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W.O. Code No. 12714

RANGE TABLES

FOR

·303-inch VICKERS MACHINE-GUN

1960

Standard Range Table for ·303-inch Mark 7 Ammunition

[Supersedes Range Table for ·303-inch Vickers Machine Gun, 1937 and Addendum to Mark 7 Ammunition in Range Tables for ·303-inch Vickers Machine Gun 1938 (Code Nos. 1460 and 1461)]

By Command of the Army Council,

R. H. Dewey

War Office,
11th July, 1960

RANGE TABLE

FOR

·303-inch MARK 7 AMMUNITION

Cartridge: S.A. Ball, ·303-inch, Mark 7.

Muzzle Velocity for which the Range Table is compiled: **2,440 f.s.**

INDEX

RANGE TABLE FOR ·303-inch,

1	2	3	4	5	6	7	8	9	10			11	12
			Corrections required for 10 m.p.h. Wind when the angle the wind makes with the Line of Fire in terms of a Clock Ray is—						No. of Elevations required.				
Range.	Tangent Angle.	Crest Clearance Angle.	3 or 9	2, 4, 8 or 10		1, 5, 7 or 11		6 or 12	Map	Rangefinder	Estimated	SAFETY ANGLE.	Equivalent Range.
			Line.	Line.	Range.	Line.	Range.	Range.					
yds.	° ′	° ′	mins.	mins.	yds.	mins.	yds.	yds.				° ′	yds.
50	0 1	0 10	1	1	0	1	0	0	1	1	1	3 17	1800
100	0 3	0 11	2	2	0	1	0	0	1	1	1	2 41	1650
150	0 5	0 12	3	3	0	1	0	0	1	1	1	2 17	1550
200	0 7	0 14	4	3	0	2	0	0	1	1	1	2 1	1450
250	0 9	0 16	5	4	0	2	0	0	1	1	1	1 50	1400
300	0 11	0 19	6	5	0	3	1	1	1	1	1	1 43	1350
350	0 14	0 21	6	5	0	3	1	1	1	1	1	1 39	1300
400	0 16	0 24	7	6	1	3	1	1	1	1	1	1 37	1300
450	0 19	0 27	7	6	1	4	1	2	1	1	1	1 36	1300
500	0 22	0 30	8	7	1	4	2	2	1	1	1	1 37	1300
550	0 25	0 34	9	7	1	4	2	2	1	1	1	1 39	1300
600	0 28	0 38	9	8	1	5	2	3	1	1	1	1 41	1300
650	0 32	0 43	10	8	1	5	3	3	1	1	1	1 45	1350
700	0 35	0 47	10	9	2	5	3	3	1	1	1	1 49	1350
750	0 39	0 51	11	10	2	6	3	4	1	1	1	1 54	1400
800	0 43	0 56	12	10	2	6	4	4	1	1	1	1 58	1450
850	0 47	1 2	13	11	2	6	4	5	1	1	1	2 4	1450
900	0 52	1 9	13	12	3	7	5	5	1	1	1	2 10	1500
950	0 57	1 15	14	12	3	7	5	6	1	1	1	2 16	1550
1000	1 2	1 22	15	13	3	7	6	7	1	1	1	2 22	1550
1050	1 8	1 29	15	13	4	8	7	8	1	1	3	2 28	1600
1100	1 14	1 36	16	14	4	8	7	8	1	1	3	2 34	1600
1150	1 20	1 43	17	15	5	8	8	9	1	1	3	2 40	1650
1200	1 27	1 50	18	15	5	9	9	10	1	1	3	2 47	1700
1250	1 34	1 58	18	16	5	9	9	11	1	1	3	2 54	1700
1300	1 41	2 6	19	17	6	10	10	12	1	1	3	3 2	1750
1350	1 49	2 15	20	17	6	10	11	13	1	1	3	3 10	1800
1400	1 57	2 25	21	18	7	10	12	14	1	1	3	3 18	1800
1450	2 6	2 35	22	19	7	11	13	15	1	1	3	3 27	1850
1500	2 15	2 45	22	19	8	11	14	16	1	1	3	3 37	1900

MARK 7 AMMUNITION

13	14	15	16	17	18	19	20	21	22	23	24
							Corrections to Elevation for—				
Minimum Clearance.	Depth of lowest shot below centre of cone.	Total depth of cone.	Dimensions of Horizontal Beaten Zone.		Time of Flight.	Slope of Descent.	10° F. decrease in temp. of air (normal = 60° F.).	1 in. decrease in barometer reading (normal = 30 in.).	Range.	Range on Mk. 8Z Sights.	Equivalent Range on Mk. 8Z Sights.
			Width.	Length.							
ft. metres	mins.	yds.	yds.	yds.	secs.	one in—	mins.	mins.	yds.	yds.	yds.
9 3					0·06	2280·0	0	0	50	—	2000
13 4					0·13	1050·0	0	0	100	—	1900
17 5					0·20	645·0	0	0	150	—	1650
20 6					0·28	415·0	0	0	200	50	1550
22 7					0·36	310·0	0	0	250	150	1450
24 7					0·45	245·0	0	0	300	200	1400
26 8					0·54	195·0	0	0	350	300	1350
28 8					0·63	155·0	0	0	400	350	1350
30 9					0·73	124·0	0	− 1	450	400	1350
33 10	7	2·2	2	250	0·83	102·0	0	− 1	500	500	1350
35 11	8	2·5	2	250	0·94	88·5	0	− 1	550	550	1350
38 12	8	2·9	3	250	1·05	77·0	0	− 1	600	600	1400
41 13	9	3·3	3	250	1·17	67·3	0	− 1	650	650	1400
45 14	9	3·7	3	250	1·29	59·1	+ 1	− 1	700	700	1450
49 15	10	4·2	4	250	1·41	52·1	+ 1	− 1	750	750	1500
53 16	10	4·7	4	245	1·54	46·2	+ 1	− 1	800	800	1500
57 17	11	5·3	4	245	1·67	41·2	+ 1	− 1	850	850	1550
61 19	12	6·1	4	245	1·81	37·0	+ 1	− 1	900	900	1600
65 20	13	7·0	5	245	1·95	33·5	+ 1	− 1	950	950	1650
69 21	14	8·0	5	240	2·10	30·5	+ 1	− 2	1000	1050	1700
73 22	14	8·9	6	240	2·25	27·9	+ 1	− 2	1050	1100	1700
77 23	15	9·7	6	240	2·41	25·6	+ 1	− 2	1100	1150	1750
80 24	15	10·3	7	235	2·57	23·5	+ 2	− 2	1150	1200	1800
84 26	15	10·7	7	225	2·73	21·5	+ 2	− 2	1200	1250	1850
87 27	15	11·0	8	215	2·90	19·7	+ 2	− 2	1250	1300	1900
91 28	15	11·3	8	205	3·08	18·1	+ 2	− 3	1300	1400	1900
95 29	15	11·6	9	195	3·26	16·6	+ 2	− 3	1350	1450	1950
99 30	15	12·0	9	185	3·44	15·3	+ 2	− 3	1400	1500	2000
103 31	15	12·4	10	175	3·63	14·2	+ 3	− 3	1450	1550	2050
107 33	15	12·8	10	170	3·83	13·2	+ 3	− 3	1500	1650	2100

RANGE TABLE FOR ·303-inch

1	2	3	4	5	6	7	8	9	10			11	12
Range.	Tangent Angle.	Crest Clearance Angle.	Corrections required for 10 m.p.h. Wind when the angle the wind makes with the Line of Fire in terms of a Clock Ray is—						No. of Elevations required.			SAFETY ANGLE.	Equivalent Range.
			3 or 9	2, 4, 8 or 10		1, 5, 7 or 11		6 or 12	Mk.	Knuckle.	Extended		
			Line.	Line.	Range.	Line.	Range.	Range.					
yds.	° ′	° ′	mins.	mins.	yds.	mins.	yds.	yds.				° ′	yds.
1550	2 25	2 56	23	20	9	12	15	17	3	3	5	3 48	1950
1600	2 35	3 8	24	21	9	12	16	18	3	3	5	3 59	1950
1650	2 46	3 20	25	21	10	12	17	19	3	3	5	4 11	2000
1700	2 57	3 33	26	22	10	13	18	21	3	3	5	4 24	2050
1750	3 9	3 47	27	23	11	13	19	22	3	3	5	4 38	2100
1800	3 21	4 1	28	24	12	14	20	23	3	3	5	4 53	2150
1850	3 34	4 16	28	25	12	14	21	24	3	3	5	5 9	2200
1900	3 47	4 32	29	25	13	15	22	26	3	3	5	5 26	2250
1950	4 1	4 49	30	26	14	15	23	27	3	3	5	5 44	2300
2000	4 16	5 8	31	27	14	16	25	29	3	3	5	6 4	2350
2050	4 32	5 28	32	28	15	16	26	30	5	5	–	6 25	2400
2100	4 48	5 48	33	29	16	17	27	31	5	5	–	6 48	2450
2150	5 5	6 9	34	30	16	17	28	33	5	5	–	7 13	2500
2200	5 23	6 32	36	31	17	18	30	35	5	5	–	7 39	2550
2250	5 42	6 56	37	32	18	18	31	37	5	5	–	8 6	2600
2300	6 1	7 21	38	33	19	19	33	38	5	5	–	8 35	2650
2350	6 21	7 46	39	34	20	19	34	39	5	5	–	9 6	2700
2400	6 42	8 12	40	35	21	20	36	41	5	5	–	9 38	2750
2450	7 4	8 40	41	36	22	21	37	43	5	5	–		
2500	7 27	9 10	43	37	23	21	39	45	5	5	–		
2550	7 51	9 41	44	38	23	22	41	47	5	7	–		
2600	8 16		45	39	24	23	42	49	5	7	–		
2650	8 42		46	40	25	23	44	51	5	7	–		
2700	9 10		48	41	27	24	46	53	5	7	–		
2750	9 39		49	43	28	25	48	55	5	7	–		
2800	10 10		51	44	29	25	50	57	5	7	–		

MARK 7 AMMUNITION—*continued*

13	14	15	16	17	18	19	20	21	22	23	24
Minimum Clearance.	Depth of lowest shot below centre of cone.	Total depth of cone.	Dimensions of Horizontal Beaten Zones.		Time of Flight.	Slope of Descent.	Corrections to Elevation for—		Range.	Range on Mk. 6Z Sights.	Equivalent Range on Mk. 6Z Sights.
			Width.	Length.			10°F. decrease in temp. of air (normal = 60°F.).	1 in. decrease in barometer reading (normal = 30 in.).			
ft. metres	mins.	yds.	yds.	yds.	secs.	ons in—	mins.	mins.	yds.	yds.	yds.
112 34	15	13·3	11	165	4·03	12·3	+ 3	– 4	1550	1700	2150
117 36	15	13·9	11	169	4·24	11·4	+ 3	– 5	1600	1750	2250
123 37	15	14·6	12	155	4·46	10·6	+ 3	– 5	1650	1850	2300
129 39	16	15·4	13	150	4·68	9·8	+ 4	– 6	1700	1900	2350
136 41	16	16·3	13	150	4·91	9·1	+ 4	– 6	1750	1950	2400
144 44	17	17·4	14	150	5·15	8·5	+ 4	– 7	1800	2050	2500
153 47	17	18·6	15	145	5·40	7·9	+ 4	– 7	1850	2100	2550
163 50	18	20·0	15	150	5·66	7·4	+ 5	– 8	1900	2150	2650
175 53	19	21·6	16	150	5·92	6·9	+ 5	– 8	1950	2250	2700
188 57	20	23·4	17	150	6·19	6·4	+ 6	– 9	2000	2300	2800
203 62	21	25·5	17	155	6·47	6·0	+ 6	–10	2050	2400	2850
220 67	23	27·8	18	155	6·76	5·6	+ 7	–11	2100	2450	2950
239 73	24	30·4	19	160	7·06	5·3	+ 7	–12	2150	2550	3050
260 79	26	33·4	19	165	7·37	5·0	+ 8	–13	2200	2600	3150
283 86	28	36·7	20	170	7·69	4·7	+ 8	–14	2250	2700	3200
309 94	30	40·4	21	175	8·02	4·4	+ 9	–15	2300	2800	3300
338 103	33	44·5	21	180	8·36	4·1	+10	–17	2350	2850	3400
369 112	35	48·9	22	185	8·70	3·8	+11	–19	2400	2950	3500
	38	53·7	23	190	9·05	3·5	+12	–20	2450	3000	
	41	59·0	23	190	9·42	3·2	+13	–22	2500	3100	
	44	64·7	24	195	9·80	3·0	+14	–24	2550	3150	
	47	71·0	25	200	10·20	2·8	+15	–26	2600	3250	
	50	77·9	26	205	10·61	2·6	+17	–28	2650	3350	
	54	85·4	27	205	11·03	2·4	+18	–30	2700	3400	
	58	93·7	28	210	11·47	2·2	+19	–33	2750	3500	
	63	103·0	28	215	11·93	2·1	+21	–36	2800	3600	

NOTES ON THE USE OF CORRECTIONS FOR ABNORMAL ATMOSPHERIC CONDITIONS

The following are the normal atmospheric conditions for sighting of small arms:—

(i) Barometric Pressure : 30 inches.
(ii) Temperature : 60 degrees Fahrenheit.
(iii) Wind : Nil.

Any variation from the above atmospheric conditions will affect the ranging of the bullet. To eliminate these effects, corrections are given in the range table to enable allowances to be made for any prevailing conditions.

(i) *Barometric Pressure*

Barometric pressure falls approximately 1 inch for every 1,000 feet above mean sea level. Therefore, the contour markings which give heights can be used to determine the pressure at any height. The difference from normal pressure will then be converted to a correction to elevation by the use of col. 21 of the range table.

Example :—

	Range to target	: 1,600 yards.
	Contour height of gun position	: 5,000 feet.
	*Pressure at mean sea level	: 31 inches.
	Therefore, Pressure at gun position	= 26 inches (fall of 5 inches).
	Difference from normal pressure	= — 4 inches.
Use Col. 21.	Correction for 1 inch decrease at 1,600 yards	= — 5 minutes.
	Therefore Correction for 4 inches decrease at 1,600 yards	= — 20 minutes.
Use Col. 2.	Tangent Angle for 1,600 yards	= 2° 35'.
	Correction for barometric pressure	= — 20'.
	Therefore, Corrected Tangent Angle	= 2° 15' which is the Tangent Angle for 1,500 yards.

Thus the range to be used on Tangent Sight should be 1,500 yards.

(ii) *Temperature*

Temperature falls approximately 3½°F. for every 1,000 feet rise in height of gun position. Therefore, the contour markings which give heights can be used to determine the temperature at any height. The difference from normal temperature will be converted to a correction to elevation by the use of col. 20 of the range table.

Example:—

	Range to target	: 1,450 yards.
	Contour height of gun position	: 3,000 feet.
	*Temperature at (say) 1,000 feet	: 37°F.
	Therefore, Temperature at gun position	= 30°F.
	Difference from normal temperature	= — 30°F.
Use Col. 20.	Correction for 10°F. decrease at 1,450 yards	= + 3 minutes.
	Therefore Correction for 30°F. decrease at 1,450 yards	= + 9 minutes.

Use Col. 2.	Tangent Angle for 1,450 yards	= 2° 6'.
	Correction for temperature	= + 9'.
	Therefore, Corrected Tangent Angle	= 2° 15' which is the Tangent Angle for 1,500 yards.

Thus the range to be used on Tangent Sight should be 1,500 yards.

*In (i) and (ii) above, (*a*) Barometric Pressure at mean sea level and temperatures at specific heights can be obtained from the nearest R.A. Command Post. (*b*) If the corrected Tangent Angle does not coincide with an exact machine gun range, work to the nearest machine gun range.

(iii) *Wind*

By estimating the strength and direction of the wind, an allowance for the effect of wind may be made. The strength may be estimated by using the guide below, and the direction by assuming the gun position to be at the centre of a clock dial and the target in the 12 o'clock position. Note the readings in the range table (cols. 4–9) against the appropriate range and clock ray of the prevailing wind. The figures given are for a 10 m.p.h. wind and these will be reduced or increased in proportion to the estimated strength of the wind.

For a head wind, *add* the range correction.
For a tail wind, *subtract* the range correction.

Example :—

	Range to target	: 1,450 yards.
	Wind	: 20 m.p.h. from 7 o'clock.
Use Col. 7.	Correction to line for 10 m.p.h. (7 o'clock ray)	= 11 minutes.
	Therefore Correction to line for 20 m.p.h. (7 o'clock ray)	= 2 × 11 minutes. = 22 minutes (to left).
Use Col. 8.	Correction to range for 10 m.p.h. (7 o'clock ray)	= 13 yards.
	Therefore Correction to range for 20 m.p.h. (7 o'clock ray)	= 2 × 13 yards. = 26 yards (subtract).

GUIDE TO ESTIMATING WIND SPEEDS

Speed m.p.h.	Effect
5	Gentle breeze; wind felt on face; leaves rustle; flags flap.
10	Leaves and small twigs in constant motion; flags do not fall (approx. 45° to pole).
15	Raises dust and loose paper; small branches are moved; flags straight (approx. 90° to pole).
20	Small trees begin to sway.
25–30	Large branches in motion; flags straight, whistling in telegraph wires.
35	Whole trees in motion; inconvenience felt in walking against wind.
40	Breaks twigs off trees; generally impedes progress.

LENGTH OF BEATEN ZONES ON SLOPING GROUND

1	2	3	4	5	6	7	8	9	10	11	12	13
	Range (Yards).											
SLOPE.	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	Length of Beaten Zones											
Forward. Slope of	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.
7° 1/8	25	40	50	60	65	70	75	85	100	125	150	175
6° 1/10	30	45	55	65	70	75	80	90	110	135	155	180
5° 1/12	35	50	65	75	80	80	85	95	115	140	165	185
4° 1/15	40	60	80	90	90	90	95	105	120	145	170	190
3° 1/20	50	75	95	110	105	100	105	115	130	155	175	195
2° 1/30	70	95	115	130	120	115	115	125	140	165	185	200
1° 1/60	105	135	160	165	150	135	130	135	150	175	190	205
30′ 1/115	150	175	190	180	165	145	140	145	160	180	195	210
Horizontal	250	245	240	230	185	160	150	150	165	185	200	215
Reverse. Slope of												
30′ 1/115	..	..	..	280	215	180	160	160	170	190	205	220
1° 1/60	..	..	..	345	255	200	175	170	180	195	210	225
2° 1/30	..	..	..	..	400	265	215	195	200	210	220	230
3° 1/20	..	..	..	..	..	395	270	225	225	230	235	240
4° 1/15	..	..	..	..	..	..	..	275	255	250	250	250
5° 1/12	..	..	..	..	..	..	..	..	295	275	265	255
6° 1/10	..	..	..	..	..	..	..	..	350	305	285	280
7° 1/8	..	..	..	..	..	..	..	..	430	345	305	280

FORMULA FOR DETERMINING ANGLE OF SIGHT

$$\text{Angle of sight (in minutes)} = \frac{(A_1 \times GO) + (A_2 \times OT)}{GT}$$

Where T is the target, G the gun line, O the OP. And where:—

A_1 is the angle of sight from G to O in minutes.

A_2 is the angle of sight from O to T in minutes.

A_1 and A_2 must be provided with their proper signs before being used in the formula, i.e., " + " for angles of elevation and " − " for angles of depression.

ALLOWANCE FOR MOVING TARGETS

At ranges between 800 and 2,800 yards:—

Multiply the target speed in miles per hour by 5.

This gives the angle in minutes through which the target will travel during the flight of the bullet.

Example:—

Target speed 12 m.p.h.

Fire ahead by 60 minutes (1 degree).

For targets moving obliquely across the line of fire, a proportion of this allowance should be given.

Below 800 yards, an allowance of 15–30 minutes will be sufficient.

INSTRUCTIONS FOR USING THE SUBTENSION TABLE ON PAGE 12

The subtended angle is printed along the top of the table, the range down the left side and the distances, in yards, which subtend the angles at the appropriate range in the body of the table:—

(a) To determine the width in yards of a target of known angular width at a known range.

Example:—

Range is 1,250 yards and angular width 2° 45′.

Against 1,250 yards—

2° is 44 yards.
40′ is 14 yards.
5′ is 2 yards.

∴ 2° 45′ subtends 60 yards.

(b) To determine the angle of sight to an object of known height above the guns and at a known range.

Example:—

Range 1,450 yards and height of object above the guns is 210 feet (70 yards).

Against 1,450 yards—

51 yards = 2°.
16 yards = 40′.
3 yards = 7′ or 8′

∴ Angle subtended is + 2° 47′ or 2° 48′.
Therefore Angle of Sight ordered to guns = +2° 50′.

TABLE FOR ·303-INCH, MARK 7

DOWN HILL

1	2	3	4	5	6	7	8
Angle of Sight							Target Range
45°	40°	35°	30°	25°	20°	15°	
yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.
400	450	450	450	450	500	500	**500**
450	450	500	500	500	550	550	**550**
500	500	550	550	550	600	600	**600**
500	550	600	600	600	650	650	**650**
550	600	650	650	650	700	700	**700**
600	650	700	700	700	750	750	**750**
650	700	700	750	750	800	800	**800**
700	750	750	800	800	850	850	**850**
750	800	800	850	850	850	900	**900**
800	800	850	900	900	900	950	**950**
800	850	900	950	950	950	1000	**1000**
850	900	950	950	1000	1000	1050	**1050**
900	950	1000	1000	1050	1050	1100	**1100**
950	1000	1050	1050	1100	1100	1150	**1150**
1000	1050	1100	1100	1150	1150	1200	**1200**
1050	1100	1150	1150	1200	1200	1250	**1250**
1100	1150	1200	1200	1250	1250	1300	**1300**
1150	1200	1200	1250	1300	1300	1350	**1350**
1150	1200	1250	1300	1350	1350	1400	**1400**
1200	1250	1300	1350	1400	1400	1450	**1450**
1250	1300	1350	1400	1450	1450	1450	**1500**
1300	1350	1400	1450	1500	1500	1500	**1550**
1350	1400	1450	1500	1500	1550	1550	**1600**
1400	1450	1500	1550	1550	1600	1600	**1650**
1450	1500	1550	1600	1600	1650	1650	**1700**
1500	1550	1600	1650	1650	1700	1700	**1750**
1550	1600	1650	1700	1700	1750	1750	**1800**
1550	1600	1700	1750	1750	1800	1800	**1850**
1600	1650	1750	1750	1800	1850	1850	**1900**
1650	1700	1750	1800	1850	1900	1900	**1950**
1700	1750	1800	1850	1900	1950	1950	**2000**
1750	1800	1850	1900	1950	2000	2000	**2050**
1800	1850	1900	1950	2000	2050	2050	**2100**
1850	1900	1950	2000	2050	2100	2100	**2150**
1900	1950	2000	2050	2100	2100	2150	**2200**
1900	2000	2050	2100	2150	2150	2200	**2250**
1950	2050	2100	2150	2200	2200	2250	**2300**
2000	2050	2150	2200	2250	2250	2300	**2350**
2050	2100	2200	2250	2300	2300	2350	**2400**
2100	2150	2250	2300	2350	2350	2400	**2450**
2150	2200	2250	2350	2400	2400	2450	**2500**
2200	2250	2300	2400	2450	2450	2500	**2550**
2200	2300	2350	2400	2450	2500	2550	**2600**
2250	2350	2400	2450	2500	2550	2600	**2650**
2300	2350	2450	2500	2550	2600	2650	**2700**
2350	2400	2500	2550	2600	2650	2700	**2750**
2400	2450	2550	2600	2650	2700	2750	**2800**

Instructions for Use of Table :—Find the Target Range in cols. 8 or 9. Read to the appropriate up-hill angle of sight column. The figure quoted is the corrected

Note.—Corrections for Barometer and

UP HILL

9	10	11	12	13	14	15	16
Target Range	Angle of Sight						
	15°	20°	25°	30°	35°	40°	45°
yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.
500	500	500	450	450	450	450	400
550	550	550	500	500	500	450	450
600	600	600	550	550	550	500	500
650	650	650	600	600	550	550	550
700	700	700	650	650	600	600	550
750	750	750	700	700	650	650	600
800	800	800	750	750	700	700	650
850	850	850	800	800	750	750	700
900	900	850	850	850	800	750	750
950	950	900	900	900	850	800	800
1000	1000	950	950	950	900	850	800
1050	1050	1000	1000	1000	950	900	850
1100	1100	1050	1050	1050	1000	950	900
1150	1150	1100	1100	1100	1050	1000	950
1200	1200	1150	1150	1100	1100	1050	1000
1250	1250	1200	1200	1150	1150	1100	1050
1300	1300	1250	1250	1200	1200	1150	1100
1350	1350	1300	1300	1250	1250	1200	1150
1400	1400	1350	1350	1300	1250	1250	1200
1450	1450	1400	1400	1350	1300	1250	1200
1500	1500	1450	1450	1400	1350	1300	1250
1550	1550	1500	1500	1450	1400	1350	1300
1600	1600	1550	1550	1500	1450	1400	1350
1650	1650	1600	1600	1550	1500	1450	1400
1700	1700	1650	1650	1600	1550	1500	1450
1750	1750	1700	1700	1650	1600	1550	1500
1800	1800	1750	1750	1700	1650	1600	1550
1850	1850	1800	1800	1750	1700	1650	1600
1900	1900	1850	1850	1800	1750	1700	1650
1950	1950	1900	1900	1850	1800	1750	1700
2000	2000	1950	1950	1900	1850	1800	1750
2050	2050	2000	2000	1950	1900	1850	1800
2100	2100	2050	2050	2000	1950	1900	1850
2150	2150	2100	2100	2050	2000	1950	1900
2200	2200	2150	2150	2100	2050	2000	1950
2250	2250	2200	2200	2150	2100	2050	2000
2300	2300	2250	2250	2200	2150	2100	2050
2350	2350	2300	2300	2250	2200	2150	2100
2400	2400	2400	2350	2300	2250	2200	2200
2450	2450	2450	2400	2350	2300	2250	2250
2500	2500	2500	2450	2450	2400	2350	2300
2550	2550	2550	2500	2500	2450	2400	2350
2600	2600	2600	2550	2550	2500	2450	2400
2650	2650	2650	2650	2600	2550	2550	2500
2700	2700	2700	2700	2650	2650	2600	2550
2750	2750	2750	2750	2750	2700	2700	2650
2800	2800	2800	2800	2800	2800	2750	2700

laterally on the left to the appropriate down-hill angle of sight column, or on the right range to be set on the sight.

Thermometer should be applied before use.

SUBTENSION

(Instructions for use

Range	DEGREES										MINUTES						100 yds. Subtension:—
	1	2	3	4	5	6	7	8	9	10	5	10	20	30	40	50	
yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	' '
50	1	2	3	3	4	5	6	7	8	9	0	0	0	0	1	1	—
100	2	3	5	7	9	11	12	14	16	18	0	0	1	1	1	1	—
150	3	5	8	10	13	16	18	21	24	26	0	1	1	1	2	2	—
200	3	7	10	14	17	21	25	28	32	35	0	1	1	2	2	3	—
250	4	9	13	17	22	26	31	35	40	44	0	1	1	2	3	4	—
300	5	10	16	21	26	32	37	42	48	53	0	1	2	3	3	4	—
350	6	12	18	24	31	37	43	49	55	62	1	1	2	3	4	5	—
400	7	14	21	28	35	42	49	56	63	71	1	1	2	3	5	6	—
450	8	16	24	31	39	47	55	63	71	79	1	1	3	4	5	7	—
500	9	17	26	35	44	53	61	70	79	88	1	1	3	4	6	7	—
550	10	19	29	38	48	58	68	77	87	97	1	2	3	5	6	8	—
600	10	21	31	42	52	63	74	84	95	106	1	2	3	5	7	9	—
650	11	23	34	45	57	68	80	91	103	115	1	2	4	6	8	9	—
700	12	24	37	49	61	74	86	98	111	123	1	2	4	6	8	10	—
750	13	26	39	52	66	79	92	105	119	132	1	2	4	7	9	11	—
800	14	28	42	56	70	84	98	112	127	141	1	2	5	7	9	12	—
850	15	30	45	59	74	89	104	119	135	150	1	2	5	7	10	12	—
900	16	31	47	63	79	95	111	126	143	159	1	3	5	8	10	13	—
950	17	33	50	66	83	100	117	134	150	168	1	3	6	8	11	14	—
1000	17	35	52	70	87	105	123	141	158	176	1	3	6	9	12	15	5 43
1050	18	37	55	73	92	110	129	148	166	185	2	3	6	9	12	15	5 27
1100	19	38	58	77	96	116	135	155	174	194	2	3	6	10	13	16	5 12
1150	20	40	60	80	101	121	141	162	182	203	2	3	7	10	13	17	4 58
1200	21	42	63	84	105	126	147	169	190	212	2	3	7	10	14	17	4 46
1250	22	44	66	87	109	131	153	176	198	220	2	4	7	11	14	18	4 35
1300	23	45	68	90	114	137	160	183	206	229	2	4	8	11	15	19	4 24
1350	24	47	71	94	118	142	166	190	214	238	2	4	8	12	16	20	4 14
1400	24	49	73	98	122	147	172	197	222	247	2	4	8	12	16	20	4 5
1450	25	51	76	101	127	152	178	204	230	256	2	4	8	12	16	21	3 57
1500	26	52	79	105	131	158	184	211	238	264	2	4	9	13	17	22	3 49

TABLE

are given on Page 9.)

Range	DEGREES										MINUTES						100 yds. Subtension:—
	1	2	3	4	5	6	7	8	9	10	5	10	20	30	40	50	
yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	yds.	' '
1550	27	54	81	108	136	163	190	218	245	273	2	5	9	14	18	23	3 42
1600	28	56	84	112	140	168	196	225	253	282	2	5	9	14	19	23	3 35
1650	29	58	86	115	144	173	203	232	261	291	2	5	10	14	19	24	3 28
1700	30	59	89	119	149	179	209	239	269	300	2	5	10	15	20	25	3 22
1750	31	61	92	122	153	184	215	246	277	309	2	5	10	15	20	25	3 16
1800	31	63	94	126	157	189	221	253	285	317	3	5	10	16	21	26	3 11
1850	32	65	97	129	162	194	227	260	293	326	3	5	11	16	22	27	3 6
1900	33	66	100	133	166	200	233	267	301	335	3	6	11	17	22	28	3 1
1950	34	68	102	136	171	205	239	274	309	344	3	6	11	17	23	28	2 56
2000	35	70	105	140	175	210	246	281	317	353	3	6	12	17	23	29	2 52
2050	36	72	107	143	179	215	252	288	325	361	3	6	12	18	24	30	2 48
2100	37	73	110	147	184	221	258	295	333	370	3	6	12	18	24	31	2 44
2150	38	75	113	150	188	226	264	302	341	379	3	6	13	19	25	31	2 40
2200	38	77	115	154	192	231	270	309	348	388	3	6	13	19	26	32	2 36
2250	39	79	118	157	197	236	276	316	356	397	3	7	13	20	26	33	2 33
2300	40	80	121	161	201	242	282	323	364	406	3	7	13	20	27	33	2 29
2350	41	82	123	164	206	247	289	330	372	414	3	7	14	21	27	34	2 26
2400	42	84	126	168	210	252	295	337	380	423	3	7	14	21	28	35	2 23
2450	43	86	128	171	214	258	301	344	388	432	4	7	14	21	29	36	2 20
2500	44	87	131	175	219	263	307	351	396	441	4	7	15	22	29	36	2 17
2550	45	89	134	178	223	268	313	358	404	450	4	7	15	22	30	37	2 15
2600	45	91	136	182	227	273	319	365	412	458	4	8	15	23	30	38	2 12
2650	46	93	139	185	232	279	325	372	420	467	4	8	15	23	31	39	2 10
2700	47	94	142	189	236	284	332	379	428	476	4	8	16	24	31	39	2 7
2750	48	96	144	192	241	289	338	386	436	485	4	8	16	24	32	40	2 5
2800	49	98	147	196	245	294	344	394	443	494	4	8	16	24	33	41	2 3
2850	50	100	149	199	249	300	350	401	451	503	4	8	17	25	33	41	2 0
2900	51	101	152	203	254	305	356	408	459	511	4	8	17	25	34	42	1 58
2950	51	103	155	206	258	310	362	415	467	520	4	9	17	26	34	43	1 56
3000	52	105	157	210	262	315	368	422	478	529	4	9	17	26	35	44	1 55

(78421) Wt. 8000/8824 2,500 9/40 Hw.