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**FIRING TABLES**  
**FOR**  
**GUN, 16-INCH, MK. II (NAVY)**  
**FIRING**  
**PROJECTILE, A. P., 2240-LB., MK. XI**  
**WITH**  
**FUZE, B.D., MK.X**

Prepared by the  
Ordnance Department, U. S. A.  
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GUN, 16-INCH, MK.II (NAVY)

INTRODUCTION

When standard Coast Artillery fire control instruments are available for preparing data for firing on moving or fixed targets, the battery commander will have little need for these firing tables. They become useful only for reference, since mechanical devices apply the necessary corrections for the various effects on range and deflection. Standard panoramic sights for Coast Artillery are designed to utilize azimuths in laying for directions.

1. GENERAL INFORMATION. These tables are based on firings conducted by the Navy at Dahlgren, Virginia from August until December of 1938. The  $G_0$  drag function was used in the reduction of data.

2. CHARACTERISTICS.

a. Gun, Mk.II (Navy)

Diameter of bore between lands	inches	16
Diameter of bore between grooves	inches	16.30
Total length of gun	inches	816.0
Length of rifled portion	inches	675.99
Travel of projectile	inches	681.68
Length of powder chamber	inches	113.83
Diameter of powder chamber	inches	18.50
Capacity of powder chamber	cubic inches	30,000
Number of grooves		96
Character of rifling, uniform twist, 1 in 32 calibers		
Maximum pressure for which gun is designed	lbs./sq.in.	38,000

b. Carriage, Barbette, 16", M1919 M1.

Total traverse	mils	6400	= 360°
Least possible elevation	mils	-124.4	= -7°
Maximum elevation	mils	+977.8	= +55°
One turn of traversing handwheel	mils	1.96	= 0.11°
One turn of elevating handwheel	mils	16.71	= 0.94°

## 3. PROJECTILE.

Projectile, Armor Piercing, 2240 lb., Mk.XI

## 4. FUZE.

Fuze, Base Detonating, Mk.X

5. EXPLANATION OF THE TABLES. This firing table has been divided into two parts. Part 1, printed on white paper, comprises data applicable in the most part to any possible combination of projectile, fuze, and powder charge, and will serve equally well for all firing tables. Part 2 gives data pertaining to a particular combination of projectile, fuze, and powder charge. It is readily distinguished from Part 1 by a difference in the color of the paper upon which it is printed.

Throughout the tables, certain conditions are assumed as standard. Mention may be made of the following:

Wind, none.

Muzzle velocity, as listed in table.

Weight of projectile, 2240 lb.

Air density at battery, (59°F. and 29.53 in. of mercury) 525.9 grains per cubic foot.

Temperature of powder, 70°F.

Temperature of air at battery (for elasticity effect), 59°F.

In addition to the standard air conditions at the battery, a standard atmospheric structure aloft has been assumed. The observed ranges, obtained from test firings, upon which these tables are based, were corrected on the basis of a comparison of observed muzzle velocity, weight of projectile, air conditions at all altitudes with the assumed standards and for rotation of the earth.

In connection with Part 1, it is to be noted that the azimuth of a wind is indicated by reference to the direction from which it blows. Since the meteorological message gives the azimuth of the wind as measured clockwise from the north, it is necessary to find the equivalent tabular direction before proceeding with the use of the wind component chart. This tabular azimuth or chart direction of the wind is therefore measured in

mils (6400 to the circle) clockwise from the plane of fire, that is from the direction toward which the gun is fired. The choice of signs for cross wind effects accords with the deflection graduations upon the standard panoramic sight. For example, a wind from the left, when the target is viewed from the position of the gun, will carry the projectile to the right. To correct for this, it is necessary to traverse the gun to the left, and this corresponds to an increased deflection setting on the sight. The effect of such a wind, being opposite in sign to the correction, is thus seen to be negative.

Although the maximum wind speed noted on this chart is only ten miles per hour, it is not to be understood that this figure is in any way intended as a restricting limit on the use of the data of the chart itself. Thus to obtain the components of a 12 mi/hr wind the components of a 10 mi/hr wind can be added to the corresponding components of a 2 mi/hr wind.

The other tables, formulae, and charts of Part 1 require no individual discussion. The principal use of the information contained in Part 1 is in the conversion of the data of the meteorological message into a form that is directly applicable to a particular battery.

Table A of Part 2 gives the range elevation relation, maximum ordinate, ballistic coefficient, and the characteristics of the trajectory at the point of fall. The ranges listed in column (1) and throughout the tables are "curved" ranges; that is, they are regarded as measured along the surface of the sphere concentric with the earth and passing through the gun. Such measurements are understood to be made from the gun to the points where the trajectories pierce this spherical surface; or in case of the correction tables for the height of target, to points on this surface directly above or below the target. These points are all at the same height above sea level as the gun, and hence may be called "level points". It should be emphasized that no correction for curvature of the earth should be applied to these ranges. Whenever the level points concerned are at the target or directly above or below it, it is evident that these ranges are equal to the geographical distance from muzzle to target such as would be read from an accurate map, and they will later be referred to as "map ranges". Such ranges are sensibly equal to the

rectilinear distances between gun and level point, though the straight line joining these points would not be exactly horizontal at the gun. In connection with range settings in general, and with especial reference to cases where gun and target are at different levels, the term "range" is sometimes used less exactly to refer to distances from gun to level points not related to the target.

The tabular elevations, given in columns (2) and (3), are strictly exact only when the gun and target are at the same level. In this case the elevation coincides with the quadrant elevation. For other cases see Tables B and C. The word "change" in the headings (4) and (5), (6) and (7) is employed because in each of these columns there are tabulated mean values to be used for decreases as well as increases. The probable errors in range and deflection are given in columns (16) and (17). It should be noted that these are Proving Ground probable errors. The characteristics of the trajectory at the point of fall are given in columns (9), (10), (11), and (12). The ballistic coefficient, column (15), is the so-called "normal" or "short arc" C. Its value is such that when it is used with the standard muzzle velocity and angle of departure for the computation of the trajectory by the method of numerical integration, the resulting range will be that tabulated.

The deflection due to drift is found in columns (13) and (14) of Table A. Thus, with no cross wind, and the absence of accidental disturbance, these columns give the total deviation of the projectile from the plane of fire, (the vertical plane containing the axis of the piece when laid for firing). The signs used are in accord with the deflection graduations upon the standard panoramic sight. The negative sign indicates that the projectile is carried to the right.

It is to be noted that in this case and throughout the tabulation of differential variations, the signs given are those of the effects and not of the corrections. For example the effect is given as positive if the trajectory is so altered that the projectile is caused to fall beyond its normal objective point.

The effect of the earth's rotation on range and deflection is a function of the latitude of the gun and of the azimuth of the plane of fire. It cannot, therefore, be incorporated in elevation and drift columns. This effect becomes quite appreciable in the case of long range guns. The effect of rotation of the earth on range is given in Table E, and the effect on deflection is given in Table K. It is to be noted that the azimuth is measured clockwise from the north.

Tables B and C are for use when the target is below or above the level of the gun. For example in the table for target below gun, (Table B), for any given map range and height of target, the quantity appearing as the "range effect" is the distance by which the map range for the given target exceeds the "range to level point", when the latter range is determined for that standard trajectory whose continuation passes through the target. These "effects", then, are given positive signs so that the correction may be made by subtracting them from the map range. The resulting corrected range is that range whose corresponding angle of elevation (as listed in Table A) is to be used as the elevation required to strike the target, (provided we assume for the moment that there are no other variations from standard).

Tables D to I inclusive give the various differential effects on range; thus, Table F gives the range effects corresponding to an increase or decrease in muzzle velocity of every 10 feet per second up to 150 feet per second.

Tables J and K give the effects on deflection due, respectively, to cross wind and to rotation of the earth.

Although cant of the carriage axle, by changing the angle of departure, has some effect upon the range, that effect is here disregarded; for, at low elevations, a fairly large cant will produce only a very small change in the angle of departure, and at high elevations, where a large cant will produce a somewhat larger change in angle of departure than at low elevations, it requires a quite large change in departure to produce a small change in range.

Among the symbols and abbreviations used are the following:

ω	(read: "omega"), meaning the quadrant angle of fall for gun and target at the same level.
P.E.	probable error
R	right
L	left
lb.	pound
deg.	degree
min.	minute
sec.	second
m	mils
in.	inches
ft.	feet
yds.	yards
f/s	feet per second
mi/hr	miles per hour
F	Fahrenheit
m.d.p.	meteorological datum plane
%	per cent
M.V.	muzzle velocity
V-V <sub>0</sub>	velocity adjustment.

6. THE METEOROLOGICAL MESSAGE. The meteorological message consists of groups of symbols arranged in codified form. The message starts with the repetition of the so-called "address of the sending station", consisting of three letters, the first of which is always M and the other two serve to identify the station. All the groups subsequent to the first group, which plays a special role, are similar in type and significance; they differ only in that they refer to different altitudes. They consist of seven digits.

With reference to the first group, if the meteorological message applies to antiaircraft or other high angle fire, the first figure is 2; if it applies to terrestrial fire other than high angle, the first figure is 3. For the 16" Gun, Mk.II firing 2240 lb. projectile, Mk.XI use message 3 at all elevations. The second and third digits of this first group give, in hundreds of feet, the altitude of the meteorological datum plane (m.d.p.) above sea level. The position of the m.d.p. is chosen by the Meteorological Service of the Army and should be little, if any, higher than the lowest battery to be served by the message. The fourth and fifth digits of this group give the temperature at the m.d.p. in degrees Fahrenheit.

The groups subsequent to the first have digits assigned to them as symbols, beginning with zero and refer to altitudes as follows:

0	The level of the m.d.p.	
1	An altitude of 600 feet	(200 yards) above m.d.p.
2	An altitude of 1500 feet	(500 yards) above m.d.p.
3	An altitude of 3000 feet	(1000 yards) above m.d.p.
4	An altitude of 4500 feet	(1500 yards) above m.d.p.
5	An altitude of 6000 feet	(2000 yards) above m.d.p.
6	An altitude of 9000 feet	(3000 yards) above m.d.p.
7	An altitude of 12000 feet	(4000 yards) above m.d.p.
8	An altitude of 15000 feet	(5000 yards) above m.d.p.
9	An altitude of 18000 feet	(6000 yards) above m.d.p.
0	An altitude of 24000 feet	(8000 yards) above m.d.p.
1	An altitude of 30000 feet	(10000 yards) above m.d.p.
2	An altitude of 36000 feet	(12000 yards) above m.d.p.

Each further increase by unity in the symbol of the altitude zone corresponds to an increase of 6000 feet in altitude above the m.d.p. It is evident that no confusion can arise from using for 10, 11, 12, etc. the symbol 0, 1, 2, etc., in order to preserve the 7 digit character of the group. The first digit of each of these groups is the group symbol mentioned above and designates the altitude zone to which the group refers. The second and third indicate the direction from which the ballistic wind blows. For this purpose the angular deviation is measured clockwise from the north in hundreds of mils (64 points to the circle). The fourth and fifth digits in each of these groups constitute a two figure symbol for the speed of the wind in miles per hour. The sixth and seventh digits serve to designate the ballistic density in per cent of normal.

The particular group of the meteorological message appropriate for use with a particular trajectory is that group of which the altitude is nearest to, but not less than, the maximum ordinate. When extreme accuracy is necessary and the meteorological data justify the procedure, it is possible to interpolate between groups of the meteorological message, making use of the exact maximum ordinate.

The above mentioned is a special case of the general method dealing with the meteorological data for battery and m.d.p. at any levels. The meteorological message is designed primarily for batteries in or near the m.d.p. When serious

differences in level occur, the data of the meteorological message must be corrected to the level of the battery. Maximum ordinates will be measured from the battery level, for all purposes. Such corrections as are made, utilize that 7 digit group of the message which corresponds to the maximum ordinate so defined. The wind at a given altitude above the battery is assumed to be identical with that at an equal altitude above the m.d.p., but the temperature and ballistic density need separate consideration. The temperature at the battery is obtained either by direct observations or by correcting to the level of the battery the temperature given in the first group of the meteorological message. This correction is made by means of the Thermometric Formula, Part 1B.

The ballistic density depends upon the maximum ordinate considered. Any one of the 7 figure groups of the message gives the ballistic density for a certain maximum ordinate measured from the m.d.p. This density when corrected by means of the Density Formula, Part 1B, becomes the ballistic density for that maximum ordinate measured from the battery.

7. USE OF THE TABLES. When standard Coast Artillery instruments are not available, it is necessary to prepare firing data by computations, using the firing tables as explained hereafter.

For convenience in reference, the differential variations and the corresponding corrections will be considered in three groups. The designation of the groups of corrections, in the order in which they will be treated, are:

- a. Position corrections
- b. Materiel corrections
- c. Weather corrections

This grouping corresponds in a general way to the order in which the data for the corrections are obtained. When the corrections refer to changes in deflection they are so indicated. Otherwise they refer to changes in range. When all the variations from standard are numerically small, and hence comparable in magnitude, it is known that a slight increase in formal accuracy is secured by making these corrections successively; that is, by correcting the map range to account for the first variation considered, and using the resulting first corrected range as a basis

for determining the magnitude of the second variation, and so forth. In most cases which will occur in practice, this increase in formal accuracy is meaningless, since the data themselves are seldom known with sufficient refinement to warrant the slight apparent gain in accuracy. Consequently, for general use with this table, all corrections may be calculated on the basis of the same fundamental quantity, namely, the map range. At the same time should it prove more convenient, there is no objection to imposing the corrections successively, except where some one of the corrections is much larger than the others. The only case which occurs frequently enough to warrant particular consideration is that of a large correction due to height of target. For this situation it has been verified that greater accuracy is secured by imposing simultaneously the velocity and height of site corrections than by imposing these corrections successively in either order.

a. Position Corrections are determinable as soon as the relative location of gun and target is known. For land firing, their geographical location would determine both the map range and the difference in altitude; for seacoast batteries, the height of the tide may also be required. Position corrections consist of those for (1) differences in altitude of gun and target, (2) corrections for rotation of the earth and (3) deflection due to drift. Tables B and C give the effects on range due to a height of target below and above the gun, respectively.

b. Materiel Corrections are determinable, for a given range, when the weight and the markings of the projectile and the relatively permanent characteristics of the particular piece and powder lot are known. These corrections consist of those for (1) variations from normal in weight of projectile and (2) estimated change in muzzle velocity,  $(V-V_0)$ , due to the conditions of the piece or of the powder when the powder is at standard powder temperature (70°F). The correction due to variation in weight of projectile is negligible in the case of the 2240 lb. Mk.XI projectile because of the small weight tolerance of  $\pm 6.5$  lbs. indicated on Drg. Navy Ord. No. 300390, Sept. 11, 1941. The estimated change in muzzle velocity is called the velocity adjustment,  $V-V_0$ , and is made by reference to the record of performance of the particular piece and powder lot, or by other empirical

methods. Usually the results of observation of previous firings are available. The necessary correction is then found by the use of the effects tabulated in Part 2, Table F.

c. Weather Corrections are determinable only upon receipt of the regular meteorological message or other reports of observation made at or near the time of firing. These corrections consist of those of (1) air density, (2) air temperature (elasticity effect), (3) range wind, (4) variation of the powder temperature from standard, and (5) deflection effect due to cross wind. The air density, air temperature, range wind, and cross wind, to be used in any case are, respectively, the ballistic density, temperature at the battery, ballistic range wind, and ballistic cross wind, all as given in or obtained from the meteorological message. In the absence of such information it will ordinarily be necessary to utilize such observation of air conditions as can be made at the battery. The maximum ordinate corresponding to the map range for use with the meteorological message is found in Part 2, Table A, Column (8).

The speed and direction of the ballistic wind are resolved into components along and across the line of fire by means of the chart of Part 1A. The range component is the ballistic range wind to be used with Part 2, Table I. The cross component is the ballistic cross wind, and the resulting deflection effects are found by reference to Part 2, Table J. The effect of the variations of the powder temperature from the standard powder temperature is found as the effect of an equivalent change in muzzle velocity. This muzzle velocity change may be read from the chart prepared for this purpose (see page 9).

The algebraic sum of all of the range effects hitherto mentioned, namely, those due to position variations, materiel variations, and weather variations, are added together algebraically and this algebraic sum subtracted from the map range. This amounts to changing the signs of the effects, thus converting them into the corrections desired, and then adding the corrections to the map range. When these calculations are made previous to a series of firings, the result is known as the initial range, being the range at which firing is begun. With it, entry is made in Part 2, Table A, and the corresponding angle of elevation is read from either column (2) or (3). The deflection

effects, when added algebraically, give the total deflection effect, and a change of sign gives the deflection corrections to be used with the panoramic sight.

When observation of fire is possible, the center of impact for succeeding rounds is adjusted to the center of target on the basis of rounds already observed, and the range corresponding to the resultant setting is called the adjusted range. The difference between the adjusted range and the initial range as defined above is assumed to be due to a variation which necessitates a correction to be applied upon  $V-V_0$ . The value of  $V-V_0$  thus continually revised, is called the velocity adjustment and requires reference to Part 2, Table F. It is used in the next firing or in firing at a different range, and is then considered as a materiel correction.

The use of the tables is illustrated by the following example:

Given: Gun, 16" Mk.II, Navy; Tabular Muzzle Velocity = 2650 f/s  
Projectile, A.P. 2240 lb., Mk.XI; Fuze, B.D., Mk.X.

Data as to Position:

Altitude of battery = 450 ft. above sea level.  
Map range to target = 25840 yards.  
Height of target = -432 ft. (432 ft. below gun)  
Azimuth of target (measured clockwise from the North)  
437 mils (24.6°)  
Latitude of the gun = 42° North.

Data as to Materiel:

Weight of projectile = 2235 lb. (0.2% below normal)  
Preliminary velocity adjustment ( $V-V_0$ ) = -18 f/s  
(18 f/s below tabular velocity)

Weather Data:

Temperature of powder = 62°F.  
Meteorological message: MSL MSL 30162 062099  
162089# 2600997 3601095 4600992 5601094 6591195

Required: Quadrant Elevation and Deflection Setting.

Solution: The tables found in Parts 1 and 2b are used throughout.

## (a) Position Corrections for Range

Entering Table B, for target below gun, we find corresponding to a mnp range of 25840 yards and a height of target of -432 ft. a range effect of +367 yds.

Entering Table E, for effects on range due to rotation of earth, we find, corresponding to a latitude of 42° and an azimuth of 24.6° a range effect of +54 yds.

## (b) Material Corrections for Range

Entering Table D, we find the effect on range for 0.2% decrease in weight of the projectile to be negligible.

In a similar manner, from Fb, we find the effect on range for an estimated decrease of -18 f/s in muzzle velocity to be -303 yds.

## (c) Weather Corrections for Range

The actual or estimated temperature of the powder at the time of firing being 62°F., instead of the standard temperature of 70°F., a correction must be introduced. The effect on muzzle velocity is obtained from the chart on page 9 and is -13 f/s. The effect on range thus occasioned is found in the same manner as above from Table Fb, to be -219 yds.

To obtain the effects of the remaining variations, the meteorological message must be deciphered and such information as is applicable to the particular trajectory considered must be utilized.

From column (8) of Table A, the maximum ordinate is found to be about 6335 so that in addition to the introductory information obtained in the meteorological message only that group of the message numbered 6 and which gives data for a maximum ordinate of 9000 ft. will be used.

From the meteorological message the following information is obtained:

Altitude of the m.d.p. above mean sea level	100 ft.
Temperature at the m.d.p.	62°F.
Azimuth of the ballistic wind (for group "6")	5900 $\mu$
Velocity of the ballistic wind (for group "6")	11 mi/hr
Ballistic density (for group "6")	9%

To obtain the components of the ballistic wind, it is necessary to secure from the recorded azimuths of target and ballistic wind, the chart direction of the wind for which the line of fire is the reference direction. Subtracting 437 mils from 5900 mils, we have for the chart direction from which the wind is blowing 5463  $\mu$

Using the Wind Component Chart, Part 1A with 11 mi/hr as the wind velocity we have corresponding to 5463 mils a range component  $W_x$ , of -6.6 mi/hr and a cross component  $W_y$ , of -8.8 mi/hr

(The components of 1 mi/hr are added to the corresponding components of 10 mi/hr to obtain the components of 11 mi/hr.)

Entering Table 1b, we find the effect on range for -6.6 mi/hr range wind (the negative sign here indicates a head wind) to be -37 yds.

The temperature at the m.d.p. given in the meteorological message cannot be used directly since the battery is 350 ft. above the m.d.p.

Using the Thermometric Formula, Part 1B, the decrease in temperature for this height is 1°F., so that the temperature for the battery is 61°F.

Entering Table B, we find the temperature (elasticity) effect on range for a temperature of 61°F. (or 2° above the normal temperature of 59°F.) to be -12 yds.

Likewise the ballistic density given in the meteorological message for this trajectory cannot be used directly since the battery is 350 ft. above the m.d.p.

Using the density formula, Part 1B, the decrease in density for this height is 1% so that the ballistic density for the battery is 9%

Entering Table Ga, we find the effect on range for the ballistic air density of 9% (or 6% below normal) to be +473 yds.

The total range effect is now obtained by adding the separate range effects algebraically. It has the value of +367+54+0-303-219-37-12+473 = 1373 yds.

The total range correction is obtained by merely changing the sign of the total range effect. It is -323 yds.

The corrected range, found by adding algebraically the total correction to the map range (or what is the same thing, subtracting algebraically the total effect) is 25840 - 323, i.e. 25517 yds.

The elevation corresponding to the corrected range of 25517 yds. is found in either column 2 or 3 of Table A. From column 2, it is 269.5  $\mu$

The deflection effects are found in a similar manner.

The deflection effect due to a -8.8 mi/hr cross wind (from left to right) is found from Table J to be -2  $\mu$

The drift is found from column (13) or (14). From column (13), it is -11  $\mu$

The deflection effect due to rotation of the earth for a latitude of 42° North and an azimuth of 24.6° is found from Table K to be -2  $\mu$

The total deflection effect is obtained by adding algebraically the separate deflection effects. It has the value of -2-11-2 = -15  $\mu$

The total deflection correction is obtained by merely changing the sign of the total deflection effect. It is +15  $\mu$

The deflection set off at the gun will be 15 mils (15 mils to the left) when the target is used as aiming point. For any other aiming point 15 mils must be added to the deflection of the target. To obtain the azimuth setting it must be recalled that deflections and azimuths are measured in opposite senses. The correction of +15 mils in deflection is the same as a correction of -15 mils in azimuth. The azimuth setting then is 437 mils -15 mils = 422  $\mu$

## PART 1

GUN, 16-INCH, MK.II (NAVY)

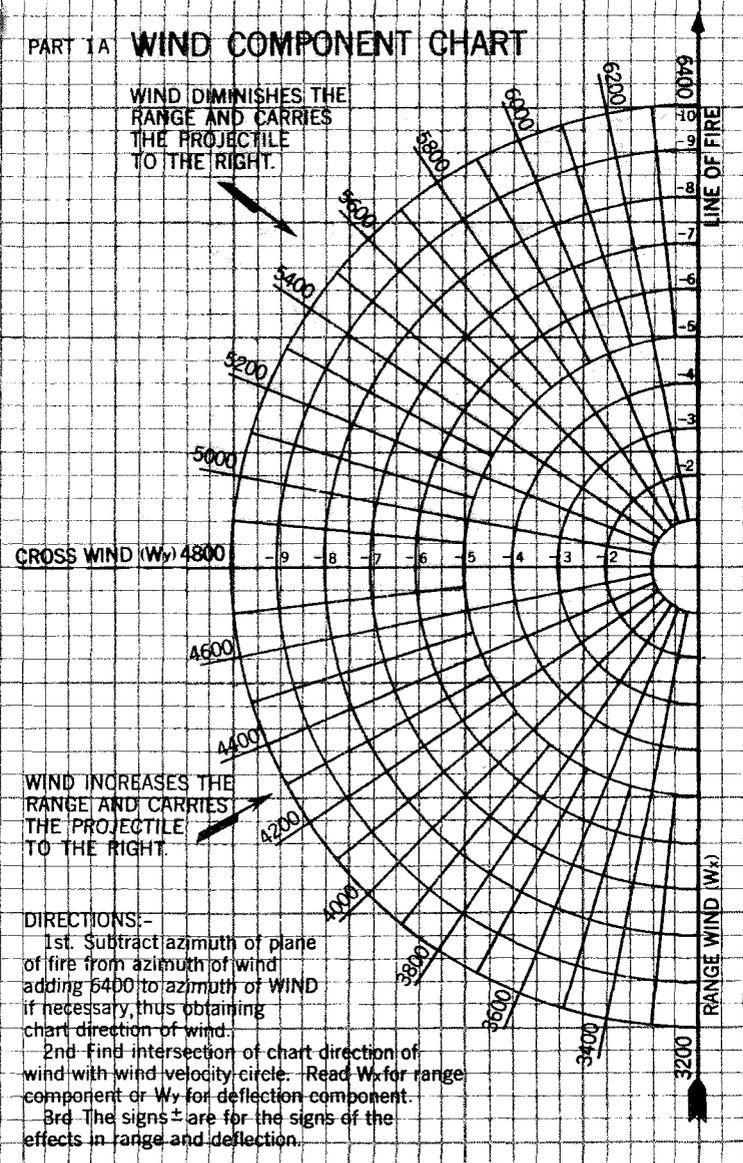
FIRING

PROJECTILE, A.P., 2240-LB., MK.XI

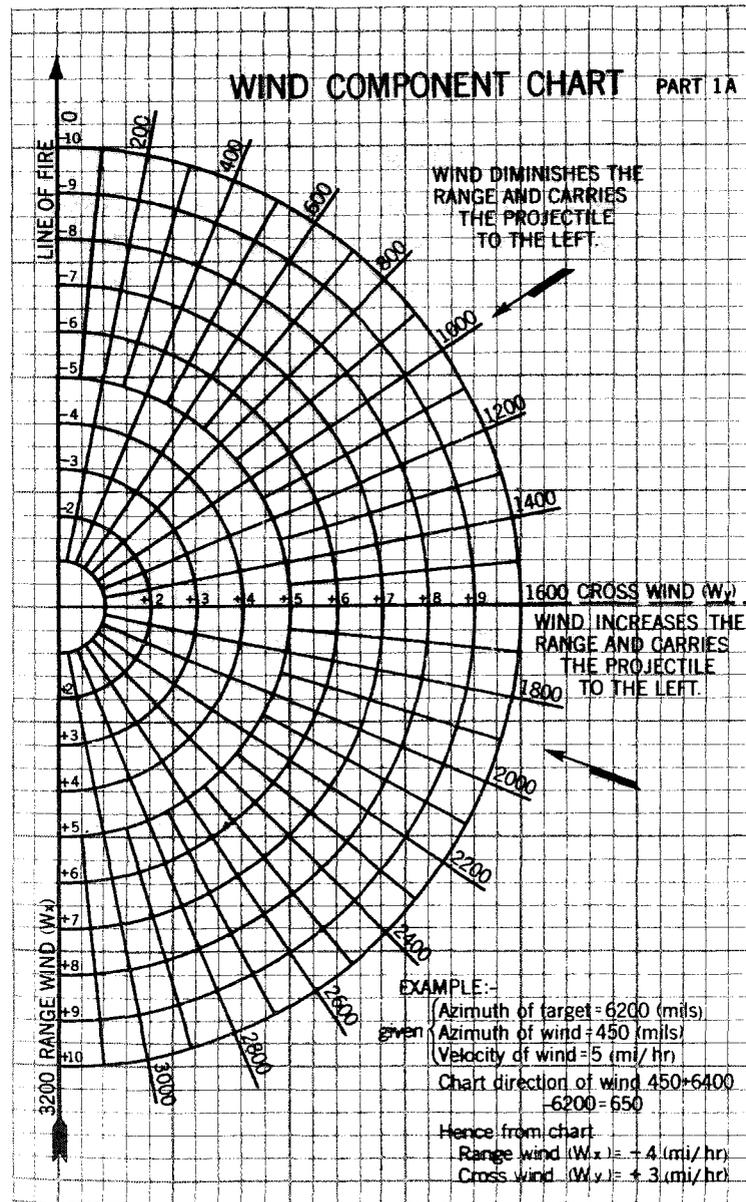
WITH

FUZE, B.D., MK.X

PART 1A WIND COMPONENT CHART



WIND COMPONENT CHART PART 1A



## PART 1E

ANGULAR CONVERSION TABLE - DEGREES TO MILS

Degrees	0	1	2	3	4	5	6	7	8	9
0	0	18	36	53	71	89	107	124	142	160
10	178	196	213	231	249	267	284	302	320	338
20	356	373	391	409	427	444	462	480	498	516
30	533	551	569	587	604	622	640	658	676	693
40	711	729	747	764	782	800	818	836	853	871
50	889	907	924	942	960	978	996	1013	1031	1049
60	1067	1084	1102	1120	1138	1156	1173	1191	1209	1227
70	1244	1262	1280	1298	1316	1333	1351	1369	1387	1404
80	1422	1440	1458	1476	1493	1511	1529	1547	1564	1582
90	1600	(Conversion Factor, 1° = 17.77778 mils)								

## PART 1F

NATURAL TRIGONOMETRIC FUNCTIONS

Mils	N. Sin	N. Cos	N. Tan	N. Cot
0	0.0000	1.0000	0.0000	-
50	.0491	.9988	.0491	20.355
100	.0980	.9952	.0985	10.153
150	.1467	.9892	.1483	6.741
200	.1951	.9808	.1989	5.027
250	.2430	.9700	.2505	3.992
300	.2903	.9569	.3033	3.297
350	.3369	.9415	.3578	2.795
400	.3827	.9239	.4142	2.414
450	.4276	.9040	.4730	2.114
500	.4714	.8819	.5345	1.871
550	.5141	.8577	.5994	1.668
600	.5556	.8315	.6682	1.497
650	.5957	.8032	.7416	1.348
700	.6344	.7730	.8207	1.219
750	.6716	.7410	.9063	1.103
800	.7071	.7071	1.0000	1.000
850	.7410	.6716	1.103	.9063
900	.7730	.6344	1.219	.8207
950	.8032	.5957	1.348	.7416
1000	.8315	.5556	1.497	.6682
1050	.8577	.5141	1.668	.5994
1100	.8819	.4714	1.871	.5345
1150	.9040	.4276	2.114	.4730
1200	.9239	.3827	2.414	.4142
1250	.9415	.3369	2.795	.3578
1300	.9569	.2903	3.297	.3033
1350	.9700	.2430	3.992	.2505
1400	.9808	.1931	5.027	.1989
1450	.9892	.1467	6.741	.1483
1500	.9952	.0980	10.153	.0985
1550	.9988	.0491	20.355	.0491
1600	1.0000	0.0000	-	0.0000

## PART 1G

TABLE OF PROBABILITY FACTORS

$$\text{"Prob"} = \frac{2}{\sqrt{\pi}} \int_0^t e^{-t^2} dt \quad \text{where} \quad \frac{t}{.476936} = \text{Factor}$$

Factor	Prob.	Factor	Prob.	Factor	Prob.	Factor	Prob.
0.00	0.0000	1.00	0.5000	2.00	0.8227	3.00	0.9570
0.05	0.0269	1.05	0.5212	2.05	0.8332	3.05	0.9603
0.10	0.0538	1.10	0.5410	2.10	0.8433	3.10	0.9635
0.15	0.0806	1.15	0.5621	2.15	0.8530	3.15	0.9664
0.20	0.1073	1.20	0.5817	2.20	0.8622	3.20	0.9691
0.25	0.1339	1.25	0.6008	2.25	0.8709	3.25	0.9716
0.30	0.1604	1.30	0.6194	2.30	0.8792	3.30	0.9740
0.35	0.1867	1.35	0.6375	2.35	0.8871	3.35	0.9762
0.40	0.2127	1.40	0.6550	2.40	0.8945	3.40	0.9782
0.45	0.2385	1.45	0.6719	2.45	0.9016	3.50	0.9817
0.50	0.2640	1.50	0.6883	2.50	0.9083	3.60	0.9848
0.55	0.2893	1.55	0.7042	2.55	0.9146	3.70	0.9874
0.60	0.3143	1.60	0.7195	2.60	0.9205	3.80	0.9896
0.65	0.3389	1.65	0.7343	2.65	0.9261	3.90	0.9915
0.70	0.3632	1.70	0.7485	2.70	0.9314	4.00	0.9930
0.75	0.3871	1.75	0.7621	2.75	0.9364	4.20	0.9954
0.80	0.4106	1.80	0.7753	2.80	0.9411	4.40	0.9970
0.85	0.4336	1.85	0.7879	2.85	0.9454	4.60	0.9981
0.90	0.4562	1.90	0.8000	2.90	0.9495	4.80	0.9988
0.95	0.4783	1.95	0.8116	2.95	0.9534	5.00	0.9993

Explanation: "Prob." is the probable proportion of shots falling in an interval of width F times the fifty percent zone (or 2 F times the probable error) with center of impact in the middle of the interval; F is the "probability factor".

Example:

Given: Zone, normal to line of fire, 40 yd. wide, 60 yd. from center of impact.

Probable error in range, 50 yd.

To determine probable proportion of hits in zone.

For (60 + 40) - zone,  $F = \frac{2(60 + 40)}{2(50)} = 2$ , hence from table,

Prob. = .82

For (60) - zone,  $F = \frac{2(60)}{2(50)} = 1.2$ , hence from table, Prob. = .58

Subtracting, Prob. for the two zones which together satisfy the condition, = .82 - .58. Hence, Prob. for either one of the two possible zones defined, is  $1/2 (.82 - .58) = 12\%$ .

A less accurate but frequently more convenient approximation is given by the "Dispersion ladder":

Center of Impact

4 P.E.	3 P.E.	2 P.E.	1 P.E.	1 P.E.	2 P.E.	3 P.E.	4 P.E.
1/2%	1 1/2%	7%	16%	25%	25%	16%	7%
							1 1/2%
							1/2%

This gives differences in Prob. for even integral multiples of the probable error.

## TABLE OF SLOPE COEFFICIENTS

sin  $\omega$ /sin ( $\omega+n$ )

n, positive (relative forward slope)																									
$\omega$	%		1		2		3		5		10		15		20		30		40		50		1,600		
	$\omega$	$n$	10	20	31	51	102	152	201	297	388	472	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
50	.81	.71	.62	.50	.33	.25	.20	.15	.12	.10	.05														
100	.93	.83	.77	.66	.50	.40	.34	.26	.21	.18	.10														
150	.94	.88	.83	.75	.60	.50	.43	.36	.29	.26	.15														
200	.95	.91	.87	.80	.67	.58	.51	.42	.36	.32	.20														
250	.96	.93	.89	.83	.72	.63	.57	.48	.41	.37	.25														
300	.97	.94	.91	.86	.75	.68	.61	.52	.46	.42	.30														
350	.97	.95	.92	.88	.79	.71	.65	.57	.51	.47	.36														
400	.98	.95	.93	.89	.81	.74	.69	.61	.55	.51	.41														
500	.98	.96	.95	.92	.85	.79	.74	.67	.62	.58	.45														
600	.99	.97	.96	.93	.87	.83	.78	.72	.67	.64	.47														
700	.99	.98	.97	.94	.90	.85	.82	.76	.72	.69	.48														
800	.99	.98	.97	.95	.91	.88	.85	.80	.77	.75	.50														
900	.99	.98	.98	.96	.93	.90	.88	.84	.81	.79	.51														
1000	.99	.99	.98	.97	.94	.92	.90	.87	.85	.84	.50														
1100	.99	.99	.98	.98	.95	.94	.92	.90	.89	.88	.50														
1200	1.00	.99	.99	.98	.97	.95	.94	.93	.92	.93	.50														

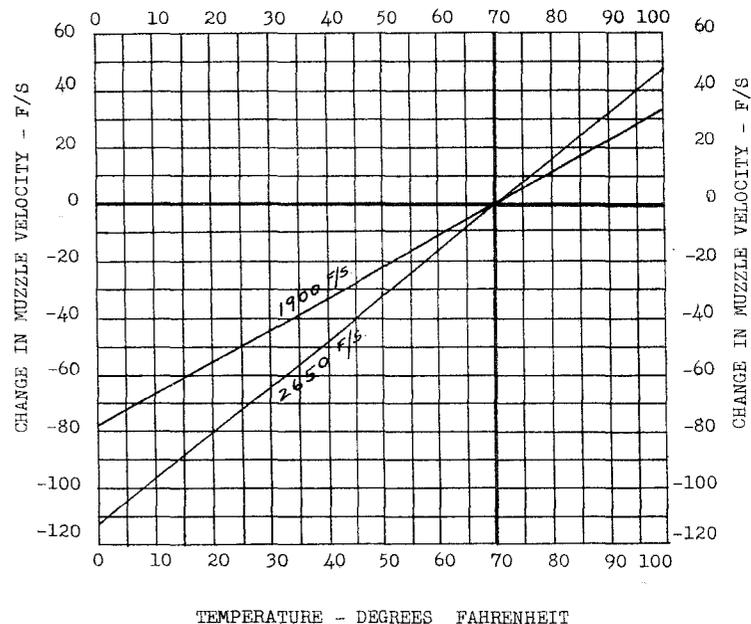
  

-n, positive (relative reverse slope)																									
$\omega$	%		1		2		3		5		10		15		20		30		40		50				
	$\omega$	$n$	10	20	31	51	102	152	201	297	388	472	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600		
50	1.26	1.69	2.57																						
100	1.11	1.26	1.44	2.03																					
150	1.07	1.16	1.25	1.51	3.08																				
200	1.05	1.11	1.18	1.34	2.02	4.11																			
250	1.04	1.09	1.14	1.23	1.67	2.52	5.06																		
300	1.03	1.07	1.11	1.20	1.50	2.00	2.99	94.86																	
350	1.03	1.06	1.09	1.16	1.39	1.74	2.31	6.46																	
400	1.02	1.05	1.08	1.14	1.32	1.59	1.97	3.78	31.39																
500	1.02	1.04	1.06	1.10	1.24	1.41	1.63	2.38	4.33	17.31															
600	1.02	1.03	1.05	1.08	1.18	1.30	1.46	1.89	2.68	4.44															
700	1.01	1.03	1.04	1.07	1.14	1.24	1.35	1.65	2.10	2.86															
800	1.01	1.02	1.03	1.05	1.12	1.19	1.27	1.49	1.80	2.24															
900	1.01	1.02	1.03	1.04	1.09	1.15	1.22	1.39	1.60	1.90															
1000	1.01	1.01	1.02	1.04	1.08	1.12	1.18	1.31	1.47	1.68															
1100	1.01	1.01	1.02	1.03	1.06	1.10	1.14	1.24	1.37	1.53															
1200	1.00	1.01	1.01	1.02	1.05	1.08	1.11	1.19	1.29	1.41															

$n$  = Slope with respect to line of site (percent and mils) ( $n = n' - s + 300$ ). Directions. Multiply range probable error (from range table) by coefficient shown above. Here  $\omega$  denotes the angle of fall (measured to line of site) (for practical purposes equal to the range table angle of fall which is its value for site 300 m, i.e., for a level trajectory);  $n'$ , the quadrant angle of slope, positive for forward slope (ground rising in enemy direction), and negative for reverse slope (ground falling in enemy direction);  $s - 300$ , the angle of site, positive for target above gun, negative for target below gun;  $n(n = n' - s + 300)$ , the slope relative to the line of site. NOTE. The quadrant angle of fall,  $\omega' = \omega - s + 300$ . EXAMPLE: Given target on reverse slope between contour lines 130 ft., and 140 ft., mean distance between contours = 67 ft., site = -20 mils, ( $s = 280$ ), angle of fall (tabulated) = 250 mils, range probable error (in range table) = 83 yards. Then,  $n'$  (in percent) =  $100 \frac{(130-140)}{67} = -15(\%)$  or -152 mils,  $n' - s + 300 = -152 - (-20) = -132$  mils. Interpolating between 1.67 (for 102 mils) and 2.32 (for 152 mils), slope coefficient =  $1.67 + \frac{30}{50} \times 0.85 = 2.18$ . Hence, range probable error to be used =  $2.18 \times 83$  yd. = 181 yards.

CHART FOR CHANGE IN MUZZLE VELOCITY FOR TEMPERATURE OF POWDER

DIFFERENT FROM NORMAL



Directions: - Enter chart with temperature of powder. Follow vertical line to the slanting line for muzzle velocity required. From there follow the horizontal line either to the left or right edge of the chart, where the change in muzzle velocity may be read.

EXAMPLE: - Suppose temperature of powder = 57°F. Standard muzzle velocity = 2650 f/s. From the chart, the change in muzzle velocity is -21 f/s and the muzzle velocity to be expected is 2629 f/s.



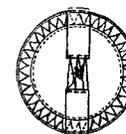
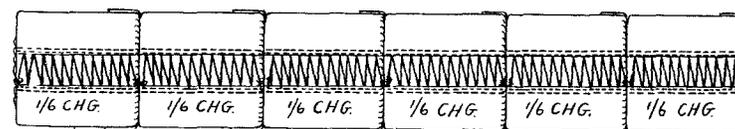
PART 2b

PROJ., A.P., 2240 LB., MK.XI

FUZE, B.D., MK.X

FULL CHARGE - M.V., 2650 F/S

DRAWING OF CHARGE



FT 16-E-1

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maximum ordinate (8)	Terminal velocity (9)
	yd	mil deg min	mil min	yd yd	ft	f/s		
0	0.0	0 00	0.7 2.3	147 44	0	2650		
100	0.8	0 02	0.7 2.3	147 43	0			
200	1.4	0 05	0.7 2.3	146 43	1			
300	2.2	0 07	0.7 2.3	146 43	1			
400	2.8	0 10	0.7 2.3	145 43	2			
500	3.4	0 12	0.7 2.3	145 43	3	2623		
600	4.2	0 14	0.7 2.3	144 43	4			
700	5.0	0 17	0.7 2.3	144 43	5			
800	5.6	0 19	0.7 2.4	143 42	6			
900	6.4	0 22	0.7 2.4	143 42	8			
1000	7.0	0 24	0.7 2.4	142 42	9	2597		
1100	7.8	0 26	0.7 2.4	142 42	10			
1200	8.6	0 29	0.7 2.4	141 42	12			
1300	9.2	0 31	0.7 2.4	141 42	13			
1400	10.0	0 34	0.7 2.4	140 42	15			
1500	10.6	0 36	0.7 2.4	140 41	17	2570		
1600	11.4	0 38	0.7 2.4	139 41	19			
1700	12.2	0 41	0.7 2.4	139 41	21			
1800	12.8	0 43	0.7 2.4	138 41	23			
1900	13.6	0 46	0.7 2.4	138 41	25			
2000	14.2	0 48	0.7 2.4	137 41	28	2544		
2100	15.0	0 51	0.7 2.5	137 41	30			
2200	15.8	0 53	0.7 2.5	136 40	33			
2300	16.4	0 56	0.7 2.5	136 40	35			
2400	17.2	0 58	0.7 2.5	135 40	38			
2500	18.0	1 01	0.7 2.5	135 40	41	2518		
2600	18.6	1 03	0.7 2.5	135 40	44			
2700	19.4	1 06	0.7 2.5	134 40	47			
2800	20.2	1 08	0.7 2.5	134 40	50			
2900	20.8	1 11	0.7 2.5	133 40	54			
3000	21.6	1 13	0.7 2.5	133 39	57	2492		
3100	22.4	1 16	0.8 2.5	132 39	61			
3200	23.2	1 18	0.8 2.5	132 39	64			
3300	23.8	1 21	0.8 2.6	132 39	68			
3400	24.6	1 23	0.8 2.6	131 39	72			
3500	25.4	1 26	0.8 2.6	131 39	76	2466		

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dfl (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
0	0 00		0	0.00	9.40	0	0	0.0	0
1	0 03	1455						0.1	100
2	0 05	679						0.2	200
2	0 08	458						0.3	300
3	0 10	340						0.5	400
4	0 13	271	0	0.00	9.40	1	0	0.6	500
4	0 15	227						0.7	600
5	0 18	196						0.8	700
6	0 20	172						0.9	800
7	0 23	153						1.0	900
7	0 25	137	-1	-0.05	9.41	1	0	1.1	1000
8	0 28	124						1.3	1100
9	0 31	113						1.4	1200
10	0 33	104						1.5	1300
11	0 36	96						1.6	1400
11	0 38	89	-1	-0.05	9.41	2	0	1.7	1500
12	0 41	83						1.8	1600
13	0 44	78						2.0	1700
14	0 47	74						2.1	1800
15	0 49	70						2.2	1900
15	0 52	66	-1	-0.05	9.42	3	1	2.3	2000
16	0 55	63						2.4	2100
17	0 57	60						2.5	2200
18	1 00	57						2.7	2300
19	1 03	54						2.8	2400
19	1 06	52	-1	-0.05	9.42	4	1	2.9	2500
20	1 08	50						3.0	2600
21	1 11	48						3.1	2700
22	1 14	46						3.2	2800
23	1 17	45						3.4	2900
24	1 20	43	-1	-0.05	9.43	5	1	3.5	3000
24	1 23	42						3.6	3100
25	1 25	40						3.7	3200
26	1 28	39						3.8	3300
27	1 31	38						4.0	3400
28	1 34	37	-1	-0.05	9.43	5	1	4.1	3500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil deg min	mil min	min	yd	yd	ft	f/s
3500	25.4	1 26	0.8	2.6	131	39	76	2466
3600	26.2	1 29	0.8	2.6	130	39	80	
3700	27.0	1 31	0.8	2.6	130	39	84	
3800	27.6	1 34	0.8	2.6	129	38	89	
3900	28.4	1 36	0.8	2.6	129	38	93	
4000	29.2	1 39	0.8	2.6	128	38	98	2440
4100	30.0	1 42	0.8	2.6	128	38	103	
4200	30.8	1 44	0.8	2.6	128	38	108	
4300	31.6	1 47	0.8	2.6	127	38	113	
4400	32.4	1 49	0.8	2.6	127	38	118	
4500	33.2	1 52	0.8	2.7	126	38	123	2414
4600	34.0	1 55	0.8	2.7	126	37	129	
4700	34.8	1 58	0.8	2.7	126	37	134	
4800	35.6	2 00	0.8	2.7	125	37	140	
4900	36.4	2 03	0.8	2.7	125	37	146	
5000	37.2	2 06	0.8	2.7	124	37	152	2388
5100	38.0	2 09	0.8	2.7	124	37	158	
5200	38.8	2 11	0.8	2.7	124	37	164	
5300	39.6	2 14	0.8	2.7	123	37	171	
5400	40.4	2 16	0.8	2.7	123	36	177	
5500	41.2	2 19	0.8	2.7	122	36	184	2362
5600	42.0	2 22	0.8	2.8	122	36	191	
5700	42.8	2 25	0.8	2.8	122	36	198	
5800	43.6	2 27	0.8	2.8	121	36	205	
5900	44.4	2 30	0.8	2.8	121	36	212	
6000	45.4	2 33	0.8	2.8	120	36	219	2337
6100	46.2	2 36	0.8	2.8	120	36	227	
6200	47.0	2 39	0.8	2.8	120	35	234	
6300	47.8	2 41	0.8	2.8	119	35	242	
6400	48.6	2 44	0.8	2.8	119	35	250	
6500	49.6	2 47	0.8	2.8	118	35	258	2312
6600	50.4	2 50	0.8	2.8	118	35	266	
6700	51.2	2 53	0.8	2.9	118	35	274	
6800	52.0	2 55	0.8	2.9	117	35	283	
6900	52.8	2 58	0.8	2.9	117	35	291	
7000	53.8	3 01	0.9	2.9	117	35	300	2287

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Df (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on--	mil	deg		yd	yd	sec	yd
28	1 34	37	-1	-0.05	9.43	5	1	4.1	3500
29	1 37	35						4.2	3600
30	1 40	34						4.3	3700
30	1 43	33						4.4	3800
31	1 46	33						4.6	3900
32	1 49	32	-1	-0.10	9.44	6	1	4.7	4000
33	1 52	31						4.8	4100
34	1 55	30						4.9	4200
35	1 58	29						5.1	4300
36	2 01	28						5.2	4400
37	2 04	28	-2	-0.10	9.45	7	1	5.3	4500
38	2 07	27						5.4	4600
38	2 10	26						5.6	4700
39	2 13	26						5.7	4800
40	2 16	25						5.8	4900
41	2 20	25	-2	-0.10	9.46	8	1	5.9	5000
42	2 23	24						6.1	5100
43	2 26	24						6.2	5200
44	2 29	23						6.3	5300
45	2 32	23						6.4	5400
46	2 36	22	-2	-0.10	9.46	9	1	6.6	5500
47	2 39	22						6.7	5600
48	2 42	21						6.8	5700
49	2 45	21						7.0	5800
50	2 48	20						7.1	5900
51	2 52	20	-2	-0.10	9.47	10	2	7.2	6000
52	2 55	19.6						7.3	6100
53	2 59	19.2						7.5	6200
54	3 02	18.9						7.6	6300
55	3 05	18.5						7.7	6400
56	3 09	18.2	-2	-0.10	9.47	11	2	7.8	6500
57	3 12	17.9						8.0	6600
58	3 16	17.5						8.1	6700
59	3 19	17.2						8.2	6800
60	3 23	16.9						8.4	6900
61	3 26	16.7	-2	-0.15	9.48	12	2	8.5	7000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)	
	yd	mil	deg	min	mil	min			yd
7000	53.8	3 01	0.9	2.9	117	35	300	2287	
7100	54.6	3 04	0.9	2.9	116	34	309		
7200	55.4	3 07	0.9	2.9	116	34	318		
7300	56.2	3 10	0.9	2.9	116	34	327		
7400	57.2	3 13	0.9	2.9	115	34	336		
7500	58.0	3 16	0.9	2.9	115	34	346	2262	
7600	58.8	3 19	0.9	2.9	114	34	356		
7700	59.8	3 22	0.9	2.9	114	34	366		
7800	60.6	3 24	0.9	3.0	114	34	376		
7900	61.6	3 27	0.9	3.0	113	34	386		
8000	62.4	3 30	0.9	3.0	113	34	397	2238	
8100	63.2	3 33	0.9	3.0	113	33	408		
8200	64.2	3 36	0.9	3.0	112	33	419		
8300	65.0	3 39	0.9	3.0	112	33	430		
8400	66.0	3 42	0.9	3.0	112	33	441		
8500	66.8	3 45	0.9	3.0	111	33	452	2214	
8600	67.8	3 48	0.9	3.0	111	33	463		
8700	68.6	3 51	0.9	3.0	111	33	475		
8800	69.6	3 55	0.9	3.0	110	33	487		
8900	70.4	3 58	0.9	3.1	110	33	499		
9000	71.4	4 01	0.9	3.1	110	33	511	2190	
9100	72.2	4 04	0.9	3.1	109	32	523		
9200	73.2	4 07	0.9	3.1	109	32	536		
9300	74.0	4 10	0.9	3.1	109	32	549		
9400	75.0	4 13	0.9	3.1	108	32	562		
9500	76.0	4 16	0.9	3.1	108	32	575	2166	
9600	76.8	4 19	0.9	3.1	108	32	588		
9700	77.8	4 22	0.9	3.1	107	32	602		
9800	78.8	4 26	0.9	3.1	107	32	616		
9900	79.6	4 29	0.9	3.2	107	32	630		
10000	80.6	4 32	0.9	3.2	106	32	644	2142	
10100	81.6	4 35	0.9	3.2	106	31	658		
10200	82.4	4 38	0.9	3.2	106	31	673		
10300	83.4	4 42	0.9	3.2	105	31	688		
10400	84.4	4 45	0.9	3.2	105	31	703		
10500	85.4	4 48	0.9	3.2	105	31	718	2118	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Df (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on--	mil	deg		yd	yd	sec	yd
61	3 26	16.7	-2	-0.15	9.48	12	2	8.5	7000
62	3 30	16.4						8.6	7100
63	3 33	16.1						8.8	7200
64	3 37	15.8						8.9	7300
65	3 41	15.6						9.0	7400
66	3 44	15.3	-2	-0.15	9.48	13	2	9.2	7500
67	3 48	15.1						9.3	7600
69	3 52	14.8						9.4	7700
70	3 55	14.6						9.6	7800
71	3 59	14.4						9.7	7900
72	4 03	14.1	-3	-0.15	9.49	14	2	9.8	8000
73	4 06	13.9						10.0	8100
74	4 10	13.7						10.1	8200
75	4 14	13.5						10.2	8300
76	4 18	13.3						10.4	8400
77	4 22	13.1	-3	-0.15	9.49	15	2	10.5	8500
79	4 25	12.9						10.6	8600
80	4 29	12.7						10.8	8700
81	4 33	12.6						10.9	8800
82	4 37	12.4						11.1	8900
83	4 41	12.2	-3	-0.15	9.50	16	2	11.2	9000
84	4 45	12.0						11.3	9100
86	4 49	11.9						11.5	9200
87	4 53	11.7						11.6	9300
88	4 57	11.6						11.8	9400
89	5 01	11.4	-3	-0.15	9.50	17	2	11.9	9500
90	5 05	11.3						12.0	9600
92	5 09	11.1						12.2	9700
93	5 13	11.0						12.3	9800
94	5 17	10.8						12.5	9900
95	5 21	10.7	-3	-0.20	9.51	18	3	12.6	10000
96	5 25	10.5						12.7	10100
98	5 29	10.4						12.9	10200
99	5 34	10.3						13.0	10300
100	5 38	10.1						13.2	10400
101	5 42	10.0	-3	-0.20	9.52	19	3	13.3	10500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil deg min	mil min	yd yd	ft	f/s		
	10500	85.4	4 48	0.9 3.2	105 31	718	2118	
10600	86.2	4 51	1.0 3.2	104 31	733			
10700	87.2	4 54	1.0 3.2	104 31	749			
10800	88.2	4 58	1.0 3.2	104 31	764			
10900	89.2	5 01	1.0 3.3	103 31	780			
11000	90.2	5 04	1.0 3.3	103 31	796	2095		
11100	91.0	5 07	1.0 3.3	103 30	812			
11200	92.0	5 11	1.0 3.3	102 30	829			
11300	93.0	5 14	1.0 3.3	102 30	845			
11400	94.0	5 18	1.0 3.3	102 30	862			
11500	95.0	5 21	1.0 3.3	102 30	879	2072		
11600	96.0	5 24	1.0 3.3	101 30	896			
11700	97.0	5 28	1.0 3.3	101 30	914			
11800	98.0	5 31	1.0 3.4	101 30	932			
11900	99.0	5 35	1.0 3.4	100 30	950			
12000	100.0	5 38	1.0 3.4	100 30	968	2050		
12100	101.0	5 41	1.0 3.4	100 30	986			
12200	102.0	5 45	1.0 3.4	99 29	1005			
12300	103.0	5 48	1.0 3.4	99 29	1024			
12400	104.0	5 52	1.0 3.4	99 29	1043			
12500	105.0	5 55	1.0 3.4	98 29	1062	2028		
12600	106.2	5 58	1.0 3.4	98 29	1081			
12700	107.2	6 02	1.0 3.5	98 29	1101			
12800	108.2	6 05	1.0 3.5	97 29	1121			
12900	109.2	6 09	1.0 3.5	97 29	1141			
13000	110.2	6 12	1.0 3.5	97 29	1162	2006		
13100	111.2	6 15	1.0 3.5	97 29	1182			
13200	112.2	6 19	1.0 3.5	96 29	1203			
13300	113.4	6 22	1.0 3.5	96 28	1224			
13400	114.4	6 26	1.0 3.5	96 28	1245			
13500	115.4	6 29	1.0 3.5	95 28	1267	1984		
13600	116.4	6 33	1.0 3.6	95 28	1289			
13700	117.6	6 36	1.0 3.6	95 28	1311			
13800	118.6	6 40	1.1 3.6	94 28	1334			
13900	119.6	6 43	1.1 3.6	94 28	1356			
14000	120.8	6 47	1.1 3.6	94 28	1379	1963		

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dfl (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on--	mil	deg		yd	yd	sec	yd
101	5 42	10.0	-3	-0.20	9.52	19	3	13.3	10500
103	5 46	9.9						13.5	10600
104	5 50	9.8						13.6	10700
105	5 55	9.7						13.7	10800
106	5 59	9.5						13.9	10900
108	6 03	9.4	-4	-0.20	9.53	20	3	14.0	11000
109	6 08	9.3						14.2	11100
110	6 12	9.2						14.3	11200
111	6 16	9.1						14.5	11300
113	6 21	9.0						14.6	11400
114	6 25	8.9	-4	-0.20	9.53	21	3	14.8	11500
115	6 29	8.8						14.9	11600
117	6 34	8.7						15.1	11700
118	6 38	8.6						15.2	11800
119	6 43	8.5						15.4	11900
121	6 47	8.4	-4	-0.20	9.54	22	3	15.5	12000
122	6 52	8.3						15.6	12100
123	6 57	8.2						15.8	12200
125	7 01	8.1						15.9	12300
126	7 06	8.0						16.1	12400
128	7 10	7.9	-4	-0.25	9.54	23	3	16.2	12500
129	7 15	7.9						16.4	12600
130	7 20	7.8						16.5	12700
132	7 24	7.7						16.7	12800
133	7 29	7.6						16.8	12900
135	7 34	7.5	-4	-0.25	9.55	24	3	17.0	13000
136	7 39	7.5						17.1	13100
137	7 44	7.4						17.3	13200
139	7 48	7.3						17.4	13300
140	7 53	7.2						17.6	13400
142	7 58	7.1	-4	-0.25	9.55	25	4	17.7	13500
143	8 03	7.1						17.9	13600
145	8 08	7.0						18.1	13700
146	8 13	6.9						18.2	13800
147	8 18	6.9						18.4	13900
149	8 23	6.8	-5	-0.25	9.56	26	4	18.5	14000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maximum ordinate (8)	Terminal velocity (9)		
	yd	mil	deg	min	mil	min			yd	yd
14000	120.8	6 47	1.1	3.6	94	28	1379	1963		
14100	121.8	6 51	1.1	3.6	94	28	1402			
14200	122.8	6 54	1.1	3.6	93	28	1426			
14300	124.0	6 58	1.1	3.6	93	28	1449			
14400	125.0	7 01	1.1	3.7	93	27	1473			
14500	126.2	7 05	1.1	3.7	92	27	1497	1942		
14600	127.2	7 09	1.1	3.7	92	27	1521			
14700	128.2	7 13	1.1	3.7	92	27	1546			
14800	129.4	7 16	1.1	3.7	91	27	1571			
14900	130.4	7 20	1.1	3.7	91	27	1596			
15000	131.6	7 24	1.1	3.7	91	27	1621	1921		
15100	132.6	7 28	1.1	3.7	91	27	1646			
15200	133.8	7 32	1.1	3.8	90	27	1672			
15300	134.8	7 35	1.1	3.8	90	27	1698			
15400	136.0	7 39	1.1	3.8	90	27	1724			
15500	137.2	7 43	1.1	3.8	89	27	1751	1901		
15600	138.2	7 47	1.1	3.8	89	26	1778			
15700	139.4	7 51	1.1	3.8	89	26	1805			
15800	140.4	7 54	1.1	3.8	89	26	1833			
15900	141.6	7 58	1.1	3.8	88	26	1861			
16000	142.8	8 02	1.1	3.8	88	26	1889	1881		
16100	143.8	8 06	1.1	3.9	88	26	1917			
16200	145.0	8 10	1.1	3.9	87	26	1946			
16300	146.2	8 13	1.1	3.9	87	26	1975			
16400	147.2	8 17	1.1	3.9	87	26	2004			
16500	148.4	8 21	1.1	3.9	87	26	2034	1862		
16600	149.6	8 25	1.2	3.9	86	26	2064			
16700	150.8	8 29	1.2	3.9	86	25	2094			
16800	152.0	8 33	1.2	3.9	86	25	2124			
16900	153.2	8 37	1.2	4.0	85	25	2155			
17000	154.2	8 41	1.2	4.0	85	25	2186	1843		
17100	155.4	8 45	1.2	4.0	85	25	2217			
17200	156.6	8 49	1.2	4.0	85	25	2249			
17300	157.8	8 53	1.2	4.0	84	25	2281			
17400	159.0	8 57	1.2	4.0	84	25	2313			
17500	160.0	9 01	1.2	4.0	84	25	2346	1825		

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on--	mil	deg		yd	yd		
149	8 23	6.8	-5	-0.25	9.56	26	4	18.5	14000
150	8 28	6.7						18.7	14100
152	8 33	6.7						18.8	14200
154	8 38	6.6						19.0	14300
155	8 43	6.5						19.1	14400
156	8 48	6.5	-5	-0.25	9.56	27	4	19.3	14500
158	8 53	6.4						19.5	14600
160	8 59	6.3						19.6	14700
161	9 04	6.3						19.8	14800
163	9 09	6.2						19.9	14900
164	9 14	6.1	-5	-0.30	9.57	28	4	20.1	15000
166	9 19	6.1						20.2	15100
167	9 25	6.0						20.4	15200
169	9 30	6.0						20.6	15300
170	9 36	5.9						20.7	15400
172	9 41	5.9	-5	-0.30	9.58	29	4	20.9	15500
174	9 46	5.8						21.0	15600
175	9 52	5.8						21.2	15700
177	9 57	5.7						21.4	15800
179	10 03	5.6						21.5	15900
180	10 08	5.6	-5	-0.30	9.59	30	4	21.7	16000
182	10 14	5.5						21.9	16100
184	10 20	5.5						22.0	16200
185	10 25	5.4						22.2	16300
187	10 31	5.4						22.3	16400
188	10 36	5.3	-6	-0.30	9.59	31	5	22.5	16500
190	10 42	5.3						22.7	16600
192	10 48	5.2						22.8	16700
194	10 54	5.2						23.0	16800
195	10 59	5.2						23.2	16900
197	11 05	5.1	-6	-0.35	9.60	32	5	23.3	17000
199	11 11	5.1						23.5	17100
201	11 17	5.0						23.7	17200
202	11 23	5.0						23.8	17300
204	11 29	4.9						24.0	17400
206	11 35	4.9	-6	-0.35	9.60	34	5	24.2	17500

FT 16-E-1

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maximum ordinate (8)	Terminal velocity (9)
	yd	mil deg min	mil min	min	yd	yd	ft	f/s
17500	160.0	9 01	1.2	4.0	84	25	2346	1825
17600	161.2	9 05	1.2	4.0	84	25	2379	
17700	162.4	9 09	1.2	4.1	83	25	2412	
17800	163.6	9 13	1.2	4.1	83	25	2445	
17900	164.8	9 17	1.2	4.1	83	24	2479	
18000	166.0	9 21	1.2	4.1	82	24	2513	1807
18100	167.2	9 25	1.2	4.1	82	24	2547	
18200	168.4	9 29	1.2	4.1	82	24	2582	
18300	169.8	9 33	1.2	4.1	82	24	2617	
18400	171.0	9 37	1.2	4.1	81	24	2652	
18500	172.2	9 41	1.2	4.2	81	24	2688	1789
18600	173.6	9 45	1.2	4.2	81	24	2724	
18700	174.8	9 49	1.2	4.2	81	24	2760	
18800	176.0	9 54	1.2	4.2	80	24	2797	
18900	177.2	9 58	1.2	4.2	80	24	2834	
19000	178.4	10 02	1.2	4.2	80	24	2871	1772
19100	179.8	10 06	1.3	4.2	80	24	2909	
19200	181.0	10 11	1.3	4.2	79	23	2946	
19300	182.2	10 15	1.3	4.3	79	23	2984	
19400	183.6	10 20	1.3	4.3	79	23	3023	
19500	184.8	10 24	1.3	4.3	79	23	3062	1755
19600	186.0	10 28	1.3	4.3	78	23	3101	
19700	187.4	10 32	1.3	4.3	78	23	3141	
19800	188.6	10 37	1.3	4.3	78	23	3181	
19900	190.0	10 41	1.3	4.3	78	23	3221	
20000	191.2	10 45	1.3	4.4	77	23	3262	1739
20100	192.6	10 49	1.3	4.4	77	23	3303	
20200	193.8	10 54	1.3	4.4	77	23	3344	
20300	195.2	10 58	1.3	4.4	77	23	3386	
20400	196.4	11 03	1.3	4.4	76	23	3428	
20500	197.8	11 07	1.3	4.4	76	22	3471	1723
20600	199.0	11 12	1.3	4.4	76	22	3514	
20700	200.4	11 16	1.3	4.5	76	22	3557	
20800	201.6	11 21	1.3	4.5	75	22	3600	
20900	203.0	11 25	1.3	4.5	75	22	3644	
21000	204.4	11 30	1.3	4.5	75	22	3689	1708

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dfl (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
206	11 35	4.9	-6	-0.35	9.60	34	5	24.2	17500
208	11 41	4.8						24.3	17600
209	11 47	4.8						24.5	17700
211	11 53	4.8						24.7	17800
213	11 59	4.7						24.8	17900
215	12 05	4.7	-6	-0.35	9.61	35	5	25.0	18000
217	12 11	4.6						25.2	18100
219	12 17	4.6						25.3	18200
220	12 24	4.6						25.5	18300
222	12 30	4.5						25.7	18400
224	12 36	4.5	-7	-0.35	9.61	36	5	25.9	18500
226	12 42	4.4						26.0	18600
228	12 49	4.4						26.2	18700
230	12 55	4.4						26.4	18800
232	13 01	4.3						26.6	18900
234	13 08	4.3	-7	-0.40	9.62	37	5	26.7	19000
235	13 14	4.3						26.9	19100
237	13 21	4.2						27.1	19200
239	13 27	4.2						27.3	19300
241	13 34	4.1						27.4	19400
243	13 41	4.1	-7	-0.40	9.62	38	6	27.6	19500
245	13 47	4.1						27.8	19600
247	13 53	4.0						28.0	19700
249	14 00	4.0						28.1	19800
251	14 07	4.0						28.3	19900
253	14 14	3.9	-7	-0.40	9.63	40	6	28.5	20000
255	14 20	3.9						28.7	20100
257	14 27	3.9						28.9	20200
259	14 34	3.9						29.0	20300
261	14 41	3.8						29.2	20400
263	14 48	3.8	-8	-0.45	9.63	41	6	29.4	20500
265	14 54	3.8						29.6	20600
267	15 01	3.7						29.8	20700
269	15 08	3.7						29.9	20800
271	15 15	3.7						30.1	20900
273	15 22	3.6	-8	-0.45	9.64	42	6	30.3	21000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)				
	yd	mil	deg	min	mil	min			yd	yd	ft	f/s
	21000	204.4	11 30	1.3	4.5	75			22	3689	1708	
21100	205.6	11 35	1.3	4.5	75	22	3734					
21200	207.0	11 39	1.3	4.5	74	22	3779					
21300	208.4	11 44	1.3	4.6	74	22	3825					
21400	209.8	11 48	1.4	4.6	74	22	3871					
21500	211.2	11 53	1.4	4.6	74	22	3917	1693				
21600	212.6	11 58	1.4	4.6	73	22	3964					
21700	214.0	12 02	1.4	4.6	73	22	4011					
21800	215.2	12 07	1.4	4.6	73	21	4058					
21900	216.6	12 11	1.4	4.7	73	21	4106					
22000	218.0	12 16	1.4	4.7	72	21	4154	1679				
22100	219.4	12 21	1.4	4.7	72	21	4203					
22200	220.8	12 25	1.4	4.7	72	21	4252					
22300	222.2	12 30	1.4	4.7	72	21	4301					
22400	223.6	12 34	1.4	4.7	71	21	4351					
22500	225.0	12 39	1.4	4.7	71	21	4401	1665				
22600	226.4	12 44	1.4	4.8	71	21	4452					
22700	227.8	12 49	1.4	4.8	71	21	4503					
22800	229.2	12 53	1.4	4.8	70	21	4555					
22900	230.6	12 58	1.4	4.8	70	21	4607					
23000	232.0	13 03	1.4	4.8	70	21	4659	1652				
23100	233.4	13 08	1.4	4.8	70	21	4712					
23200	234.8	13 13	1.4	4.9	70	21	4765					
23300	236.4	13 17	1.4	4.9	69	20	4819					
23400	237.8	13 22	1.4	4.9	69	20	4873					
23500	239.2	13 27	1.5	4.9	69	20	4928	1640				
23600	240.6	13 32	1.5	4.9	69	20	4983					
23700	242.2	13 37	1.5	4.9	68	20	5040					
23800	243.6	13 42	1.5	5.0	68	20	5095					
23900	245.0	13 47	1.5	5.0	68	20	5150					
24000	246.6	13 52	1.5	5.0	68	20	5210	1628				
24100	248.0	13 57	1.5	5.0	67	20	5265					
24200	249.4	14 02	1.5	5.0	67	20	5325					
24300	251.0	14 07	1.5	5.0	67	20	5380					
24400	252.4	14 12	1.5	5.1	67	20	5440					
24500	254.0	14 17	1.5	5.1	67	20	5500	1617				

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dfl (16) (17)		Time of flight (18)	Range (19)		
mil	deg min	1 on--	mil	deg		yd	yd			sec	yd
273	15 22	3.6	-8	-0.45		9.64	42			6	30.3
275	15 29	3.6						30.5	21100		
277	15 36	3.6						30.7	21200		
279	15 43	3.6						30.9	21300		
282	15 50	3.5						31.0	21400		
284	15 57	3.5	-8	-0.45	9.64	43	6	31.2	21500		
286	16 04	3.5						31.4	21600		
288	16 11	3.4						31.6	21700		
290	16 19	3.4						31.8	21800		
292	16 26	3.4						32.0	21900		
294	16 33	3.4	-8	-0.50	9.65	44	6	32.2	22000		
296	16 40	3.3						32.3	22100		
299	16 48	3.3						32.5	22200		
301	16 55	3.3						32.7	22300		
303	17 02	3.3						32.9	22400		
305	17 10	3.2	-9	-0.50	9.65	46	7	33.1	22500		
307	17 17	3.2						33.3	22600		
310	17 24	3.2						33.5	22700		
312	17 32	3.2						33.7	22800		
314	17 39	3.1						33.9	22900		
316	17 47	3.1	-9	-0.50	9.66	47	7	34.1	23000		
318	17 54	3.1						34.2	23100		
321	18 02	3.1						34.4	23200		
323	18 10	3.0						34.6	23300		
325	18 17	3.0						34.8	23400		
327	18 25	3.0	-9	-0.55	9.67	48	7	35.0	23500		
330	18 32	3.0						35.2	23600		
332	18 40	3.0						35.4	23700		
334	18 48	2.9						35.6	23800		
336	18 55	2.9						35.8	23900		
339	19 03	2.9	-10	-0.55	9.68	49	7	36.0	24000		
341	19 11	2.9						36.2	24100		
343	19 19	2.9						36.4	24200		
346	19 27	2.8						36.6	24300		
348	19 34	2.8						36.8	24400		
350	19 42	2.8	-10	-0.55	9.68	51	7	37.0	24500		

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maximum ordinate (8)	Terminal velocity (9)
	yd	mil deg min	mil min	yd yd	ft	f/s		
24500	254.0	14 17	1.5 5.1	67 20	5500	1617		
24600	255.4	14 22	1.5 5.1	66 20	5555			
24700	257.0	14 27	1.5 5.1	66 20	5615			
24800	258.4	14 33	1.5 5.1	66 20	5680			
24900	260.0	14 38	1.5 5.1	66 19	5740			
25000	261.6	14 43	1.5 5.2	66 19	5800	1606		
25100	263.0	14 48	1.5 5.2	65 19	5860			
25200	264.6	14 53	1.5 5.2	65 19	5925			
25300	266.2	14 59	1.5 5.2	65 19	5985			
25400	267.6	15 04	1.5 5.2	65 19	6050			
25500	269.2	15 09	1.6 5.2	65 19	6115	1596		
25600	270.8	15 14	1.6 5.3	64 19	6180			
25700	272.4	15 19	1.6 5.3	64 19	6245			
25800	273.8	15 25	1.6 5.3	64 19	6310			
25900	275.4	15 30	1.6 5.3	64 19	6375			
26000	277.0	15 35	1.6 5.3	63 19	6440	1586		
26100	278.6	15 40	1.6 5.3	63 19	6510			
26200	280.2	15 46	1.6 5.4	63 19	6575			
26300	281.8	15 51	1.6 5.4	63 19	6640			
26400	283.4	15 57	1.6 5.4	63 19	6710			
26500	285.0	16 02	1.6 5.4	62 19	6780	1577		
26600	286.6	16 07	1.6 5.4	62 18	6850			
26700	288.2	16 13	1.6 5.4	62 18	6920			
26800	289.8	16 18	1.6 5.5	62 18	6990			
26900	291.4	16 24	1.6 5.5	62 18	7060			
27000	293.0	16 29	1.6 5.5	61 18	7130	1569		
27100	294.8	16 35	1.6 5.5	61 18	7200			
27200	296.4	16 40	1.6 5.5	61 18	7275			
27300	298.0	16 46	1.6 5.6	61 18	7345			
27400	299.6	16 51	1.7 5.6	61 18	7420			
27500	301.2	16 57	1.7 5.6	60 18	7495	1561		
27600	303.0	17 03	1.7 5.6	60 18	7565			
27700	304.6	17 08	1.7 5.6	60 18	7640			
27800	306.4	17 14	1.7 5.6	60 18	7715			
27900	308.0	17 19	1.7 5.7	60 18	7795			
28000	309.6	17 25	1.7 5.7	59 18	7870	1554		

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Df (16) (17)		Time of flight (18)	Range (19)
mil deg min	1 on—	mil deg	yd yd	sec		yd			
350	19 42	2.8	-10 -0.55	9.68	51 7	37.0	24500		
353	19 50	2.8				37.2	24600		
355	19 58	2.8				37.4	24700		
357	20 06	2.7				37.6	24800		
360	20 14	2.7				37.8	24900		
362	20 22	2.7	-10 -0.60	9.69	52 7	38.0	25000		
365	20 30	2.7				38.2	25100		
367	20 38	2.7				38.4	25200		
369	20 46	2.6				38.6	25300		
372	20 54	2.6				38.8	25400		
374	21 02	2.6	-11 -0.60	9.69	53 8	39.0	25500		
377	21 11	2.6				39.2	25600		
379	21 19	2.6				39.4	25700		
381	21 27	2.5				39.6	25800		
384	21 35	2.5				39.8	25900		
386	21 43	2.5	-11 -0.60	9.70	54 8	40.0	26000		
389	21 52	2.5				40.2	26100		
391	22 00	2.5				40.4	26200		
394	22 08	2.5				40.6	26300		
396	22 17	2.4				40.8	26400		
398	22 25	2.4	-11 -0.65	9.70	55 8	41.0	26500		
401	22 33	2.4				41.2	26600		
404	22 42	2.4				41.4	26700		
406	22 50	2.4				41.7	26800		
409	22 59	2.4				41.9	26900		
411	23 07	2.3	-12 -0.65	9.70	56 8	42.1	27000		
414	23 15	2.3				42.3	27100		
416	23 24	2.3				42.5	27200		
419	23 32	2.3				42.7	27300		
421	23 41	2.3				42.9	27400		
423	23 50	2.3	-12 -0.65	9.71	58 8	43.1	27500		
426	23 58	2.2				43.3	27600		
429	24 07	2.2				43.6	27700		
431	24 16	2.2				43.8	27800		
434	24 24	2.2				44.0	27900		
436	24 33	2.2	-12 -0.70	9.71	59 8	44.2	28000		

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil	deg	min	yd	yd		
28000	309.6	17 25	1.7	5.7	59	18	7870	1554
28100	311.4	17 31	1.7	5.7	59	18	7945	
28200	313.2	17 37	1.7	5.7	59	18	8025	
28300	314.8	17 42	1.7	5.7	59	17	8105	
28400	316.6	17 48	1.7	5.8	59	17	8180	
28500	318.2	17 54	1.7	5.8	58	17	8260	1547
28600	320.0	18 00	1.7	5.8	58	17	8340	
28700	321.6	18 06	1.7	5.8	58	17	8425	
28800	323.4	18 11	1.7	5.8	58	17	8505	
28900	325.0	18 17	1.7	5.9	58	17	8585	
29000	326.8	18 23	1.7	5.9	57	17	8670	1541
29100	328.6	18 29	1.7	5.9	57	17	8755	
29200	330.4	18 35	1.8	5.9	57	17	8835	
29300	332.0	18 41	1.8	5.9	57	17	8920	
29400	333.8	18 47	1.8	6.0	57	17	9005	
29500	335.6	18 53	1.8	6.0	56	17	9090	1536
29600	337.4	18 59	1.8	6.0	56	17	9175	
29700	339.2	19 05	1.8	6.0	56	17	9265	
29800	341.0	19 11	1.8	6.0	56	17	9350	
29900	342.8	19 17	1.8	6.1	56	17	9440	
30000	344.6	19 23	1.8	6.1	55	16	9525	1531
30100	346.4	19 29	1.8	6.1	55	16	9615	
30200	348.2	19 35	1.8	6.1	55	16	9705	
30300	350.0	19 42	1.8	6.1	55	16	9795	
30400	351.8	19 48	1.8	6.2	55	16	9885	
30500	353.6	19 54	1.8	6.2	55	16	9975	1527
30600	355.4	20 00	1.8	6.2	54	16	10070	
30700	357.2	20 06	1.8	6.2	54	16	10160	
30800	359.2	20 13	1.8	6.2	54	16	10250	
30900	361.0	20 19	1.9	6.3	54	16	10350	
31000	362.8	20 25	1.9	6.3	54	16	10440	1523
31100	364.6	20 31	1.9	6.3	54	16	10540	
31200	366.6	20 38	1.9	6.3	53	16	10630	
31300	368.4	20 44	1.9	6.3	53	16	10730	
31400	370.4	20 51	1.9	6.4	53	16	10830	
31500	372.2	20 57	1.9	6.4	53	16	10930	1520

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Df (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
436	24 33	2.2	-12	-0.70	9.71	59	8	44.2	28000
439	24 41	2.2						44.4	28100
442	24 50	2.2						44.6	28200
444	24 59	2.1						44.8	28300
447	25 08	2.1						45.1	28400
449	25 16	2.1	-13	-0.70	9.72	60	9	45.3	28500
452	25 25	2.1						45.5	28600
455	25 34	2.1						45.7	28700
457	25 42	2.1						46.0	28800
460	25 51	2.1						46.2	28900
462	26 00	2.1	-13	-0.75	9.72	61	9	46.4	29000
465	26 09	2.0						46.6	29100
467	26 17	2.0						46.8	29200
470	26 26	2.0						47.0	29300
473	26 35	2.0						47.3	29400
475	26 44	1.99	-13	-0.75	9.72	62	9	47.5	29500
478	26 52	1.97						47.7	29600
480	27 01	1.96						47.9	29700
483	27 10	1.95						48.2	29800
486	27 19	1.94						48.4	29900
488	27 28	1.92	-14	-0.80	9.73	63	9	48.6	30000
491	27 36	1.91						48.8	30100
493	27 45	1.90						49.1	30200
496	27 54	1.89						49.3	30300
499	28 03	1.88						49.5	30400
501	28 12	1.87	-14	-0.80	9.73	64	9	49.8	30500
504	28 21	1.85						50.0	30600
507	28 29	1.84						50.2	30700
509	28 38	1.83						50.5	30800
512	28 47	1.82						50.7	30900
514	28 56	1.81	-15	-0.80	9.73	65	9	50.9	31000
517	29 05	1.80						51.1	31100
520	29 14	1.79						51.4	31200
522	29 23	1.78						51.6	31300
525	29 32	1.77						51.8	31400
527	29 40	1.75	-15	-0.85	9.74	66	9	52.1	31500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil deg min	mil min	min	yd	yd	ft	f/s
31500	372.2	20 57	1.9	6.4	53	16	10930	1520
31600	374.2	21 03	1.9	6.4	53	16	11020	
31700	376.0	21 10	1.9	6.4	52	16	11120	
31800	378.0	21 16	1.9	6.5	52	15	11220	
31900	379.8	21 23	1.9	6.5	52	15	11320	
32000	381.8	21 29	1.9	6.5	52	15	11430	1517
32100	383.8	21 36	1.9	6.5	52	15	11530	
32200	385.6	21 42	1.9	6.6	52	15	11630	
32300	387.6	21 49	1.9	6.6	51	15	11730	
32400	389.6	21 55	2.0	6.6	51	15	11840	
32500	391.6	22 02	2.0	6.6	51	15	11950	1515
32600	393.4	22 09	2.0	6.7	51	15	12050	
32700	395.4	22 15	2.0	6.7	51	15	12150	
32800	397.4	22 22	2.0	6.7	50	15	12260	
32900	399.4	22 28	2.0	6.7	50	15	12370	
33000	401.4	22 35	2.0	6.7	50	15	12480	1513
33100	403.4	22 42	2.0	6.8	50	15	12590	
33200	405.4	22 49	2.0	6.8	50	15	12700	
33300	407.4	22 55	2.0	6.8	50	15	12810	
33400	409.4	23 02	2.0	6.8	49	15	12920	
33500	411.4	23 09	2.0	6.9	49	15	13030	1512
33600	413.6	23 16	2.0	6.9	49	14	13140	
33700	415.6	23 23	2.1	6.9	49	14	13260	
33800	417.6	23 29	2.1	7.0	49	14	13370	
33900	419.6	23 36	2.1	7.0	48	14	13490	
34000	421.6	23 43	2.1	7.0	48	14	13600	1511
34100	423.8	23 50	2.1	7.0	48	14	13720	
34200	425.8	23 57	2.1	7.1	48	14	13840	
34300	428.0	24 04	2.1	7.1	48	14	13960	
34400	430.0	24 11	2.1	7.1	48	14	14070	
34500	432.2	24 18	2.1	7.2	47	14	14190	1511
34600	434.2	24 25	2.1	7.2	47	14	14310	
34700	436.4	24 32	2.1	7.2	47	14	14440	
34800	438.4	24 40	2.1	7.2	47	14	14560	
34900	440.6	24 47	2.2	7.3	47	14	14690	
35000	442.8	24 54	2.2	7.3	46	14	14810	1511

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
\* FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dft (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
527	29 40	1.75	-15	-0.85	9.74	66	9	52.1	31500
530	29 49	1.74						52.3	31600
533	29 58	1.73						52.5	31700
536	30 07	1.72						52.8	31800
538	30 16	1.71						53.0	31900
541	30 25	1.70	-15	-0.85	9.74	67	10	53.3	32000
544	30 35	1.69						53.5	32100
546	30 44	1.68						53.7	32200
549	30 53	1.67						54.0	32300
552	31 02	1.66						54.2	32400
554	31 11	1.65	-16	-0.90	9.74	68	10	54.5	32500
557	31 20	1.64						54.7	32600
560	31 29	1.63						54.9	32700
562	31 38	1.62						55.2	32800
565	31 47	1.61						55.4	32900
568	31 56	1.60	-16	-0.90	9.75	69	10	55.7	33000
570	32 05	1.60						55.9	33100
573	32 14	1.59						56.1	33200
576	32 23	1.58						56.4	33300
579	32 32	1.57						56.6	33400
581	32 41	1.56	-17	-0.95	9.75	70	10	56.9	33500
584	32 50	1.55						57.1	33600
587	33 00	1.54						57.4	33700
589	33 09	1.53						57.6	33800
592	33 18	1.52						57.9	33900
595	33 27	1.51	-17	-0.95	9.75	71	10	58.2	34000
597	33 36	1.50						58.4	34100
600	33 45	1.50						58.6	34200
603	33 55	1.49						58.9	34300
606	34 04	1.48						59.1	34400
608	34 13	1.47	-17	-1.00	9.75	72	10	59.4	34500
611	34 22	1.46						59.6	34600
614	34 31	1.45						59.9	34700
617	34 41	1.45						60.1	34800
619	34 50	1.44						60.4	34900
622	34 59	1.43	-18	-1.00	9.75	73	10	60.7	35000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range		Change in range for 1 mil 1 min change in elev		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
			(4)	(5)	(6)	(7)		
			mil	min	yd	yd		
35000	442.8	24 54	2.2	7.3	46	14	14810	1511
35100	445.0	25 01	2.2	7.3	46	14	14940	
35200	447.2	25 09	2.2	7.3	46	14	15060	
35300	449.4	25 16	2.2	7.4	46	14	15190	
35400	451.6	25 24	2.2	7.4	46	13	15320	
35500	453.6	25 31	2.2	7.4	45	13	15450	1512
35600	455.8	25 38	2.2	7.5	45	13	15580	
35700	458.2	25 46	2.2	7.5	45	13	15710	
35800	460.4	25 53	2.2	7.5	45	13	15840	
35900	462.6	26 00	2.2	7.6	45	13	15970	
36000	464.8	26 08	2.3	7.6	44	13	16110	1514
36100	467.0	26 16	2.3	7.6	44	13	16240	
36200	469.4	26 24	2.3	7.7	44	13	16380	
36300	471.6	26 31	2.3	7.7	44	13	16520	
36400	474.0	26 39	2.3	7.7	44	13	16660	
36500	476.2	26 47	2.3	7.8	43	13	16800	1516
36600	478.4	26 55	2.3	7.8	43	13	16940	
36700	480.8	27 03	2.3	7.8	43	13	17080	
36800	483.2	27 10	2.3	7.9	43	13	17220	
36900	485.4	27 18	2.3	7.9	43	13	17360	
37000	487.8	27 26	2.4	8.0	42	13	17510	1519
37100	490.2	27 34	2.4	8.0	42	12	17650	
37200	492.6	27 42	2.4	8.0	42	12	17800	
37300	495.0	27 50	2.4	8.1	42	12	17950	
37400	497.4	27 58	2.4	8.1	41	12	18100	
37500	499.8	28 06	2.4	8.2	41	12	18250	1522
37600	502.2	28 14	2.4	8.2	41	12	18400	
37700	504.6	28 23	2.4	8.3	41	12	18560	
37800	507.0	28 31	2.5	8.3	41	12	18710	
37900	509.6	28 40	2.5	8.4	40	12	18870	
38000	512.0	28 48	2.5	8.4	40	12	19030	1525
38100	514.4	28 57	2.5	8.5	40	12	19190	
38200	517.0	29 05	2.5	8.5	40	12	19350	
38300	519.6	29 14	2.5	8.6	39	12	19510	
38400	522.0	29 22	2.6	8.6	39	12	19670	
38500	524.6	29 31	2.6	8.7	39	12	19840	1529

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift		Ballistic coefficient (15)	Probable error in R D/I		Time of flight (18)	Range (19)
			(13)	(14)		(16)	(17)		
			mil	deg		yd	yd		
622	34 59	1.43	-18	-1.00	9.75	73	10	60.7	35000
625	35 08	1.42						60.9	35100
627	35 17	1.41						61.2	35200
630	35 27	1.40						61.4	35300
633	35 36	1.40						61.7	35400
636	35 45	1.39	-18	-1.05	9.75	74	10	62.0	35500
638	35 54	1.38						62.2	35600
641	36 04	1.37						62.5	35700
644	36 13	1.37						62.8	35800
647	36 22	1.36						63.0	35900
649	36 32	1.35	-19	-1.05	9.76	75	10	63.3	36000
652	36 41	1.34						63.5	36100
655	36 50	1.33						63.8	36200
658	37 00	1.33						64.1	36300
660	37 09	1.32						64.3	36400
663	37 18	1.31	-19	-1.10	9.76	75	10	64.6	36500
666	37 28	1.30						64.9	36600
669	37 37	1.30						65.2	36700
672	37 47	1.29						65.4	36800
674	37 56	1.28						65.7	36900
677	38 05	1.28	-20	-1.10	9.76	76	10	66.0	37000
680	38 15	1.27						66.3	37100
683	38 24	1.26						66.5	37200
686	38 34	1.25						66.8	37300
688	38 43	1.25						67.1	37400
691	38 53	1.24	-20	-1.15	9.76	77	10	67.4	37500
694	39 02	1.23						67.6	37600
697	39 12	1.23						67.9	37700
700	39 21	1.22						68.2	37800
702	39 31	1.21						68.5	37900
705	39 40	1.21	-21	-1.15	9.76	78	10	68.8	38000
708	39 50	1.20						69.1	38100
711	40 00	1.19						69.4	38200
714	40 09	1.19						69.7	38300
717	40 19	1.18						69.9	38400
719	40 28	1.17	-21	-1.20	9.76	78	10	70.2	38500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil	deg	min	yd	yd	ft	f/s
38500	524.6	29 31	2.6	8.7	39	12	19840	1529
38600	527.2	29 40	2.6	8.7	39	11	20000	
38700	529.8	29 48	2.6	8.8	38	11	20160	
38800	532.4	29 57	2.6	8.8	38	11	20340	
38900	535.0	30 06	2.6	8.9	38	11	20500	
39000	537.6	30 15	2.7	8.9	38	11	20680	1533
39100	540.4	30 24	2.7	9.0	37	11	20860	
39200	543.0	30 33	2.7	9.1	37	11	21040	
39300	545.8	30 42	2.7	9.2	37	11	21220	
39400	548.4	30 52	2.7	9.2	36	11	21400	
39500	551.2	31 01	2.8	9.3	36	11	21580	1538
39600	554.0	31 10	2.8	9.4	36	11	21760	
39700	556.8	31 20	2.8	9.5	36	11	21940	
39800	559.6	31 29	2.8	9.5	35	10	22140	
39900	562.4	31 39	2.8	9.6	35	10	22320	
40000	565.2	31 48	2.9	9.7	35	10	22520	1543
40100	568.0	31 58	2.9	9.8	34	10	22700	
40200	571.0	32 07	2.9	9.9	34	10	22900	
40300	573.8	32 17	2.9	10.0	34	10	23100	
40400	576.8	32 27	3.0	10.0	34	10	23300	
40500	579.8	32 37	3.0	10.1	33	10	23500	1549
40600	582.8	32 47	3.0	10.2	33	10	23720	
40700	585.8	32 57	3.1	10.3	33	10	23920	
40800	589.0	33 08	3.1	10.4	32	10	24120	
40900	592.0	33 18	3.1	10.5	32	9	24340	
41000	595.2	33 29	3.2	10.6	32	9	24560	1556
41100	598.4	33 40	3.2	10.8	31	9	24780	
41200	601.6	33 51	3.2	10.9	31	9	25000	
41300	604.8	34 02	3.3	11.0	31	9	25220	
41400	608.0	34 13	3.3	11.1	30	9	25460	
41500	611.4	34 24	3.4	11.2	30	9	25680	1564
41600	614.8	34 35	3.4	11.4	30	9	25920	
41700	618.2	34 47	3.4	11.5	29	9	26160	
41800	621.6	34 58	3.5	11.7	29	9	26400	
41900	625.0	35 10	3.5	11.8	28	8	26640	
42000	628.6	35 22	3.6	12.0	28	8	26900	1572

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)			Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R D/I (16) (17)		Time of flight (18)	Range (19)
mil	deg	min	1 on—	mil	deg		yd	yd	sec	yd
719	40	28	1.17	-21	-1.20	9.76	78	10	70.2	38500
722	40	38	1.17						70.5	38600
725	40	48	1.16						70.8	38700
728	40	57	1.15						71.1	38800
731	41	07	1.15						71.4	38900
734	41	17	1.14	-22	-1.20	9.76	79	10	71.7	39000
737	41	27	1.13						72.0	39100
740	41	36	1.13						72.3	39200
743	41	46	1.12						72.6	39300
746	41	56	1.11						72.9	39400
748	42	06	1.11	-22	-1.25	9.76	79	10	73.2	39500
751	42	16	1.10						73.6	39600
754	42	26	1.09						73.9	39700
757	42	36	1.09						74.2	39800
760	42	46	1.08						74.5	39900
763	42	56	1.08	-23	-1.25	9.76	80	10	74.8	40000
766	43	06	1.07						75.1	40100
769	43	16	1.06						75.5	40200
772	43	26	1.06						75.8	40300
775	43	36	1.05						76.1	40400
778	43	47	1.04	-23	-1.30	9.76	80	10	76.5	40500
781	43	57	1.04						76.8	40600
785	44	08	1.03						77.1	40700
788	44	18	1.02						77.5	40800
791	44	28	1.02						77.8	40900
794	44	39	1.01	-24	-1.35	9.75	80	9	78.2	41000
797	44	50	1.01						78.5	41100
800	45	00	1.00						78.9	41200
803	45	11	0.99						79.2	41300
807	45	22	0.99						79.6	41400
810	45	33	0.98	-24	-1.35	9.75	81	9	80.0	41500
813	45	44	0.97						80.3	41600
816	45	55	0.97						80.7	41700
820	46	06	0.96						81.0	41800
823	46	17	0.96						81.4	41900
826	46	28	0.95	-25	-1.40	9.75	81	9	81.8	42000

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Range (1)	Elevation (2) (3)		Change in elev for 100 yd change in range (4) (5)		Change in range for 1 mil 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil deg min	mil min	yd yd	ft	f/s		
	42000	628.6	35 22	3.6 12.0	28 8	26900	1572	
42100	632.2	35 34	3.6 12.2	28 8	27160			
42200	635.8	35 46	3.7 12.4	27 8	27420			
42300	639.6	35 59	3.7 12.6	27 8	27680			
42400	643.2	36 11	3.8 12.8	26 8	27940			
42500	647.0	36 24	3.9 13.0	26 8	28220	1581		
42600	651.0	36 37	3.9 13.2	26 8	28500			
42700	655.0	36 50	4.0 13.4	25 7	28780			
42800	659.0	37 04	4.1 13.7	25 7	29080			
42900	663.0	37 18	4.1 13.9	24 7	29380			
43000	667.2	37 32	4.2 14.2	24 7	29680	1592		
43100	671.4	37 46	4.3 14.5	23 7	29980			
43200	675.8	38 01	4.4 14.8	23 7	30300			
43300	680.2	38 16	4.5 15.2	22 6	30640			
43400	684.8	38 31	4.6 15.6	22 6	30980			
43500	689.6	38 47	4.7 16.0	21 6	31320	1605		
43600	694.4	39 03	4.8 16.5	20 6	31680			
43700	699.4	39 20	5.0 17.1	20 6	32040			
43800	704.6	39 37	5.2 17.7	19 5	32420			
43900	710.0	39 55	5.4 18.4	18 5	32820			
44000	715.4	40 14	5.6 19.1	18 5	33240	1621		
44100	721.2	40 34	5.9 19.9	17 5	33680			
44200	727.2	40 54	6.2 20.8	16 5	34120			
44300	733.6	41 15	6.5 21.9	15 4	34600			
44400	740.2	41 38	6.9 23.2	14 4	35100			
44500	747.2	42 02	7.4 24.9	14 4	35640	1641		
44600	754.8	42 28	8.0 27.0	13 4	36220			
44700	763.2	42 56	8.8 29.7	12 3	36860			
44800	772.6	43 27	9.9 33.4	11 3	37560			
44900	783.2	44 03	11.6 39.2	9 2	38360			
45000	796.2	44 47	14.9 50.4	7 2	39360	1672		
45100	814.6	45 49			40760			
45155	841.6	47 20			42840	1700		

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE A

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dtl (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
826	46 28	0.95	-25	-1.40	9.75	81	9	81.8	42000
829	46 40	0.94						82.2	42100
833	46 51	0.94						82.6	42200
836	47 03	0.93						83.0	42300
840	47 15	0.93						83.4	42400
843	47 26	0.92	-26	-1.45	9.75	81	9	83.8	42500
847	47 38	0.91						84.2	42600
850	47 51	0.91						84.6	42700
854	48 03	0.90						85.1	42800
858	48 15	0.89						85.5	42900
861	48 28	0.89	-26	-1.50	9.75	81	9	85.9	43000
865	48 41	0.88						86.4	43100
869	48 54	0.87						86.8	43200
873	49 07	0.87						87.3	43300
877	49 20	0.86						87.8	43400
881	49 34	0.85	-27	-1.55	9.74	80	9	88.3	43500
885	49 48	0.84						88.8	43600
890	50 02	0.84						89.3	43700
894	50 16	0.83						89.8	43800
898	50 31	0.82						90.4	43900
903	50 47	0.82	-28	-1.60	9.74	80	8	91.0	44000
908	51 04	0.81						91.5	44100
913	51 21	0.80						92.1	44200
918	51 38	0.79						92.7	44300
923	51 57	0.78						93.4	44400
929	52 17	0.77	-29	-1.65	9.73	79	8	94.2	44500
935	52 38	0.76						95.0	44600
942	53 00	0.75						95.8	44700
950	53 25	0.74						96.7	44800
958	53 54	0.73						97.8	44900
968	54 28	0.71	-30	-1.70	9.72	77	7	99.0	45000
983	55 16	0.69						100.8	45100
1003	56 26	0.66	-32	-1.75	9.70	74	6	103.3	45155

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards									
	1000	1500	2000	2500	3000	3500	4000	4500	5000	
-10	478	316	234	186	153	128	110	96	85	
-20	959	633	469	372	306	257	220	192	170	
-30		952	705	559	460	387	331	288	255	
-40		1272	943	747	615	517	443	385	340	
-50			1182	936	770	648	555	483	426	
-60			1421	1126	926	779	667	580	512	
-70			1661	1317	1082	911	780	678	598	
-80			1902	1508	1239	1043	893	777	685	
-90				1700	1396	1175	1007	876	772	
-100				1893	1554	1308	1121	975	859	
-110				2087	1712	1441	1236	1075	947	
-120				2282	1870	1575	1351	1175	1035	
-130				2477	2028	1709	1467	1276	1123	
-140					2186	1843	1583	1377	1211	
-150					2344	1978	1700	1479	1300	
-160					2503	2114	1817	1580	1389	
-170					2662	2250	1934	1682	1479	
-180					2821	2386	2052	1785	1569	
-190					2981	2522	2171	1888	1659	
-200						2659	2290	1991	1749	
-220						2934	2529	2199	1931	
-240						3212	2770	2408	2114	
-260						3495	3012	2618	2298	
-280							3256	2829	2483	
-300							3503	3041	2669	
-320							3754	3254	2856	
-340								3467	3044	
-360								3681	3234	
-380								3896	3424	
-400								4112	3615	
-420								4330	3807	
-440									4000	
-460									4193	
-480									4387	
-500									4582	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Map Range - Yards										Height of Target Feet
5500	6000	6500	7000	7500	8000	8500	9000	9500		
76	68	62	57	53	49	45	42	39	-10	
152	137	125	114	105	97	90	84	78	-20	
228	206	187	171	158	146	135	125	117	-30	
304	275	250	229	211	195	180	167	156	-40	
381	344	313	287	264	243	225	209	195	-50	
458	413	376	345	317	292	270	251	234	-60	
534	482	439	402	370	341	315	293	273	-70	
611	551	501	459	423	390	360	334	312	-80	
688	620	564	517	476	439	405	376	351	-90	
766	690	628	575	529	488	451	418	390	-100	
844	760	691	633	583	538	497	461	430	-110	
922	830	755	691	636	587	543	504	469	-120	
1000	900	818	749	689	636	588	546	508	-130	
1078	970	882	808	743	685	634	588	547	-140	
1156	1040	945	866	797	735	679	630	587	-150	
1235	1111	1009	924	850	784	725	672	626	-160	
1315	1182	1073	982	904	834	771	715	666	-170	
1394	1253	1138	1041	958	884	817	758	706	-180	
1474	1324	1202	1100	1012	934	863	800	746	-190	
1554	1396	1266	1158	1066	984	909	843	786	-200	
1715	1539	1395	1276	1174	1084	1002	929	865	-220	
1876	1683	1525	1394	1283	1184	1095	1015	945	-240	
2038	1827	1655	1513	1392	1285	1188	1101	1025	-260	
2202	1973	1786	1632	1501	1386	1282	1188	1105	-280	
2367	2120	1918	1752	1611	1487	1375	1274	1186	-300	
2533	2268	2051	1872	1721	1588	1469	1361	1267	-320	
2699	2416	2184	1993	1832	1690	1563	1449	1348	-340	
2866	2565	2318	2114	1942	1792	1657	1536	1429	-360	
3034	2714	2452	2236	2053	1894	1752	1624	1510	-380	
3204	2865	2587	2358	2165	1997	1847	1712	1592	-400	
3374	3017	2723	2481	2277	2100	1942	1800	1674	-420	
3545	3169	2860	2604	2389	2202	2037	1889	1757	-440	
3716	3322	2997	2728	2501	2305	2132	1978	1840	-460	
3888	3476	3135	2852	2614	2409	2228	2067	1922	-480	
4062	3631	3274	2977	2727	2512	2324	2156	2005	-500	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards									
	9500	10000	10500	11000	11500	12000	12500	13000	13500	
-10	39	36	34	32	30	28	27	25	24	
-20	78	73	68	64	60	57	54	51	48	
-30	117	109	102	96	91	86	81	76	72	
-40	156	146	137	129	121	114	108	102	97	
-50	195	182	171	161	151	143	135	128	121	
-60	234	219	205	193	181	171	162	153	145	
-70	273	255	239	225	212	200	189	178	169	
-80	312	292	274	257	242	229	216	204	193	
-90	351	329	309	290	273	257	243	230	218	
-100	390	365	343	322	303	286	270	255	242	
-110	430	402	377	354	333	314	297	281	266	
-120	469	439	412	387	364	343	324	307	291	
-130	508	475	446	419	394	372	351	332	315	
-140	547	512	481	452	425	401	379	358	340	
-150	587	549	515	484	456	430	406	384	364	
-160	626	586	550	517	487	459	433	409	388	
-170	666	623	585	550	517	487	460	435	413	
-180	706	661	620	582	548	516	487	461	437	
-190	746	698	654	614	578	545	515	487	461	
-200	786	735	689	647	609	574	542	513	486	
-220	865	809	759	712	670	632	597	565	535	
-240	945	883	828	778	732	690	651	616	584	
-260	1025	958	898	843	793	748	706	668	633	
-280	1105	1033	968	909	855	806	761	720	683	
-300	1186	1108	1038	975	917	864	816	772	732	
-320	1267	1183	1108	1041	979	922	871	824	781	
-340	1348	1259	1179	1107	1041	981	926	876	831	
-360	1429	1334	1249	1173	1103	1039	981	929	881	
-380	1510	1409	1320	1240	1166	1098	1037	981	930	
-400	1592	1485	1391	1306	1228	1157	1093	1034	980	
-420	1674	1562	1463	1373	1291	1216	1148	1087	1030	
-440	1757	1639	1534	1440	1354	1275	1204	1139	1079	
-460	1840	1716	1606	1507	1417	1335	1260	1192	1129	
-480	1922	1793	1678	1574	1480	1394	1316	1245	1179	
-500	2005	1870	1750	1642	1543	1453	1372	1298	1229	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards									
	14000	14500	15000	15500	16000	16500	17000	17500	18000	
-10	23	22	21	20	19	18	17	16	16	-10
-20	46	44	42	40	38	36	34	33	31	-20
-30	69	65	62	59	56	54	51	49	47	-30
-40	92	87	83	79	75	71	68	65	62	-40
-50	115	109	104	99	94	89	85	82	78	-50
-60	138	131	125	119	113	107	102	98	93	-60
-70	161	153	145	138	131	125	120	115	109	-70
-80	184	175	166	158	150	143	137	131	125	-80
-90	207	197	187	178	169	161	154	147	140	-90
-100	230	219	208	198	188	179	171	164	156	-100
-110	253	241	229	218	207	197	188	180	172	-110
-120	276	263	250	238	226	215	205	196	187	-120
-130	300	285	271	258	245	233	222	212	203	-130
-140	323	307	291	277	263	251	240	229	219	-140
-150	346	329	312	296	282	269	257	245	234	-150
-160	369	351	333	316	301	287	274	262	250	-160
-170	392	373	354	336	320	305	291	278	266	-170
-180	415	395	375	356	339	323	308	294	281	-180
-190	438	417	396	376	358	341	326	311	297	-190
-200	462	439	417	396	377	359	343	328	313	-200
-220	508	483	459	436	415	396	378	361	344	-220
-240	555	527	501	476	453	432	412	393	375	-240
-260	601	571	543	516	491	468	446	426	407	-260
-280	648	616	585	556	529	504	481	459	439	-280
-300	695	660	627	596	567	540	515	492	470	-300
-320	742	705	669	636	605	577	550	525	502	-320
-340	789	749	712	677	644	613	584	558	533	-340
-360	836	794	754	717	682	649	619	591	565	-360
-380	883	838	796	757	720	686	654	624	596	-380
-400	930	883	839	798	759	723	689	657	628	-400
-420	977	928	882	839	798	760	724	691	660	-420
-440	1024	973	925	879	836	796	759	724	692	-440
-460	1071	1018	968	920	875	833	794	758	724	-460
-480	1119	1063	1010	960	913	869	829	791	756	-480
-500	1166	1108	1053	1001	952	906	864	825	788	-500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards									
	18000	18500	19000	19500	20000	20500	21000	21500	22000	
-10	16	15	14	14	13	13	12	12	11	
-20	31	30	29	27	26	25	24	23	23	
-30	47	45	43	41	40	38	37	35	34	
-40	62	59	57	55	53	51	49	47	45	
-50	78	74	71	68	66	64	61	58	56	
-60	93	89	86	82	79	76	73	70	68	
-70	109	104	100	96	92	89	85	82	79	
-80	125	119	114	110	106	102	98	94	91	
-90	140	134	129	124	119	114	110	106	102	
-100	156	149	143	137	132	127	122	117	113	
-110	172	164	157	151	145	139	134	129	124	
-120	187	179	172	165	158	152	147	141	136	
-130	203	194	186	179	172	165	159	153	147	
-140	219	209	200	192	185	178	171	164	158	
-150	234	224	215	206	198	190	183	176	170	
-160	250	239	229	220	211	203	195	188	181	
-170	266	254	243	233	224	216	207	199	192	
-180	281	269	258	247	238	229	220	211	203	
-190	297	284	272	261	251	241	232	223	215	
-200	313	299	287	275	264	254	244	235	226	
-220	344	329	316	303	291	280	269	259	249	
-240	375	359	344	330	317	305	293	282	272	
-260	407	389	373	358	344	331	318	306	294	
-280	439	420	402	385	370	356	342	329	317	
-300	470	450	431	413	397	382	367	353	340	
-320	502	480	460	441	424	408	392	377	363	
-340	533	510	489	469	451	434	417	401	386	
-360	565	541	518	497	477	459	441	424	408	
-380	596	571	547	525	504	485	466	448	431	
-400	628	601	576	553	531	511	491	472	454	
-420	660	631	605	581	558	537	516	496	477	
-440	692	662	635	609	585	563	541	520	500	
-460	724	693	664	637	612	588	565	543	523	
-480	756	723	693	665	639	614	590	567	546	
-500	788	754	723	694	666	640	615	591	569	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards									
	23000	24000	25000	26000	27000	28000	29000	30000	31000	
-10	10	10	9	8	8	7	7	6	6	-10
-20	21	19	18	17	16	15	14	13	12	-20
-30	32	29	27	25	23	22	20	19	18	-30
-40	42	39	36	34	31	29	27	26	24	-40
-50	52	48	45	42	39	36	34	32	30	-50
-60	63	58	54	50	47	44	41	38	36	-60
-70	73	68	63	59	55	51	48	45	42	-70
-80	84	78	72	67	62	58	54	51	48	-80
-90	94	87	81	76	70	65	61	58	54	-90
-100	105	97	90	84	78	73	68	64	60	-100
-110	115	107	99	92	86	80	75	70	66	-110
-120	126	117	108	100	93	87	82	77	72	-120
-130	136	126	117	108	101	95	89	83	78	-130
-140	147	136	126	117	109	102	96	90	85	-140
-150	158	146	135	126	117	109	102	96	91	-150
-160	168	156	145	135	125	116	109	103	97	-160
-170	178	166	154	143	133	124	116	109	103	-170
-180	188	175	163	151	141	131	122	115	109	-180
-190	199	185	172	160	148	138	129	122	115	-190
-200	210	195	181	168	156	145	136	128	121	-200
-220	231	214	199	185	172	160	150	141	133	-220
-240	252	234	217	201	187	174	163	154	145	-240
-260	273	253	235	218	203	189	177	166	157	-260
-280	294	273	253	235	218	203	190	179	169	-280
-300	315	292	271	252	234	218	204	192	181	-300
-320	336	311	289	269	250	233	218	205	193	-320
-340	357	331	307	285	265	247	231	217	205	-340
-360	378	351	326	302	281	262	245	230	217	-360
-380	399	370	344	319	296	276	258	243	230	-380
-400	421	390	362	336	312	291	272	256	242	-400
-420	442	410	380	353	328	306	286	269	254	-420
-440	463	429	398	370	344	321	300	282	266	-440
-460	484	449	417	387	360	336	314	295	278	-460
-480	506	469	435	404	376	350	327	308	291	-480
-500	527	488	453	421	391	364	341	321	303	-500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards							
	31000	32000	33000	34000	35000	36000	37000	38000
-10	6	6	5	5	5	5	4	4
-20	12	11	11	10	10	9	8	8
-30	18	17	16	15	14	13	13	12
-40	24	23	22	20	19	18	17	16
-50	30	28	27	26	24	22	21	20
-60	36	34	32	31	29	27	25	24
-70	42	40	38	36	34	32	30	28
-80	48	46	43	41	38	36	34	32
-90	54	51	49	46	43	40	38	36
-100	60	57	54	51	48	45	42	40
-110	66	63	59	56	53	50	47	44
-120	72	68	65	61	58	54	51	48
-130	78	74	70	66	62	59	55	52
-140	85	80	76	71	67	63	59	56
-150	91	86	81	77	72	68	64	60
-160	97	91	86	82	77	73	68	64
-170	103	97	92	87	82	77	72	68
-180	109	103	97	92	86	81	76	72
-190	115	109	103	97	91	86	81	76
-200	121	114	108	102	96	91	85	80
-220	133	126	119	112	106	100	94	88
-240	145	137	129	122	115	109	102	96
-260	157	148	140	132	125	118	111	104
-280	169	160	151	143	135	127	119	112
-300	181	171	162	153	144	136	128	120
-320	193	183	173	163	154	145	136	128
-340	205	194	183	173	163	154	145	136
-360	217	205	194	183	173	163	153	144
-380	230	217	205	194	183	172	162	152
-400	242	229	216	204	192	181	170	160
-420	254	240	227	214	202	190	179	168
-440	266	252	238	225	212	199	187	176
-460	278	263	249	235	222	209	196	184
-480	291	275	260	245	231	218	205	192
-500	303	286	270	255	241	227	213	200

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE B

## TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of Target Feet	Map Range - Yards							
	39000	40000	41000	42000	43000	44000	45000	45200
-10	4	4	3	3	3	3	2	
-20	8	7	7	6	6	5	5	
-30	11	10	10	9	9	8	8	
-40	15	14	13	12	12	11	10	
-50	19	18	17	16	15	14	12	
-60	23	21	20	19	17	16	15	
-70	26	24	23	22	20	19	18	
-80	30	28	26	25	23	22	20	
-90	34	32	30	28	26	24	22	
-100	38	35	33	31	29	27	25	
-110	42	39	36	34	32	30	28	
-120	45	42	40	37	35	32	30	
-130	49	46	43	40	37	35	32	
-140	53	50	47	43	40	37	35	
-150	56	53	50	46	43	40	38	
-160	60	57	53	50	46	43	40	
-170	64	60	57	53	49	45	42	
-180	68	64	60	56	52	48	45	
-190	71	67	63	59	54	50	47	
-200	75	71	67	62	57	53	50	45
-220	83	78	73	68	63	59	55	48
-240	90	85	80	74	69	64	60	51
-260	98	92	87	81	75	70	65	54
-280	105	99	93	87	81	75	70	57
-300	113	106	100	93	86	80	75	60
-320	120	113	106	99	92	86	80	63
-340	128	120	112	105	98	91	85	67
-360	136	128	120	112	104	97	90	71
-380	143	135	126	118	110	102	95	75
-400	151	142	133	124	115	107	100	79
-420	158	149	140	130	121	113	105	83
-440	166	156	146	136	127	118	110	88
-460	173	163	153	142	132	123	115	93
-480	181	170	159	148	138	129	120	98
-500	188	177	166	155	144	134	125	103

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of Target	Map Range - Yards									
	Feet	1000	1500	2000	2500	3000	3500	4000	4500	5000
10		-474	-314	-232	-184	-152	-128	-109	-95	-84
20		-944	-625	-464	-368	-303	-255	-218	-190	-168
30			-934	-695	-551	-454	-382	-327	-285	-252
40			-1241	-925	-732	-603	-508	-435	-379	-336
50				-1153	-913	-752	-634	-543	-473	-419
60				-1380	-1093	-900	-759	-651	-567	-502
70				-1605	-1271	-1047	-883	-758	-661	-585
80				-1828	-1448	-1193	-1007	-864	-754	-668
90					-1624	-1339	-1130	-970	-847	-751
100					-1799	-1484	-1252	-1075	-939	-833
110					-1973	-1628	-1374	-1180	-1031	-915
120					-2145	-1771	-1495	-1285	-1123	-997
130					-2316	-1913	-1616	-1390	-1215	-1078
140					-2485	-2054	-1736	-1494	-1307	-1160
150						-2194	-1855	-1598	-1399	-1242
160						-2333	-1974	-1701	-1490	-1324
170							-2471	-2092	-1804	-1405
180							-2609	-2210	-1907	-1486
190							-2745	-2328	-2010	-1567
200							-2880	-2445	-2112	-1853
220								-2678	-2317	-2034
240								-2910	-2520	-2214
260								-3141	-2722	-2393
280								-3371	-2923	-2571
300									-3124	-2749
320									-3323	-2926
340									-3521	-3103
360									-3717	-3278
380									-3912	-3451
400										-3624
420										-3795
440										-3965
460										-4133
480										-4299
500										-4463
										-3986

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of Target	Map Range - Yards									
	5500	6000	6500	7000	7500	8000	8500	9000	9500	Feet
10	-76	-69	-63	-57	-53	-49	-45	-42	-39	10
20	-151	-137	-125	-114	-105	-97	-89	-83	-78	20
30	-226	-205	-187	-171	-157	-145	-134	-124	-116	30
40	-301	-273	-249	-228	-209	-193	-179	-166	-155	40
50	-376	-341	-311	-285	-262	-241	-223	-207	-193	50
60	-450	-408	-373	-342	-314	-289	-267	-248	-232	60
70	-525	-476	-435	-399	-366	-337	-312	-290	-270	70
80	-599	-543	-496	-455	-418	-385	-356	-331	-309	80
90	-674	-611	-558	-511	-469	-432	-400	-372	-347	90
100	-748	-678	-619	-567	-521	-480	-444	-413	-386	100
110	-822	-745	-680	-623	-572	-527	-488	-454	-424	110
120	-896	-812	-741	-679	-624	-575	-532	-495	-462	120
130	-969	-879	-802	-735	-675	-622	-576	-536	-501	130
140	-1043	-946	-863	-791	-727	-670	-620	-577	-539	140
150	-1116	-1012	-924	-847	-778	-717	-664	-618	-577	150
160	-1190	-1079	-985	-903	-829	-764	-708	-659	-615	160
170	-1263	-1146	-1046	-958	-880	-812	-752	-699	-653	170
180	-1336	-1212	-1106	-1013	-931	-859	-796	-740	-691	180
190	-1409	-1278	-1166	-1068	-982	-906	-839	-781	-729	190
200	-1482	-1344	-1226	-1123	-1032	-952	-882	-821	-767	200
220	-1627	-1476	-1346	-1232	-1133	-1046	-969	-902	-842	220
240	-1772	-1607	-1466	-1342	-1234	-1139	-1056	-983	-918	240
260	-1916	-1738	-1585	-1451	-1334	-1232	-1142	-1063	-993	260
280	-2060	-1868	-1704	-1560	-1434	-1324	-1228	-1144	-1069	280
300	-2203	-1997	-1821	-1668	-1534	-1416	-1314	-1224	-1144	300
320	-2345	-2125	-1938	-1776	-1634	-1509	-1400	-1304	-1218	320
340	-2487	-2254	-2055	-1883	-1733	-1601	-1485	-1383	-1293	340
360	-2628	-2382	-2172	-1990	-1831	-1692	-1570	-1463	-1368	360
380	-2769	-2509	-2288	-2097	-1930	-1783	-1655	-1543	-1442	380
400	-2908	-2635	-2403	-2203	-2028	-1874	-1740	-1622	-1516	400
420	-3047	-2761	-2518	-2309	-2126	-1965	-1825	-1701	-1590	420
440	-3185	-2886	-2632	-2414	-2224	-2056	-1909	-1780	-1664	440
460	-3321	-3010	-2746	-2519	-2321	-2146	-1993	-1858	-1737	460
480	-3456	-3134	-2860	-2624	-2418	-2236	-2077	-1937	-1811	480
500	-3590	-3257	-2973	-2728	-2514	-2326	-2161	-2015	-1884	500

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of Target	Map Range - Yards									
	Feet	9500	10000	10500	11000	11500	12000	12500	13000	13500
10	-39	-36	-34	-32	-30	-28	-27	-25	-24	
20	-78	-73	-68	-64	-60	-57	-54	-51	-48	
30	-116	-109	-102	-96	-90	-85	-80	-76	-72	
40	-155	-145	-136	-128	-120	-113	-107	-101	-96	
50	-193	-181	-170	-160	-150	-142	-134	-127	-120	
60	-232	-217	-204	-192	-180	-170	-161	-152	-144	
70	-270	-253	-238	-224	-210	-198	-187	-177	-168	
80	-309	-289	-271	-255	-240	-226	-214	-203	-192	
90	-347	-325	-305	-287	-270	-255	-241	-228	-216	
100	-386	-361	-339	-319	-300	-283	-267	-253	-240	
110	-424	-397	-373	-351	-330	-311	-294	-278	-264	
120	-462	-433	-406	-382	-360	-339	-320	-303	-288	
130	-501	-469	-440	-413	-389	-367	-347	-329	-312	
140	-539	-504	-473	-445	-419	-395	-374	-354	-336	
150	-577	-540	-507	-477	-449	-423	-400	-379	-360	
160	-615	-576	-540	-508	-479	-452	-427	-404	-383	
170	-653	-612	-574	-539	-508	-480	-454	-429	-407	
180	-691	-647	-607	-571	-538	-508	-480	-454	-431	
190	-729	-683	-641	-603	-568	-536	-507	-480	-455	
200	-767	-718	-674	-634	-597	-564	-533	-505	-479	
220	-842	-789	-741	-697	-656	-619	-586	-555	-526	
240	-918	-860	-807	-759	-715	-675	-638	-605	-574	
260	-993	-931	-874	-822	-774	-731	-691	-655	-621	
280	-1069	-1001	-940	-884	-833	-787	-744	-704	-668	
300	-1144	-1071	-1006	-947	-892	-842	-796	-754	-715	
320	-1218	-1141	-1072	-1009	-951	-897	-848	-803	-762	
340	-1293	-1212	-1138	-1071	-1009	-953	-901	-853	-809	
360	-1368	-1282	-1204	-1133	-1068	-1008	-953	-902	-856	
380	-1442	-1351	-1269	-1194	-1126	-1063	-1005	-952	-903	
400	-1516	-1420	-1334	-1256	-1184	-1118	-1057	-1001	-950	
420	-1590	-1490	-1399	-1317	-1242	-1173	-1109	-1051	-997	
440	-1664	-1559	-1464	-1378	-1300	-1228	-1161	-1100	-1044	
460	-1737	-1628	-1529	-1440	-1358	-1282	-1213	-1149	-1090	
480	-1811	-1697	-1594	-1501	-1416	-1337	-1264	-1198	-1137	
500	-1884	-1766	-1659	-1562	-1473	-1391	-1316	-1247	-1184	

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Map Range - Yards										Height of Target
14000	14500	15000	15500	16000	16500	17000	17500	18000	Feet	
-23	-22	-21	-20	-19	-18	-17	-16	-16	10	
-45	-43	-41	-39	-37	-36	-34	-32	-31	20	
-68	-65	-62	-59	-56	-53	-51	-48	-46	30	
-91	-87	-82	-78	-75	-71	-68	-65	-62	40	
-114	-108	-103	-98	-93	-89	-85	-81	-78	50	
-137	-130	-123	-117	-112	-107	-102	-97	-93	60	
-160	-152	-144	-137	-131	-125	-119	-114	-109	70	
-182	-173	-165	-157	-149	-142	-136	-130	-124	80	
-205	-195	-185	-176	-168	-160	-153	-146	-139	90	
-228	-217	-206	-196	-187	-178	-170	-162	-155	100	
-251	-239	-227	-216	-206	-196	-187	-178	-170	110	
-274	-260	-247	-235	-224	-213	-203	-194	-185	120	
-296	-282	-268	-255	-243	-231	-220	-210	-201	130	
-319	-303	-288	-274	-261	-249	-237	-226	-216	140	
-342	-325	-309	-294	-280	-267	-254	-242	-232	150	
-364	-346	-329	-313	-298	-284	-271	-258	-247	160	
-387	-368	-350	-333	-317	-302	-288	-275	-263	170	
-410	-390	-371	-353	-336	-320	-305	-291	-278	180	
-432	-411	-391	-372	-354	-337	-321	-307	-294	190	
-455	-433	-412	-392	-373	-355	-338	-323	-309	200	
-500	-476	-453	-431	-410	-390	-372	-355	-339	220	
-545	-518	-493	-469	-446	-425	-405	-387	-370	240	
-590	-561	-534	-508	-483	-460	-439	-419	-401	260	
-635	-604	-575	-547	-520	-495	-472	-451	-432	280	
-680	-647	-616	-586	-557	-530	-506	-484	-463	300	
-724	-689	-656	-624	-593	-565	-539	-516	-494	320	
-769	-732	-697	-663	-630	-600	-573	-548	-524	340	
-814	-774	-737	-701	-667	-635	-606	-580	-555	360	
-858	-816	-777	-739	-703	-670	-640	-612	-586	380	
-903	-859	-818	-778	-740	-705	-673	-644	-616	400	
-947	-901	-858	-817	-777	-740	-706	-675	-646	420	
-992	-944	-898	-855	-814	-775	-739	-707	-677	440	
-1036	-986	-938	-893	-850	-810	-773	-739	-707	460	
-1081	-1028	-979	-932	-887	-845	-806	-771	-738	480	
-1125	-1070	-1019	-970	-923	-879	-839	-802	-768	500	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of Target	Map Range - Yards									
	Feet	18000	18500	19000	19500	20000	20500	21000	21500	22000
10	-16	-15	-14	-14	-13	-13	-12	-12	-11	
20	-31	-30	-28	-27	-26	-25	-24	-23	-22	
30	-46	-44	-43	-41	-39	-38	-36	-35	-33	
40	-62	-59	-57	-55	-53	-51	-49	-47	-45	
50	-78	-74	-71	-69	-66	-63	-61	-59	-57	
60	-93	-89	-85	-82	-79	-76	-73	-70	-68	
70	-109	-104	-100	-96	-92	-88	-85	-82	-79	
80	-124	-119	-114	-109	-105	-101	-97	-94	-90	
90	-139	-133	-128	-123	-118	-114	-110	-106	-102	
100	-155	-148	-142	-137	-131	-126	-122	-117	-113	
110	-170	-163	-156	-150	-144	-139	-134	-129	-124	
120	-185	-177	-170	-163	-157	-151	-146	-140	-135	
130	-201	-192	-184	-177	-170	-164	-158	-152	-147	
140	-216	-207	-198	-190	-183	-176	-170	-164	-158	
150	-232	-222	-213	-204	-196	-189	-182	-175	-169	
160	-247	-237	-227	-218	-210	-202	-194	-187	-180	
170	-263	-252	-242	-232	-223	-214	-206	-198	-191	
180	-278	-266	-256	-246	-236	-227	-218	-210	-202	
190	-294	-281	-270	-259	-249	-240	-231	-222	-214	
200	-309	-296	-284	-273	-262	-252	-243	-234	-225	
220	-339	-325	-312	-300	-288	-277	-267	-257	-248	
240	-370	-354	-340	-327	-314	-302	-291	-280	-270	
260	-401	-384	-369	-354	-340	-327	-315	-303	-292	
280	-432	-414	-397	-381	-366	-352	-339	-327	-315	
300	-463	-443	-425	-408	-392	-377	-363	-350	-337	
320	-494	-473	-453	-435	-418	-402	-387	-373	-359	
340	-524	-502	-481	-462	-444	-427	-411	-396	-381	
360	-555	-531	-509	-489	-470	-452	-435	-419	-404	
380	-586	-561	-538	-516	-496	-477	-459	-442	-426	
400	-616	-590	-566	-543	-522	-502	-484	-466	-449	
420	-646	-619	-594	-570	-548	-528	-508	-489	-471	
440	-677	-649	-622	-597	-574	-553	-532	-512	-493	
460	-707	-678	-650	-624	-600	-577	-556	-536	-516	
480	-738	-707	-678	-651	-626	-602	-580	-559	-538	
500	-768	-736	-706	-678	-652	-627	-604	-582	-560	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Map Range - Yards									Height of Target
23000	24000	25000	26000	27000	28000	29000	30000	31000	
-10	-10	-9	-8	-8	-7	-7	-6	-6	10
-21	-19	-18	-17	-15	-14	-14	-13	-12	20
-31	-29	-27	-25	-23	-22	-20	-19	-18	30
-42	-39	-36	-33	-31	-29	-27	-26	-24	40
-53	-49	-45	-42	-39	-36	-34	-32	-30	50
-63	-58	-54	-50	-46	-43	-41	-38	-36	60
-74	-68	-63	-58	-54	-51	-48	-45	-42	70
-84	-78	-72	-67	-62	-58	-54	-51	-48	80
-95	-88	-81	-75	-70	-65	-61	-57	-54	90
-105	-97	-90	-83	-77	-72	-68	-64	-60	100
-115	-107	-99	-92	-85	-79	-74	-70	-66	110
-125	-116	-108	-100	-93	-87	-81	-76	-72	120
-136	-126	-117	-108	-100	-94	-88	-83	-78	130
-147	-136	-126	-116	-108	-101	-95	-89	-84	140
-157	-146	-135	-125	-116	-108	-102	-96	-90	150
-167	-155	-144	-133	-124	-116	-109	-103	-97	160
-177	-164	-152	-141	-131	-123	-116	-109	-103	170
-188	-174	-161	-149	-139	-130	-122	-115	-109	180
-199	-184	-170	-158	-147	-137	-129	-122	-115	190
-209	-194	-179	-166	-155	-145	-136	-128	-121	200
-230	-213	-197	-183	-171	-160	-150	-141	-133	220
-251	-233	-216	-200	-186	-174	-163	-154	-145	240
-271	-252	-234	-217	-202	-189	-177	-166	-157	260
-292	-271	-251	-233	-217	-203	-190	-179	-169	280
-313	-290	-268	-249	-232	-217	-204	-192	-181	300
-333	-309	-286	-265	-247	-231	-217	-205	-193	320
-354	-328	-304	-282	-263	-246	-231	-217	-205	340
-375	-347	-321	-298	-278	-260	-244	-230	-217	360
-395	-366	-339	-315	-294	-275	-258	-243	-229	380
-416	-385	-357	-332	-309	-289	-271	-255	-241	400
-436	-404	-375	-348	-324	-303	-284	-268	-253	420
-457	-424	-393	-365	-340	-317	-297	-280	-265	440
-478	-443	-410	-381	-355	-331	-311	-293	-277	460
-499	-462	-428	-398	-370	-345	-324	-306	-289	480
-519	-481	-446	-414	-385	-359	-337	-318	-301	500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of Target	Map Range - Yards							
	Feet	31000	32000	33000	34000	35000	36000	37000
10	-6	-6	-5	-5	-5	-4	-4	-4
20	-12	-11	-11	-10	-10	-9	-8	-8
30	-18	-17	-16	-15	-14	-14	-13	-12
40	-24	-23	-22	-20	-19	-18	-17	-16
50	-30	-28	-27	-25	-24	-22	-21	-20
60	-36	-34	-32	-31	-29	-27	-25	-24
70	-42	-40	-38	-36	-34	-32	-30	-28
80	-48	-46	-43	-41	-38	-36	-34	-32
90	-54	-51	-49	-46	-43	-40	-38	-36
100	-60	-57	-54	-51	-48	-45	-42	-40
110	-66	-63	-59	-56	-53	-50	-47	-44
120	-72	-68	-65	-61	-57	-54	-51	-48
130	-78	-74	-70	-66	-62	-58	-55	-52
140	-84	-80	-75	-71	-67	-63	-59	-56
150	-90	-85	-80	-76	-72	-68	-64	-60
160	-97	-91	-86	-81	-76	-72	-68	-64
170	-103	-97	-91	-86	-81	-76	-72	-68
180	-109	-103	-97	-91	-86	-81	-76	-72
190	-115	-108	-102	-96	-91	-86	-81	-76
200	-121	-114	-107	-101	-95	-90	-85	-80
220	-133	-125	-118	-111	-105	-99	-93	-88
240	-145	-137	-129	-121	-114	-108	-102	-96
260	-157	-148	-140	-132	-124	-117	-110	-104
280	-169	-160	-151	-142	-134	-126	-119	-112
300	-181	-171	-161	-152	-143	-135	-127	-120
320	-193	-182	-172	-162	-153	-144	-136	-128
340	-205	-194	-183	-173	-162	-153	-144	-136
360	-217	-205	-194	-183	-172	-162	-152	-143
380	-229	-217	-205	-193	-182	-171	-161	-151
400	-241	-228	-215	-203	-191	-180	-169	-159
420	-253	-239	-226	-213	-201	-189	-178	-167
440	-265	-250	-236	-223	-210	-198	-186	-175
460	-277	-262	-247	-233	-220	-207	-195	-183
480	-289	-273	-257	-243	-229	-216	-203	-191
500	-301	-284	-268	-253	-239	-225	-212	-199

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE C

## TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Map Range - Yards								Height of Target
39000	40000	41000	42000	43000	44000	45000	45100	
-4	-3	-3	-3	-3	-3	-2	-2	10
-7	-7	-7	-6	-6	-5	-5	-4	20
-11	-10	-10	-9	-9	-8	-8	-6	30
-15	-14	-13	-12	-12	-11	-10	-9	40
-19	-18	-16	-15	-14	-13	-12	-11	50
-22	-21	-20	-19	-17	-16	-15	-13	60
-26	-24	-23	-22	-20	-19	-18	-15	70
-30	-28	-26	-25	-23	-22	-20	-17	80
-34	-32	-30	-28	-26	-24	-22	-19	90
-37	-35	-33	-31	-29	-27	-25	-21	100
-41	-38	-36	-34	-32	-30	-28	-23	110
-45	-42	-40	-37	-35	-32	-30	-25	120
-49	-46	-43	-40	-37	-35	-33	-27	130
-52	-49	-46	-43	-40	-37	-35	-29	140
-56	-52	-49	-46	-43	-40	-38	-31	150
-60	-56	-53	-50	-46	-43	-40	-33	160
-64	-60	-56	-53	-49	-45	-42	-34	170
-67	-63	-59	-56	-52	-48	-45	-36	180
-71	-67	-63	-59	-55	-51	-48	-38	190
-75	-70	-66	-62	-57	-53	-50	-40	200
-83	-78	-73	-68	-63	-59	-55	-43	220
-90	-85	-79	-74	-69	-64	-60	-47	240
-98	-92	-86	-80	-74	-69	-65	-51	260
-105	-99	-92	-86	-80	-75	-70	-55	280
-113	-106	-99	-93	-86	-80	-75		300
-120	-113	-106	-99	-92	-86	-80		320
-128	-120	-112	-105	-98	-91	-85		340
-135	-127	-119	-111	-103	-96	-89		360
-142	-134	-125	-117	-109	-101	-94		380
-150	-141	-132	-123	-114	-106	-99		400
-157	-148	-139	-129	-120	-112	-104		420
-165	-155	-145	-135	-126	-117	-109		440
-172	-162	-152	-142	-132	-123	-114		460
-180	-169	-158	-148	-138	-128	-119		480
-187	-176	-165	-154	-143	-133	-124		500

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
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PART 2b TABLE D

WEIGHT OF PROJECTILE  
EFFECTS IN YARDS OF RANGE DUE TO VARIATIONS IN

Because of the small weight tolerance of  $\pm 6.5$  lbs. for the 2240 lb. A.P. Projectile MK.XI (Drg. Navy Ord. No. 300390, Sept. 11, 1941) the projectile weight effect on range is negligible at all ranges.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 0°

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+6-	+11-	+16-	+20-	+22-	+23-
4000	0	+12-	+22-	+31-	+38-	+42-	+44-
6000	0	+17-	+32-	+45-	+55-	+61-	+63-
8000	0	+21-	+40-	+57-	+70-	+78-	+81-
10000	0	+25-	+48-	+68-	+84-	+94-	+97-
12000	0	+29-	+56-	+79-	+97-	+108-	+111-
14000	0	+32-	+62-	+88-	+108-	+120-	+124-
16000	0	+36-	+68-	+96-	+118-	+132-	+136-
18000	0	+38-	+73-	+103-	+126-	+142-	+147-
20000	0	+41-	+78-	+110-	+135-	+151-	+156-
22000	0	+43-	+82-	+116-	+143-	+159-	+165-
24000	0	+45-	+86-	+122-	+149-	+166-	+172-
26000	0	+46-	+89-	+126-	+155-	+173-	+179-
28000	0	+48-	+93-	+132-	+161-	+179-	+185-
30000	0	+49-	+96-	+136-	+166-	+184-	+191-
32000	0	+51-	+98-	+139-	+170-	+190-	+196-
34000	0	+52-	+101-	+143-	+174-	+194-	+201-
36000	0	+53-	+102-	+145-	+178-	+198-	+204-
38000	0	+54-	+104-	+147-	+180-	+200-	+206-
40000	0	+54-	+103-	+146-	+179-	+200-	+206-
41000	0	+53-	+102-	+145-	+178-	+198-	+205-
42000	0	+52-	+101-	+143-	+175-	+195-	+202-
43000	0	+51-	+98-	+139-	+170-	+190-	+196-
44000	0	+48-	+93-	+132-	+162-	+181-	+186-
45000	0	+42-	+80-	+113-	+140-	+156-	+160-
45155	0	+36-	+70-	+99-	+121-	+135-	+140-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 10° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+6-	+11-	+16-	+20-	+22-	+23-
4000	0	+12-	+22-	+31-	+38-	+42-	+44-
6000	0	+16-	+31-	+44-	+54-	+60-	+62-
8000	0	+21-	+40-	+56-	+69-	+77-	+80-
10000	0	+25-	+48-	+68-	+83-	+92-	+96-
12000	0	+28-	+55-	+78-	+95-	+106-	+110-
14000	0	+32-	+61-	+87-	+106-	+119-	+123-
16000	0	+35-	+67-	+95-	+116	+130-	+135-
18000	0	+37-	+72-	+102-	+125-	+140-	+145-
20000	0	+40-	+77-	+109-	+133-	+149-	+154-
22000	0	+42-	+81-	+115-	+141-	+157-	+162-
24000	0	+44-	+85-	+120-	+147-	+164-	+170-
26000	0	+46-	+88-	+125-	+153-	+170-	+176-
28000	0	+47-	+91-	+129-	+158-	+176-	+182-
30000	0	+49-	+94-	+133-	+163-	+182-	+188-
32000	0	+50-	+96-	+136-	+167-	+187-	+194-
34000	0	+51-	+99-	+140-	+172-	+192-	+198-
36000	0	+52-	+101-	+143-	+175-	+195-	+202-
38000	0	+53-	+102-	+144-	+177-	+197-	+204-
40000	0	+53-	+102-	+144-	+176-	+197-	+204-
41000	0	+52-	+101-	+143-	+175-	+195-	+202-
42000	0	+51-	+99-	+141-	+173-	+193-	+199-
43000	0	+50-	+97-	+137-	+168-	+187-	+193-
44000	0	+48-	+92-	+130-	+159-	+177-	+183-
45000	0	+41-	+79-	+112-	+137-	+153-	+158-
45155	0	+36-	+69-	+98-	+120-	+134-	+138-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 20° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+6-	+11-	+15-	+18-	+20-	+22-
4000	0	+11-	+21-	+29-	+35-	+39-	+41-
6000	0	+16-	+30-	+42-	+51-	+57-	+59-
8000	0	+20-	+38-	+54-	+66-	+74-	+77-
10000	0	+24-	+45-	+64-	+79-	+88-	+92-
12000	0	+28-	+53-	+74-	+90-	+101-	+105-
14000	0	+31-	+59-	+83-	+101-	+113-	+117-
16000	0	+33-	+64-	+90-	+110-	+123-	+128-
18000	0	+36-	+69-	+98-	+120-	+133-	+137-
20000	0	+38-	+73-	+104-	+127-	+142-	+147-
22000	0	+40-	+77-	+109-	+134-	+149-	+155-
24000	0	+42-	+81-	+114-	+140-	+156-	+162-
26000	0	+44-	+84-	+118-	+145-	+162-	+168-
28000	0	+45-	+87-	+123-	+151-	+168-	+174-
30000	0	+47-	+90-	+127-	+155-	+173-	+179-
32000	0	+48-	+92-	+130-	+160-	+178-	+183-
34000	0	+49-	+94-	+133-	+164-	+183-	+188-
36000	0	+50-	+96-	+136-	+167-	+186-	+192-
38000	0	+50-	+97-	+137-	+168-	+188-	+194-
40000	0	+50-	+96-	+136-	+167-	+187-	+194-
41000	0	+50-	+96-	+135-	+166-	+186-	+192-
42000	0	+49-	+95-	+134-	+164-	+183-	+190-
43000	0	+48-	+92-	+130-	+160-	+179-	+184-
44000	0	+45-	+87-	+124-	+152-	+169-	+174-
45000	0	+39-	+76-	+107-	+131-	+146-	+151-
45155	0	+34-	+66-	+93-	+114-	+127-	+131-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 30° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+5-	+10-	+14-	+17-	+19-	+20-
4000	0	+10-	+19-	+27-	+33-	+37-	+38-
6000	0	+14-	+27-	+38-	+47-	+53-	+54-
8000	0	+18-	+35-	+49-	+60-	+67-	+70-
10000	0	+22-	+42-	+59-	+72-	+81-	+84-
12000	0	+25-	+48-	+68-	+83-	+93-	+96-
14000	0	+28-	+54-	+76-	+93-	+104-	+108-
16000	0	+31-	+59-	+83-	+102-	+114-	+118-
18000	0	+33-	+64-	+90-	+110-	+123-	+127-
20000	0	+35-	+68-	+96-	+117-	+130-	+135-
22000	0	+37-	+71-	+101-	+124-	+138-	+142-
24000	0	+38-	+74-	+105-	+129-	+144-	+149-
26000	0	+40-	+77-	+109-	+134-	+150-	+155-
28000	0	+41-	+80-	+113-	+138-	+154-	+160-
30000	0	+43-	+83-	+117-	+143-	+160-	+165-
32000	0	+44-	+85-	+120-	+147-	+164-	+170-
34000	0	+45-	+87-	+123-	+151-	+168-	+174-
36000	0	+46-	+89-	+126-	+154-	+171-	+177-
38000	0	+47-	+90-	+127-	+155-	+173-	+179-
40000	0	+47-	+90-	+127-	+155-	+173-	+179-
41000	0	+46-	+89-	+126-	+154-	+172-	+178-
42000	0	+45-	+87-	+123-	+151-	+169-	+175-
43000	0	+44-	+85-	+120-	+147-	+164-	+170-
44000	0	+42-	+81-	+114-	+140-	+156-	+161-
45000	0	+36-	+69-	+98-	+120-	+134-	+139-
45155	0	+32-	+61-	+86-	+105-	+117-	+122-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 40° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+5-	+9-	+12-	+15-	+17-	+18-
4000	0	+9-	+17-	+24-	+29-	+32-	+34-
6000	0	+13-	+24-	+34-	+42-	+47-	+49-
8000	0	+16-	+31-	+44-	+54-	+60-	+62-
10000	0	+19-	+37-	+52-	+64-	+72-	+74-
12000	0	+22-	+43-	+60-	+73-	+82-	+86-
14000	0	+25-	+48-	+67-	+82-	+92-	+95-
16000	0	+27-	+52-	+74-	+91-	+101-	+104-
18000	0	+29-	+56-	+80-	+97-	+109-	+113-
20000	0	+31-	+60-	+85-	+104-	+116-	+120-
22000	0	+33-	+63-	+89-	+109-	+122-	+126-
24000	0	+34-	+66-	+93-	+114-	+127-	+131-
26000	0	+35-	+68-	+97-	+119-	+132-	+136-
28000	0	+37-	+71-	+100-	+123-	+137-	+142-
30000	0	+38-	+73-	+103-	+126-	+141-	+146-
32000	0	+39-	+75-	+106-	+130-	+145-	+150-
34000	0	+40-	+77-	+109-	+133-	+148-	+154-
36000	0	+41-	+79-	+111-	+136-	+152-	+157-
38000	0	+41-	+79-	+112-	+137-	+153-	+159-
40000	0	+41-	+79-	+112-	+137-	+153-	+158-
41000	0	+41-	+79-	+111-	+136-	+152-	+157-
42000	0	+40-	+77-	+109-	+134-	+149-	+154-
43000	0	+39-	+75-	+106-	+130-	+145-	+149-
44000	0	+36-	+71-	+101-	+124-	+138-	+142-
45000	0	+31-	+61-	+87-	+107-	+119-	+123-
45155	0	+28-	+54-	+76-	+93-	+104-	+108-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 50° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+4-	+7-	+10-	+12-	+14-	+15-
4000	0	+7-	+14-	+20-	+24-	+27-	+28-
6000	0	+10-	+20-	+29-	+35-	+39-	+40-
8000	0	+13-	+26-	+37-	+45-	+50-	+52-
10000	0	+16-	+31-	+44-	+54-	+60-	+62-
12000	0	+19-	+35-	+50-	+61-	+69-	+72-
14000	0	+21-	+40-	+56-	+69-	+77-	+80-
16000	0	+23-	+44-	+62-	+76-	+85-	+88-
18000	0	+24-	+47-	+67-	+82-	+91-	+94-
20000	0	+26-	+50-	+71-	+87-	+97-	+101-
22000	0	+28-	+53-	+75-	+92-	+102-	+105-
24000	0	+29-	+55-	+78-	+96-	+107-	+111-
26000	0	+29-	+57-	+81-	+99-	+111-	+115-
28000	0	+30-	+59-	+84-	+103-	+115-	+119-
30000	0	+31-	+61-	+87-	+106-	+118-	+123-
32000	0	+33-	+63-	+89-	+109-	+122-	+126-
34000	0	+33-	+64-	+91-	+112-	+125-	+129-
36000	0	+34-	+66-	+93-	+114-	+127-	+131-
38000	0	+35-	+67-	+94-	+115-	+129-	+133-
40000	0	+34-	+66-	+94-	+115-	+128-	+133-
41000	0	+34-	+66-	+93-	+114-	+127-	+132-
42000	0	+34-	+65-	+92-	+112-	+125-	+130-
43000	0	+33-	+63-	+89-	+109-	+122-	+126-
44000	0	+31-	+60-	+85-	+104-	+116-	+120-
45000	0	+27-	+52-	+73-	+89-	+100-	+103-
45155	0	+23-	+45-	+64-	+78-	+87-	+90-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE E

ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 60° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+3-	+6-	+8-	+10-	+11-	+11-
4000	0	+6-	+11-	+16-	+19-	+21-	+22-
6000	0	+8-	+16-	+22-	+27-	+30-	+32-
8000	0	+11-	+20-	+28-	+35-	+39-	+40-
10000	0	+13-	+24-	+34-	+42-	+47-	+48-
12000	0	+15-	+28-	+39-	+48-	+54-	+56-
14000	0	+17-	+32-	+44-	+54-	+60-	+62-
16000	0	+18-	+34-	+48-	+59-	+66-	+68-
18000	0	+19-	+37-	+52-	+64-	+71-	+73-
20000	0	+20-	+39-	+55-	+67-	+75-	+78-
22000	0	+21-	+41-	+58-	+71-	+79-	+82-
24000	0	+22-	+43-	+61-	+74-	+83-	+86-
26000	0	+24-	+45-	+63-	+77-	+86-	+89-
28000	0	+25-	+47-	+65-	+79-	+89-	+93-
30000	0	+25-	+48-	+67-	+82-	+92-	+95-
32000	0	+26-	+49-	+69-	+85-	+95-	+98-
34000	0	+26-	+50-	+71-	+87-	+97-	+100-
36000	0	+27-	+51-	+72-	+88-	+99-	+103-
38000	0	+27-	+52-	+73-	+89-	+100-	+104-
40000	0	+27-	+52-	+73-	+89-	+99-	+103-
41000	0	+27-	+51-	+72-	+88-	+99-	+103-
42000	0	+26-	+50-	+71-	+87-	+97-	+101-
43000	0	+24-	+48-	+69-	+85-	+95-	+98-
44000	0	+23-	+46-	+66-	+81-	+90-	+93-
45000	0	+22-	+41-	+57-	+69-	+77-	+80-
45155	0	+19-	+36-	+50-	+61-	+68-	+70-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE E

ROTATION OF EARTH, EFFECTS IN YARDS OF RANGE, DUE TO

Latitude 70° (North or South)

Range Yards	Azimuth of Target - Degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+2-	+4-	+6-	+7-	+8-	+8-
4000	0	+4-	+8-	+11-	+13-	+14-	+15-
6000	0	+6-	+11-	+15-	+19-	+21-	+22-
8000	0	+7-	+14-	+20-	+24-	+27-	+28-
10000	0	+9-	+17-	+24-	+29-	+32-	+33-
12000	0	+10-	+19-	+27-	+33-	+37-	+38-
14000	0	+11-	+21-	+30-	+37-	+41-	+42-
16000	0	+12-	+23-	+33-	+40-	+45-	+47-
18000	0	+13-	+25-	+36-	+44-	+49-	+50-
20000	0	+14-	+27-	+38-	+46-	+51-	+53-
22000	0	+14-	+28-	+40-	+49-	+55-	+56-
24000	0	+15-	+29-	+41-	+51-	+57-	+59-
26000	0	+16-	+30-	+43-	+53-	+59-	+61-
28000	0	+17-	+32-	+45-	+55-	+61-	+63-
30000	0	+17-	+33-	+47-	+57-	+63-	+65-
32000	0	+18-	+34-	+47-	+58-	+65-	+67-
34000	0	+18-	+35-	+49-	+60-	+67-	+69-
36000	0	+18-	+35-	+50-	+61-	+68-	+70-
38000	0	+18-	+35-	+50-	+61-	+68-	+71-
40000	0	+18-	+35-	+50-	+61-	+68-	+71-
41000	0	+18-	+35-	+50-	+61-	+68-	+70-
42000	0	+17-	+34-	+49-	+60-	+67-	+69-
43000	0	+17-	+33-	+47-	+58-	+65-	+67-
44000	0	+17-	+32-	+45-	+55-	+62-	+64-
45000	0	+14-	+27-	+38-	+47-	+53-	+55-
45155	0	+12-	+24-	+34-	+42-	+47-	+48-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of Target - Degrees						

NOTE: For the argument at the top of the tables use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN

Range Yards	Increase in Muzzle Velocity - Feet Per Second							
	10	20	30	40	50	60	70	80
1000	7	14	21	27	34	41	47	53
2000	14	28	41	54	68	81	94	106
3000	21	41	61	81	101	120	140	159
4000	27	54	81	108	134	160	186	212
5000	34	68	102	135	168	200	232	264
6000	41	82	122	162	201	240	278	315
7000	48	95	142	188	234	279	323	367
8000	55	109	162	215	267	318	369	419
9000	61	122	182	241	299	357	414	470
10000	68	135	201	267	332	396	459	521
11000	75	148	221	293	364	434	503	571
12000	81	161	240	318	395	471	547	621
13000	87	174	259	343	427	509	591	671
14000	94	186	277	368	458	546	634	720
15000	100	198	295	392	488	583	676	768
16000	106	211	314	417	519	619	718	816
17000	112	222	332	441	548	654	759	864
18000	118	235	350	465	578	690	801	911
19000	124	247	368	489	608	726	843	959
20000	130	258	386	512	637	761	884	1006
21000	136	270	404	536	667	797	925	1053
22000	142	283	422	560	697	833	967	1100
23000	148	295	440	584	727	869	1009	1147
24000	154	307	458	608	757	905	1051	1195
25000	160	320	477	633	788	942	1094	1244
26000	167	333	497	659	820	980	1138	1294
27000	174	346	516	685	852	1018	1182	1344
28000	181	359	536	712	885	1057	1227	1395
29000	188	374	558	740	920	1098	1274	1448
30000	195	388	579	768	955	1140	1322	1503
31000	203	403	601	797	991	1183	1372	1559
32000	211	419	625	828	1029	1227	1423	1616
33000	219	435	649	860	1068	1273	1476	1676
34000	228	452	674	892	1108	1321	1530	1737
35000	236	469	699	925	1149	1369	1586	1800

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN

Increase in Muzzle Velocity - Feet Per Second							Range Yards
90	100	110	120	130	140	150	
60	66	71	77	83	89	96	1000
119	131	143	155	167	179	191	2000
177	196	214	232	250	268	285	3000
236	260	284	308	332	355	378	4000
294	325	355	385	414	443	471	5000
352	389	425	461	496	530	564	6000
410	453	495	536	577	617	657	7000
468	516	564	611	658	704	749	8000
525	580	634	687	739	790	841	9000
582	643	703	762	820	877	933	10000
638	705	771	836	900	963	1025	11000
695	767	838	909	979	1048	1116	12000
751	829	906	982	1058	1133	1206	13000
806	890	973	1055	1137	1217	1296	14000
860	950	1039	1128	1215	1301	1386	15000
914	1010	1105	1199	1292	1384	1475	16000
967	1069	1170	1270	1368	1466	1563	17000
1020	1128	1235	1340	1444	1547	1650	18000
1073	1187	1299	1410	1520	1629	1737	19000
1126	1246	1364	1481	1596	1710	1824	20000
1179	1304	1428	1550	1671	1791	1910	21000
1232	1363	1492	1620	1747	1873	1997	22000
1285	1422	1557	1691	1823	1954	2084	23000
1339	1481	1622	1761	1899	2035	2171	24000
1393	1541	1687	1832	1976	2117	2258	25000
1449	1602	1754	1904	2053	2200	2346	26000
1505	1664	1821	1977	2131	2283	2434	27000
1562	1726	1889	2051	2210	2367	2523	28000
1621	1791	1959	2126	2291	2454	2614	29000
1682	1858	2032	2204	2374	2542	2707	30000
1744	1926	2106	2283	2459	2632	2802	31000
1807	1995	2181	2364	2545	2724	2900	32000
1873	2067	2259	2448	2634	2819	3000	33000
1941	2142	2340	2535	2727	2917	3103	34000
2011	2219	2424	2625	2823	3018	3209	35000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Fa

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN

Range Yards	Increase in Muzzle Velocity - Feet Per Second							
	10	20	30	40	50	60	70	80
35000	236	469	699	925	1149	1369	1586	1800
36000	245	487	725	960	1191	1419	1644	1865
37000	254	505	752	995	1235	1471	1704	1932
38000	264	524	781	1033	1281	1525	1766	2003
39000	275	545	811	1073	1330	1583	1832	2077
40000	286	567	843	1115	1382	1644	1902	2155
41000	298	591	879	1161	1438	1710	1976	2237
42000	312	617	917	1210	1498	1779	2055	2325
43000	326	645	957	1262	1561	1853	2139	2418
44000	342	674	999	1317	1628	1931	2227	2515
45000	359	706	1045	1376	1699	2014	2320	2618
46000	374	739	1094	1440	1776	2103	2421	2729
47000			1149	1511	1862	2202	2532	2851
48000					1960	2315	2657	2988
49000								3143
50000								
51000								

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Fa

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN

Increase in Muzzle Velocity - Feet Per Second							Range Yards
90	100	110	120	130	140	150	
2011	2219	2424	2625	2823	3018	3209	35000
2083	2298	2509	2717	2921	3122	3319	36000
2157	2379	2597	2811	3022	3229	3432	37000
2235	2464	2689	2909	3126	3339	3548	38000
2317	2553	2785	3011	3234	3453	3668	39000
2403	2646	2885	3118	3347	3571	3791	40000
2493	2744	2989	3229	3464	3693	3918	41000
2589	2847	3099	3345	3586	3820	4049	42000
2690	2955	3214	3467	3713	3952	4185	43000
2795	3068	3334	3593	3845	4089	4326	44000
2907	3188	3461	3727	3984	4233	4474	45000
3028	3317	3598	3870	4132	4386	4630	46000
3159	3458	3746	4024	4291	4549	4796	47000
3306	3612	3907	4191	4464	4725	4975	48000
3470	3784	4086	4376	4653	4918	5169	49000
		4291	4586	4866	5132	5383	50000
				5115	5379	5626	51000

PROJ., A.P., 2240 LB., MK.XI  
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PART 2b TABLE Fb

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN

Range Yards	Decrease in Muzzle Velocity - Feet Per Second							
	10	20	30	40	50	60	70	80
1000	-7	-14	-21	-28	-36	-43	-51	-58
2000	-14	-28	-42	-56	-71	-86	-101	-116
3000	-21	-42	-63	-85	-107	-129	-152	-175
4000	-28	-56	-84	-113	-143	-172	-202	-233
5000	-35	-70	-105	-141	-178	-215	-253	-291
6000	-42	-84	-127	-170	-214	-258	-303	-348
7000	-49	-98	-148	-198	-249	-301	-353	-405
8000	-56	-112	-169	-226	-284	-343	-402	-462
9000	-62	-125	-189	-253	-318	-384	-451	-518
10000	-69	-139	-209	-280	-352	-425	-499	-573
11000	-76	-152	-229	-307	-386	-466	-546	-627
12000	-82	-165	-249	-333	-419	-505	-592	-681
13000	-88	-177	-268	-359	-451	-544	-638	-734
14000	-95	-190	-287	-384	-483	-582	-683	-785
15000	-101	-202	-305	-409	-514	-620	-727	-835
16000	-107	-215	-324	-434	-545	-658	-771	-885
17000	-113	-227	-342	-459	-576	-695	-815	-935
18000	-119	-239	-361	-483	-607	-732	-858	-985
19000	-125	-251	-379	-507	-637	-768	-900	-1033
20000	-131	-263	-397	-531	-667	-804	-942	-1081
21000	-137	-275	-415	-555	-697	-840	-985	-1130
22000	-143	-287	-433	-580	-728	-877	-1028	-1180
23000	-149	-300	-452	-605	-759	-915	-1072	-1230
24000	-155	-312	-471	-630	-791	-953	-1117	-1282
25000	-162	-325	-490	-656	-824	-993	-1164	-1336
26000	-169	-339	-510	-683	-858	-1034	-1212	-1391
27000	-176	-353	-531	-711	-893	-1077	-1262	-1449
28000	-183	-367	-553	-740	-930	-1121	-1314	-1509
29000	-190	-382	-575	-770	-968	-1168	-1369	-1572
30000	-198	-397	-598	-802	-1008	-1216	-1426	-1638
31000	-206	-413	-623	-835	-1049	-1266	-1485	-1706
32000	-213	-429	-648	-869	-1092	-1318	-1546	-1777
33000	-221	-446	-674	-904	-1136	-1371	-1609	-1850
34000	-230	-464	-700	-939	-1181	-1426	-1674	-1925
35000	-239	-482	-727	-976	-1228	-1483	-1741	-2002

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PART 2b TABLE Fb

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN

Range Yards	Decrease in Muzzle Velocity - Feet Per Second						
	90	100	110	120	130	140	150
1000	-66	-73	-81	-89	-97	-105	-113
2000	-132	-147	-163	-178	-194	-210	-226
3000	-198	-221	-244	-268	-292	-316	-340
4000	-263	-294	-325	-357	-389	-421	-454
5000	-329	-367	-406	-446	-486	-526	-567
6000	-394	-440	-487	-534	-582	-630	-679
7000	-458	-512	-567	-622	-677	-734	-791
8000	-523	-584	-646	-709	-772	-837	-902
9000	-586	-655	-725	-795	-866	-938	-1011
10000	-649	-725	-802	-879	-958	-1037	-1118
11000	-710	-793	-877	-962	-1048	-1135	-1223
12000	-771	-861	-952	-1044	-1137	-1231	-1327
13000	-830	-927	-1025	-1124	-1224	-1325	-1428
14000	-888	-992	-1097	-1203	-1309	-1417	-1526
15000	-945	-1055	-1167	-1279	-1392	-1507	-1622
16000	-1001	-1118	-1236	-1354	-1474	-1595	-1717
17000	-1057	-1180	-1304	-1429	-1556	-1683	-1812
18000	-1113	-1242	-1372	-1504	-1636	-1770	-1905
19000	-1168	-1303	-1440	-1577	-1716	-1856	-1997
20000	-1222	-1364	-1507	-1650	-1795	-1941	-2089
21000	-1277	-1425	-1574	-1724	-1875	-2028	-2182
22000	-1333	-1487	-1643	-1799	-1957	-2117	-2277
23000	-1390	-1551	-1713	-1876	-2041	-2207	-2374
24000	-1448	-1616	-1785	-1955	-2127	-2300	-2474
25000	-1509	-1684	-1860	-2037	-2216	-2397	-2579
26000	-1572	-1754	-1938	-2123	-2310	-2498	-2688
27000	-1638	-1828	-2020	-2213	-2408	-2604	-2802
28000	-1706	-1905	-2105	-2307	-2511	-2716	-2922
29000	-1778	-1985	-2194	-2405	-2618	-2833	-3049
30000	-1853	-2069	-2287	-2508	-2730	-2955	-3182
31000	-1930	-2156	-2384	-2615	-2848	-3083	-3320
32000	-2010	-2246	-2484	-2725	-2969	-3215	-3463
33000	-2093	-2339	-2588	-2839	-3094	-3351	-3611
34000	-2178	-2435	-2695	-2957	-3223	-3492	-3763
35000	-2266	-2534	-2805	-3079	-3356	-3637	-3920

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PROJ., A.P., 2240 LB., MK.XI  
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 FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Fb

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN

Range Yards	Decrease in Muzzle Velocity - Feet Per Second							
	10	20	30	40	50	60	70	80
35000	-239	-482	-727	-976	-1228	-1483	-1741	-2002
36000	-248	-500	-755	-1014	-1276	-1541	-1810	-2082
37000	-258	-519	-785	-1053	-1326	-1602	-1882	-2166
38000	-268	-540	-816	-1095	-1379	-1667	-1958	-2253
39000	-279	-562	-849	-1141	-1437	-1737	-2041	-2349
40000	-291	-586	-886	-1192	-1502	-1816	-2135	-2458
41000	-304	-614	-929	-1250	-1576	-1907	-2243	-2585
42000	-319	-646	-978	-1317	-1663	-2013	-2371	-2737
43000	-336	-682	-1035	-1396	-1766	-2144	-2531	-2926
44000	-355	-724	-1103	-1492	-1891	-2314		
45000	-379	-777	-1191					

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PART 2b TABLE Fb

MUZZLE VELOCITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN

Decrease in Muzzle Velocity - Feet Per Second							Range Yards
90	100	110	120	130	140	150	
-2266	-2534	-2805	-3079	-3356	-3637	-3920	35000
-2358	-2637	-2919	-3205	-3494	-3787	-4083	36000
-2453	-2743	-3037	-3336	-3638	-3943	-4252	37000
-2553	-2856	-3163	-3474	-3789	-4108	-4431	38000
-2662	-2979	-3301	-3626	-3956	-4290	-4628	39000
-2787	-3120	-3458	-3801	-4148	-4500	-4857	40000
-2934	-3287	-3646	-4011	-4381	-4757	-5139	41000
-3110	-3490	-3878	-4273				42000
-3329							43000
							44000
							45000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Ga

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN  
(59° F and 29.5 + in.)

Range Yards	Decrease in Air Density - Per Cent							
	1	2	3	4	5	6	7	8
1000	1	1	2	3	4	4	5	6
2000	2	3	5	7	8	9	11	13
3000	3	5	8	11	13	15	18	21
4000	4	7	11	15	19	22	26	30
5000	5	10	15	20	25	30	35	41
6000	6	13	20	26	32	39	46	53
7000	8	16	25	33	41	50	58	66
8000	10	20	30	41	51	61	71	81
9000	12	24	36	49	61	73	85	98
10000	14	29	43	58	72	86	101	116
11000	17	34	51	68	84	101	118	135
12000	20	39	59	79	98	117	136	156
13000	22	45	67	90	112	134	156	179
14000	25	51	76	102	127	152	178	203
15000	28	57	86	115	143	172	201	229
16000	32	64	97	129	161	193	225	257
17000	36	72	108	144	180	215	251	287
18000	40	80	120	160	200	239	279	319
19000	44	88	132	176	220	264	308	352
20000	48	97	145	194	242	290	339	387
21000	53	106	159	212	265	318	371	424
22000	58	116	174	231	289	347	405	463
23000	63	126	189	252	315	378	441	504
24000	69	137	205	274	342	410	478	546
25000	75	149	223	297	371	444	517	590
26000	81	161	241	320	400	479	557	636
27000	87	173	259	344	429	514	598	683
28000	93	185	277	368	459	550	640	731
29000	99	197	295	393	490	587	683	779
30000	105	210	314	418	521	624	726	828
31000	111	222	333	444	553	662	770	878
32000	118	235	352	469	585	700	814	928
33000	124	248	371	494	616	737	857	977
34000	131	261	390	519	647	774	900	1026
35000	137	273	408	543	678	811	943	1074

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FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Ga

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN  
(59° F and 29.5 + in.)

Decrease in Air Density - Per Cent								Range Yards
9	10	11	12	13	14	15	16	
7	7	8	9	10	11	11	12	1000
15	16	18	19	21	23	24	26	2000
24	26	29	31	34	37	39	42	3000
34	38	42	45	49	53	56	60	4000
46	51	56	61	66	71	76	81	5000
59	66	72	79	85	92	99	105	6000
74	82	90	99	107	116	124	132	7000
91	101	111	121	131	142	152	162	8000
110	122	134	146	158	171	183	195	9000
130	145	159	173	187	202	217	231	10000
152	169	186	202	219	236	253	270	11000
176	195	215	234	253	273	292	312	12000
201	223	246	268	290	313	335	357	13000
228	254	280	305	330	356	381	406	14000
258	287	316	344	373	402	430	459	15000
290	322	354	386	419	451	483	515	16000
323	359	395	431	467	503	539	575	17000
358	398	438	478	518	558	598	638	18000
396	440	484	528	572	616	660	704	19000
435	484	532	581	629	677	726	774	20000
477	530	583	636	689	742	795	848	21000
521	578	636	694	752	810	867	925	22000
567	629	692	754	817	880	942	1004	23000
614	682	750	817	885	952	1019	1086	24000
663	737	810	882	955	1027	1099	1171	25000
714	793	871	949	1027	1104	1181	1258	26000
767	851	934	1017	1100	1183	1265	1347	27000
821	910	999	1087	1175	1263	1351	1438	28000
875	970	1065	1158	1251	1345	1438	1530	29000
930	1031	1131	1230	1329	1428	1526	1624	30000
985	1092	1198	1303	1408	1512	1615	1719	31000
1041	1153	1265	1376	1486	1596	1705	1814	32000
1096	1214	1332	1449	1565	1680	1795	1909	33000
1151	1275	1398	1521	1643	1764	1884	2004	34000
1205	1335	1464	1592	1720	1847	1973	2098	35000

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PART 2b TABLE Ga

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN  
(59° F and 29.5 + in.)

Range Yards	Decrease in Air Density - Per Cent							
	1	2	3	4	5	6	7	8
35000	137	273	408	543	678	811	943	1074
36000	143	285	426	568	708	847	985	1122
37000	149	297	444	591	737	882	1026	1169
38000	155	309	462	614	765	916	1066	1215
39000	160	320	479	637	794	950	1106	1260
40000	166	331	496	659	822	984	1145	1305
41000	172	343	513	682	850	1017	1184	1350
42000	178	355	531	706	879	1052	1225	1396
43000	184	367	550	731	911	1090	1268	1445
44000	191	381	570	758	945	1130	1314	1497
45000	199	397	593	787	980	1172	1362	1551
46000	208	413	616	817	1017	1216	1413	1609
47000						1261	1470	1675
48000								
49000								

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FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Ga

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO DECREASE IN  
(59° F and 29.5 + in.)

Decrease in Air Density - Per Cent								Range Yards
9	10	11	12	13	14	15	16	
1205	1335	1464	1592	1720	1847	1973	2098	35000
1258	1394	1529	1663	1796	1929	2061	2192	36000
1311	1452	1593	1733	1872	2010	2147	2284	37000
1363	1510	1656	1802	1946	2089	2231	2374	38000
1413	1566	1718	1869	2018	2167	2315	2463	39000
1464	1622	1779	1935	2090	2244	2398	2551	40000
1515	1679	1841	2002	2162	2322	2481	2639	41000
1567	1737	1905	2071	2236	2401	2565	2728	42000
1621	1796	1970	2142	2312	2481	2650	2818	43000
1678	1858	2037	2215	2391	2565	2739	2912	44000
1738	1924	2108	2292	2474	2654	2833	3011	45000
1803	1995	2185	2374	2562	2748	2932	3116	46000
1876	2074	2269	2463	2656	2848	3038	3228	47000
1960	2162	2362	2560	2757	2954	3151	3348	48000
					3067	3272	3477	49000

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PART 2b TABLE Gb

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN  
(59° F and 29.5 + in.)

Range Yards	Increase in Air Density - Per Cent							
	1	2	3	4	5	6	7	8
1000	-1	-2	-2	-3	-4	-5	-6	-7
2000	-2	-4	-5	-7	-9	-11	-13	-15
3000	-3	-6	-8	-11	-14	-17	-20	-23
4000	-4	-8	-12	-16	-20	-24	-28	-32
5000	-5	-10	-16	-21	-26	-32	-37	-42
6000	-6	-13	-20	-27	-33	-40	-47	-53
7000	-8	-16	-25	-33	-41	-49	-58	-66
8000	-10	-20	-30	-40	-50	-60	-70	-80
9000	-12	-24	-36	-48	-60	-72	-84	-96
10000	-14	-28	-42	-57	-71	-85	-99	-113
11000	-16	-33	-49	-66	-83	-99	-115	-132
12000	-19	-38	-57	-76	-95	-114	-133	-152
13000	-22	-44	-65	-87	-109	-131	-152	-174
14000	-25	-50	-74	-99	-124	-149	-173	-198
15000	-28	-56	-84	-112	-140	-168	-196	-224
16000	-31	-63	-95	-126	-158	-189	-221	-252
17000	-35	-71	-106	-141	-177	-212	-247	-282
18000	-39	-79	-118	-157	-197	-236	-275	-314
19000	-43	-87	-131	-174	-218	-262	-305	-349
20000	-48	-96	-145	-193	-241	-290	-338	-386
21000	-53	-106	-160	-213	-266	-320	-373	-426
22000	-58	-117	-176	-234	-292	-351	-409	-468
23000	-64	-128	-192	-255	-319	-383	-447	-511
24000	-69	-138	-208	-277	-346	-416	-486	-556
25000	-75	-149	-224	-300	-375	-451	-527	-603
26000	-81	-161	-242	-324	-405	-487	-569	-652
27000	-87	-174	-261	-349	-436	-524	-613	-702
28000	-93	-186	-280	-374	-468	-563	-658	-754
29000	-99	-199	-299	-400	-501	-603	-705	-807
30000	-106	-212	-319	-426	-534	-643	-752	-861
31000	-113	-226	-339	-453	-568	-683	-799	-915
32000	-119	-239	-359	-480	-601	-723	-846	-969
33000	-125	-251	-378	-506	-634	-762	-892	-1022
34000	-132	-264	-397	-531	-666	-801	-937	-1074
35000	-138	-277	-416	-556	-697	-839	-982	-1125

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PART 2b TABLE Gb

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN  
(59° F and 29.5 + in.)

Increase in Air Density - Per Cent								Range Yards
9	10	11	12	13	14	15	16	
-8	-9	-9	-10	-11	-11	-12	-13	1000
-16	-18	-19	-21	-23	-24	-26	-28	2000
-25	-28	-30	-33	-36	-39	-42	-45	3000
-35	-39	-43	-47	-51	-55	-59	-63	4000
-47	-52	-57	-62	-68	-73	-78	-83	5000
-60	-67	-73	-79	-87	-93	-100	-106	6000
-75	-83	-91	-99	-108	-116	-124	-132	7000
-91	-101	-111	-121	-131	-141	-151	-161	8000
-108	-120	-132	-144	-156	-168	-180	-192	9000
-127	-141	-155	-169	-184	-198	-212	-226	10000
-148	-164	-181	-197	-214	-230	-247	-263	11000
-171	-190	-209	-228	-247	-266	-285	-304	12000
-196	-218	-239	-261	-283	-305	-326	-348	13000
-223	-248	-272	-297	-322	-347	-371	-396	14000
-252	-280	-308	-336	-364	-392	-420	-448	15000
-283	-315	-347	-378	-409	-441	-473	-504	16000
-317	-353	-388	-423	-458	-494	-529	-564	17000
-354	-393	-432	-472	-511	-550	-589	-629	18000
-393	-436	-480	-524	-567	-611	-654	-698	19000
-435	-483	-531	-579	-627	-676	-724	-772	20000
-479	-532	-585	-638	-691	-745	-798	-851	21000
-526	-584	-642	-700	-759	-818	-876	-935	22000
-575	-638	-702	-766	-831	-895	-959	-1023	23000
-626	-695	-765	-835	-906	-976	-1046	-1116	24000
-679	-754	-831	-907	-984	-1060	-1137	-1214	25000
-734	-816	-899	-982	-1065	-1148	-1232	-1316	26000
-791	-880	-970	-1060	-1150	-1240	-1331	-1422	27000
-850	-946	-1043	-1140	-1237	-1335	-1433	-1531	28000
-910	-1013	-1117	-1221	-1326	-1431	-1537	-1642	29000
-971	-1081	-1192	-1304	-1416	-1528	-1641	-1754	30000
-1032	-1150	-1268	-1387	-1506	-1626	-1746	-1867	31000
-1093	-1218	-1343	-1469	-1596	-1723	-1851	-1979	32000
-1153	-1285	-1417	-1550	-1684	-1818	-1953	-2089	33000
-1212	-1350	-1489	-1629	-1770	-1911	-2053	-2196	34000
-1269	-1414	-1560	-1707	-1854	-2002	-2151	-2300	35000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Gb

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN  
(59° F and 29.5 + in.)

Range Yards	Increase in Air Density - Per Cent							
	1	2	3	4	5	6	7	8
35000	-138	-277	-416	-556	-697	-839	-982	-1125
36000	-144	-289	-435	-581	-728	-876	-1025	-1174
37000	-150	-301	-453	-605	-758	-912	-1067	-1223
38000	-156	-313	-471	-629	-788	-948	-1109	-1271
39000	-162	-325	-489	-653	-818	-984	-1151	-1319
40000	-168	-337	-507	-677	-848	-1020	-1194	-1368
41000	-174	-349	-525	-702	-879	-1057	-1238	-1418
42000	-180	-361	-544	-727	-911	-1096	-1282	-1469
43000	-186	-374	-563	-753	-944	-1135	-1327	-1520
44000	-193	-388	-584	-780	-977	-1174	-1372	-1570
45000	-201	-403	-606	-809	-1012			

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Gb

AIR DENSITY, EFFECTS IN YARDS OF RANGE, DUE TO INCREASE IN  
(59° F and 29.5 + in.)

Increase in Air Density - Per Cent								Range Yards
9	10	11	12	13	14	15	16	
-1269	-1414	-1560	-1707	-1854	-2002	-2151	-2300	35000
-1325	-1477	-1629	-1782	-1936	-2091	-2246	-2402	36000
-1380	-1538	-1697	-1856	-2016	-2177	-2339	-2501	37000
-1434	-1598	-1763	-1928	-2094	-2261	-2429	-2598	38000
-1488	-1658	-1829	-2001	-2173	-2346	-2520	-2695	39000
-1543	-1719	-1896	-2074	-2252	-2431	-2611	-2792	40000
-1599	-1781	-1964	-2148	-2332	-2517	-2703	-2890	41000
-1657	-1845	-2033	-2222	-2412	-2602	-2794	-2987	42000
-1714	-1908	-2102	-2296	-2491	-2687	-2884	-3082	43000
-1769	-1969	-2169						44000
								45000

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE H

TEMPERATURE (ELASTICITY), EFFECTS IN YARDS OF RANGE  
(59° F.)

Range Yards	Temperature of Air - Degrees Fahrenheit												
	0	10	20	30	40	50	59	60	70	80	90	100	
1000	5	4	3	2	2	1	0	0	0	-1	-1	-2	
2000	11	9	6	4	3	1	0	0	-1	-2	-3	-4	
3000	18	14	10	7	5	2	0	0	-2	-4	-6	-7	
4000	26	20	15	11	7	3	0	0	-3	-6	-8	-10	
5000	34	27	20	14	9	4	0	0	-4	-8	-11	-14	
6000	43	34	26	18	11	5	0	-1	-6	-11	-15	-19	
7000	53	42	32	23	14	6	0	-1	-8	-14	-19	-24	
8000	64	51	39	28	18	8	0	-1	-9	-17	-24	-30	
9000	76	61	47	34	21	9	0	-1	-11	-20	-29	-37	
10000	88	71	55	40	25	11	0	-1	-13	-24	-34	-44	
11000	101	82	63	46	29	13	0	-1	-15	-28	-40	-51	
12000	115	93	72	52	33	15	0	-2	-18	-33	-46	-59	
13000	130	105	82	59	38	17	0	-2	-20	-37	-53	-68	
14000	146	118	92	67	43	20	0	-2	-23	-42	-61	-78	
15000	163	132	103	75	48	22	0	-3	-26	-48	-69	-89	
16000	181	147	115	84	54	25	0	-3	-29	-54	-78	-100	
17000	200	163	128	93	60	28	0	-3	-32	-60	-87	-113	
18000	220	180	141	103	66	31	0	-3	-36	-67	-97	-126	
19000	241	197	154	113	73	34	0	-4	-40	-74	-107	-139	
20000	262	214	168	123	79	37	0	-4	-43	-81	-118	-153	
21000	284	232	182	133	86	40	0	-4	-47	-89	-129	-167	
22000	307	251	197	144	93	43	0	-5	-52	-97	-140	-182	
23000	331	271	212	156	101	47	0	-5	-56	-105	-152	-197	
24000	355	291	228	167	108	50	0	-6	-60	-113	-164	-213	
25000	380	311	244	179	116	54	0	-6	-64	-121	-176	-229	
26000	405	332	260	191	124	58	0	-6	-69	-130	-189	-246	
27000	431	353	277	203	131	61	0	-7	-74	-139	-202	-263	
28000	457	375	294	216	140	65	0	-7	-78	-147	-214	-279	
29000	483	397	312	229	148	69	0	-8	-83	-156	-227	-296	
30000	510	419	330	242	156	73	0	-8	-88	-165	-240	-313	
31000	537	441	347	255	165	77	0	-9	-93	-174	-253	-330	
32000	564	463	364	268	173	81	0	-9	-97	-182	-266	-347	
33000	591	485	382	281	182	85	0	-9	-101	-191	-279	-364	
34000	618	507	399	293	190	89	0	-10	-106	-200	-292	-381	
35000	644	529	416	306	198	93	0	-10	-111	-209	-305	-398	

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE H

TEMPERATURE (ELASTICITY), EFFECTS IN YARDS OF RANGE  
(59° F.)

Range Yards	Temperature of Air - Degrees Fahrenheit												
	0	10	20	30	40	50	59	60	70	80	90	100	
35000	644	529	416	306	198	93	0	-10	-111	-209	-305	-398	
36000	670	550	433	318	206	96	0	-11	-116	-218	-317	-414	
37000	695	571	449	330	214	100	0	-11	-120	-226	-330	-431	
38000	721	592	466	343	222	104	0	-12	-125	-235	-343	-448	
39000	746	613	483	355	230	108	0	-12	-129	-243	-355	-464	
40000	772	634	499	367	238	112	0	-12	-133	-252	-368	-481	
41000	798	655	516	380	246	115	0	-13	-138	-260	-380	-497	
42000	824	677	533	392	254	119	0	-13	-142	-269	-393	-514	
43000	849	698	550	405	263	123	0	-14	-147	-277	-405	-530	
44000	875	719	567	418	271	127	0	-14	-151	-285	-416	-544	
45000	900	741	585	431	280	131	0	-14	-156	-294	-428	-559	
46000	926	763	603	445	289	136	0	-15					
47000	952												

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Ia

## REAR WIND, EFFECTS IN YARDS OF RANGE, DUE TO

Range Yards	Rear Wind - Miles Per Hour									
	5	10	15	20	25	30	35	40	45	50
1000	0	0	0	1	1	1	1	2	2	2
2000	0	0	1	2	2	3	3	4	4	5
3000	1	1	2	3	4	5	5	6	7	8
4000	1	2	3	4	6	7	8	9	11	12
5000	2	3	4	6	8	10	11	13	15	17
6000	2	4	6	8	10	13	15	17	19	22
7000	3	5	8	10	13	16	19	21	24	27
8000	3	6	10	13	16	19	23	26	30	33
9000	4	8	12	16	19	23	28	32	36	40
10000	5	9	14	19	23	28	33	38	43	48
11000	5	11	16	22	27	33	39	44	50	56
12000	6	12	19	25	31	38	45	51	58	65
13000	7	14	22	29	36	44	52	59	67	75
14000	8	16	25	33	41	50	59	68	77	86
15000	9	18	28	37	47	57	67	77	88	98
16000	11	21	32	42	53	64	76	87	99	110
17000	12	24	36	47	59	72	85	98	111	123
18000	13	27	40	53	66	81	95	110	124	137
19000	15	30	44	59	74	90	106	122	137	152
20000	16	33	49	65	82	99	117	134	151	168
21000	18	36	54	72	90	109	128	147	166	185
22000	20	39	59	79	99	120	140	161	182	202
23000	22	43	65	86	108	131	153	176	198	220
24000	24	47	71	94	118	142	166	191	215	239
25000	26	51	77	102	128	154	180	207	233	259
26000	28	55	83	110	138	166	194	223	251	279
27000	30	59	89	119	149	179	209	240	270	300
28000	32	64	96	128	160	192	224	257	289	321
29000	34	68	102	137	171	205	239	274	308	342
30000	36	72	109	146	182	218	254	291	327	364
31000	39	77	115	154	193	232	270	308	347	386
32000	41	82	122	163	204	245	286	326	367	408
33000	43	86	129	172	215	258	301	344	387	430
34000	45	90	136	181	226	272	317	362	407	452
35000	48	95	143	190	238	286	333	380	427	475

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE Ia

## REAR WIND, EFFECTS IN YARDS OF RANGE, DUE TO

Range Yards	Rear Wind - Miles Per Hour									
	5	10	15	20	25	30	35	40	45	50
35000	48	95	143	190	238	286	333	380	427	475
36000	50	100	150	200	250	300	349	399	448	498
37000	52	105	157	210	262	314	366	418	470	522
38000	54	109	164	219	273	328	383	437	492	546
39000	57	114	171	228	285	342	400	457	514	571
40000	60	119	178	237	297	357	417	477	536	596
41000	62	124	185	247	309	372	435	497	559	622
42000	64	129	193	258	322	387	453	518	583	649
43000	67	134	202	270	337	405	473	541	609	678
44000	71	141	212	284	355	426	497	568	639	711
45000	75	150	225	301	376	451	526	601	676	752
46000	81	161	241	321	400	480	561	643	726	809

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE 1b

## HEAD WIND, EFFECTS IN YARDS OF RANGE, DUE TO

Range Yards	Head Wind - Miles Per Hour									
	5	10	15	20	25	30	35	40	45	50
1000	0	0	-1	-1	-1	-2	-2	-3	-3	-4
2000	-1	-1	-2	-3	-3	-4	-5	-6	-7	-8
3000	-1	-2	-3	-4	-5	-6	-8	-10	-11	-13
4000	-1	-3	-4	-5	-7	-9	-11	-14	-16	-18
5000	-2	-4	-5	-7	-9	-12	-15	-18	-20	-23
6000	-2	-5	-7	-9	-12	-15	-19	-22	-25	-28
7000	-3	-6	-9	-12	-15	-19	-23	-26	-30	-34
8000	-4	-7	-11	-15	-18	-23	-27	-31	-36	-40
9000	-4	-8	-13	-18	-22	-27	-32	-37	-42	-47
10000	-5	-10	-16	-21	-26	-32	-37	-43	-49	-55
11000	-6	-12	-18	-24	-30	-37	-43	-50	-56	-63
12000	-7	-14	-20	-27	-34	-42	-49	-57	-64	-72
13000	-8	-16	-23	-31	-39	-47	-56	-64	-73	-81
14000	-9	-18	-26	-35	-44	-53	-63	-72	-82	-91
15000	-10	-20	-30	-40	-50	-60	-71	-81	-92	-102
16000	-11	-22	-34	-45	-56	-67	-79	-91	-102	-114
17000	-12	-25	-38	-50	-62	-75	-88	-101	-113	-126
18000	-14	-28	-42	-55	-69	-83	-97	-111	-125	-139
19000	-15	-31	-46	-61	-76	-92	-107	-122	-138	-153
20000	-17	-34	-50	-67	-84	-101	-118	-134	-151	-168
21000	-18	-37	-55	-73	-92	-110	-129	-147	-166	-184
22000	-20	-40	-60	-80	-100	-120	-141	-161	-181	-201
23000	-22	-44	-65	-87	-109	-131	-153	-175	-197	-219
24000	-24	-48	-71	-95	-119	-143	-166	-190	-214	-238
25000	-26	-52	-77	-103	-129	-155	-180	-206	-232	-258
26000	-28	-56	-83	-111	-139	-167	-195	-222	-250	-278
27000	-30	-60	-90	-120	-150	-180	-210	-239	-269	-299
28000	-32	-64	-97	-129	-161	-193	-225	-257	-289	-321
29000	-34	-69	-103	-138	-172	-206	-240	-275	-309	-343
30000	-37	-74	-110	-147	-184	-220	-256	-293	-329	-365
31000	-39	-78	-117	-156	-195	-234	-272	-310	-349	-387
32000	-41	-82	-124	-165	-206	-247	-287	-328	-369	-409
33000	-43	-86	-130	-174	-217	-260	-303	-346	-389	-431
34000	-46	-91	-137	-182	-228	-273	-318	-364	-409	-454
35000	-48	-96	-144	-191	-239	-287	-334	-382	-429	-477

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE 1b

## HEAD WIND, EFFECTS IN YARDS OF RANGE, DUE TO

Range Yards	Head Wind - Miles Per Hour									
	5	10	15	20	25	30	35	40	45	50
35000	-48	-96	-144	-191	-239	-287	-334	-382	-429	-477
36000	-50	-100	-150	-200	-250	-300	-350	-400	-450	-500
37000	-52	-104	-156	-208	-260	-313	-365	-418	-470	-523
38000	-54	-108	-162	-217	-271	-325	-380	-435	-490	-545
39000	-56	-112	-169	-226	-282	-338	-395	-452	-510	-567
40000	-59	-117	-176	-235	-293	-352	-411	-470	-530	-589
41000	-61	-122	-183	-244	-305	-367	-428	-489	-550	-612
42000	-64	-127	-191	-254	-318	-382	-445	-509	-572	-636
43000	-67	-133	-199	-265	-332	-398	-464	-530	-596	-662
44000	-70	-139	-208	-278	-348	-417	-486	-555	-624	-693
45000	-74	-147	-220	-293	-367	-441	-514	-587	-660	-734
46000	-80	-159								

## CROSS WIND EFFECTS

Range Yards	In Mils					In Degrees				
	Cross Wind - Miles Per Hour									
	10	20	30	40	50	10	20	30	40	50
1000	0.1	0.1	0.2	0.2	0.3	0.01	0.01	0.01	0.01	0.02
2000	0.1	0.2	0.3	0.4	0.5	0.01	0.01	0.02	0.02	0.03
3000	0.2	0.3	0.5	0.6	0.8	0.01	0.02	0.03	0.04	0.05
4000	0.2	0.4	0.7	0.9	1.1	0.01	0.02	0.04	0.05	0.06
5000	0.3	0.6	0.8	1.1	1.4	0.02	0.03	0.05	0.06	0.08
6000	0.3	0.7	1.0	1.4	1.7	0.02	0.04	0.06	0.07	0.10
7000	0.4	0.8	1.2	1.6	2.0	0.02	0.05	0.07	0.09	0.11
8000	0.5	0.9	1.4	1.9	2.4	0.03	0.05	0.08	0.11	0.13
9000	0.5	1.1	1.6	2.2	2.7	0.03	0.06	0.09	0.12	0.15
10000	0.6	1.2	1.9	2.5	3.1	0.03	0.07	0.11	0.14	0.17
11000	0.7	1.4	2.1	2.8	3.5	0.04	0.08	0.12	0.16	0.19
12000	0.8	1.5	2.3	3.1	3.8	0.05	0.09	0.13	0.17	0.21
13000	0.8	1.7	2.5	3.4	4.2	0.05	0.09	0.14	0.19	0.24
14000	0.9	1.8	2.7	3.6	4.6	0.05	0.10	0.15	0.20	0.26
15000	1.0	2.0	2.9	3.9	4.9	0.06	0.11	0.16	0.22	0.28
16000	1.1	2.1	3.2	4.2	5.3	0.06	0.12	0.18	0.24	0.30
17000	1.1	2.3	3.4	4.5	5.7	0.06	0.13	0.19	0.25	0.32
18000	1.2	2.4	3.6	4.8	6.0	0.07	0.14	0.20	0.27	0.34
19000	1.3	2.6	3.8	5.1	6.4	0.07	0.14	0.21	0.29	0.36
20000	1.4	2.7	4.1	5.4	6.8	0.08	0.15	0.23	0.30	0.38
21000	1.4	2.9	4.3	5.7	7.2	0.08	0.16	0.24	0.32	0.41
22000	1.5	3.0	4.5	6.0	7.6	0.08	0.17	0.25	0.34	0.43
23000	1.6	3.2	4.8	6.3	7.9	0.09	0.18	0.27	0.36	0.45
24000	1.7	3.3	5.0	6.6	8.3	0.10	0.19	0.28	0.37	0.47
25000	1.7	3.5	5.2	6.9	8.7	0.10	0.20	0.29	0.39	0.49
26000	1.8	3.6	5.4	7.2	9.0	0.10	0.20	0.30	0.41	0.51
27000	1.9	3.8	5.6	7.5	9.4	0.11	0.21	0.32	0.42	0.53
28000	2.0	3.9	5.9	7.8	9.8	0.11	0.22	0.33	0.44	0.55
29000	2.0	4.0	6.1	8.1	10.1	0.11	0.23	0.34	0.46	0.57
30000	2.1	4.2	6.3	8.4	10.5	0.12	0.24	0.35	0.47	0.59
31000	2.2	4.3	6.5	8.7	10.8	0.12	0.24	0.37	0.49	0.61
32000	2.2	4.5	6.7	8.9	11.2	0.12	0.25	0.38	0.50	0.63
33000	2.3	4.6	6.9	9.2	11.5	0.13	0.26	0.39	0.52	0.65
34000	2.4	4.7	7.1	9.4	11.8	0.14	0.27	0.40	0.53	0.66
35000	2.4	4.8	7.2	9.7	12.1	0.14	0.27	0.41	0.55	0.68

## CROSS WIND EFFECTS

Range Yards	In Mils					In Degrees				
	Cross Wind - Miles Per Hour									
	10	20	30	40	50	10	20	30	40	50
35000	2.4	4.8	7.2	9.7	12.1	0.14	0.27	0.41	0.55	0.68
36000	2.5	4.9	7.4	9.9	12.4	0.14	0.28	0.42	0.56	0.70
37000	2.5	5.1	7.6	10.1	12.7	0.14	0.29	0.43	0.57	0.71
38000	2.6	5.2	7.7	10.3	12.9	0.15	0.29	0.43	0.58	0.73
39000	2.6	5.3	7.9	10.5	13.2	0.15	0.30	0.44	0.59	0.74
40000	2.7	5.4	8.1	10.7	13.4	0.15	0.30	0.45	0.60	0.75
41000	2.7	5.5	8.2	10.9	13.7	0.15	0.31	0.46	0.61	0.77
42000	2.8	5.6	8.4	11.1	13.9	0.16	0.32	0.47	0.62	0.78
43000	2.8	5.7	8.5	11.4	14.2	0.16	0.32	0.48	0.64	0.80
44000	2.9	5.8	8.7	11.7	14.6	0.16	0.33	0.49	0.66	0.82
45000	3.0	6.0	9.0	12.1	15.1	0.17	0.34	0.51	0.68	0.85
45155	3.1	6.2	9.2	12.3	15.4	0.17	0.35	0.52	0.69	0.87

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 0°

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14000	+0.1-	+0.1-	0.0	0.0	0.0	-0.1+	-0.1+
16000	+0.1-	+0.1-	0.0	0.0	0.0	-0.1+	-0.1+
18000	+0.1-	+0.1-	+0.1-	0.0	-0.1+	-0.1+	-0.1+
20000	+0.1-	+0.1-	+0.1-	0.0	-0.1+	-0.1+	-0.1+
22000	+0.2-	+0.1-	+0.1-	0.0	-0.1+	-0.1+	-0.2+
24000	+0.2-	+0.2-	+0.1-	0.0	-0.1+	-0.2+	-0.2+
26000	+0.3-	+0.2-	+0.1-	0.0	-0.1+	-0.2+	-0.3+
28000	+0.3-	+0.2-	+0.1-	0.0	-0.1+	-0.2+	-0.3+
30000	+0.4-	+0.3-	+0.2-	0.0	-0.2+	-0.3+	-0.4+
32000	+0.5-	+0.4-	+0.2-	0.0	-0.2+	-0.4+	-0.5+
34000	+0.6-	+0.5-	+0.3-	0.0	-0.3+	-0.5+	-0.6+
36000	+0.7-	+0.5-	+0.3-	0.0	-0.3+	-0.5+	-0.7+
38000	+0.8-	+0.7-	+0.4-	0.0	-0.4+	-0.7+	-0.8+
40000	+1.0-	+0.8-	+0.5-	0.0	-0.5+	-0.8+	-1.0+
42000	+1.3-	+1.0-	+0.6-	0.0	-0.6+	-1.0+	-1.3+
44000	+1.8-	+1.5-	+0.9-	0.0	-0.9+	-1.5+	-1.8+
45155	+2.5-	+2.2-	+1.3-	0.0	-1.3+	-2.2+	-2.5+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 0°

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 10° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
6000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
8000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
10000	-0.1+	-0.1+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+
12000	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+
14000	-0.2+	-0.2+	-0.2+	-0.2+	-0.3+	-0.3+	-0.3+
16000	-0.2+	-0.2+	-0.2+	-0.3+	-0.3+	-0.3+	-0.3+
18000	-0.2+	-0.2+	-0.3+	-0.3+	-0.4+	-0.4+	-0.4+
20000	-0.2+	-0.2+	-0.3+	-0.3+	-0.4+	-0.4+	-0.5+
22000	-0.2+	-0.3+	-0.3+	-0.4+	-0.5+	-0.5+	-0.5+
24000	-0.2+	-0.3+	-0.3+	-0.4+	-0.5+	-0.6+	-0.6+
26000	-0.2+	-0.3+	-0.4+	-0.5+	-0.6+	-0.7+	-0.7+
28000	-0.2+	-0.3+	-0.4+	-0.5+	-0.6+	-0.7+	-0.8+
30000	-0.2+	-0.3+	-0.4+	-0.6+	-0.8+	-0.9+	-1.0+
32000	-0.1+	-0.2+	-0.4+	-0.6+	-0.8+	-1.0+	-1.1+
34000	-0.1+	-0.2+	-0.4+	-0.7+	-1.0+	-1.1+	-1.3+
36000	-0.1+	-0.2+	-0.4+	-0.7+	-1.0+	-1.3+	-1.4+
38000	0.0	-0.1+	-0.4+	-0.8+	-1.2+	-1.5+	-1.6+
40000	+0.1-	0.0	-0.4+	-0.9+	-1.4+	-1.8+	-1.9+
42000	+0.3-	+0.1-	-0.3+	-0.9+	-1.6+	-2.1+	-2.2+
44000	+0.6-	+0.4-	-0.2+	-1.1+	-1.9+	-2.5+	-2.8+
45155	+1.3-	+0.9-	0.0	-1.2+	-2.5+	-3.5+	-3.8+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 10° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 20° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
6000	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+
8000	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.3+	-0.3+
10000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
12000	-0.3+	-0.3+	-0.3+	-0.4+	-0.4+	-0.4+	-0.4+
14000	-0.4+	-0.4+	-0.4+	-0.4+	-0.4+	-0.5+	-0.5+
16000	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+	-0.6+	-0.6+
18000	-0.5+	-0.5+	-0.5+	-0.6+	-0.6+	-0.7+	-0.7+
20000	-0.6+	-0.6+	-0.6+	-0.7+	-0.7+	-0.8+	-0.8+
22000	-0.6+	-0.6+	-0.7+	-0.8+	-0.8+	-0.9+	-0.9+
24000	-0.7+	-0.7+	-0.7+	-0.8+	-0.9+	-1.0+	-1.0+
26000	-0.7+	-0.7+	-0.8+	-0.9+	-1.0+	-1.1+	-1.2+
28000	-0.7+	-0.8+	-0.9+	-1.0+	-1.2+	-1.3+	-1.3+
30000	-0.8+	-0.8+	-0.9+	-1.1+	-1.3+	-1.4+	-1.5+
32000	-0.8+	-0.9+	-1.0+	-1.2+	-1.4+	-1.5+	-1.7+
34000	-0.8+	-0.9+	-1.1+	-1.2+	-1.5+	-1.8+	-1.9+
36000	-0.8+	-0.9+	-1.2+	-1.3+	-1.7+	-2.0+	-2.1+
38000	-0.8+	-0.9+	-1.2+	-1.6+	-2.0+	-2.3+	-2.4+
40000	-0.7+	-0.9+	-1.3+	-1.8+	-2.2+	-2.5+	-2.7+
42000	-0.6+	-0.8+	-1.3+	-1.9+	-2.5+	-2.9+	-3.1+
44000	-0.5+	-0.7+	-1.3+	-2.1+	-2.9+	-3.5+	-3.7+
45155	0.0	-0.3+	-1.2+	-2.4+	-3.6+	-4.5+	-4.8+
	180	150	120	90	60	30	0
	180	210	240	270	300	330	360
	Azimuth of Target - Degrees						

Latitude 20° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 30° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+
6000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
8000	-0.3+	-0.3+	-0.3+	-0.4+	-0.4+	-0.4+	-0.4+
10000	-0.4+	-0.4+	-0.4+	-0.5+	-0.5+	-0.5+	-0.5+
12000	-0.5+	-0.5+	-0.5+	-0.6+	-0.6+	-0.6+	-0.6+
14000	-0.6+	-0.6+	-0.6+	-0.7+	-0.7+	-0.7+	-0.7+
16000	-0.7+	-0.7+	-0.7+	-0.8+	-0.8+	-0.8+	-0.8+
18000	-0.8+	-0.8+	-0.8+	-0.9+	-0.9+	-1.0+	-1.0+
20000	-0.9+	-0.9+	-0.9+	-1.0+	-1.0+	-1.1+	-1.1+
22000	-1.0+	-1.0+	-1.0+	-1.1+	-1.2+	-1.2+	-1.2+
24000	-1.1+	-1.1+	-1.1+	-1.2+	-1.3+	-1.4+	-1.4+
26000	-1.1+	-1.2+	-1.3+	-1.4+	-1.5+	-1.5+	-1.6+
28000	-1.2+	-1.3+	-1.4+	-1.5+	-1.6+	-1.7+	-1.8+
30000	-1.3+	-1.4+	-1.5+	-1.6+	-1.8+	-1.9+	-2.0+
32000	-1.4+	-1.5+	-1.6+	-1.8+	-2.0+	-2.1+	-2.2+
34000	-1.4+	-1.5+	-1.7+	-1.9+	-2.2+	-2.4+	-2.5+
36000	-1.5+	-1.6+	-1.8+	-2.1+	-2.4+	-2.6+	-2.7+
38000	-1.6+	-1.7+	-2.0+	-2.3+	-2.6+	-2.9+	-3.0+
40000	-1.6+	-1.8+	-2.1+	-2.5+	-2.9+	-3.2+	-3.4+
42000	-1.6+	-1.8+	-2.2+	-2.7+	-3.3+	-3.7+	-3.9+
44000	-1.6+	-1.8+	-2.3+	-3.0+	-3.8+	-4.4+	-4.6+
45155	-1.3+	-1.6+	-2.4+	-3.5+	-4.6+	-5.4+	-5.7+
	180	150	120	90	60	30	0
	180	210	240	270	300	330	360
	Azimuth of Target - Degrees						

Latitude 30° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 40° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+	-0.2+
6000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
8000	-0.4+	-0.4+	-0.4+	-0.5+	-0.5+	-0.5+	-0.5+
10000	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+
12000	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+
14000	-0.8+	-0.8+	-0.8+	-0.8+	-0.9+	-0.9+	-0.9+
16000	-0.9+	-0.9+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+
18000	-1.0+	-1.0+	-1.1+	-1.1+	-1.2+	-1.2+	-1.2+
20000	-1.2+	-1.2+	-1.2+	-1.3+	-1.3+	-1.3+	-1.4+
22000	-1.3+	-1.3+	-1.3+	-1.4+	-1.5+	-1.5+	-1.5+
24000	-1.4+	-1.4+	-1.5+	-1.6+	-1.7+	-1.7+	-1.7+
26000	-1.6+	-1.6+	-1.6+	-1.7+	-1.8+	-1.9+	-1.9+
28000	-1.7+	-1.7+	-1.8+	-1.9+	-2.0+	-2.1+	-2.1+
30000	-1.8+	-1.8+	-1.9+	-2.1+	-2.2+	-2.3+	-2.4+
32000	-1.9+	-2.0+	-2.1+	-2.3+	-2.5+	-2.6+	-2.6+
34000	-2.0+	-2.1+	-2.3+	-2.5+	-2.7+	-2.9+	-3.0+
36000	-2.2+	-2.3+	-2.5+	-2.7+	-2.9+	-3.1+	-3.2+
38000	-2.3+	-2.4+	-2.6+	-2.9+	-3.2+	-3.5+	-3.6+
40000	-2.4+	-2.5+	-2.8+	-3.2+	-3.6+	-3.9+	-4.0+
42000	-2.5+	-2.7+	-3.0+	-3.5+	-4.0+	-4.4+	-4.5+
44000	-2.6+	-2.8+	-3.3+	-4.0+	-4.7+	-5.2+	-5.3+
45155	-2.6+	-2.9+	-3.6+	-4.5+	-5.4+	-6.1+	-6.5+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 40° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

## ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 50° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
6000	-0.4+	-0.4+	-0.4+	-0.4+	-0.4+	-0.4+	-0.4+
8000	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+	-0.6+
10000	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+
12000	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+	-0.9+
14000	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+
16000	-1.1+	-1.1+	-1.1+	-1.2+	-1.2+	-1.2+	-1.2+
18000	-1.3+	-1.3+	-1.3+	-1.3+	-1.4+	-1.4+	-1.4+
20000	-1.4+	-1.4+	-1.5+	-1.5+	-1.5+	-1.6+	-1.6+
22000	-1.6+	-1.6+	-1.6+	-1.7+	-1.7+	-1.8+	-1.8+
24000	-1.7+	-1.8+	-1.8+	-1.9+	-1.9+	-2.0+	-2.0+
26000	-1.9+	-1.9+	-2.0+	-2.1+	-2.1+	-2.2+	-2.2+
28000	-2.1+	-2.1+	-2.2+	-2.3+	-2.3+	-2.5+	-2.5+
30000	-2.3+	-2.3+	-2.4+	-2.5+	-2.6+	-2.7+	-2.7+
32000	-2.4+	-2.5+	-2.6+	-2.7+	-2.8+	-2.9+	-3.0+
34000	-2.6+	-2.7+	-2.8+	-3.0+	-3.2+	-3.3+	-3.3+
36000	-2.8+	-2.9+	-3.0+	-3.2+	-3.4+	-3.6+	-3.7+
38000	-3.0+	-3.1+	-3.3+	-3.5+	-3.8+	-4.0+	-4.1+
40000	-3.2+	-3.3+	-3.5+	-3.8+	-4.2+	-4.4+	-4.5+
42000	-3.4+	-3.5+	-3.8+	-4.2+	-4.6+	-4.9+	-5.0+
44000	-3.6+	-3.7+	-4.2+	-4.7+	-5.3+	-5.7+	-5.8+
45155	-3.8+	-4.0+	-4.6+	-5.4+	-6.2+	-6.8+	-7.0+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 50° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE K

ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 60° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
6000	-0.4+	-0.4+	-0.4+	-0.4+	-0.5+	-0.5+	-0.5+
8000	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+	-0.6+
10000	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+
12000	-0.9+	-0.9+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+
14000	-1.1+	-1.1+	-1.1+	-1.1+	-1.1+	-1.2+	-1.2+
16000	-1.3+	-1.3+	-1.3+	-1.3+	-1.3+	-1.3+	-1.4+
18000	-1.4+	-1.5+	-1.5+	-1.5+	-1.5+	-1.5+	-1.6+
20000	-1.6+	-1.6+	-1.7+	-1.7+	-1.7+	-1.7+	-1.8+
22000	-1.8+	-1.8+	-1.9+	-1.9+	-1.9+	-2.0+	-2.0+
24000	-2.0+	-2.0+	-2.1+	-2.1+	-2.2+	-2.2+	-2.2+
26000	-2.2+	-2.2+	-2.3+	-2.3+	-2.4+	-2.5+	-2.5+
28000	-2.4+	-2.4+	-2.5+	-2.6+	-2.7+	-2.7+	-2.7+
30000	-2.6+	-2.6+	-2.7+	-2.8+	-2.9+	-3.0+	-3.0+
32000	-2.8+	-2.9+	-3.0+	-3.1+	-3.2+	-3.3+	-3.3+
34000	-3.1+	-3.1+	-3.2+	-3.4+	-3.5+	-3.6+	-3.6+
36000	-3.3+	-3.4+	-3.5+	-3.7+	-3.8+	-3.9+	-4.0+
38000	-3.5+	-3.6+	-3.8+	-4.0+	-4.2+	-4.3+	-4.4+
40000	-3.8+	-3.9+	-4.1+	-4.4+	-4.6+	-4.7+	-4.8+
42000	-4.1+	-4.3+	-4.5+	-4.8+	-5.1+	-5.3+	-5.4+
44000	-4.5+	-4.6+	-4.9+	-5.3+	-5.7+	-6.0+	-6.2+
45155	-4.8+	-5.0+	-5.5+	-6.1+	-6.7+	-7.2+	-7.4+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 60° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

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PROJ., A.P., 2240 LB., MK.XI  
FUZE, B.D., MK.X  
FULL CHARGE - M.V. 2650 F/S

PART 2b TABLE K

ROTATION OF EARTH, DEFLECTION EFFECTS IN MILS, DUE TO

Latitude 70° (North)

Range Yards	Azimuth of Target - Degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
4000	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+	-0.3+
6000	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+	-0.5+
8000	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+	-0.7+
10000	-0.8+	-0.8+	-0.8+	-0.8+	-0.8+	-0.9+	-0.9+
12000	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+	-1.0+
14000	-1.2+	-1.2+	-1.2+	-1.2+	-1.2+	-1.2+	-1.2+
16000	-1.4+	-1.4+	-1.4+	-1.4+	-1.4+	-1.4+	-1.5+
18000	-1.6+	-1.6+	-1.6+	-1.6+	-1.6+	-1.7+	-1.7+
20000	-1.8+	-1.8+	-1.8+	-1.9+	-1.9+	-1.9+	-1.9+
22000	-2.0+	-2.0+	-2.0+	-2.1+	-2.1+	-2.1+	-2.1+
24000	-2.2+	-2.2+	-2.3+	-2.3+	-2.3+	-2.4+	-2.4+
26000	-2.4+	-2.5+	-2.5+	-2.5+	-2.6+	-2.6+	-2.6+
28000	-2.7+	-2.7+	-2.8+	-2.8+	-2.9+	-2.9+	-2.9+
30000	-2.9+	-3.0+	-3.0+	-3.1+	-3.1+	-3.2+	-3.2+
32000	-3.2+	-3.2+	-3.3+	-3.3+	-3.4+	-3.5+	-3.5+
34000	-3.4+	-3.5+	-3.6+	-3.6+	-3.7+	-3.8+	-3.8+
36000	-3.7+	-3.8+	-3.9+	-4.0+	-4.1+	-4.2+	-4.2+
38000	-4.0+	-4.1+	-4.2+	-4.3+	-4.5+	-4.6+	-4.6+
40000	-4.4+	-4.4+	-4.5+	-4.7+	-4.9+	-5.0+	-5.1+
42000	-4.7+	-4.8+	-4.9+	-5.1+	-5.3+	-5.5+	-5.6+
44000	-5.2+	-5.3+	-5.5+	-5.8+	-6.1+	-6.3+	-6.4+
45155	-5.8+	-5.9+	-6.2+	-6.6+	-7.0+	-7.3+	-7.5+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of Target - Degrees						

Latitude 70° (South)

NOTE: A negative sign means that the effect is to the right; a positive sign, to the left. For the argument at the top of the tables, use the sign that precedes the number; for the argument at the bottom, the sign that follows the number. Azimuth is measured clockwise from the North.

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TABLE FOR CALCULATING THE EQUIVALENT FULL CHARGE EROSION EFFECT  
OF THE 2/3 CHARGE

A.P. PROJECTILE MK.XI

B.D. FUZE MK.X

Charge	No. of Rounds Equivalent in erosion effect to one full charge	Equivalent erosion ef- fect in decimals
2/3	10	.097
Full	1	1

APPENDIX

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