,360	5,340	5,320	5,290	5,270
63	5,250	5,230	5,200	5,180	5,160	5,140	5,110	5,090	5,070	5,050
64	5,020	5,000	4,980	4,960	4,930	4,910	4,890	4,870	4,850	4,820
65	4,800	4,780	4,760	4,740	4,720	4,690	4,670	4,650	4,630	4,610
66	4,590	4,560	4,540	4,520	4,500	4,480	4,460	4,440	4,410	4,390
67	4,370	4,350	4,330	4,310	4,290	4,270	4,250	4,220	4,200	4,180
68	4,160	4,140	4,120	4,100	4,080	4,060	4,040	4,020	4,000	3,970
69	3,950	3,930	3,910	3,890	3,870	3,850	3,830	3,810	3,790	3,770
70	3,750	3,730	3,710	3,690	3,670	3,650	3,630	3,610	3,590	3,570
71	3,550	3,530	3,510	3,490	3,470	3,450	3,430	3,410	3,390	3,370
72	3,350	3,330	3,310	3,290	3,270	3,250	3,230	3,210	3,190	3,170
73	3,150	3,130	3,110	3,090	3,070	3,050	3,030	3,010	2,990	2,970
74	2,950	2,930	2,910	2,900	2,880	2,860	2,840	2,820	2,800	2,780
75	2,760	2,740	2,720	2,700	2,680	2,660	2,640	2,630	2,610	2,590
76	2,570	2,550	2,530	2,510	2,490	2,470	2,450	2,430	2,420	2,400
77	2,380	2,360	2,340	2,320	2,300	2,280	2,260	2,250	2,230	2,210
78	2,190	2,170	2,150	2,130	2,110	2,100	2,080	2,060	2,040	2,020
79	2,000	1,980	1,960	1,950	1,930	1,910	1,890	1,870	1,850	1,830
80	1,820	1,800	1,780	1,760	1,740	1,720	1,710	1,690	1,670	1,650
81	1,630	1,610	1,590	1,580	1,560	1,540	1,520	1,500	1,480	1,470
82	1,450	1,430	1,410	1,390	1,370	1,360	1,340	1,320	1,300	1,280
83	1,260	1,250	1,230	1,210	1,190	1,170	1,160	1,140	1,120	1,100
84	1,080	1,060	1,050	1,030	1,010	990	970	960	940	920
85	900	880	860	850	830	810	790	770	760	740
86	720	700	680	670	650	630	610	590	580	560
87	540	520	500	490	470	450	430	410	400	380
88	360	340	320	310	290	270	250	230	220	200
89	180	160	140	130	110	90	70	50	40	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

**52 MINUTES AFTER RELEASE**  
**10,500 YARDS ALTITUDE**

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<i>Horizontal distance of balloon in yards from observing point</i>										
5	120,020	117,650	115,370	113,190	111,080	109,040	107,090	105,200	103,370	101,610
6	99,900	98,250	96,650	95,110	93,610	92,160	90,750	89,380	88,060	86,770
7	85,520	84,300	83,120	81,970	80,850	79,760	78,690	77,660	76,650	75,670
8	74,710	73,780	72,860	71,980	71,110	70,260	69,430	68,620	67,830	67,050
9	66,290	65,550	64,830	64,120	63,430	62,750	62,080	61,430	60,790	60,160
10	59,550	58,950	58,360	57,780	57,210	56,650	56,110	55,570	55,040	54,530
11	54,020	53,520	53,030	52,550	52,070	51,610	51,150	50,700	50,260	49,830
12	49,400	48,980	48,560	48,160	47,760	47,360	46,970	46,590	46,220	45,850
13	45,480	45,120	44,770	44,420	44,070	43,740	43,400	43,070	42,750	42,430
14	42,110	41,800	41,500	41,190	40,890	40,600	40,310	40,020	39,740	39,460
15	39,190	38,920	38,650	38,380	38,120	37,860	37,610	37,350	37,110	36,860
16	36,620	36,380	36,140	35,910	35,680	35,450	35,220	35,000	34,780	34,560
17	34,340	34,130	33,920	33,710	33,510	33,300	33,100	32,900	32,700	32,510
18	32,320	32,120	31,940	31,750	31,560	31,380	31,200	31,020	30,840	30,670
19	30,490	30,320	30,150	29,980	29,820	29,650	29,490	29,330	29,160	29,010
20	28,850	28,690	28,540	28,390	28,230	28,080	27,940	27,790	27,640	27,500
21	27,350	27,210	27,070	26,930	26,790	26,660	26,520	26,390	26,250	26,120
22	25,990	25,860	25,730	25,600	25,480	25,350	25,220	25,100	24,980	24,860
23	24,740	24,620	24,500	24,380	24,260	24,150	24,030	23,920	23,810	23,690
24	23,580	23,470	23,360	23,260	23,150	23,040	22,930	22,830	22,720	22,620
25	22,520	22,420	22,310	22,210	22,110	22,010	21,920	21,820	21,720	21,620
26	21,530	21,430	21,340	21,240	21,150	21,060	20,970	20,880	20,790	20,700
27	20,610	20,520	20,430	20,340	20,260	20,170	20,080	20,000	19,920	19,830
28	19,750	19,660	19,580	19,500	19,420	19,340	19,260	19,180	19,100	19,020
29	18,940	18,860	18,790	18,710	18,630	18,560	18,480	18,410	18,330	18,260
30	18,190	18,110	18,040	17,970	17,900	17,830	17,750	17,680	17,610	17,540
31	17,480	17,410	17,340	17,270	17,200	17,130	17,070	17,000	16,930	16,870
32	16,800	16,740	16,670	16,610	16,540	16,480	16,420	16,360	16,290	16,230
33	16,170	16,110	16,050	15,990	15,920	15,860	15,800	15,740	15,680	15,630
34	15,570	15,510	15,450	15,390	15,340	15,280	15,220	15,160	15,110	15,050
35	15,000	14,940	14,880	14,830	14,770	14,720	14,670	14,610	14,560	14,500
36	14,450	14,400	14,350	14,290	14,240	14,190	14,140	14,090	14,040	13,980
37	13,930	13,880	13,830	13,780	13,730	13,680	13,630	13,580	13,540	13,490
38	13,440	13,390	13,340	13,300	13,250	13,200	13,150	13,110	13,060	13,010
39	12,970	12,920	12,870	12,830	12,780	12,740	12,690	12,650	12,600	12,560
40	12,510	12,470	12,420	12,380	12,340	12,290	12,250	12,210	12,160	12,120
41	12,080	12,040	11,990	11,950	11,910	11,870	11,830	11,790	11,740	11,700
42	11,660	11,620	11,580	11,540	11,500	11,460	11,420	11,380	11,340	11,300
43	11,260	11,220	11,180	11,140	11,100	11,060	11,030	10,990	10,950	10,910
44	10,870	10,830	10,800	10,760	10,720	10,680	10,650	10,610	10,570	10,540

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	10,500	10,460	10,430	10,390	10,350	10,320	10,280	10,250	10,210	10,180
46	10,140	10,100	10,070	10,030	10,000	9,960	9,930	9,890	9,860	9,830
47	9,790	9,760	9,720	9,690	9,660	9,620	9,590	9,550	9,520	9,490
48	9,450	9,420	9,390	9,360	9,320	9,290	9,260	9,220	9,190	9,160
49	9,130	9,100	9,060	9,030	9,000	8,970	8,940	8,900	8,870	8,840
50	8,810	8,780	8,750	8,720	8,690	8,660	8,620	8,590	8,560	8,530
51	8,500	8,470	8,440	8,410	8,380	8,350	8,320	8,290	8,260	8,230
52	8,200	8,170	8,140	8,120	8,090	8,060	8,030	8,000	7,970	7,940
53	7,910	7,880	7,860	7,830	7,800	7,770	7,740	7,710	7,680	7,660
54	7,630	7,600	7,570	7,540	7,520	7,490	7,460	7,430	7,410	7,380
55	7,350	7,320	7,300	7,270	7,240	7,220	7,190	7,160	7,140	7,110
56	7,080	7,060	7,030	7,000	6,980	6,950	6,920	6,900	6,870	6,840
57	6,820	6,790	6,770	6,740	6,720	6,690	6,660	6,640	6,610	6,590
58	6,560	6,540	6,510	6,480	6,460	6,430	6,410	6,380	6,360	6,330
59	6,310	6,280	6,260	6,230	6,210	6,190	6,160	6,140	6,110	6,090
60	6,060	6,040	6,010	5,990	5,960	5,940	5,920	5,890	5,870	5,840
61	5,820	5,800	5,770	5,750	5,720	5,700	5,680	5,650	5,630	5,610
62	5,580	5,560	5,540	5,510	5,490	5,470	5,440	5,420	5,400	5,370
63	5,350	5,330	5,300	5,280	5,260	5,240	5,210	5,190	5,170	5,140
64	5,120	5,100	5,080	5,050	5,030	5,010	4,990	4,960	4,940	4,920
65	4,900	4,870	4,850	4,830	4,810	4,790	4,760	4,740	4,720	4,700
66	4,670	4,650	4,630	4,610	4,590	4,570	4,540	4,520	4,500	4,480
67	4,460	4,440	4,410	4,390	4,370	4,350	4,330	4,310	4,280	4,260
68	4,240	4,220	4,200	4,180	4,160	4,140	4,110	4,090	4,070	4,050
69	4,030	4,010	3,990	3,970	3,950	3,930	3,900	3,880	3,860	3,840
70	3,820	3,800	3,780	3,760	3,740	3,720	3,700	3,680	3,660	3,640
71	3,620	3,590	3,570	3,550	3,530	3,510	3,490	3,470	3,450	3,430
72	3,410	3,390	3,370	3,350	3,330	3,310	3,290	3,270	3,250	3,230
73	3,210	3,190	3,170	3,150	3,130	3,110	3,090	3,070	3,050	3,030
74	3,010	2,990	2,970	2,950	2,930	2,910	2,890	2,870	2,850	2,830
75	2,810	2,790	2,770	2,750	2,740	2,720	2,700	2,680	2,660	2,640
76	2,620	2,600	2,580	2,560	2,540	2,520	2,500	2,480	2,460	2,440
77	2,420	2,400	2,390	2,370	2,350	2,330	2,310	2,290	2,270	2,250
78	2,230	2,210	2,190	2,170	2,160	2,140	2,120	2,100	2,080	2,060
79	2,040	2,020	2,000	1,980	1,960	1,950	1,930	1,910	1,890	1,870
80	1,850	1,830	1,810	1,790	1,780	1,760	1,740	1,720	1,700	1,680
81	1,660	1,640	1,630	1,610	1,590	1,570	1,550	1,530	1,510	1,490
82	1,480	1,460	1,440	1,420	1,400	1,380	1,360	1,350	1,330	1,310
83	1,290	1,270	1,250	1,230	1,210	1,200	1,180	1,160	1,140	1,120
84	1,100	1,090	1,070	1,050	1,030	1,010	990	970	960	940
85	920	900	880	860	840	830	810	790	770	750
86	730	720	700	680	660	640	620	610	590	570
87	550	530	510	500	480	460	440	420	400	390
88	370	350	330	310	290	270	260	240	220	200
89	180	160	150	130	110	90	70	60	40	20



Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	<i>Horizontal distance of balloon in yards from observing point</i>									
45	10,700	10,660	10,630	10,590	10,550	10,510	10,480	10,440	10,410	10,370
46	10,330	10,300	10,260	10,230	10,190	10,150	10,120	10,080	10,050	10,010
47	9,980	9,940	9,910	9,870	9,840	9,800	9,770	9,740	9,700	9,670
48	9,630	9,600	9,570	9,530	9,500	9,470	9,430	9,400	9,370	9,330
49	9,300	9,270	9,240	9,200	9,170	9,140	9,110	9,070	9,040	9,010
50	8,980	8,950	8,910	8,880	8,850	8,820	8,790	8,760	8,730	8,700
51	8,660	8,630	8,600	8,570	8,540	8,510	8,480	8,450	8,420	8,390
52	8,360	8,330	8,300	8,270	8,240	8,210	8,180	8,150	8,120	8,090
53	8,060	8,030	8,000	7,980	7,950	7,920	7,890	7,860	7,830	7,800
54	7,770	7,750	7,720	7,690	7,660	7,630	7,600	7,580	7,550	7,520
55	7,490	7,460	7,440	7,410	7,380	7,350	7,330	7,300	7,270	7,240
56	7,220	7,190	7,160	7,140	7,110	7,080	7,060	7,030	7,000	6,980
57	6,950	6,920	6,900	6,870	6,840	6,820	6,790	6,760	6,740	6,710
58	6,690	6,660	6,630	6,610	6,580	6,560	6,530	6,510	6,480	6,450
59	6,430	6,400	6,380	6,350	6,330	6,300	6,280	6,250	6,230	6,200
60	6,180	6,150	6,130	6,100	6,080	6,050	6,030	6,000	5,980	5,960
61	5,930	5,910	5,880	5,860	5,830	5,810	5,790	5,760	5,740	5,710
62	5,690	5,670	5,640	5,620	5,590	5,570	5,550	5,520	5,500	5,480
63	5,450	5,430	5,400	5,380	5,360	5,330	5,310	5,290	5,270	5,240
64	5,220	5,200	5,170	5,150	5,130	5,100	5,080	5,060	5,030	5,010
65	4,990	4,970	4,940	4,920	4,900	4,880	4,850	4,830	4,810	4,790
66	4,760	4,740	4,720	4,700	4,670	4,650	4,630	4,610	4,590	4,560
67	4,540	4,520	4,500	4,480	4,450	4,430	4,410	4,390	4,370	4,340
68	4,320	4,300	4,280	4,260	4,240	4,210	4,190	4,170	4,150	4,130
69	4,110	4,090	4,060	4,040	4,020	4,000	3,980	3,960	3,940	3,920
70	3,890	3,870	3,850	3,830	3,810	3,790	3,770	3,750	3,730	3,710
71	3,680	3,660	3,640	3,620	3,600	3,580	3,560	3,540	3,520	3,500
72	3,480	3,460	3,440	3,410	3,390	3,370	3,350	3,330	3,310	3,290
73	3,270	3,250	3,230	3,210	3,190	3,170	3,150	3,130	3,110	3,090
74	3,070	3,050	3,030	3,010	2,990	2,970	2,950	2,930	2,910	2,890
75	2,870	2,850	2,830	2,810	2,790	2,770	2,750	2,730	2,710	2,690
76	2,670	2,650	2,630	2,610	2,590	2,570	2,550	2,530	2,510	2,490
77	2,470	2,450	2,430	2,410	2,390	2,370	2,350	2,330	2,310	2,290
78	2,270	2,250	2,240	2,220	2,200	2,180	2,160	2,140	2,120	2,100
79	2,080	2,060	2,040	2,020	2,000	1,980	1,960	1,940	1,930	1,910
80	1,890	1,870	1,850	1,830	1,810	1,790	1,770	1,750	1,730	1,710
81	1,690	1,680	1,660	1,640	1,620	1,600	1,580	1,560	1,540	1,520
82	1,500	1,480	1,470	1,450	1,430	1,410	1,390	1,370	1,350	1,330
83	1,310	1,290	1,280	1,260	1,240	1,220	1,200	1,180	1,160	1,140
84	1,120	1,110	1,090	1,070	1,050	1,030	1,010	990	970	950
85	940	920	900	880	860	840	820	800	790	770
86	750	730	710	690	670	650	640	620	600	580
87	560	540	520	500	490	470	450	430	410	390
88	370	350	340	320	300	280	260	240	220	210
89	190	170	150	130	110	90	70	60	40	20



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	10,900	10,860	10,820	10,790	10,750	10,710	10,670	10,640	10,600	10,560
46	10,530	10,490	10,450	10,420	10,380	10,340	10,310	10,270	10,240	10,200
47	10,160	10,130	10,090	10,060	10,020	9,990	9,950	9,920	9,880	9,850
48	9,810	9,780	9,750	9,710	9,680	9,640	9,610	9,580	9,540	9,510
49	9,480	9,440	9,410	9,380	9,340	9,310	9,280	9,240	9,210	9,180
50	9,150	9,110	9,080	9,050	9,020	8,990	8,950	8,920	8,890	8,860
51	8,830	8,800	8,760	8,730	8,700	8,670	8,640	8,610	8,580	8,550
52	8,520	8,490	8,450	8,420	8,390	8,360	8,330	8,300	8,270	8,240
53	8,210	8,180	8,150	8,120	8,100	8,070	8,040	8,010	7,980	7,950
54	7,920	7,890	7,860	7,830	7,800	7,770	7,750	7,720	7,690	7,660
55	7,630	7,600	7,580	7,550	7,520	7,490	7,460	7,440	7,410	7,380
56	7,350	7,320	7,300	7,270	7,240	7,210	7,190	7,160	7,130	7,110
57	7,080	7,050	7,020	7,000	6,970	6,940	6,920	6,890	6,860	6,840
58	6,810	6,780	6,760	6,730	6,710	6,680	6,650	6,630	6,600	6,580
59	6,550	6,520	6,500	6,470	6,450	6,420	6,400	6,370	6,340	6,320
60	6,290	6,270	6,240	6,220	6,190	6,170	6,140	6,120	6,090	6,070
61	6,040	6,020	5,990	5,970	5,940	5,920	5,890	5,870	5,840	5,820
62	5,800	5,770	5,750	5,720	5,700	5,670	5,650	5,630	5,600	5,580
63	5,550	5,530	5,510	5,480	5,460	5,430	5,410	5,390	5,360	5,340
64	5,320	5,290	5,270	5,250	5,220	5,200	5,180	5,150	5,130	5,110
65	5,080	5,060	5,040	5,010	4,990	4,970	4,940	4,920	4,900	4,880
66	4,850	4,830	4,810	4,780	4,760	4,740	4,720	4,690	4,670	4,650
67	4,630	4,600	4,580	4,560	4,540	4,510	4,490	4,470	4,450	4,430
68	4,400	4,380	4,360	4,340	4,320	4,290	4,270	4,250	4,230	4,210
69	4,180	4,160	4,140	4,120	4,100	4,080	4,050	4,030	4,010	3,990
70	3,970	3,950	3,920	3,900	3,880	3,860	3,840	3,820	3,800	3,770
71	3,750	3,730	3,710	3,690	3,670	3,650	3,630	3,600	3,580	3,560
72	3,540	3,520	3,500	3,480	3,460	3,440	3,420	3,400	3,370	3,350
73	3,330	3,310	3,290	3,270	3,250	3,230	3,210	3,190	3,170	3,150
74	3,130	3,100	3,080	3,060	3,040	3,020	3,000	2,980	2,960	2,940
75	2,920	2,900	2,880	2,860	2,840	2,820	2,800	2,780	2,760	2,740
76	2,720	2,700	2,680	2,660	2,640	2,620	2,600	2,580	2,560	2,540
77	2,520	2,500	2,480	2,460	2,440	2,420	2,400	2,380	2,360	2,340
78	2,320	2,300	2,280	2,260	2,240	2,220	2,200	2,180	2,160	2,140
79	2,120	2,100	2,080	2,060	2,040	2,020	2,000	1,980	1,960	1,940
80	1,920	1,900	1,880	1,860	1,840	1,820	1,800	1,780	1,770	1,750
81	1,730	1,710	1,690	1,670	1,650	1,630	1,610	1,590	1,570	1,550
82	1,530	1,510	1,490	1,470	1,450	1,430	1,420	1,400	1,380	1,360
83	1,340	1,320	1,300	1,280	1,260	1,240	1,220	1,200	1,180	1,160
84	1,150	1,130	1,110	1,090	1,070	1,050	1,030	1,010	990	970
85	950	930	920	900	880	860	840	820	800	780
86	760	740	720	700	690	670	650	630	610	590
87	570	550	530	510	490	480	460	440	420	400
88	380	360	340	320	300	290	270	250	230	210
89	190	170	150	130	110	100	80	60	40	20





Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	11,100	11,060	11,020	10,980	10,950	10,910	10,870	10,830	10,790	10,760
46	10,720	10,680	10,640	10,610	10,570	10,530	10,500	10,460	10,420	10,390
47	10,350	10,310	10,280	10,240	10,210	10,170	10,140	10,100	10,060	10,030
48	9,990	9,960	9,920	9,890	9,860	9,820	9,790	9,750	9,720	9,680
49	9,650	9,620	9,580	9,550	9,510	9,480	9,450	9,410	9,380	9,350
50	9,310	9,280	9,250	9,220	9,180	9,150	9,120	9,090	9,050	9,020
51	8,990	8,960	8,920	8,890	8,860	8,830	8,800	8,770	8,730	8,700
52	8,670	8,640	8,610	8,580	8,550	8,520	8,490	8,460	8,430	8,390
53	8,360	8,330	8,300	8,270	8,240	8,210	8,180	8,150	8,120	8,090
54	8,060	8,040	8,010	7,980	7,950	7,920	7,890	7,860	7,830	7,800
55	7,770	7,740	7,710	7,690	7,660	7,630	7,600	7,570	7,540	7,520
56	7,490	7,460	7,430	7,400	7,370	7,350	7,320	7,290	7,260	7,240
57	7,210	7,180	7,150	7,130	7,100	7,070	7,040	7,020	6,990	6,960
58	6,940	6,910	6,880	6,860	6,830	6,800	6,780	6,750	6,720	6,700
59	6,670	6,640	6,620	6,590	6,560	6,540	6,510	6,490	6,460	6,430
60	6,410	6,380	6,360	6,330	6,310	6,280	6,250	6,230	6,200	6,180
61	6,150	6,130	6,100	6,080	6,050	6,030	6,000	5,980	5,950	5,930
62	5,900	5,880	5,850	5,830	5,800	5,780	5,750	5,730	5,700	5,680
63	5,660	5,630	5,610	5,580	5,560	5,530	5,510	5,490	5,460	5,440
64	5,410	5,390	5,370	5,340	5,320	5,290	5,270	5,250	5,220	5,200
65	5,180	5,150	5,130	5,110	5,080	5,060	5,040	5,010	4,990	4,970
66	4,940	4,920	4,900	4,870	4,850	4,830	4,800	4,780	4,760	4,730
67	4,710	4,690	4,670	4,640	4,620	4,600	4,580	4,550	4,530	4,510
68	4,480	4,460	4,440	4,420	4,390	4,370	4,350	4,330	4,310	4,280
69	4,260	4,240	4,220	4,190	4,170	4,150	4,130	4,110	4,080	4,060
70	4,040	4,020	4,000	3,970	3,950	3,930	3,910	3,890	3,870	3,840
71	3,820	3,800	3,780	3,760	3,740	3,710	3,690	3,670	3,650	3,630
72	3,610	3,590	3,560	3,540	3,520	3,500	3,480	3,460	3,440	3,410
73	3,390	3,370	3,350	3,330	3,310	3,290	3,270	3,250	3,220	3,200
74	3,180	3,160	3,140	3,120	3,100	3,080	3,060	3,040	3,020	3,000
75	2,970	2,950	2,930	2,910	2,890	2,870	2,850	2,830	2,810	2,790
76	2,770	2,750	2,730	2,710	2,690	2,660	2,640	2,620	2,600	2,580
77	2,560	2,540	2,520	2,500	2,480	2,460	2,440	2,420	2,400	2,380
78	2,360	2,340	2,320	2,300	2,280	2,260	2,240	2,220	2,200	2,180
79	2,160	2,140	2,120	2,100	2,080	2,060	2,040	2,020	2,000	1,980
80	1,960	1,940	1,920	1,900	1,880	1,860	1,840	1,820	1,800	1,780
81	1,760	1,740	1,720	1,700	1,680	1,660	1,640	1,620	1,600	1,580
82	1,560	1,540	1,520	1,500	1,480	1,460	1,440	1,420	1,400	1,380
83	1,360	1,340	1,320	1,300	1,280	1,260	1,250	1,230	1,210	1,190
84	1,170	1,150	1,130	1,110	1,090	1,070	1,050	1,030	1,010	990
85	970	950	930	910	890	870	850	830	820	800
86	780	760	740	720	700	680	660	640	620	600
87	580	560	540	520	500	480	470	450	430	410
88	390	370	350	330	310	290	270	250	230	210
89	190	170	150	140	120	100	80	60	40	20



Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	11,300	11,260	11,220	11,180	11,140	11,100	11,070	11,030	10,990	10,950
46	10,910	10,870	10,840	10,800	10,760	10,720	10,690	10,650	10,610	10,570
47	10,540	10,500	10,460	10,430	10,390	10,350	10,320	10,280	10,250	10,210
48	10,170	10,140	10,100	10,070	10,030	10,000	9,960	9,930	9,890	9,860
49	9,820	9,790	9,750	9,720	9,690	9,650	9,620	9,580	9,550	9,520
50	9,480	9,450	9,410	9,380	9,350	9,320	9,280	9,250	9,220	9,180
51	9,150	9,120	9,090	9,050	9,020	8,990	8,960	8,920	8,890	8,860
52	8,830	8,800	8,770	8,730	8,700	8,670	8,640	8,610	8,580	8,550
53	8,520	8,480	8,450	8,420	8,390	8,360	8,330	8,300	8,270	8,240
54	8,210	8,180	8,150	8,120	8,090	8,060	8,030	8,000	7,970	7,940
55	7,910	7,880	7,850	7,820	7,800	7,770	7,740	7,710	7,680	7,650
56	7,620	7,590	7,560	7,540	7,510	7,480	7,450	7,420	7,390	7,370
57	7,340	7,310	7,280	7,250	7,230	7,200	7,170	7,140	7,120	7,090
58	7,060	7,030	7,010	6,980	6,950	6,920	6,900	6,870	6,840	6,820
59	6,790	6,760	6,740	6,710	6,680	6,660	6,630	6,600	6,580	6,550
60	6,520	6,500	6,470	6,450	6,420	6,390	6,370	6,340	6,320	6,290
61	6,260	6,240	6,210	6,190	6,160	6,140	6,110	6,080	6,060	6,030
62	6,010	5,980	5,960	5,930	5,910	5,880	5,860	5,830	5,810	5,780
63	5,760	5,730	5,710	5,680	5,660	5,630	5,610	5,580	5,560	5,540
64	5,510	5,490	5,460	5,440	5,410	5,390	5,370	5,340	5,320	5,290
65	5,270	5,250	5,220	5,200	5,170	5,150	5,130	5,100	5,080	5,050
66	5,030	5,010	4,980	4,960	4,940	4,910	4,890	4,870	4,840	4,820
67	4,800	4,770	4,750	4,730	4,700	4,680	4,660	4,630	4,610	4,590
68	4,570	4,540	4,520	4,500	4,470	4,450	4,430	4,410	4,380	4,360
69	4,340	4,320	4,290	4,270	4,250	4,220	4,200	4,180	4,160	4,140
70	4,110	4,090	4,070	4,050	4,020	4,000	3,980	3,960	3,940	3,910
71	3,890	3,870	3,850	3,820	3,800	3,780	3,760	3,740	3,720	3,690
72	3,670	3,650	3,630	3,610	3,580	3,560	3,540	3,520	3,500	3,480
73	3,450	3,430	3,410	3,390	3,370	3,350	3,330	3,300	3,280	3,260
74	3,240	3,220	2,200	3,180	3,160	3,130	3,110	3,090	3,070	3,050
75	3,030	3,010	2,990	2,960	2,940	2,920	2,900	2,880	2,860	2,840
76	2,820	2,800	2,780	2,750	2,730	2,710	2,690	2,670	2,650	2,630
77	2,610	2,590	2,570	2,550	2,530	2,510	2,480	2,460	2,440	2,420
78	2,400	2,380	2,360	2,340	2,320	2,300	2,280	2,260	2,240	2,220
79	2,200	2,180	2,160	2,140	2,110	2,090	2,070	2,050	2,030	2,010
80	1,990	1,970	1,950	1,930	1,910	1,890	1,870	1,850	1,830	1,810
81	1,790	1,770	1,750	1,730	1,710	1,690	1,670	1,650	1,630	1,610
82	1,590	1,570	1,550	1,530	1,510	1,490	1,470	1,450	1,430	1,410
83	1,390	1,370	1,350	1,330	1,310	1,290	1,270	1,250	1,230	1,210
84	1,190	1,170	1,150	1,130	1,110	1,090	1,070	1,050	1,030	1,010
85	990	970	950	930	910	890	870	850	830	810
86	790	770	750	730	710	690	670	650	630	610
87	590	570	550	530	510	490	470	450	430	410
88	390	370	360	340	320	300	280	260	240	220
89	200	180	160	140	120	100	80	60	40	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

57 MINUTES AFTER RELEASE  
11,500 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
5	131,450	128,860	126,360	123,970	121,660	119,430	117,290	115,220	113,220	111,280
6	109,420	107,610	105,860	104,170	102,520	100,930	99,390	97,890	96,440	95,030
7	93,660	92,330	91,030	89,770	88,550	87,350	86,190	85,060	83,950	82,880
8	81,830	80,800	79,800	78,830	77,880	76,950	76,040	75,150	74,290	73,440
9	72,610	71,800	71,000	70,230	69,470	68,720	67,990	67,280	66,580	65,890
10	65,220	64,560	63,910	63,280	62,660	62,050	61,450	60,860	60,290	59,720
11	59,160	58,620	58,080	57,550	57,030	56,520	56,020	55,530	55,050	54,570
12	54,100	53,640	53,190	52,740	52,310	51,870	51,450	51,030	50,620	50,210
13	49,810	49,420	49,030	48,650	48,270	47,900	47,540	47,180	46,820	46,470
14	46,120	45,780	45,450	45,120	44,790	44,470	44,150	43,840	43,530	43,220
15	42,920	42,620	42,330	42,040	41,750	41,470	41,190	40,910	40,640	40,370
16	40,110	39,840	39,580	39,330	39,070	38,820	38,580	38,330	38,090	37,850
17	37,620	37,380	37,150	36,920	36,700	36,470	36,250	36,030	35,820	35,610
18	35,390	35,180	34,980	34,770	34,570	34,370	34,170	33,980	33,780	33,590
19	33,400	33,210	33,020	32,840	32,660	32,470	32,300	32,120	31,940	31,770
20	31,600	31,420	31,260	31,090	30,920	30,760	30,600	30,430	30,270	30,120
21	29,960	29,800	29,650	29,500	29,340	29,190	29,050	28,900	28,750	28,610
22	28,460	28,320	28,180	28,040	27,900	27,760	27,630	27,490	27,360	27,220
23	27,090	26,960	26,830	26,700	26,580	26,450	26,320	26,200	26,070	25,950
24	25,830	25,710	25,590	25,470	25,350	25,230	25,120	25,000	24,890	24,770
25	24,660	24,550	24,440	24,330	24,220	24,110	24,000	23,890	23,790	23,680
26	23,580	23,470	23,370	23,270	23,170	23,070	22,970	22,870	22,770	22,670
27	22,570	22,470	22,380	22,280	22,190	22,090	22,000	21,900	21,810	21,720
28	21,630	21,540	21,450	21,360	21,270	21,180	21,090	21,000	20,920	20,830
29	20,750	20,660	20,580	20,490	20,410	20,330	20,240	20,160	20,080	20,000
30	19,920	19,840	19,760	19,680	19,600	19,520	19,450	19,370	19,290	19,220
31	19,140	19,060	18,990	18,910	18,840	18,770	18,690	18,620	18,550	18,480
32	18,400	18,330	18,260	18,190	18,120	18,050	17,980	17,910	17,840	17,780
33	17,710	17,640	17,570	17,510	17,440	17,370	17,310	17,240	17,180	17,110
34	17,050	16,990	16,920	16,860	16,800	16,730	16,670	16,610	16,550	16,490
35	16,420	16,360	16,300	16,240	16,180	16,120	16,060	16,000	15,940	15,890
36	15,830	15,770	15,710	15,650	15,600	15,540	15,480	15,430	15,370	15,320
37	15,260	15,210	15,150	15,100	15,040	14,990	14,930	14,880	14,830	14,770
38	14,720	14,670	14,610	14,560	14,510	14,460	14,410	14,350	14,300	14,250
39	14,200	14,150	14,100	14,050	14,000	13,950	13,900	13,850	13,800	13,750
40	13,710	13,660	13,610	13,560	13,510	13,460	13,420	13,370	13,320	13,280
41	13,230	13,180	13,140	13,090	13,040	13,000	12,950	12,910	12,860	12,820
42	12,770	12,730	12,680	12,640	12,590	12,550	12,510	12,460	12,420	12,380
43	12,330	12,290	12,250	12,200	12,160	12,120	12,080	12,030	11,990	11,950
44	11,910	11,870	11,830	11,780	11,740	11,700	11,660	11,620	11,580	11,540

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45-----	11,500	11,460	11,420	11,380	11,340	11,300	11,260	11,220	11,180	11,140
46-----	11,110	11,070	11,030	10,990	10,950	10,910	10,870	10,840	10,800	10,760
47-----	10,720	10,690	10,650	10,610	10,570	10,540	10,500	10,460	10,430	10,390
48-----	10,350	10,320	10,280	10,250	10,210	10,170	10,140	10,100	10,070	10,030
49-----	10,000	9,960	9,930	9,890	9,860	9,820	9,790	9,750	9,720	9,680
50-----	9,650	9,620	9,580	9,550	9,510	9,480	9,450	9,410	9,380	9,350
51-----	9,310	9,280	9,250	9,210	9,180	9,150	9,110	9,080	9,050	9,020
52-----	8,980	8,950	8,920	8,890	8,860	8,820	8,790	8,760	8,730	8,700
53-----	8,670	8,630	8,600	8,570	8,540	8,510	8,480	8,450	8,420	8,390
54-----	8,360	8,320	8,290	8,260	8,230	8,200	8,170	8,140	8,110	8,080
55-----	8,050	8,020	7,990	7,960	7,930	7,900	7,870	7,840	7,820	7,790
56-----	7,760	7,730	7,700	7,670	7,640	7,610	7,580	7,550	7,530	7,500
57-----	7,470	7,440	7,410	7,380	7,350	7,330	7,300	7,270	7,240	7,210
58-----	7,190	7,160	7,130	7,100	7,070	7,050	7,020	6,990	6,960	6,940
59-----	6,910	6,880	6,860	6,830	6,800	6,770	6,750	6,720	6,690	6,670
60-----	6,640	6,610	6,590	6,560	6,530	6,510	6,480	6,450	6,430	6,400
61-----	6,370	6,350	6,320	6,300	6,270	6,240	6,220	6,190	6,170	6,140
62-----	6,110	6,090	6,060	6,040	6,010	5,990	5,960	5,940	5,910	5,880
63-----	5,860	5,830	5,810	5,780	5,760	5,730	5,710	5,680	5,660	5,630
64-----	5,610	5,580	5,560	5,530	5,510	5,490	5,460	5,440	5,410	5,390
65-----	5,360	5,340	5,310	5,290	5,270	5,240	5,220	5,190	5,170	5,140
66-----	5,120	5,100	5,070	5,050	5,020	5,000	4,980	4,950	4,930	4,910
67-----	4,880	4,860	4,830	4,810	4,790	4,760	4,740	4,720	4,690	4,670
68-----	4,650	4,620	4,600	4,580	4,550	4,530	4,510	4,480	4,460	4,440
69-----	4,410	4,390	4,370	4,350	4,320	4,300	4,280	4,250	4,230	4,210
70-----	4,190	4,160	4,140	4,120	4,090	4,070	4,050	4,030	4,000	3,980
71-----	3,960	3,940	3,910	3,890	3,870	3,850	3,830	3,800	3,780	3,760
72-----	3,740	3,710	3,690	3,670	3,650	3,630	3,600	3,580	3,560	3,540
73-----	3,520	3,490	3,470	3,450	3,430	3,410	3,380	3,360	3,340	3,320
74-----	3,300	3,280	3,250	3,230	3,210	3,190	3,170	3,150	3,120	3,100
75-----	3,080	3,060	3,040	3,020	3,000	2,970	2,950	2,930	2,910	2,890
76-----	2,870	2,850	2,820	2,800	2,780	2,760	2,740	2,720	2,700	2,680
77-----	2,660	2,630	2,610	2,590	2,570	2,550	2,530	2,510	2,490	2,470
78-----	2,440	2,420	2,400	2,380	2,360	2,340	2,320	2,300	2,280	2,260
79-----	2,240	2,210	2,190	2,170	2,150	2,130	2,110	2,090	2,070	2,050
80-----	2,030	2,010	1,990	1,970	1,950	1,920	1,900	1,880	1,860	1,840
81-----	1,820	1,800	1,780	1,760	1,740	1,720	1,700	1,680	1,660	1,640
82-----	1,620	1,600	1,580	1,550	1,530	1,510	1,490	1,470	1,450	1,430
83-----	1,410	1,390	1,370	1,350	1,330	1,310	1,290	1,270	1,250	1,230
84-----	1,210	1,190	1,170	1,150	1,130	1,110	1,090	1,070	1,050	1,030
85-----	1,010	990	970	950	930	910	880	860	840	820
86-----	800	780	760	740	720	700	680	660	640	620
87-----	600	580	560	540	520	500	480	460	440	420
88-----	400	380	360	340	320	300	280	260	240	220
89-----	200	180	160	140	120	100	80	60	40	20

PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

58 MINUTES AFTER RELEASE  
11,700 YARDS ALTITUDE

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
5	133, 730	131, 100	128, 560	126, 130	123, 770	121, 500	119, 330	117, 220	115, 180	113, 220
6	111, 320	109, 480	107, 700	105, 980	104, 310	102, 690	101, 120	99, 600	98, 120	96, 680
7	95, 290	93, 930	92, 610	91, 330	90, 090	88, 870	87, 690	86, 540	85, 410	84, 320
8	83, 250	82, 210	81, 190	80, 200	79, 230	78, 290	77, 360	76, 460	75, 580	74, 720
9	73, 870	73, 050	72, 240	71, 450	70, 670	69, 920	69, 180	68, 450	67, 740	67, 040
10	66, 350	65, 680	65, 030	64, 380	63, 750	63, 130	62, 520	61, 920	61, 330	60, 760
11	60, 190	59, 630	59, 090	58, 550	58, 020	57, 510	57, 000	56, 500	56, 000	55, 520
12	55, 040	54, 580	54, 110	53, 660	53, 220	52, 780	52, 340	51, 920	51, 500	51, 080
13	50, 680	50, 280	49, 880	49, 480	49, 110	48, 730	48, 360	48, 000	47, 630	47, 280
14	46, 930	46, 580	46, 240	45, 900	45, 570	45, 240	44, 920	44, 600	44, 280	43, 970
15	43, 670	43, 360	43, 060	42, 770	42, 480	42, 190	41, 900	41, 620	41, 350	41, 070
16	40, 800	40, 540	40, 270	40, 010	39, 750	39, 500	39, 250	39, 000	38, 750	38, 510
17	38, 270	38, 030	37, 800	37, 560	37, 330	37, 110	36, 880	36, 660	36, 440	36, 220
18	36, 010	35, 800	35, 590	35, 380	35, 170	34, 970	34, 770	34, 570	34, 370	34, 170
19	33, 980	33, 790	33, 600	33, 410	33, 220	33, 040	32, 860	32, 680	32, 500	32, 320
20	32, 150	31, 970	31, 800	31, 630	31, 460	31, 290	31, 130	30, 960	30, 800	30, 640
21	30, 480	30, 320	30, 160	30, 010	29, 850	29, 700	29, 550	29, 400	29, 250	29, 100
22	28, 960	28, 810	28, 670	28, 530	28, 390	28, 250	28, 110	27, 970	27, 830	27, 700
23	27, 560	27, 430	27, 300	27, 170	27, 040	26, 910	26, 780	26, 650	26, 530	26, 400
24	26, 280	26, 160	26, 030	25, 910	25, 790	25, 670	25, 560	25, 440	25, 320	25, 210
25	25, 090	24, 980	24, 860	24, 750	24, 640	24, 530	24, 420	24, 310	24, 200	24, 090
26	23, 990	23, 880	23, 780	23, 670	23, 570	23, 470	23, 360	23, 260	23, 160	23, 060
27	22, 960	22, 860	22, 770	22, 670	22, 570	22, 480	22, 380	22, 280	22, 190	22, 100
28	22, 000	21, 910	21, 820	21, 730	21, 640	21, 550	21, 460	21, 370	21, 280	21, 190
29	21, 110	21, 020	20, 930	20, 850	20, 760	20, 680	20, 600	20, 510	20, 430	20, 350
30	20, 270	20, 180	20, 100	20, 020	19, 940	19, 860	19, 780	19, 710	19, 630	19, 550
31	19, 470	19, 400	19, 320	19, 240	19, 170	19, 090	19, 020	18, 940	18, 870	18, 800
32	18, 720	18, 650	18, 580	18, 510	18, 440	18, 370	18, 300	18, 230	18, 150	18, 090
33	18, 020	17, 950	17, 880	17, 810	17, 740	17, 680	17, 610	17, 540	17, 480	17, 410
34	17, 350	17, 280	17, 220	17, 150	17, 090	17, 020	16, 960	16, 900	16, 830	16, 770
35	16, 710	16, 650	16, 590	16, 530	16, 460	16, 400	16, 340	16, 280	16, 220	16, 160
36	16, 100	16, 040	15, 990	15, 930	15, 870	15, 810	15, 750	15, 700	15, 640	15, 580
37	15, 530	15, 470	15, 410	15, 360	15, 300	15, 250	15, 190	15, 140	15, 080	15, 030
38	14, 970	14, 920	14, 870	14, 810	14, 760	14, 710	14, 660	14, 600	14, 550	14, 500
39	14, 450	14, 400	14, 350	14, 300	14, 240	14, 190	14, 140	14, 090	14, 040	13, 990
40	13, 940	13, 890	13, 840	13, 800	13, 750	13, 700	13, 650	13, 600	13, 550	13, 510
41	13, 460	13, 410	13, 360	13, 320	13, 270	13, 220	13, 180	13, 130	13, 090	13, 040
42	12, 990	12, 950	12, 900	12, 860	12, 810	12, 770	12, 720	12, 680	12, 630	12, 590
43	12, 550	12, 500	12, 460	12, 420	12, 370	12, 330	12, 290	12, 240	12, 200	12, 160
44	12, 120	12, 070	12, 030	11, 990	11, 950	11, 910	11, 860	11, 820	11, 780	11, 740

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	11,700	11,660	11,620	11,580	11,540	11,500	11,460	11,420	11,380	11,340
46	11,300	11,260	11,220	11,180	11,140	11,100	11,060	11,030	10,990	10,950
47	10,910	10,870	10,830	10,800	10,760	10,720	10,680	10,650	10,610	10,570
48	10,530	10,500	10,460	10,420	10,390	10,350	10,310	10,280	10,240	10,210
49	10,170	10,130	10,100	10,060	10,030	9,990	9,960	9,920	9,890	9,850
50	9,820	9,780	9,750	9,710	9,680	9,640	9,610	9,580	9,540	9,510
51	9,470	9,440	9,410	9,370	9,340	9,310	9,270	9,240	9,210	9,170
52	9,140	9,110	9,080	9,040	9,010	8,980	8,950	8,910	8,880	8,850
53	8,820	8,780	8,750	8,720	8,690	8,660	8,630	8,590	8,560	8,530
54	8,500	8,470	8,440	8,410	8,380	8,350	8,310	8,280	8,250	8,220
55	8,190	8,160	8,130	8,100	8,070	8,040	8,010	7,980	7,950	7,920
56	7,890	7,860	7,830	7,800	7,770	7,740	7,710	7,690	7,660	7,630
57	7,600	7,570	7,540	7,510	7,480	7,450	7,430	7,400	7,370	7,340
58	7,310	7,280	7,250	7,230	7,200	7,170	7,140	7,110	7,090	7,060
59	7,030	7,000	6,970	6,950	6,920	6,890	6,860	6,840	6,810	6,780
60	6,750	6,730	6,700	6,670	6,650	6,620	6,590	6,570	6,540	6,510
61	6,490	6,460	6,430	6,410	6,380	6,350	6,330	6,300	6,270	6,250
62	6,220	6,190	6,170	6,140	6,120	6,090	6,060	6,040	6,010	5,990
63	5,960	5,940	5,910	5,880	5,860	5,830	5,810	5,780	5,760	5,730
64	5,710	5,680	5,660	5,630	5,610	5,580	5,560	5,530	5,510	5,480
65	5,460	5,430	5,410	5,380	5,360	5,330	5,310	5,280	5,260	5,230
66	5,210	5,180	5,160	5,140	5,110	5,090	5,060	5,040	5,010	4,990
67	4,970	4,940	4,920	4,890	4,870	4,850	4,820	4,800	4,770	4,750
68	4,730	4,700	4,680	4,660	4,630	4,610	4,590	4,560	4,540	4,510
69	4,490	4,470	4,440	4,420	4,400	4,370	4,350	4,330	4,300	4,280
70	4,260	4,240	4,210	4,190	4,170	4,140	4,120	4,100	4,070	4,050
71	4,030	4,010	3,980	3,960	3,940	3,910	3,890	3,870	3,850	3,820
72	3,800	3,780	3,760	3,730	3,710	3,690	3,670	3,640	3,620	3,600
73	3,580	3,550	3,530	3,510	3,490	3,470	3,440	3,420	3,400	3,380
74	3,350	3,330	3,310	3,290	3,270	3,240	3,220	3,200	3,180	3,160
75	3,140	3,110	3,090	3,070	3,050	3,030	3,000	2,980	2,960	2,940
76	2,920	2,900	2,870	2,850	2,830	2,810	2,790	2,770	2,740	2,720
77	2,700	2,680	2,660	2,640	2,620	2,590	2,570	2,550	2,530	2,510
78	2,490	2,470	2,440	2,420	2,400	2,380	2,360	2,340	2,320	2,300
79	2,270	2,250	2,230	2,210	2,190	2,170	2,150	2,130	2,110	2,080
80	2,060	2,040	2,020	2,000	1,980	1,960	1,940	1,920	1,890	1,870
81	1,850	1,830	1,810	1,790	1,770	1,750	1,730	1,710	1,690	1,670
82	1,640	1,620	1,600	1,580	1,560	1,540	1,520	1,500	1,480	1,460
83	1,440	1,420	1,400	1,370	1,350	1,330	1,310	1,290	1,270	1,250
84	1,230	1,210	1,190	1,170	1,150	1,130	1,110	1,090	1,060	1,040
85	1,020	1,000	980	960	940	920	900	880	860	840
86	820	800	780	760	740	720	700	670	650	630
87	610	590	570	550	530	510	490	470	450	430
88	410	390	370	350	330	310	290	270	250	220
89	200	180	160	140	120	100	80	60	40	20





Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Horizontal distance of balloon in yards from observing point										
45	11,900	11,860	11,820	11,780	11,730	11,690	11,650	11,610	11,570	11,530
46	11,490	11,450	11,410	11,370	11,330	11,290	11,250	11,210	11,170	11,140
47	11,100	11,060	11,020	10,980	10,940	10,900	10,870	10,830	10,790	10,750
48	10,710	10,680	10,640	10,600	10,570	10,530	10,490	10,450	10,420	10,380
49	10,340	10,310	10,270	10,240	10,200	10,160	10,130	10,090	10,060	10,020
50	9,990	9,950	9,910	9,880	9,840	9,810	9,770	9,740	9,710	9,670
51	9,640	9,600	9,570	9,530	9,500	9,470	9,430	9,400	9,360	9,330
52	9,300	9,260	9,230	9,200	9,160	9,130	9,100	9,070	9,030	9,000
53	8,970	8,930	8,900	8,870	8,840	8,810	8,770	8,740	8,710	8,680
54	8,650	8,610	8,580	8,550	8,520	8,490	8,460	8,430	8,390	8,360
55	8,330	8,300	8,270	8,240	8,210	8,180	8,150	8,120	8,090	8,060
56	8,030	8,000	7,970	7,940	7,910	7,880	7,850	7,820	7,790	7,760
57	7,730	7,700	7,670	7,640	7,610	7,580	7,550	7,520	7,490	7,460
58	7,440	7,410	7,380	7,350	7,320	7,290	7,260	7,240	7,210	7,180
59	7,150	7,120	7,090	7,070	7,040	7,010	6,980	6,950	6,930	6,900
60	6,870	6,840	6,820	6,790	6,760	6,730	6,710	6,680	6,650	6,620
61	6,600	6,570	6,540	6,520	6,490	6,460	6,430	6,410	6,380	6,350
62	6,330	6,300	6,270	6,250	6,220	6,190	6,170	6,140	6,120	6,090
63	6,060	6,040	6,010	5,990	5,960	5,930	5,910	5,880	5,860	5,830
64	5,800	5,780	5,750	5,730	5,700	5,680	5,650	5,630	5,600	5,570
65	5,550	5,520	5,500	5,470	5,450	5,420	5,400	5,370	5,350	5,320
66	5,300	5,270	5,250	5,220	5,200	5,170	5,150	5,120	5,100	5,080
67	5,050	5,030	5,000	4,980	4,950	4,930	4,900	4,880	4,860	4,830
68	4,810	4,780	4,760	4,740	4,710	4,690	4,660	4,640	4,620	4,590
69	4,570	4,540	4,520	4,500	4,470	4,450	4,430	4,400	4,380	4,350
70	4,330	4,310	4,280	4,260	4,240	4,210	4,190	4,170	4,140	4,120
71	4,100	4,070	4,050	4,030	4,000	3,980	3,960	3,940	3,910	3,890
72	3,870	3,840	3,820	3,800	3,770	3,750	3,730	3,710	3,680	3,660
73	3,640	3,620	3,590	3,570	3,550	3,520	3,500	3,480	3,460	3,430
74	3,410	3,390	3,370	3,340	3,320	3,300	3,280	3,260	3,230	3,210
75	3,190	3,170	3,140	3,120	3,100	3,080	3,060	3,030	3,010	2,990
76	2,970	2,950	2,920	2,900	2,880	2,860	2,830	2,810	2,790	2,770
77	2,750	2,730	2,700	2,680	2,660	2,640	2,620	2,590	2,570	2,550
78	2,530	2,510	2,490	2,460	2,440	2,420	2,400	2,380	2,360	2,330
79	2,310	2,290	2,270	2,250	2,230	2,210	2,180	2,160	2,140	2,120
80	2,100	2,080	2,060	2,030	2,010	1,990	1,970	1,950	1,930	1,910
81	1,880	1,860	1,840	1,820	1,800	1,780	1,760	1,740	1,710	1,690
82	1,670	1,650	1,630	1,610	1,590	1,570	1,550	1,520	1,500	1,480
83	1,460	1,440	1,420	1,400	1,380	1,360	1,330	1,310	1,290	1,270
84	1,250	1,230	1,210	1,190	1,170	1,150	1,120	1,100	1,080	1,060
85	1,040	1,020	1,000	980	960	940	920	890	870	850
86	830	810	790	770	750	730	710	690	670	640
87	620	600	580	560	540	520	500	480	460	440
88	420	390	370	350	330	310	290	270	250	230
89	210	190	170	150	120	100	80	60	40	20

# PILOT BALLOON TABLES (30-GRAM) HORIZONTAL DISTANCE

## 60 MINUTES AFTER RELEASE

### 12,100 YARDS ALTITUDE

Degrees	<i>Elevation angle of balloon in degrees and tenths of a degree</i>									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<i>Horizontal distance of balloon in yards from observing point</i>										
5	138,300	135,580	132,950	130,440	128,010	125,660	123,410	121,230	119,120	117,090
6	115,120	113,220	111,380	109,600	107,870	106,200	104,580	103,000	101,470	99,990
7	98,550	97,140	95,780	94,460	93,170	91,910	90,690	89,490	88,330	87,200
8	86,100	85,020	83,970	82,940	81,940	80,960	80,010	79,070	78,160	77,270
9	76,400	75,540	74,710	73,890	73,090	72,310	71,540	70,790	70,050	69,330
10	68,620	67,930	67,250	66,580	65,930	65,290	64,660	64,040	63,430	62,830
11	62,250	61,670	61,110	60,550	60,010	59,470	58,950	58,430	57,920	57,420
12	56,930	56,440	55,960	55,500	55,030	54,580	54,130	53,690	53,260	52,830
13	52,410	52,000	51,590	51,190	50,790	50,400	50,020	49,640	49,260	48,890
14	48,530	48,170	47,820	47,470	47,130	46,790	46,450	46,120	45,800	45,480
15	45,160	44,850	44,540	44,230	43,930	43,630	43,340	43,050	42,760	42,480
16	42,200	41,920	41,650	41,380	41,110	40,850	40,590	40,330	40,080	39,830
17	39,580	39,330	39,090	38,850	38,610	38,380	38,140	37,910	37,690	37,460
18	37,240	37,020	36,800	36,590	36,370	36,160	35,950	35,750	35,540	35,340
19	35,140	34,940	34,750	34,550	34,360	34,170	33,980	33,790	33,610	33,430
20	33,240	33,060	32,890	32,710	32,540	32,360	32,190	32,020	31,850	31,690
21	31,520	31,360	31,200	31,040	30,880	30,720	30,560	30,410	30,250	30,100
22	29,950	29,800	29,650	29,500	29,360	29,210	29,070	28,930	28,780	28,640
23	28,510	28,370	28,230	28,100	27,960	27,830	27,700	27,570	27,430	27,300
24	27,180	27,050	26,920	26,800	26,670	26,550	26,430	26,310	26,190	26,070
25	25,950	25,830	25,710	25,600	25,480	25,370	25,260	25,140	25,030	24,920
26	24,810	24,700	24,590	24,480	24,380	24,270	24,160	24,060	23,950	23,850
27	23,750	23,650	23,540	23,440	23,340	23,240	23,140	23,050	22,950	22,850
28	22,760	22,660	22,570	22,470	22,380	22,290	22,190	22,100	22,010	21,920
29	21,830	21,740	21,650	21,560	21,470	21,390	21,300	21,210	21,130	21,040
30	20,960	20,870	20,790	20,710	20,620	20,540	20,460	20,380	20,300	20,220
31	20,140	20,060	19,980	19,900	19,820	19,750	19,670	19,590	19,510	19,440
32	19,360	19,290	19,210	19,140	19,070	18,990	18,920	18,850	18,780	18,700
33	18,630	18,560	18,490	18,420	18,350	18,280	18,210	18,140	18,070	18,010
34	17,940	17,870	17,810	17,740	17,670	17,610	17,540	17,470	17,410	17,350
35	17,280	17,220	17,150	17,090	17,030	16,960	16,900	16,840	16,780	16,710
36	16,650	16,590	16,530	16,470	16,410	16,350	16,290	16,230	16,170	16,120
37	16,060	16,000	15,940	15,880	15,830	15,770	15,710	15,650	15,600	15,540
38	15,490	15,430	15,380	15,320	15,270	15,210	15,160	15,100	15,050	15,000
39	14,940	14,890	14,840	14,780	14,730	14,680	14,630	14,570	14,520	14,470
40	14,420	14,370	14,320	14,270	14,220	14,170	14,120	14,070	14,020	13,970
41	13,920	13,870	13,820	13,770	13,730	13,680	13,630	13,580	13,530	13,490
42	13,440	13,390	13,340	13,300	13,250	13,200	13,160	13,110	13,070	13,020
43	12,980	12,930	12,890	12,840	12,800	12,750	12,710	12,660	12,620	12,570
44	12,530	12,490	12,440	12,400	12,360	12,310	12,270	12,230	12,180	12,140

Degrees	Elevation angle of balloon in degrees and tenths of a degree									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	Horizontal distance of balloon in yards from observing point									
45	12,100	12,060	12,020	11,970	11,930	11,890	11,850	11,810	11,770	11,750
46	11,680	11,640	11,600	11,560	11,520	11,480	11,440	11,400	11,360	11,320
47	11,280	11,240	11,200	11,170	11,130	11,090	11,050	11,010	10,970	10,930
48	10,890	10,860	10,820	10,780	10,740	10,710	10,670	10,630	10,590	10,560
49	10,520	10,480	10,440	10,410	10,370	10,330	10,300	10,260	10,230	10,190
50	10,150	10,120	10,080	10,050	10,010	9,970	9,940	9,900	9,870	9,830
51	9,800	9,760	9,730	9,690	9,660	9,620	9,590	9,560	9,520	9,490
52	9,450	9,420	9,390	9,350	9,320	9,280	9,250	9,220	9,180	9,150
53	9,120	9,080	9,050	9,020	8,990	8,950	8,920	8,890	8,860	8,820
54	8,790	8,760	8,730	8,690	8,660	8,630	8,600	8,570	8,540	8,500
55	8,470	8,440	8,410	8,380	8,350	8,320	8,280	8,250	8,220	8,190
56	8,160	8,130	8,100	8,070	8,040	8,010	7,980	7,950	7,920	7,890
57	7,860	7,830	7,800	7,770	7,740	7,710	7,680	7,650	7,620	7,590
58	7,560	7,530	7,500	7,470	7,440	7,410	7,390	7,360	7,330	7,300
59	7,270	7,240	7,210	7,180	7,160	7,130	7,100	7,070	7,040	7,010
60	6,990	6,960	6,930	6,900	6,870	6,850	6,820	6,790	6,760	6,730
61	6,710	6,680	6,650	6,620	6,600	6,570	6,540	6,520	6,490	6,460
62	6,430	6,410	6,380	6,350	6,330	6,300	6,270	6,250	6,220	6,190
63	6,170	6,140	6,110	6,090	6,060	6,030	6,010	5,980	5,950	5,930
64	5,900	5,880	5,850	5,820	5,800	5,770	5,750	5,720	5,690	5,670
65	5,640	5,620	5,590	5,570	5,540	5,510	5,490	5,460	5,440	5,410
66	5,390	5,360	5,340	5,310	5,290	5,260	5,240	5,210	5,190	5,160
67	5,140	5,110	5,090	5,060	5,040	5,010	4,990	4,960	4,940	4,910
68	4,890	4,860	4,840	4,820	4,790	4,770	4,740	4,720	4,690	4,670
69	4,640	4,620	4,600	4,570	4,550	4,520	4,500	4,480	4,450	4,430
70	4,400	4,380	4,360	4,350	4,310	4,280	4,260	4,240	4,210	4,190
71	4,170	4,140	4,120	4,100	4,070	4,050	4,030	4,000	3,980	3,950
72	3,930	3,910	3,880	3,860	3,840	3,820	3,790	3,770	3,750	3,720
73	3,700	3,680	3,650	3,630	3,610	3,580	3,560	3,540	3,520	3,490
74	3,470	3,450	3,420	3,400	3,380	3,360	3,330	3,310	3,290	3,260
75	3,240	3,220	3,200	3,170	3,150	3,130	3,110	3,080	3,060	3,040
76	3,020	2,990	2,970	2,950	2,930	2,900	2,880	2,860	2,840	2,820
77	2,790	2,770	2,750	2,730	2,700	2,680	2,660	2,640	2,620	2,590
78	2,570	2,550	2,530	2,510	2,480	2,460	2,440	2,420	2,400	2,370
79	2,350	2,330	2,310	2,290	2,260	2,240	2,220	2,200	2,180	2,160
80	2,130	2,110	2,090	2,070	2,050	2,020	2,000	1,980	1,960	1,940
81	1,920	1,890	1,870	1,850	1,830	1,810	1,790	1,770	1,740	1,720
82	1,700	1,680	1,660	1,640	1,610	1,590	1,570	1,550	1,530	1,510
83	1,490	1,460	1,440	1,420	1,400	1,380	1,360	1,340	1,310	1,290
84	1,270	1,250	1,230	1,210	1,190	1,170	1,140	1,120	1,100	1,080
85	1,060	1,040	1,020	990	970	950	930	910	890	870
86	850	820	800	780	760	740	720	700	680	660
87	630	610	590	570	550	530	510	490	460	440
88	420	400	380	360	340	320	300	270	250	230
89	210	190	170	150	130	110	80	60	40	20

