

# ON DISPERSION OF B.L. 7·2-IN. HOWITZER

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## ABSTRACT

The breadth and length of 50 per cent probability zones in B.L. 7·2-IN HOWITZER have been found to be quadratic functions of range, when the angle of projection is less than 45°.

It is of obvious interest to search for an expression which will give the dispersion at any range. The authors have found that the length L in yards and breadth B in yards of the 50 per cent probability zone are given by

$$B = a + b(R/1000) + C(R/1000)^2 \quad \dots \quad (1)$$

$$\text{and } (L/10) = p + q(R/1000) + r(R/1000)^2 \quad \dots \quad (2)$$

where R is the range in yards.

Table I gives the values a, b, c, p, q and r for the various charges in the Howitzer.

TABLE I

*Values of a, b, c, p, q and r for various charges in B.L. 7·2-IN. HOWITZER.*

Charge	a	b	c	p	q	r
I .. ..	2·323	0·6530	0·0824	2·920	0·338	0·0890
II .. ..	4·560	-0·5200	0·123	4·986	-0·190	0·0857
III .. ..	3·046	0·9411	0·00386	4·049	-0·123	0·0540
IV .. ..	7·900	-0·03116	0·00065	2·970	-0·0127	0·0406
V .. ..	6·697	-0·68431	0·0724	4·812	-0·484	0·0317

Table II gives the values of length and breadth of 50 per cent probability zones at various ranges for various charges as calculated from Equations (1) and (2), as well as those given in range tables.

TABLE II

*Dispersion of B.L. 7·2-IN. HOWITZER*

						B in Yards		L/10 in Yards	
						Observed	Calculated	Observed	Calculated
						<b>FIRST CHARGE</b>			
2	..	..	..	..	..	4	4·0	4	4·0
3	..	..	..	..	..	5	5·0	5	4·7
4	..	..	..	..	..	6	6·3	6	5·7

R/1000 in Yards					B in Yards		L/10 in Yards	
					Observed	Calculated	Observed	Calculated
<b>FIRST CHARGE—<i>contd.</i></b>								
4.5	..	..	..	..	7	6.9		
5	..	..	..	..	8	7.6	7	6.8
6	..	..	..	..	9	9.2	8	8.2
6.5	..	..	..	..	10	10.0	9	8.9
7	..	..	..	..	11	10.9	10	9.6
<b>SECOND CHARGE</b>								
2	..	..	..	..	4	4.0	5	5.0
5	..	..	..	..	5	5.0	6	6.2
6	..	..	..	..	6	5.9	7	6.5
7	..	..	..	..	7	7.0	8	7.9
8	..	..	..	..	8	8.3	9	9.0
8.5	..	..	..	..	9	9.0		
9	..	..	..	..	10	9.8	10	10.2
9.5	..	..	..	..			11	10.9
<b>THIRD CHARGE</b>								
2	..	..	..	..	6	5.9	4	4.0
4	..	..	..	..	7	6.9		
6	..	..	..	..	8	8.8	5	5.2
7	..	..	..	..			6	5.8
8	..	..	..	..	10	10.8	7	6.5
10	..	..	..	..	12	12.8	8	8.2
11	..	..	..	..	14	13.9	9	9.2
12	..	..	..	..	15	14.9	10	10.3
13	..	..	..	..	17	15.9	12	11.6
<b>FOURTH CHARGE</b>								
2	..	..	..	..	7	7.6	3	3.1
4	..	..	..	..	8	7.7		
5	..	..	..	..			4	3.9
6	..	..	..	..	9	8.3		
7	..	..	..	..			5	4.6

R/1000 in Yards	B in Yards		L/10 in Yards	
	Observed	Calculated	Observed	Calculated

FOURTH CHARGE—*contd.*

8	..	..	..	..	10	9.6	..	..
9	..	..	..	..	..	..	6	6.1
10	..	..	..	..	11	11.3	7	6.9
11	..	..	..	..	12	12.4	8	7.7
12	..	..	..	..	13	13.6	..	..
13	..	..	..	..	15	14.9	9	9.7
14	..	..	..	..	16	16.4	11	10.8
15	..	..	..	..	18	17.8	12	11.9
16	..	..	..	..	20	19.7	13	13.2
16.5	..	..	..	..	..	..	14	13.8

## FIFTH CHARGE

2	..	..	..	..	5	5.6	4	4.1
6	..	..	..	..	6	5.2	..	..
9	..	..	..	..	7	6.4	..	..
11	..	..	..	..	8	7.9	..	..
12	..	..	..	..	9	8.9	..	..
13	..	..	..	..	10	10.0	5	4.5
14	..	..	..	..	11	11.3	..	..
15	..	..	..	..	12	12.7	..	..
16	..	..	..	..	14	14.3	..	..
17	..	..	..	..	15	16.0	6	6.6
18	..	..	..	..	18	17.8	7	7.3
19	..	..	..	..	21	19.8	8	8.0
19.6	..	..	..	..	..	..	9	8.5

The calculated results as given by Equations (1) and (2) are in quite close agreement with the observed ones.

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