FT 6-C-2

# FIRING TABLES

FOR

## GUN, 6-INCH

M1897M1, M1900, M1903, M1905, M1908
M1908M1, AND M1908M11

WITH

108-LB. A. P. PROJECTILE

1940

FT 6-C-2

# FIRING TABLES

FOR

# GUN, 6-INCH

## M1897MI, M1900, M1903, M1905, M1908 M1908MI, AND M1908MII

FIRING

## 108-LB. A. P. PROJECTILE

WITH

## FUZE, B. D. MK.V

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FT 6-C-2 is published for the information and guidance of all concerned.

These firing tables contain the same data as FT 6-C-1 as changed by FT 6-C-1, C-1, dated July 1, 1931, which may be continued in use.

C. M. WESSON,
Major General,
Chief of Ordnance.

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## INTRODUCTION



## PART I

Data to be used with all approximations of projectile, flat, and rocket motion.



## PART II

Data to be used with 105 ft. A. P. Projectile.

# GUN, 6 INCH

## M1897MI, M1900, M1903, M1905, M1908, M1908MI AND M1908MII

## INTRODUCTION

1. GENERAL INFORMATION. These tables are based on T.S. No. 192 and T.S. No. 188 which is the extension of Ordnance Form No. 992, dated February 27, 1913.

2. CHARACTERISTICS.

a. Guns. (See chart on following page.)

b. Carriages. (See chart on following page.)

3. PROJECTILE.

108 lb. A. P. projectile.

4. FUZES.

Base Detonating Mark V.

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.

5. EXPLANATION OF TABLES. This firing table has been divided into two parts. Part 1 comprises data applicable to any possible combination of projectile, fuze, and powder charge, and will serve equally well for all firing tables. It is printed on white paper. 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.
Air density at battery, (59° F. and 29.53 inches of mercury) 525.9 grains per cubic foot.
Temperature of air at battery (for elasticity effect) 59° F.
Temperature of powder 70° F.
Weight of projectile, as listed in table.

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

| a. Guns | | M1897MI | M1900 | M1903 | M1905 | M1908, M1908MI M1908MII |
|---|---|---|---|---|---|---|
| Diameter of the bore between lands, | in. | 6 | 6 | 6 | 6 | 6 |
| Diameter of the bore between grooves, | in. | 6.08 | 6.08 | 6.08 | 6.10 | 6.10 |
| Total length of gun, | in. | 277.85 | 310.4 | 310.4 | 309.8 | 277.0 |
| Length of rifled portion, | in. | 228.81 | 254.14 | 254.66 | 254.1 | 231.25 |
| Travel of projectile, | in. | 233.56 | 257.38 | 257.9 | 257.34 | 235.82 |
| Length of powder chamber, | in. | 33.89 | 43.37 | 42.35 | 42.66 | 31.63 |
| Diameter of powder chamber, | in. | 7.0 | 8.0 | 8.0 | 8.0 | 7.0 |
| Capacity of powder chamber, | cu.in. | 1278 | 2085 | 2185 | 2094 | 1230 |
| Number of grooves, | | 36 | 36 | 36 | 54 | 54 |
| Character of rifling, | | Increasing 1 in 50 to 1 in 25 calibers | Increasing 1 in 50 to 1 in 25 calibers | Increasing 1 in 50 to 1 in 25 calibers | Uniform 1 in 25 calibers | Increasing 1 in 50 to 1 in 25 calibers |
| Maximum pressure, | psi | 38,000 | 38,000 | 38,000 | 38,000 | 38,000 |

| b. Carriages | 6" D.C. M1898 | 6" B.C. M1900 | 6" D.C.L.F. M1903 | 6" D.C.L.F. M1905 | 6" D.C.L.F. M1905MI | 6" D.C.L.F. M1905MII | 6" B.C. M1910 |
|---|---|---|---|---|---|---|---|
| Total traverse, | 170° =3022.2ø | 360° = 6400ø | 170°=3022.2ø | 170°=3022.2ø | 170°=3022.2ø | 170°=3022.2ø | 360° = 6400ø when free 120°=2133.4ø for casement emplacements |
| Least possible elevation, | -5°=-88.9ø | -5°=-88.9ø | -5°=-88.9ø | -5°=-88.9ø | -5°=-88.9ø | -5°=-88.9ø | -3°=-53.3ø |
| Greatest possible elevation, | 15°=266.7ø | 20°=355.6ø | 15°=266.7ø | 15°=266.7ø | 15°=266.7ø | 15°=266.7ø | 12°=213.3ø |
| Traverse for one turn of traversing handwheel | | 2.78°=49.42ø | | | | | 2.727°=48.48ø |
| for slow motion | 0.386°=6.86ø | | 0.55°=9.78ø | 0.45°=8.0ø | 0.375°=6.67ø | 0.47°=8.36ø | |
| for fast motion | 3.873°=68.85ø | | 8.2°=145.8ø | 7.02°=124.8ø | 7.02°=124.8ø | 7.02°=124.8ø | |
| Change in elevation for one turn of elevating handwheel | 0.59°=10.47ø | 0.37°=6.58ø | 0.37°=10.13ø | 0.39°=6.93ø | 0.39°=6.93ø | 0.39°=6.93ø | 0.35°=6.22ø |

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 true 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 mph wind the components of a 10 mph wind can be added to the corresponding components of a 2 mph 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 or at the point of burst. 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 heading (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. In case of ballistic air temperature other than 59° F., Table H is to be used. The

deflection due to drift, Columns (13) and (14) of Table A includes the effect of lateral jump. In the case of gun designed with trunnion axis not level with respect to the carriage the effect on deflection of this "permanent cant" is included in the tabular drift. Thus, with no cross wind, and in 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 and the positive sign indicates that the combination of the effects of drift and lateral jump has resulted in a deviation of the projectile to the left of the plane of fire.

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 probable errors in range and deflection are given in Columns (16) and (17). These, as noted at the bottom of each page, 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 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 the 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 from the true 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 the table) 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 J inclusive give the various differential effects, thus Table F gives the range effects corresponding to increase or decrease in muzzle velocity 10, 20, 30, 40, 50, 60, 70, 80, 90, up to 150 feet per second.

Table K gives the deflection effects in mils due to Rotation of the Earth for varying latitudes and azimuths.

Although the 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:

| | |
|---|---|
| $\omega$ | (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 |
| psi | pounds per square inch |
| deg. | degree |
| min. | minute |
| sec. | second |
| ₥ | mils |
| in. | inches |
| ft. | feet |
| yd. | yards |
| f/s | feet per second |
| mi/hr | miles per hour |
| F. | Fahrenheit |
| m.d.p. | meteorological datum plane |
| % | percent |
| M.V. | muzzle velocity |
| $V-V_o$ | 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, the first digit is the digit 3, to indicate that the message which follows is for the "terrestrial" artillery. A different digit in this place will indicate that the message is designed for a different purpose, such as for the airplane service or antiaircraft batteries. 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 the m.d.p. |
| 2 | An altitude of | 1500 feet | (500 yards) | above the m.d.p. |
| 3 | An altitude of | 3000 feet | (1000 yards) | above the m.d.p. |
| 4 | An altitude of | 4500 feet | (1500 yards) | above the m.d.p. |
| 5 | An altitude of | 6000 feet | (2000 yards) | above the m.d.p. |
| 6 | An altitude of | 9000 feet | (3000 yards) | above the m.d.p. |
| 7 | An altitude of | 12000 feet | (4000 yards) | above the m.d.p. |
| 8 | An altitude of | 15000 feet | (5000 yards) | above the m.d.p. |
| 9 | An altitude of | 18000 feet | (6000 yards) | above the m.d.p. |
| 0 | An altitude of | 24000 feet | (8000 yards) | above the m.d.p. |
| 1 | An altitude of | 30000 feet | (10000 yards) | above the m.d.p. |
| 2 | An altitude of | 36000 feet | (12000 yards) | above the 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 true 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 percent 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 observation 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.

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

7. USE OF THE TABLES. 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, and
(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 or in height of burst, 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 difference in altitude of gun and target. Corrections for Rotation of the Earth may be regarded as Position Corrections. The drift may be regarded as necessitating a position correction in deflection, the cant effect due to the carriage not being level also necessitates a position correction in deflection since it is determinable from a knowledge of the map range. Tables B and C giving "Position effects", may be entered with "map ranges" as one argument and "Height of Target" as the other argument. The position effect must be algebraically subtracted from the map range to determine the geographical distance to the level point on that trajectory, or its continuation, which, under standard conditions, passes through the target.

(b) Materiel corrections are determinable, for a given range, when the weight and the markings of the projectile and the relative 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, (2) estimated change in muzzle velocity, $(V - V_o)$, due to the conditions of the piece or of the powder when the powder is at standard

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powder temperature (70° F.). The correction on account of variation in weight of projectile is usually obtained from Table D, Part 2, for any given marking. The estimated change in muzzle velocity is called the velocity adjustment, $V - V_o$, and is made by reference to the record of performance of the particular piece and powder lot, or 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 for (1) air density, (2) air temperature (elasticity effect), (3) range wind, (4) variation of the powder temperature from standard. The deflection effect of the cross wind may be regarded as leading to weather corrections. 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 ballistic wind, given in speed and direction, is 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 Part 1, I.

The algebraic sum of all of the range effects hitherto mentioned, namely, of those due to position variations, materiel variations, 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 into 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 correction 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 $V - V_o$. The value of $V - V_o$ 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 following example illustrates the use of the tables:

Given: Gun, 6", Model of 1897MI mounted on disappearing carriage, Tabular Muzzle Velocity = 2600 f/s.

Data as to position:

Altitude of battery = 450 ft. above sea level.
Map range to target = 13,040 yards.
Height of target = -232 ft. (232 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 = 107 lb. (1% below normal).
Preliminary velocity adjustment ($V - V_o$) = -18 f/s (18 f/s below tabular velocity).

Weather data:

Temperature of powder = 62° F.
Meteorological message: MSL MSL 30162 0620799 1620898 2591096 3591196 4600994

Required: Quadrant elevation and deflection setting.

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

(a) Position corrections for range.

Entering Table B, for target below gun, we find corresponding to a map range of 13040 yards and a height of target of -232 ft. a range effect of . . . . . +197 yd.

Entering Table E, for effects on range due to Rotation of the Earth, we find, corresponding to a latitude of 42° and an azimuth of 24.6° a range effect of . . . . . + 17 yd.

(b) Materiel corrections for range.

Entering Table D, we find the effect on range for 1.0% decrease in weight of projectile to be . . . . . - 9 yd.

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 . . . . . -107 yd.

(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 for powder of 70° F., a correction must be introduced. The effect on muzzle velocity is obtained from Part 1, I, and is -10 f/s. The effect on range thus occasioned is found in the same manner as above from Table Fb, to be . . . . - 59 yd.

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 2900 feet so that in addition to the introductory information obtained in the meteorological message only that group of the message numbered 3 and which gives data for a maximum ordinate of 3000 feet will be used. Interpolation in the message between groups 2 and 3 for the exact maximum ordinate may be used, should the data justify it.

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 "3") . . . . . | 5900 mils |
| Velocity of the ballistic wind (for group "3") . . . . . | 11 mi/hr |
| Ballistic density (for group "3") . . . . . | 96% |

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 mils

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 the 1 mi/hr is added to the corresponding components of 10 mi/hr to obtain the components of 11 mi/hr.

Entering Table I, we find the effect on range for -6.6 mi/hr range wind to be . . . . . -53 yd.

The temperature at the m.d.p. given in the meteorological message cannot be used directly since the battery is 350 feet 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 H, we find the temperature (elasticity) effect on range for a temperature of 61° F. (or 2° Fahrenheit above the normal temperature of 59° F.) to be . . . . . -2 yd.

The ballistic density given in the meteorological message for this trajectory cannot be used directly since the battery is 350 feet 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 of the battery is . . . . . 95%

Entering Table Ga, we find the effect on range for the ballistic air density of 95% or 5% below normal to be +304 yd.

The total range effect is now obtained by adding the separate range effects algebraically. It has the value of +197+17-9-107-59 -53-2+304 = . . . . . +289 yd.

The total range correction is obtained by merely changing the sign of the total range effect. It is . . . . -289 yd.

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 13,040 yards, minus 289 yards, i.e. . . . . 12,751 yd.

The elevation corresponding to the corrected range of 12,751 yards is found in either Column (2) or (3) of Table A. It is . . . . . 206.6 mils (11° 38')

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 -3.7 mils (-0.20°)

The drift from Column (13) or (14) to be . . -12 mils (-0.70°)

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 . . . . . -1.2 mils (-0.05°)

The total deflection effect is obtained by adding algebraically the separate deflection effects. It has the value of -3.7-12-1.2 = . . . . . -16.9 mils (-0.95°)

The total deflection correction is obtained by merely changing the sign of the total deflection effect. It is +16.9 mils (+0.95°)

The deflection set off at the gun will be +16.9 mils (16.9 mils to the left) when the target is used as aiming point. For any other aiming point 16.9 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 +16.9 mils in deflection is the same as a correction of -16.9 mils in azimuth. The azimuth setting then is 437 mils minus 16.9 mils = . . . . . 420.1 mils (23.65°)

PART 1

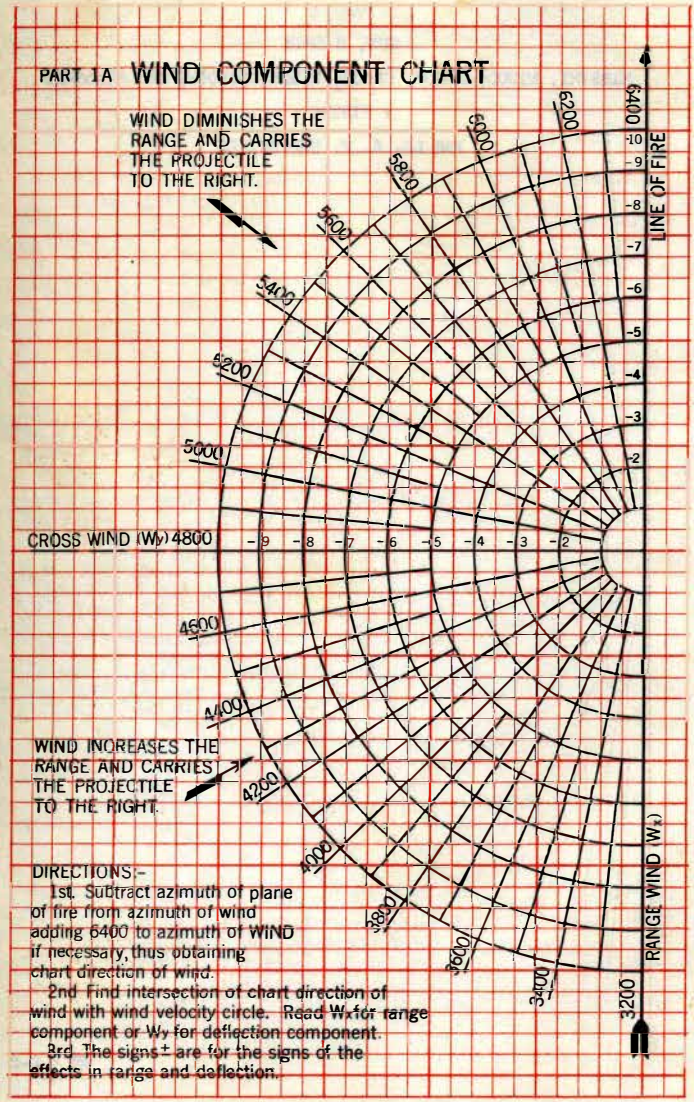
GUN, 6 INCH

M1897MI, M1900, M1903, M1905, M1908, M1908MI AND M1908MII

FIRING

108 LB. A. P. PROJECTILE

# PART 1A WIND COMPONENT CHART

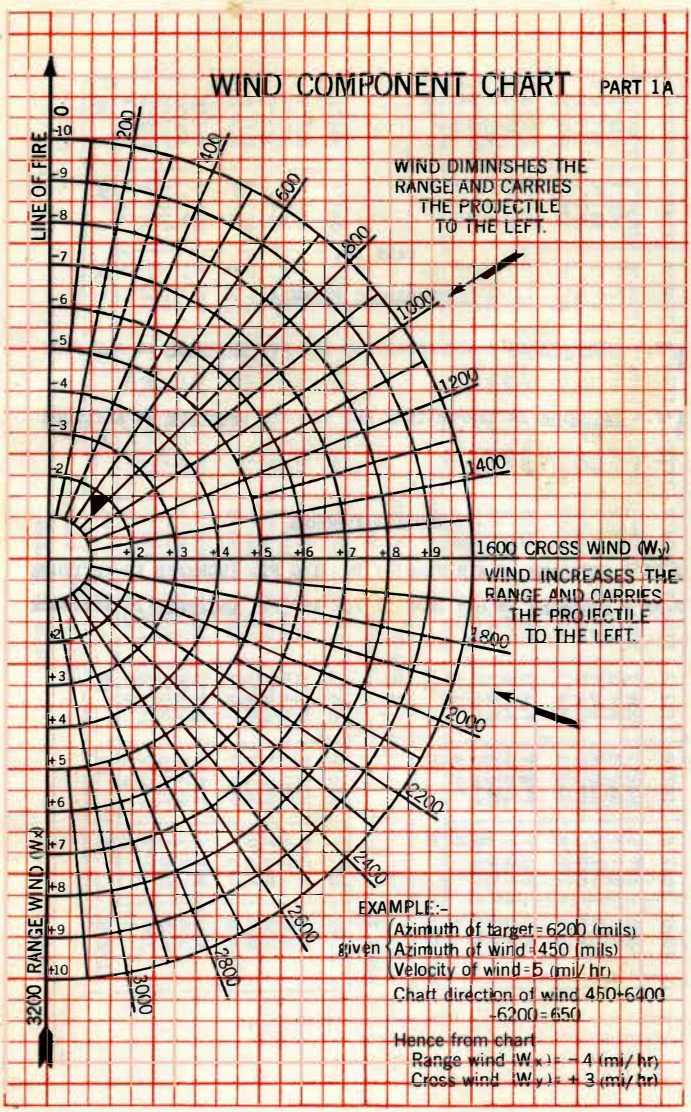



DIRECTIONS:-

1st. Subtract azimuth of plane of fire from azimuth of wind adding 6400 to azimuth of WIND if necessary, thus obtaining chart direction of wind.

2nd. Find intersection of chart direction of wind with wind velocity circle. Read $W_x$ for range component or $W_y$ for deflection component.

3rd. The signs ± are for the signs of the effects in range and deflection.


WIND COMPONENT CHART PART 1A
LINE OF FIRE
0
-10
-9
-8
-7
-6
-5
-4
-3
-2
+2
+3
+4
+5
+6
+7
+8
+9
+10
3200 RANGE WIND (Wx)
200
400
600
800
1000
1200
1400
1600 CROSS WIND (Wy)
1800
2000
2200
2400
2600
2800
3000
WIND DIMINISHES THE RANGE AND CARRIES THE PROJECTILE TO THE LEFT.
WIND INCREASES THE RANGE AND CARRIES THE PROJECTILE TO THE LEFT.
EXAMPLE:-
given
Azimuth of target = 6200 (mils)
Azimuth of wind = 450 (mils)
Velocity of wind = 5 (mi/hr)
Chart direction of wind 450+6400 -6200 = 650
Hence from chart
Range wind (Wx) = -4 (mi/hr)
Cross wind (Wy) = +3 (mi/hr)

## PART 1B.

### THERMOMETRIC FORMULA

$\frac{1}{5}$°F.= DECREASE IN TEMPERATURE FOR 100 FT. INCREASE IN ALTITUDE

$\frac{1}{5}$°F.= INCREASE IN TEMPERATURE FOR 100 FT. DECREASE IN ALTITUDE

### DENSITY FORMULA

0.3% = DECREASE IN AIR DENSITY FOR 100 FT. INCREASE IN ALTITUDE

0.3% = INCREASE IN AIR DENSITY FOR 100 FT. DECREASE IN ALTITUDE

PART 1C.

YARDS TO METERS

1 yd = 0.91440 meters

| YARDS | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 9.1 | 18.3 | 27.4 | 36.6 | 45.7 | 54.9 | 64.0 | 73.2 | 82.3 |
| 100 | 91.4 | 100.6 | 109.7 | 118.9 | 128.0 | 137.2 | 146.3 | 155.4 | 164.6 | 173.7 |
| 200 | 182.9 | 192.0 | 201.2 | 210.3 | 219.5 | 228.6 | 237.7 | 246.9 | 256.0 | 265.2 |
| 300 | 274.3 | 283.5 | 292.6 | 301.8 | 310.9 | 320.0 | 329.2 | 338.3 | 347.5 | 356.6 |
| 400 | 365.8 | 374.9 | 384.0 | 393.2 | 402.3 | 411.5 | 420.6 | 429.8 | 438.9 | 448.1 |
| 500 | 457.2 | 466.3 | 475.5 | 484.6 | 493.8 | 502.9 | 512.1 | 521.2 | 530.4 | 539.5 |
| 600 | 548.6 | 557.8 | 566.9 | 576.1 | 585.2 | 594.4 | 603.5 | 612.7 | 621.8 | 630.9 |
| 700 | 640.1 | 649.2 | 658.4 | 667.5 | 676.7 | 685.8 | 695.0 | 704.1 | 713.2 | 722.4 |
| 800 | 731.5 | 740.7 | 749.8 | 759.0 | 768.1 | 777.2 | 786.4 | 795.5 | 804.7 | 813.8 |
| 900 | 823.0 | 832.1 | 841.2 | 850.4 | 859.5 | 868.7 | 877.8 | 887.0 | 896.1 | 905.3 |
| 1000 | 914.4 | 923.6 | 932.7 | 941.8 | 951.0 | 960.1 | 969.3 | 978.4 | 987.6 | 996.7 |

PART 1D.

METERS TO YARDS

1 meter = 1.0936 yds.

| METERS | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 10.9 | 21.9 | 32.8 | 43.7 | 54.7 | 65.6 | 76.6 | 87.5 | 98.4 |
| 100 | 109.4 | 120.3 | 131.2 | 142.2 | 153.1 | 164.0 | 175.0 | 185.9 | 196.8 | 207.8 |
| 200 | 218.7 | 229.7 | 240.6 | 251.5 | 262.5 | 273.4 | 284.3 | 295.3 | 306.2 | 317.2 |
| 300 | 328.1 | 339.0 | 350.0 | 360.9 | 371.8 | 382.8 | 393.7 | 404.6 | 415.6 | 426.5 |
| 400 | 437.4 | 448.4 | 459.3 | 470.2 | 481.2 | 492.1 | 503.1 | 514.0 | 524.9 | 535.9 |
| 500 | 546.8 | 557.7 | 568.7 | 579.6 | 590.6 | 601.5 | 612.4 | 623.4 | 634.3 | 645.2 |
| 600 | 656.2 | 667.1 | 678.0 | 689.0 | 699.9 | 710.8 | 721.8 | 732.7 | 743.7 | 754.6 |
| 700 | 765.5 | 776.5 | 787.4 | 798.3 | 809.3 | 820.2 | 831.1 | 842.1 | 853.0 | 864.0 |
| 800 | 874.9 | 885.8 | 896.8 | 907.7 | 918.6 | 929.6 | 940.5 | 951.4 | 962.4 | 973.3 |
| 900 | 984.2 | 995.2 | 1006.1 | 1017.1 | 1028.0 | 1038.9 | 1049.9 | 1060.8 | 1071.7 | 1082.7 |
| 1000 | 1093.6 | 1104.6 | 1115.5 | 1126.4 | 1137.4 | 1148.3 | 1159.2 | 1170.2 | 1181.1 | 1192.0 |

PART 1E

ANGULAR CONVERSION TABLE - DEGREES TO MILS

| Degrees | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 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 per cent 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 yds. wide, 60 yds. from center of impact.
Probable Error in Range, 50 yds.
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%.

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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.

PART 1H TABLE OF SLOPE COEFFICIENTS

sin ω/sin (ω+n).

n, positive (relative forward slope)

| ω (measured from line of site) mils \ % | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 31 | 51 | 102 | 152 | 201 | 297 | 388 | 472 | 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 | .53 |
| 600 | .99 | .97 | .96 | .93 | .87 | .83 | .78 | .72 | .67 | .64 | .67 |
| 700 | .99 | .98 | .97 | .94 | .90 | .85 | .82 | .76 | .72 | .69 | .82 |
| 800 | .99 | .98 | .97 | .95 | .91 | .88 | .85 | .80 | .77 | .75 | 1.00 |
| 900 | .99 | .98 | .98 | .96 | .93 | .90 | .88 | .84 | .81 | .79 | 1.22 |
| 1000 | .99 | .99 | .98 | .97 | .94 | .92 | .90 | .87 | .85 | .84 | 1.50 |
| 1100 | .99 | .99 | .98 | .98 | .95 | .94 | .92 | .90 | .89 | .88 | 1.87 |
| 1200 | 1.00 | .99 | .99 | .98 | .97 | .95 | .94 | .93 | .92 | .93 | 2.41 |

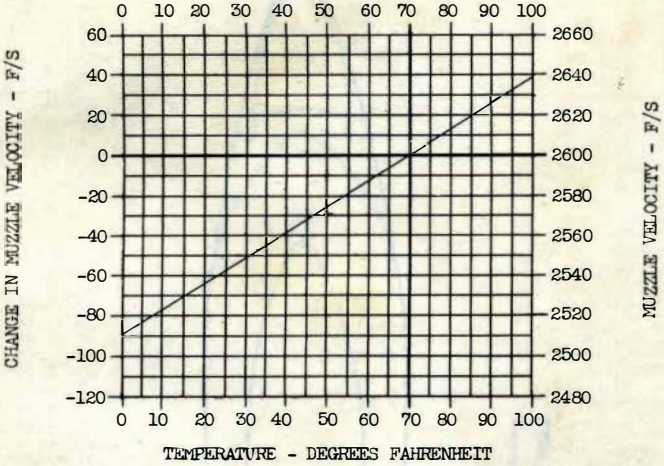
-n, positive (relative reverse slope)

| ω = angle of fall (mils) \ % | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 31 | 51 | 102 | 152 | 201 | 297 | 388 | 472 |
| 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 | 1.25 | 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 (per cent and mils)(n = n'-s+300). Directions. Multiply range probable error (from range table) by coefficient shown above. Here ω 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, ω'=ω-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 yd.
Then, n'(in per cent) = 100 $\frac{(130-140)}{67}$= -15(%) or -152 mils, n' -s+300 = -152-(-20) = -132 mils. Interpolating between 1.67 (for 102 mils) and 2.52 (for 152 mils), slope coefficient = 1.67 $+\frac{30}{50}$ x 0.85 = 2.18. Hence, range probable error to be used = 2.18 x 83 yd. = 181 yd.

# CHART FOR CHANGE IN MUZZLE VELOCITY FOR TEMPERATURE OF POWDER DIFFERENT FROM NORMAL

$$\Delta V = 1.27(T - 70^\circ)$$




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

Example: Suppose temperature of powder = 59° F. Standard muzzle velocity = 2600 f/s. From the chart, the change in muzzle velocity is -14 f/s and the muzzle velocity to be expected is 2586 f/s.

PART 2

GUN, 6 INCH

M1897MI, M1900, M1903, M1905, M1908, M1908MI AND M1908MII

MOUNTED ON DISAPPEARING CARRIAGE

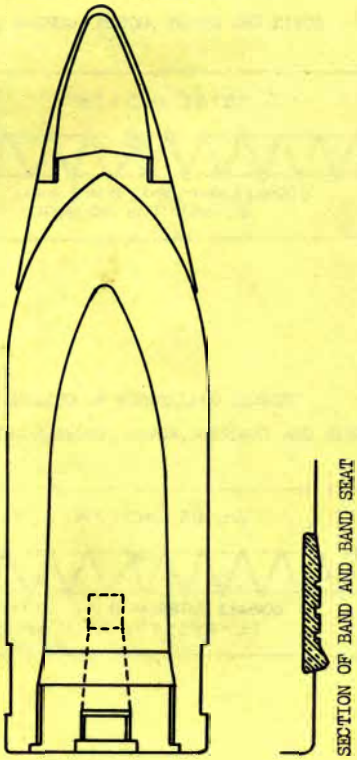
108 LB. A. P. PROJECTILE

FUZE, BASE DET. (MARK V)

MUZZLE VELOCITY = 2600 F/S

JUMP VARIABLE

TABLES A - K INCLUSIVE



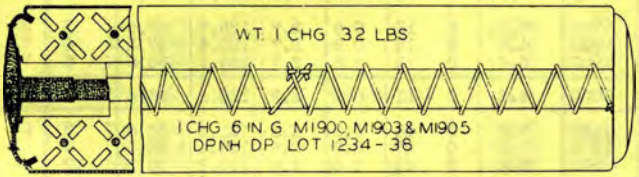

108 LB. A.P. PROJECTILE

261384 O—40——3

PROPELLING CHARGES

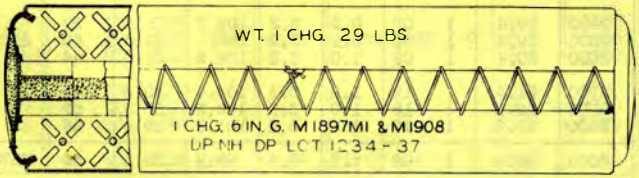
DRAWING OF PROPELLING CHARGE

GUN, 6-INCH, M1900, M1903 AND M1905




DRAWING OF PROPELLING CHARGE

GUN, 6-INCH, M1897MI, M1908, M1908MI AND M1908MII



A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range (1) | Elevation (2) | Elevation (3) | Change in elev. for 100 yd change in range (4) | Change in elev. for 100 yd change in range (5) | Change in range for 1 mil change in elev. (6) | Change in range for 1 min change in elev. (7) | Maximum ordinate (8) | Terminal velocity (9) |
|---|---|---|---|---|---|---|---|---|
| yards | mils | deg min | mils | min | yards | yards | feet | f/s |
| 0 | -1.4 | -0 05 | 0.8 | 2.5 | 136.1 | 40.3 | 0 | 2600 |
| 100 | -0.8 | -0 03 | 0.8 | 2.5 | 134.6 | 39.9 | 1 | |
| 200 | 0.0 | 0 00 | 0.8 | 2.5 | 133.2 | 39.5 | 1 | |
| 300 | +0.8 | +0 03 | 0.8 | 2.6 | 131.9 | 39.1 | 1 | |
| 400 | 1.6 | 0 05 | 0.8 | 2.6 | 130.6 | 38.7 | 2 | |
| 500 | 2.2 | 0 08 | 0.8 | 2.6 | 129.3 | 38.3 | 2 | 2507 |
| 600 | 3.0 | 0 10 | 0.8 | 2.6 | 128.0 | 37.9 | 3 | |
| 700 | 3.8 | 0 13 | 0.8 | 2.7 | 126.7 | 37.6 | 3 | |
| 800 | 4.6 | 0 16 | 0.8 | 2.7 | 125.4 | 37.2 | 4 | |
| 900 | 5.4 | 0 18 | 0.8 | 2.7 | 124.1 | 36.8 | 5 | |
| 1000 | 6.2 | 0 21 | 0.8 | 2.7 | 122.8 | 36.4 | 6 | 2417 |
| 1100 | 7.0 | 0 24 | 0.8 | 2.8 | 121.6 | 36.0 | 7 | |
| 1200 | 7.8 | 0 27 | 0.8 | 2.8 | 120.4 | 35.7 | 9 | |
| 1300 | 8.8 | 0 29 | 0.8 | 2.8 | 119.2 | 35.3 | 10 | |
| 1400 | 9.6 | 0 32 | 0.8 | 2.9 | 117.9 | 34.9 | 12 | |
| 1500 | 10.4 | 0 35 | 0.9 | 2.9 | 116.7 | 34.6 | 14 | 2329 |
| 1600 | 11.2 | 0 38 | 0.9 | 2.9 | 115.5 | 34.2 | 16 | |
| 1700 | 12.2 | 0 41 | 0.9 | 3.0 | 114.3 | 33.9 | 18 | |
| 1800 | 13.0 | 0 44 | 0.9 | 3.0 | 113.1 | 33.5 | 20 | |
| 1900 | 13.8 | 0 47 | 0.9 | 3.0 | 111.9 | 33.2 | 22 | |
| 2000 | 14.8 | 0 50 | 0.9 | 3.0 | 110.8 | 32.8 | 25 | 2243 |
| 2100 | 15.6 | 0 53 | 0.9 | 3.1 | 109.8 | 32.6 | 28 | |
| 2200 | 16.6 | 0 56 | 0.9 | 3.1 | 108.8 | 32.3 | 31 | |
| 2300 | 17.6 | 0 59 | 0.9 | 3.1 | 107.8 | 32.0 | 34 | |
| 2400 | 18.4 | 1 02 | 0.9 | 3.2 | 106.7 | 31.6 | 37 | |
| 2500 | 19.4 | 1 05 | 0.9 | 3.2 | 105.1 | 31.3 | 40 | 2159 |
| 2600 | 20.4 | 1 09 | 1.0 | 3.2 | 104.5 | 31.0 | 44 | |
| 2700 | 21.4 | 1 12 | 1.0 | 3.3 | 103.4 | 30.6 | 48 | |
| 2800 | 22.2 | 1 15 | 1.0 | 3.3 | 102.2 | 30.3 | 52 | |
| 2900 | 23.2 | 1 19 | 1.0 | 3.4 | 101.0 | 29.9 | 56 | |
| 3000 | 24.2 | 1 22 | 1.0 | 3.4 | 99.9 | 29.6 | 60 | 2078 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on - | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 00 | | 0 | 0.00 | 4.83 | 20 | 0 | 0.0 | 0 |
| 1 | 0 | 03 | 1375 | | | | | | 0.1 | 100 |
| 1 | 0 | 05 | 688 | | | | | | 0.2 | 200 |
| 2 | 0 | 08 | 452 | | | | | | 0.4 | 300 |
| 3 | 0 | 10 | 337 | | | | | | 0.5 | 400 |
| 4 | 0 | 13 | 266 | 0 | 0.00 | 4.83 | 21 | 0 | 0.6 | 500 |
| 5 | 0 | 16 | 220 | | | | | | 0.7 | 600 |
| 6 | 0 | 18 | 187 | | | | | | 0.8 | 700 |
| 6 | 0 | 21 | 162 | | | | | | 1.0 | 800 |
| 7 | 0 | 24 | 143 | | | | | | 1.1 | 900 |
| 8 | 0 | 27 | 127 | 0 | 0.00 | 4.83 | 22 | 0 | 1.2 | 1000 |
| 9 | 0 | 30 | 115 | | | | | | 1.3 | 1100 |
| 10 | 0 | 33 | 104 | | | | | | 1.4 | 1200 |
| 11 | 0 | 36 | 95 | | | | | | 1.5 | 1300 |
| 12 | 0 | 39 | 87 | | | | | | 1.7 | 1400 |
| 13 | 0 | 43 | 81 | 0 | 0.00 | 4.82 | 22 | 0 | 1.8 | 1500 |
| 14 | 0 | 46 | 75 | | | | | | 2.0 | 1600 |
| 15 | 0 | 49 | 70 | | | | | | 2.1 | 1700 |
| 16 | 0 | 53 | 65 | | | | | | 2.2 | 1800 |
| 17 | 0 | 56 | 61 | | | | | | 2.4 | 1900 |
| 18 | 1 | 00 | 57 | -1 | -0.05 | 4.82 | 24 | 0 | 2.5 | 2000 |
| 19 | 1 | 04 | 54 | | | | | | 2.6 | 2100 |
| 20 | 1 | 07 | 51 | | | | | | 2.8 | 2200 |
| 21 | 1 | 11 | 48 | | | | | | 2.9 | 2300 |
| 22 | 1 | 15 | 46 | | | | | | 3.0 | 2400 |
| 23 | 1 | 19 | 43 | -1 | -0.05 | 4.82 | 25 | 0 | 3.2 | 2500 |
| 25 | 1 | 23 | 41 | | | | | | 3.3 | 2600 |
| 26 | 1 | 27 | 39 | | | | | | 3.5 | 2700 |
| 27 | 1 | 31 | 38 | | | | | | 3.6 | 2800 |
| 28 | 1 | 36 | 36 | | | | | | 3.7 | 2900 |
| 30 | 1 | 40 | 34 | -1 | -0.05 | 4.82 | 26 | 1 | 3.9 | 3000 |

*This is Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range (1) | Elevation (2) | (3) | | Change in elev. for 100 yd change in range (4) | (5) | Change in range for 1 mil change in elev. (6) | 1 min (7) | Maximum ordinate (8) | Terminal velocity (9) |
|---|---|---|---|---|---|---|---|---|---|
| yards | mils | deg | min | mils | min | yards | yards | feet | f/s |
| 3000 | 24.2 | 1 | 22 | 1.0 | 3.4 | 99.9 | 29.6 | 60 | 2078 |
| 3100 | 25.2 | 1 | 25 | 1.0 | 3.4 | 98.9 | 29.3 | 65 | |
| 3200 | 26.4 | 1 | 29 | 1.0 | 3.4 | 97.8 | 29.0 | 70 | |
| 3300 | 27.4 | 1 | 32 | 1.0 | 3.5 | 96.7 | 28.7 | 75 | |
| 3400 | 28.4 | 1 | 36 | 1.0 | 3.5 | 95.6 | 28.3 | 80 | |
| 3500 | 29.4 | 1 | 39 | 1.1 | 3.6 | 94.5 | 28.0 | 85 | 1999 |
| 3600 | 30.4 | 1 | 43 | 1.1 | 3.6 | 93.5 | 27.7 | 91 | |
| 3700 | 31.6 | 1 | 47 | 1.1 | 3.6 | 92.5 | 27.4 | 97 | |
| 3800 | 32.6 | 1 | 50 | 1.1 | 3.7 | 91.5 | 27.1 | 103 | |
| 3900 | 33.8 | 1 | 54 | 1.1 | 3.7 | 90.5 | 26.8 | 109 | |
| 4000 | 34.8 | 1 | 58 | 1.1 | 3.8 | 89.5 | 26.5 | 116 | 1922 |
| 4100 | 36.0 | 2 | 01 | 1.1 | 3.8 | 88.6 | 26.3 | 123 | |
| 4200 | 37.0 | 2 | 05 | 1.1 | 3.9 | 87.6 | 26.0 | 130 | |
| 4300 | 38.2 | 2 | 09 | 1.2 | 3.9 | 86.6 | 25.7 | 137 | |
| 4400 | 39.4 | 2 | 13 | 1.2 | 3.9 | 85.6 | 25.4 | 145 | |
| 4500 | 40.6 | 2 | 17 | 1.2 | 4.0 | 84.6 | 25.1 | 153 | 1847 |
| 4600 | 41.8 | 2 | 21 | 1.2 | 4.0 | 83.7 | 24.8 | 161 | |
| 4700 | 43.0 | 2 | 25 | 1.2 | 4.1 | 82.7 | 24.5 | 170 | |
| 4800 | 44.2 | 2 | 29 | 1.2 | 4.1 | 81.8 | 24.2 | 179 | |
| 4900 | 45.4 | 2 | 33 | 1.2 | 4.2 | 80.9 | 24.0 | 188 | |
| 5000 | 46.6 | 2 | 38 | 1.3 | 4.2 | 79.9 | 23.7 | 197 | 1775 |
| 5100 | 47.8 | 2 | 42 | 1.3 | 4.3 | 79.0 | 23.4 | 207 | |
| 5200 | 49.2 | 2 | 46 | 1.3 | 4.3 | 78.1 | 23.2 | 217 | |
| 5300 | 50.4 | 2 | 50 | 1.3 | 4.4 | 77.2 | 22.9 | 227 | |
| 5400 | 51.8 | 2 | 55 | 1.3 | 4.4 | 76.3 | 22.6 | 238 | |
| 5500 | 53.0 | 2 | 59 | 1.3 | 4.5 | 75.4 | 22.4 | 249 | 1706 |
| 5600 | 54.4 | 3 | 03 | 1.3 | 4.5 | 74.5 | 22.1 | 260 | |
| 5700 | 55.8 | 3 | 08 | 1.4 | 4.6 | 73.7 | 21.8 | 272 | |
| 5800 | 57.0 | 3 | 13 | 1.4 | 4.6 | 72.9 | 21.6 | 284 | |
| 5900 | 58.4 | 3 | 17 | 1.4 | 4.7 | 72.1 | 21.4 | 296 | |
| 6000 | 59.8 | 3 | 22 | 1.4 | 4.7 | 71.2 | 21.1 | 309 | 1639 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on - | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 1 | 40 | 34 | -1 | -0.05 | 4.82 | 26 | 1 | 3.9 | 3000 |
| 31 | 1 | 44 | 33 | | | | | | 4.0 | 3100 |
| 32 | 1 | 49 | 32 | | | | | | 4.1 | 3200 |
| 34 | 1 | 54 | 30 | | | | | | 4.3 | 3300 |
| 35 | 1 | 58 | 29 | | | | | | 4.5 | 3400 |
| 36 | 2 | 03 | 28 | -1 | -0.05 | 4.81 | 27 | 1 | 4.7 | 3500 |
| 38 | 2 | 08 | 27 | | | | | | 4.8 | 3600 |
| 39 | 2 | 13 | 26 | | | | | | 4.9 | 3700 |
| 41 | 2 | 18 | 25 | | | | | | 5.1 | 3800 |
| 42 | 2 | 23 | 24 | | | | | | 5.2 | 3900 |
| 44 | 2 | 28 | 23 | -2 | -0.10 | 4.81 | 28 | 1 | 5.4 | 4000 |
| 45 | 2 | 33 | 22 | | | | | | 5.5 | 4100 |
| 47 | 2 | 39 | 22 | | | | | | 5.7 | 4200 |
| 49 | 2 | 44 | 21 | | | | | | 5.9 | 4300 |
| 50 | 2 | 50 | 20 | | | | | | 6.0 | 4400 |
| 52 | 2 | 56 | 20 | -2 | -0.10 | 4.81 | 30 | 1 | 6.2 | 4500 |
| 54 | 3 | 02 | 19 | | | | | | 6.3 | 4600 |
| 56 | 3 | 08 | 18 | | | | | | 6.5 | 4700 |
| 58 | 3 | 14 | 18 | | | | | | 6.7 | 4800 |
| 59 | 3 | 20 | 17 | | | | | | 6.8 | 4900 |
| 61 | 3 | 26 | 17 | -2 | -0.10 | 4.80 | 32 | 1 | 7.0 | 5000 |
| 63 | 3 | 32 | 16 | | | | | | 7.2 | 5100 |
| 65 | 3 | 39 | 16 | | | | | | 7.4 | 5200 |
| 67 | 3 | 46 | 15 | | | | | | 7.5 | 5300 |
| 69 | 3 | 53 | 15 | | | | | | 7.7 | 5400 |
| 71 | 4 | 00 | 14 | -3 | -0.15 | 4.80 | 34 | 1 | 7.9 | 5500 |
| 73 | 4 | 07 | 14 | | | | | | 8.1 | 5600 |
| 75 | 4 | 14 | 13 | | | | | | 8.2 | 5700 |
| 78 | 4 | 22 | 13 | | | | | | 8.4 | 5800 |
| 80 | 4 | 29 | 13 | | | | | | 8.6 | 5900 |
| 82 | 4 | 37 | 12 | -3 | -0.15 | 4.80 | 37 | 1 | 8.8 | 6000 |

*This is the Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range | Elevation | | | Change in elev. for 100 yd change in range | | Change in range for 1 mil change in elev. | 1 min | Maximum ordinate | Terminal velocity |
|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | | (4) | (5) | (6) | (7) | (8) | (9) |
| yards | mils | deg | min | mils | min | yards | yards | feet | f/s |
| 6000 | 59.8 | 3 | 22 | 1.4 | 4.7 | 71.2 | 21.1 | 309 | 1639 |
| 6100 | 61.2 | 3 | 27 | 1.4 | 4.8 | 70.4 | 20.9 | 322 | |
| 6200 | 62.6 | 3 | 31 | 1.4 | 4.8 | 69.6 | 20.6 | 336 | |
| 6300 | 64.0 | 3 | 36 | 1.5 | 4.9 | 68.7 | 20.4 | 350 | |
| 6400 | 65.6 | 3 | 41 | 1.5 | 5.0 | 67.9 | 20.1 | 364 | |
| 6500 | 67.0 | 3 | 46 | 1.5 | 5.0 | 67.1 | 19.9 | 379 | 1575 |
| 6600 | 68.6 | 3 | 51 | 1.5 | 5.1 | 66.3 | 19.7 | 394 | |
| 6700 | 70.0 | 3 | 56 | 1.5 | 5.2 | 65.5 | 19.4 | 410 | |
| 6800 | 71.6 | 4 | 02 | 1.5 | 5.2 | 64.8 | 19.2 | 426 | |
| 6900 | 73.0 | 4 | 07 | 1.6 | 5.3 | 64.0 | 19.0 | 443 | |
| 7000 | 74.6 | 4 | 12 | 1.6 | 5.3 | 63.2 | 18.7 | 460 | 1514 |
| 7100 | 76.2 | 4 | 17 | 1.6 | 5.4 | 62.5 | 18.5 | 478 | |
| 7200 | 77.8 | 4 | 23 | 1.6 | 5.5 | 61.8 | 18.3 | 496 | |
| 7300 | 79.4 | 4 | 28 | 1.6 | 5.5 | 61.0 | 18.1 | 515 | |
| 7400 | 81.2 | 4 | 34 | 1.7 | 5.6 | 60.3 | 17.9 | 534 | |
| 7500 | 82.8 | 4 | 40 | 1.7 | 5.7 | 59.5 | 17.6 | 553 | 1456 |
| 7600 | 84.6 | 4 | 45 | 1.7 | 5.7 | 58.8 | 17.4 | 573 | |
| 7700 | 86.2 | 4 | 51 | 1.7 | 5.8 | 58.1 | 17.2 | 594 | |
| 7800 | 88.0 | 4 | 57 | 1.7 | 5.9 | 57.4 | 17.0 | 615 | |
| 7900 | 89.6 | 5 | 03 | 1.8 | 6.0 | 56.6 | 16.7 | 637 | |
| 8000 | 91.4 | 5 | 09 | 1.8 | 6.0 | 55.9 | 16.5 | 659 | 1401 |
| 8100 | 93.2 | 5 | 15 | 1.8 | 6.1 | 55.3 | 16.4 | 682 | |
| 8200 | 95.0 | 5 | 21 | 1.8 | 6.2 | 54.6 | 16.2 | 706 | |
| 8300 | 96.8 | 5 | 27 | 1.9 | 6.3 | 53.9 | 16.0 | 730 | |
| 8400 | 98.8 | 5 | 33 | 1.9 | 6.3 | 53.2 | 15.8 | 755 | |
| 8500 | 100.6 | 5 | 40 | 1.9 | 6.4 | 52.6 | 15.6 | 780 | 1350 |
| 8600 | 102.6 | 5 | 46 | 1.9 | 6.5 | 51.9 | 15.4 | 806 | |
| 8700 | 104.4 | 5 | 53 | 1.9 | 6.6 | 51.3 | 15.2 | 833 | |
| 8800 | 106.4 | 5 | 59 | 2.0 | 6.7 | 50.7 | 15.0 | 861 | |
| 8900 | 108.4 | 6 | 06 | 2.0 | 6.7 | 50.1 | 14.8 | 889 | |
| 9000 | 110.4 | 6 | 13 | 2.0 | 6.8 | 49.4 | 14.6 | 918 | 1302 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on - | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 82 | 4 | 37 | 12 | -3 | -0.15 | 4.80 | 37 | 1 | 8.8 | 6000 |
| 84 | 4 | 45 | 12 | | | | | | 9.0 | 6100 |
| 87 | 4 | 53 | 12 | | | | | | 9.2 | 6200 |
| 89 | 5 | 01 | 11 | | | | | | 9.3 | 6300 |
| 92 | 5 | 10 | 11 | | | | | | 9.5 | 6400 |
| 94 | 5 | 18 | 11 | -3 | -0.20 | 4.79 | 39 | 1 | 9.7 | 6500 |
| 97 | 5 | 27 | 10 | | | | | | 9.9 | 6600 |
| 100 | 5 | 36 | 10 | | | | | | 10.1 | 5600 |
| 102 | 5 | 45 | 9.9 | | | | | | 10.3 | 6800 |
| 105 | 5 | 54 | 9.7 | | | | | | 10.5 | 6900 |
| 108 | 6 | 03 | 9.4 | -4 | -0.20 | 4.79 | 42 | 2 | 10.7 | 7000 |
| 110 | 6 | 13 | 9.2 | | | | | | 10.9 | 7100 |
| 113 | 6 | 22 | 8.9 | | | | | | 11.1 | 7200 |
| 116 | 6 | 32 | 8.7 | | | | | | 11.3 | 7300 |
| 119 | 6 | 42 | 8.5 | | | | | | 11.5 | 7400 |
| 122 | 6 | 53 | 8.3 | -4 | -0.25 | 4.78 | 45 | 2 | 11.7 | 7500 |
| 125 | 7 | 03 | 8.1 | | | | | | 11.9 | 7600 |
| 129 | 7 | 14 | 7.9 | | | | | | 12.1 | 7700 |
| 132 | 7 | 25 | 7.7 | | | | | | 12.4 | 7800 |
| 135 | 7 | 36 | 7.5 | | | | | | 12.6 | 7900 |
| 139 | 7 | 47 | 7.3 | -5 | -0.25 | 4.78 | 48 | 2 | 12.8 | 8000 |
| 142 | 7 | 58 | 7.1 | | | | | | 13.0 | 8100 |
| 145 | 8 | 10 | 7.0 | | | | | | 13.2 | 8200 |
| 149 | 8 | 22 | 6.8 | | | | | | 13.5 | 8300 |
| 152 | 8 | 34 | 6.6 | | | | | | 13.7 | 8400 |
| 156 | 8 | 46 | 6.5 | -5 | -0.30 | 4.77 | 51 | 2 | 13.9 | 8500 |
| 160 | 8 | 58 | 6.3 | | | | | | 14.1 | 8600 |
| 164 | 9 | 11 | 6.2 | | | | | | 14.4 | 8700 |
| 167 | 9 | 24 | 6.9 | | | | | | 14.6 | 8800 |
| 171 | 9 | 37 | 5.9 | | | | | | 14.8 | 8900 |
| 175 | 9 | 50 | 5.8 | -6 | -0.30 | 4.77 | 55 | 2 | 15.1 | 9000 |

*This is the Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range (1) | Elevation (2) | Elevation (3) | | Change in elev. for 100 yd change in range (4) | (5) | Change in range for 1 mil change in elev. (6) | Change in range for 1 min change in elev. (7) | Maximum ordinate (8) | Terminal velocity (9) |
|---|---|---|---|---|---|---|---|---|---|
| yards | mils | deg | min | mils | min | yards | yards | feet | f/s |
| 9000 | 110.4 | 6 | 13 | 2.0 | 6.8 | 49.4 | 14.6 | 918 | 1302 |
| 9100 | 112.4 | 6 | 19 | 2.0 | 6.9 | 48.8 | 14.5 | 948 | |
| 9200 | 114.4 | 6 | 26 | 2.1 | 7.0 | 48.2 | 14.3 | 978 | |
| 9300 | 116.6 | 6 | 33 | 2.1 | 7.1 | 47.6 | 14.1 | 1009 | |
| 9400 | 118.6 | 6 | 40 | 2.1 | 7.2 | 47.0 | 13.9 | 1041 | |
| 9500 | 120.8 | 6 | 48 | 2.2 | 7.3 | 46.4 | 13.8 | 1074 | 1258 |
| 9600 | 122.8 | 6 | 55 | 2.2 | 7.4 | 45.8 | 13.6 | 1108 | |
| 9700 | 125.0 | 7 | 02 | 2.2 | 7.4 | 45.3 | 13.4 | 1143 | |
| 9800 | 127.4 | 7 | 10 | 2.2 | 7.5 | 44.8 | 13.3 | 1178 | |
| 9900 | 129.6 | 7 | 17 | 2.3 | 7.6 | 44.2 | 13.1 | 1214 | |
| 10000 | 131.8 | 7 | 25 | 2.3 | 7.7 | 43.6 | 12.9 | 1251 | 1219 |
| 10100 | 134.2 | 7 | 33 | 2.3 | 7.8 | 43.1 | 12.8 | 1289 | |
| 10200 | 136.6 | 7 | 41 | 2.4 | 7.9 | 42.5 | 12.6 | 1328 | |
| 10300 | 138.8 | 7 | 49 | 2.4 | 8.0 | 42.0 | 12.4 | 1368 | |
| 10400 | 141.2 | 7 | 56 | 2.4 | 8.1 | 41.5 | 12.3 | 1409 | |
| 10500 | 143.6 | 8 | 05 | 2.4 | 8.2 | 41.0 | 12.1 | 1450 | 1183 |
| 10600 | 146.2 | 8 | 13 | 2.5 | 8.3 | 40.5 | 12.0 | 1492 | |
| 10700 | 148.6 | 8 | 21 | 2.5 | 8.4 | 40.0 | 11.9 | 1535 | |
| 10800 | 151.0 | 8 | 30 | 2.5 | 8.6 | 39.5 | 11.7 | 1580 | |
| 10900 | 153.6 | 8 | 38 | 2.6 | 8.7 | 39.0 | 11.6 | 1626 | |
| 11000 | 156.2 | 8 | 47 | 2.6 | 8.8 | 38.5 | 11.4 | 1673 | 1151 |
| 11100 | 158.8 | 8 | 56 | 2.6 | 8.9 | 38.1 | 11.3 | 1721 | |
| 11200 | 161.4 | 9 | 05 | 2.7 | 9.0 | 37.6 | 11.1 | 1770 | |
| 11300 | 164.2 | 9 | 14 | 2.7 | 9.1 | 37.1 | 11.0 | 1820 | |
| 11400 | 166.8 | 9 | 23 | 2.7 | 9.2 | 36.7 | 10.9 | 1871 | |
| 11500 | 169.6 | 9 | 32 | 2.8 | 9.3 | 36.2 | 10.8 | 1923 | 1122 |
| 11600 | 172.4 | 9 | 42 | 2.8 | 9.4 | 35.8 | 10.6 | 1976 | |
| 11700 | 175.2 | 9 | 51 | 2.8 | 9.5 | 35.4 | 10.5 | 2030 | |
| 11800 | 178.0 | 10 | 01 | 2.9 | 9.7 | 35.0 | 10.4 | 2086 | |
| 11900 | 180.8 | 10 | 10 | 2.9 | 9.8 | 34.6 | 10.2 | 2143 | |
| 12000 | 183.8 | 10 | 20 | 2.9 | 9.9 | 34.1 | 10.1 | 2201 | 1097 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
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PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on - | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 175 | 9 | 50 | 5.8 | -6 | -0.30 | 4.77 | 55 | 2 | 15.1 | 9000 |
| 179 | 10 | 04 | 5.6 | | | | | | 15.3 | 9100 |
| 183 | 10 | 17 | 5.5 | | | | | | 15.6 | 9200 |
| 187 | 10 | 31 | 5.4 | | | | | | 15.8 | 9300 |
| 191 | 10 | 45 | 5.3 | | | | | | 16.0 | 9400 |
| 196 | 11 | 00 | 5.1 | -6 | -0.35 | 4.76 | 59 | 3 | 16.3 | 9500 |
| 200 | 11 | 15 | 5.0 | | | | | | 16.5 | 9600 |
| 204 | 11 | 30 | 4.9 | | | | | | 16.8 | 9700 |
| 209 | 11 | 45 | 4.8 | | | | | | 17.0 | 9800 |
| 213 | 12 | 00 | 4.7 | | | | | | 17.3 | 9900 |
| 218 | 12 | 16 | 4.6 | -7 | -0.40 | 4.75 | 63 | 3 | 17.6 | 10000 |
| 223 | 12 | 32 | 4.5 | | | | | | 17.8 | 10100 |
| 228 | 12 | 48 | 4.4 | | | | | | 18.1 | 10200 |
| 232 | 13 | 04 | 4.3 | | | | | | 18.3 | 10300 |
| 237 | 13 | 21 | 4.2 | | | | | | 18.6 | 10400 |
| 242 | 13 | 38 | 4.1 | -8 | -0.45 | 4.74 | 68 | 3 | 18.9 | 10500 |
| 247 | 13 | 54 | 4.0 | | | | | | 19.1 | 10600 |
| 252 | 14 | 11 | 4.0 | | | | | | 19.4 | 10700 |
| 258 | 14 | 29 | 3.9 | | | | | | 19.7 | 10800 |
| 263 | 14 | 46 | 3.8 | | | | | | 20.0 | 10900 |
| 268 | 15 | 04 | 3.7 | -9 | -0.50 | 4.73 | 74 | 4 | 20.2 | 11000 |
| 273 | 15 | 22 | 3.6 | | | | | | 20.5 | 11100 |
| 279 | 15 | 40 | 3.6 | | | | | | 20.8 | 11200 |
| 284 | 15 | 58 | 3.5 | | | | | | 21.1 | 11300 |
| 290 | 16 | 17 | 3.4 | | | | | | 21.4 | 11400 |
| 295 | 16 | 35 | 3.4 | -9 | -0.55 | 4.72 | 80 | 4 | 21.6 | 11500 |
| 300 | 16 | 54 | 3.3 | | | | | | 21.9 | 11600 |
| 306 | 17 | 13 | 3.2 | | | | | | 22.2 | 11700 |
| 312 | 17 | 32 | 3.2 | | | | | | 22.5 | 11800 |
| 317 | 17 | 51 | 3.1 | | | | | | 22.8 | 11900 |
| 323 | 18 | 11 | 3.0 | -10 | -0.60 | 4.71 | 86 | 5 | 23.1 | 12000 |

*This is the Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range (1) | Elevation (2) | (3) | | Change in elev. for 100 yd change in range (4) | (5) | Change in range for 1 mil change in elev. (6) | 1 min (7) | Maximum ordinate (8) | Terminal velocity (9) |
|---|---|---|---|---|---|---|---|---|---|
| yards | mils | deg | min | mils | min | yards | yards | feet | f/s |
| 12000 | 183.8 | 10 | 20 | 2.9 | 9.9 | 34.1 | 10.1 | 2201 | 1096 |
| 12100 | 186.6 | 10 | 30 | 3.0 | 10.0 | 33.7 | 10.0 | 2260 | |
| 12200 | 189.6 | 10 | 40 | 3.0 | 10.1 | 33.3 | 9.9 | 2321 | |
| 12300 | 192.6 | 10 | 50 | 3.0 | 10.3 | 32.9 | 9.8 | 2383 | |
| 12400 | 195.8 | 11 | 01 | 3.1 | 10.4 | 32.5 | 9.6 | 2446 | |
| 12500 | 198.8 | 11 | 11 | 3.1 | 10.5 | 32.1 | 9.5 | 2511 | 1075 |
| 12600 | 202.0 | 11 | 21 | 3.1 | 10.6 | 31.8 | 9.4 | 2577 | |
| 12700 | 205.0 | 11 | 32 | 3.2 | 10.8 | 31.4 | 9.3 | 2644 | |
| 12800 | 208.2 | 11 | 43 | 3.2 | 10.9 | 31.0 | 9.2 | 2713 | |
| 12900 | 211.6 | 11 | 54 | 3.3 | 11.0 | 30.6 | 9.1 | 2783 | |
| 13000 | 214.8 | 12 | 05 | 3.3 | 11.2 | 30.3 | 9.0 | 2855 | 1058 |
| 13100 | 218.2 | 12 | 16 | 3.3 | 11.3 | 29.9 | 8.9 | 2928 | |
| 13200 | 221.4 | 12 | 28 | 3.4 | 11.4 | 29.6 | 8.8 | 3003 | |
| 13300 | 224.8 | 12 | 39 | 3.4 | 11.6 | 29.2 | 8.7 | 3079 | |
| 13400 | 228.2 | 12 | 51 | 3.5 | 11.7 | 28.9 | 8.6 | 3157 | |
| 13500 | 231.8 | 13 | 02 | 3.5 | 11.8 | 28.5 | 8.5 | 3236 | 1044 |
| 13600 | 235.2 | 13 | 14 | 3.5 | 12.0 | 28.2 | 8.4 | 3317 | |
| 13700 | 238.8 | 13 | 26 | 3.6 | 12.1 | 27.8 | 8.3 | 3399 | |
| 13800 | 242.4 | 13 | 38 | 3.6 | 12.3 | 27.5 | 8.2 | 3483 | |
| 13900 | 246.0 | 13 | 51 | 3.7 | 12.4 | 27.2 | 8.1 | 3569 | |
| 14000 | 249.8 | 14 | 03 | 3.7 | 12.6 | 26.9 | 8.0 | 3656 | 1034 |
| 14100 | 253.4 | 14 | 16 | 3.8 | 12.7 | 26.6 | 7.9 | 3745 | |
| 14200 | 257.2 | 14 | 28 | 3.8 | 12.9 | 26.3 | 7.8 | 3836 | |
| 14300 | 261.0 | 14 | 41 | 3.9 | 13.0 | 26.0 | 7.7 | 3928 | |
| 14400 | 265.0 | 14 | 54 | 3.9 | 13.2 | 25.7 | 7.6 | 4022 | |
| 14500 | 268.8 | 15 | 08 | 3.9 | 13.3 | 25.3 | 7.5 | 4118 | 1027 |
| 14600 | 272.8 | 15 | 21 | 4.0 | 13.5 | 25.0 | 7.4 | 4216 | |
| 14700 | 276.8 | 15 | 34 | 4.1 | 13.7 | 24.7 | 7.3 | 4316 | |
| 14800 | 281.0 | 15 | 48 | 4.1 | 13.8 | 24.4 | 7.2 | 4418 | |
| 14900 | 285.0 | 16 | 02 | 4.2 | 14.0 | 24.1 | 7.1 | 4521 | |
| 15000 | 289.2 | 16 | 16 | 4.2 | 14.2 | 23.8 | 7.1 | 4626 | 1022 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on - | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 323 | 18 | 11 | 3.0 | -10 | -0.60 | 4.71 | 86 | 5 | 23.1 | 12000 |
| 329 | 18 | 30 | 2.99 | | | | | | 23.4 | 12100 |
| 335 | 18 | 50 | 2.93 | | | | | | 23.7 | 12200 |
| 341 | 19 | 10 | 2.88 | | | | | | 24.0 | 12300 |
| 347 | 19 | 30 | 2.82 | | | | | | 24.3 | 12400 |
| 353 | 19 | 50 | 2.77 | -11 | -0.65 | 4.70 | 91 | 5 | 24.6 | 12500 |
| 359 | 20 | 11 | 2.72 | | | | | | 24.9 | 12600 |
| 365 | 20 | 31 | 2.67 | | | | | | 25.2 | 12700 |
| 371 | 20 | 52 | 2.62 | | | | | | 25.5 | 12800 |
| 377 | 21 | 13 | 2.58 | | | | | | 25.9 | 12900 |
| 383 | 21 | 34 | 2.53 | -12 | -0.70 | 4.69 | 96 | 6 | 26.2 | 13000 |
| 390 | 21 | 55 | 2.49 | | | | | | 26.5 | 13100 |
| 396 | 22 | 16 | 2.44 | | | | | | 26.8 | 13200 |
| 402 | 22 | 37 | 2.40 | | | | | | 27.1 | 13300 |
| 409 | 22 | 59 | 2.36 | | | | | | 27.5 | 13400 |
| 415 | 23 | 21 | 2.32 | -13 | -0.75 | 4.67 | 100 | 6 | 27.8 | 13500 |
| 422 | 23 | 43 | 2.28 | | | | | | 28.1 | 13600 |
| 428 | 24 | 05 | 2.24 | | | | | | 28.4 | 13700 |
| 435 | 24 | 28 | 2.20 | | | | | | 28.8 | 13800 |
| 442 | 24 | 50 | 2.16 | | | | | | 29.1 | 13900 |
| 448 | 25 | 12 | 2.13 | -14 | -0.80 | 4.65 | 105 | 6 | 29.5 | 14000 |
| 455 | 25 | 34 | 2.09 | | | | | | 29.8 | 14100 |
| 461 | 25 | 56 | 2.06 | | | | | | 30.1 | 14200 |
| 468 | 26 | 19 | 2.02 | | | | | | 30.5 | 14300 |
| 475 | 26 | 42 | 1.99 | | | | | | 30.8 | 14400 |
| 482 | 27 | 05 | 1.96 | -16 | -0.85 | 4.63 | 110 | 7 | 31.2 | 14500 |
| 488 | 27 | 28 | 1.92 | | | | | | 31.5 | 14600 |
| 495 | 27 | 51 | 1.89 | | | | | | 31.9 | 14700 |
| 502 | 28 | 14 | 1.86 | | | | | | 32.2 | 14800 |
| 509 | 28 | 38 | 1.83 | | | | | | 32.6 | 14900 |
| 516 | 29 | 02 | 1.80 | -17 | -0.95 | 4.60 | 114 | 7 | 33.0 | 15000 |

*This is the Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Range (1) | Elevation (2) | (3) | | Change in elev. for 100 yd change in range (4) | (5) | Change in range for 1 mil change in elev. (6) | 1 min (7) | Maximum ordinate (8) | Terminal velocity (9) |
|---|---|---|---|---|---|---|---|---|---|
| yards | mils | deg | min | mils | min | yards | yards | feet | f/s |
| 15000 | 289.2 | 16 | 16 | 4.2 | 14.2 | 23.8 | 7.1 | 4626 | 1022 |
| 15100 | 293.4 | 16 | 30 | 4.3 | 14.4 | 23.5 | 7.0 | 4733 | |
| 15200 | 297.6 | 16 | 44 | 4.3 | 14.5 | 23.2 | 6.9 | 4842 | |
| 15300 | 302.0 | 16 | 59 | 4.4 | 14.7 | 22.9 | 6.8 | 4953 | |
| 15400 | 306.2 | 17 | 14 | 4.4 | 14.9 | 22.6 | 6.7 | 5065 | |
| 15500 | 310.6 | 17 | 29 | 4.5 | 15.1 | 22.3 | 6.6 | 5180 | 1019 |
| 15600 | 315.2 | 17 | 44 | 4.5 | 15.3 | 22.0 | 6.5 | 5300 | |
| 15700 | 319.8 | 17 | 59 | 4.6 | 15.5 | 21.7 | 6.4 | 5420 | |
| 15800 | 324.4 | 18 | 15 | 4.6 | 15.7 | 21.5 | 6.4 | 5540 | |
| 15900 | 329.0 | 18 | 30 | 4.7 | 15.9 | 21.2 | 6.3 | 5665 | |
| 16000 | 333.8 | 18 | 46 | 4.8 | 16.2 | 20.9 | 6.2 | 5790 | 1018 |
| 16100 | 338.6 | 19 | 03 | 4.9 | 16.4 | 20.6 | 6.1 | 5915 | |
| 16200 | 343.6 | 19 | 19 | 4.9 | 16.6 | 20.3 | 6.0 | 6045 | |
| 16300 | 348.4 | 19 | 36 | 5.0 | 16.8 | 20.0 | 5.9 | 6180 | |
| 16400 | 353.4 | 19 | 53 | 5.1 | 17.1 | 19.7 | 5.9 | 6315 | |
| 16500 | 358.6 | 20 | 10 | 5.1 | 17.4 | 19.4 | 5.8 | 6455 | 1017 |
| 16600 | 363.8 | 20 | 28 | 5.2 | 17.6 | 19.2 | 5.7 | 6595 | |
| 16700 | 369.0 | 20 | 45 | 5.3 | 17.9 | 18.9 | 5.6 | 6740 | |
| 16800 | 374.4 | 21 | 03 | 5.4 | 18.2 | 18.6 | 5.5 | 6885 | |
| 16900 | 379.8 | 21 | 22 | 5.5 | 18.5 | 18.3 | 5.4 | 7035 | |
| 17000 | 385.2 | 21 | 40 | 5.5 | 18.8 | 18.0 | 5.3 | 7190 | 1016 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE A

| Angle of fall (10) mils | (11) deg | (11) min | Slope of fall (12) 1 on – | Deflection due to drift (13) mils | (14) deg | Ballistic coefficient (15) | *Probable error in R (16) yd | Dfl (17) yd | Time of flight (18) sec | Range (19) yards |
|---|---|---|---|---|---|---|---|---|---|---|
| 516 | 29 | 02 | 1.80 | -17 | -0.95 | 4.60 | 114 | 7 | 33.0 | 15000 |
| 523 | 29 | 26 | 1.77 | | | | | | 33.3 | 15100 |
| 530 | 29 | 50 | 1.74 | | | | | | 33.7 | 15200 |
| 538 | 30 | 14 | 1.72 | | | | | | 34.0 | 15300 |
| 545 | 30 | 38 | 1.69 | | | | | | 34.4 | 15400 |
| 552 | 31 | 02 | 1.66 | -18 | -1.00 | 4.57 | 118 | 8 | 34.8 | 15500 |
| 559 | 31 | 26 | 1.63 | | | | | | 35.2 | 15600 |
| 566 | 31 | 50 | 1.61 | | | | | | 35.5 | 15700 |
| 573 | 32 | 14 | 1.59 | | | | | | 35.9 | 15800 |
| 580 | 32 | 38 | 1.56 | | | | | | 36.3 | 15900 |
| 587 | 33 | 02 | 1.54 | -20 | -1.10 | 4.54 | 122 | 8 | 36.7 | 16000 |
| 594 | 33 | 26 | 1.51 | | | | | | 37.1 | 16100 |
| 602 | 33 | 50 | 1.49 | | | | | | 37.5 | 16200 |
| 609 | 34 | 14 | 1.47 | | | | | | 37.9 | 16300 |
| 616 | 34 | 39 | 1.45 | | | | | | 38.3 | 16400 |
| 623 | 35 | 04 | 1.42 | -21 | -1.20 | 4.50 | 125 | 8 | 38.7 | 16500 |
| 631 | 35 | 29 | 1.40 | | | | | | 39.1 | 16600 |
| 638 | 35 | 54 | 1.38 | | | | | | 39.5 | 16700 |
| 646 | 36 | 19 | 1.36 | | | | | | 39.9 | 16800 |
| 653 | 36 | 44 | 1.34 | | | | | | 40.4 | 16900 |
| 660 | 37 | 09 | 1.31 | -23 | -1.25 | 4.45 | 129 | 9 | 40.8 | 17000 |

*This is the Proving Ground Probable Error.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. =2600 f/s

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

| Height of target | Map Range - yards | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| feet | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |
| -10 | 438 | 271 | 194 | 147 | 115 | 94 | 78 | 66 | 56 |
| -20 | 892 | 551 | 391 | 296 | 232 | 188 | 156 | 132 | 113 |
| -30 | | 841 | 592 | 447 | 350 | 283 | 235 | 198 | 169 |
| -40 | | 1140 | 796 | 600 | 470 | 379 | 314 | 265 | 226 |
| -50 | | 1449 | 1004 | 755 | 592 | 477 | 394 | 332 | 283 |
| -60 | | | 1217 | 912 | 715 | 576 | 475 | 400 | 341 |
| -70 | | | 1436 | 1072 | 840 | 676 | 557 | 468 | 399 |
| -80 | | | 1663 | 1235 | 966 | 777 | 640 | 537 | 457 |
| -90 | | | 1900 | 1401 | 1094 | 879 | 723 | 606 | 515 |
| -100 | | | | 1570 | 1224 | 982 | 806 | 676 | 574 |
| -110 | | | | 1742 | 1355 | 1087 | 891 | 746 | 634 |
| -120 | | | | 1918 | 1487 | 1193 | 977 | 817 | 694 |
| -130 | | | | 2098 | 1621 | 1300 | 1064 | 889 | 755 |
| -140 | | | | 2282 | 1757 | 1408 | 1151 | 961 | 815 |
| -150 | | | | 2471 | 1896 | 1517 | 1239 | 1033 | 876 |
| -160 | | | | | 2037 | 1627 | 1328 | 1106 | 937 |
| -170 | | | | | 2180 | 1738 | 1417 | 1180 | 999 |
| -180 | | | | | 2326 | 1850 | 1508 | 1256 | 1062 |
| -190 | | | | | 2475 | 1962 | 1599 | 1332 | 1124 |
| -200 | | | | | 2628 | 2075 | 1691 | 1408 | 1187 |
| -220 | | | | | 2943 | 2304 | 1878 | 1561 | 1315 |
| -240 | | | | | | 2539 | 2069 | 1716 | 1444 |
| -260 | | | | | | 2783 | 2264 | 1874 | 1575 |
| -280 | | | | | | 3039 | 2462 | 2034 | 1708 |
| -300 | | | | | | 3312 | 2664 | 2197 | 1842 |
| -320 | | | | | | | 2871 | 2362 | 1978 |
| -340 | | | | | | | 3083 | 2530 | 2115 |
| -360 | | | | | | | 3300 | 2701 | 2254 |
| -380 | | | | | | | 3522 | 2876 | 2396 |
| -400 | | | | | | | 3749 | 3054 | 2541 |
| -420 | | | | | | | 3981 | 3235 | 2688 |
| -440 | | | | | | | | 3419 | 2837 |
| -460 | | | | | | | | 3607 | 2989 |
| -480 | | | | | | | | 3800 | 3144 |
| -500 | | | | | | | | 3998 | 3303 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

| Map Range - yards | | | | | | | | Height of target |
|---|---|---|---|---|---|---|---|---|
| 5500 | 6000 | 6500 | 7000 | 7500 | 8000 | 8500 | 9000 | feet |
| 48 | 42 | 37 | 32 | 28 | 25 | 22 | 19 | -10 |
| 97 | 84 | 73 | 64 | 56 | 49 | 44 | 39 | -20 |
| 146 | 127 | 110 | 96 | 84 | 74 | 65 | 58 | -30 |
| 195 | 169 | 147 | 128 | 112 | 98 | 87 | 78 | -40 |
| 244 | 211 | 183 | 160 | 140 | 123 | 109 | 97 | -50 |
| 294 | 254 | 220 | 192 | 168 | 148 | 131 | 117 | -60 |
| 343 | 297 | 258 | 225 | 197 | 173 | 153 | 136 | -70 |
| 393 | 340 | 295 | 257 | 225 | 198 | 175 | 155 | -80 |
| 442 | 383 | 333 | 290 | 254 | 223 | 197 | 175 | -90 |
| 492 | 426 | 370 | 322 | 282 | 248 | 219 | 195 | -100 |
| 543 | 470 | 408 | 355 | 311 | 273 | 242 | 215 | -110 |
| 595 | 514 | 446 | 388 | 340 | 299 | 264 | 235 | -120 |
| 647 | 558 | 484 | 421 | 368 | 324 | 287 | 255 | -130 |
| 698 | 602 | 522 | 454 | 397 | 350 | 310 | 275 | -140 |
| 750 | 646 | 560 | 487 | 426 | 375 | 332 | 295 | -150 |
| 802 | 691 | 599 | 521 | 455 | 401 | 355 | 315 | -160 |
| 854 | 736 | 638 | 555 | 485 | 427 | 377 | 335 | -170 |
| 907 | 781 | 676 | 588 | 514 | 452 | 400 | 355 | -180 |
| 959 | 826 | 715 | 622 | 543 | 478 | 423 | 375 | -190 |
| 1012 | 871 | 754 | 655 | 573 | 504 | 446 | 396 | -200 |
| 1120 | 963 | 833 | 724 | 633 | 556 | 492 | 437 | -220 |
| 1229 | 1056 | 913 | 793 | 693 | 609 | 538 | 477 | -240 |
| 1339 | 1149 | 993 | 862 | 753 | 662 | 584 | 518 | -260 |
| 1450 | 1243 | 1073 | 932 | 814 | 715 | 631 | 559 | -280 |
| 1563 | 1338 | 1154 | 1002 | 875 | 768 | 677 | 600 | -300 |
| 1677 | 1435 | 1237 | 1073 | 937 | 822 | 724 | 641 | -320 |
| 1792 | 1533 | 1321 | 1145 | 999 | 876 | 772 | 683 | -340 |
| 1909 | 1632 | 1405 | 1218 | 1062 | 930 | 819 | 725 | -360 |
| 2027 | 1732 | 1490 | 1291 | 1125 | 985 | 867 | 767 | -380 |
| 2146 | 1833 | 1576 | 1364 | 1188 | 1040 | 915 | 809 | -400 |
| 2267 | 1935 | 1663 | 1438 | 1252 | 1096 | 964 | 852 | -420 |
| 2390 | 2038 | 1751 | 1513 | 1316 | 1151 | 1013 | 895 | -440 |
| 2515 | 2142 | 1839 | 1589 | 1381 | 1208 | 1063 | 939 | -460 |
| 2642 | 2247 | 1928 | 1665 | 1447 | 1265 | 1112 | 982 | -480 |
| 2771 | 2353 | 2018 | 1741 | 1512 | 1322 | 1162 | 1025 | -500 |

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A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

| Height of target | Map Range - yards | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| feet | 9500 | 10000 | 10500 | 11000 | 11500 | 12000 | 12500 | 13000 |
| -10 | 17 | 15 | 14 | 12 | 11 | 10 | 9 | 8 |
| -20 | 35 | 31 | 28 | 25 | 23 | 20 | 18 | 17 |
| -30 | 52 | 47 | 42 | 38 | 34 | 30 | 27 | 25 |
| -40 | 70 | 63 | 56 | 50 | 45 | 41 | 37 | 34 |
| -50 | 87 | 78 | 70 | 63 | 57 | 51 | 46 | 42 |
| -60 | 104 | 93 | 84 | 76 | 68 | 61 | 55 | 50 |
| -70 | 122 | 109 | 98 | 88 | 80 | 72 | 65 | 59 |
| -80 | 139 | 125 | 112 | 101 | 91 | 82 | 74 | 68 |
| -90 | 157 | 141 | 126 | 113 | 102 | 92 | 83 | 76 |
| -100 | 174 | 156 | 140 | 126 | 114 | 103 | 93 | 85 |
| -110 | 192 | 172 | 154 | 139 | 125 | 113 | 103 | 93 |
| -120 | 210 | 188 | 169 | 152 | 137 | 124 | 112 | 102 |
| -130 | 227 | 204 | 183 | 164 | 148 | 134 | 122 | 111 |
| -140 | 245 | 219 | 197 | 177 | 160 | 145 | 131 | 119 |
| -150 | 263 | 235 | 211 | 190 | 171 | 155 | 141 | 128 |
| -160 | 281 | 251 | 225 | 202 | 182 | 165 | 150 | 137 |
| -170 | 299 | 267 | 239 | 215 | 194 | 176 | 160 | 146 |
| -180 | 317 | 283 | 254 | 228 | 205 | 186 | 169 | 154 |
| -190 | 335 | 299 | 268 | 241 | 217 | 196 | 178 | 162 |
| -200 | 353 | 315 | 282 | 253 | 228 | 207 | 188 | 171 |
| -220 | 389 | 347 | 310 | 278 | 251 | 228 | 207 | 188 |
| -240 | 425 | 379 | 339 | 304 | 274 | 248 | 225 | 205 |
| -260 | 461 | 411 | 368 | 330 | 297 | 269 | 244 | 222 |
| -280 | 497 | 444 | 397 | 356 | 321 | 290 | 263 | 240 |
| -300 | 533 | 476 | 426 | 382 | 344 | 311 | 282 | 257 |
| -320 | 570 | 509 | 455 | 408 | 368 | 332 | 301 | 274 |
| -340 | 607 | 541 | 484 | 434 | 391 | 353 | 320 | 291 |
| -360 | 644 | 574 | 513 | 460 | 414 | 374 | 339 | 309 |
| -380 | 681 | 607 | 543 | 487 | 438 | 396 | 359 | 327 |
| -400 | 718 | 640 | 572 | 513 | 462 | 417 | 378 | 344 |
| -420 | 756 | 673 | 601 | 539 | 485 | 438 | 397 | 362 |
| -440 | 794 | 707 | 631 | 566 | 509 | 459 | 416 | 379 |
| -460 | 832 | 740 | 661 | 592 | 533 | 481 | 436 | 397 |
| -480 | 870 | 774 | 691 | 619 | 556 | 502 | 455 | 414 |
| -500 | 908 | 808 | 721 | 645 | 580 | 523 | 474 | 432 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

| Map Range - yards | | | | | | | | Height of target |
|---|---|---|---|---|---|---|---|---|
| 13500 | 14000 | 14500 | 15000 | 15500 | 16000 | 16500 | 17000 | feet |
| 8 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | -10 |
| 16 | 14 | 13 | 12 | 11 | 10 | 9 | 9 | -20 |
| 23 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | -30 |
| 31 | 28 | 26 | 24 | 22 | 20 | 19 | 18 | -40 |
| 39 | 35 | 32 | 30 | 27 | 25 | 23 | 22 | -50 |
| 46 | 42 | 39 | 36 | 33 | 30 | 28 | 26 | -60 |
| 54 | 49 | 45 | 42 | 39 | 36 | 33 | 31 | -70 |
| 62 | 57 | 52 | 48 | 44 | 41 | 38 | 35 | -80 |
| 70 | 64 | 59 | 54 | 50 | 46 | 42 | 39 | -90 |
| 78 | 71 | 65 | 60 | 55 | 51 | 47 | 43 | -100 |
| 85 | 78 | 72 | 66 | 61 | 56 | 52 | 48 | -110 |
| 93 | 85 | 78 | 72 | 66 | 61 | 56 | 52 | -120 |
| 101 | 93 | 85 | 78 | 72 | 66 | 61 | 57 | -130 |
| 109 | 100 | 92 | 84 | 77 | 71 | 66 | 61 | -140 |
| 117 | 107 | 98 | 90 | 83 | 76 | 70 | 65 | -150 |
| 125 | 114 | 105 | 96 | 88 | 81 | 75 | 69 | -160 |
| 133 | 121 | 111 | 102 | 94 | 87 | 80 | 74 | -170 |
| 140 | 128 | 118 | 109 | 100 | 92 | 85 | 78 | -180 |
| 148 | 136 | 125 | 115 | 105 | 97 | 90 | 83 | -190 |
| 156 | 143 | 131 | 121 | 111 | 103 | 95 | 87 | -200 |
| 172 | 158 | 145 | 133 | 122 | 113 | 104 | 96 | -220 |
| 188 | 172 | 158 | 145 | 133 | 123 | 114 | 105 | -240 |
| 203 | 186 | 171 | 157 | 145 | 134 | 123 | 113 | -260 |
| 219 | 201 | 184 | 169 | 156 | 144 | 133 | 122 | -280 |
| 235 | 215 | 197 | 181 | 167 | 154 | 142 | 131 | -300 |
| 251 | 229 | 210 | 193 | 178 | 164 | 151 | 139 | -320 |
| 266 | 244 | 224 | 206 | 190 | 175 | 161 | 148 | -340 |
| 282 | 258 | 237 | 218 | 201 | 185 | 171 | 157 | -360 |
| 298 | 273 | 251 | 231 | 213 | 196 | 180 | 166 | -380 |
| 314 | 288 | 264 | 243 | 224 | 206 | 190 | 175 | -400 |
| 331 | 303 | 278 | 255 | 235 | 216 | 199 | 183 | -420 |
| 347 | 318 | 291 | 267 | 246 | 227 | 209 | 192 | -440 |
| 363 | 332 | 305 | 280 | 258 | 238 | 219 | 201 | -460 |
| 379 | 347 | 318 | 292 | 269 | 248 | 228 | 210 | -480 |
| 395 | 362 | 332 | 305 | 280 | 258 | 238 | 219 | -500 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 F/S

PART 2 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 | -416 | -265 | -190 | -143 | -114 | -92 | -76 | -64 | -55 |
| 20 | -812 | -524 | -376 | -285 | -227 | -183 | -151 | -128 | -110 |
| 30 | | -776 | -558 | -425 | -338 | -274 | -227 | -192 | -165 |
| 40 | | -1020 | -736 | -563 | -448 | -364 | -302 | -256 | -219 |
| 50 | | -1256 | -910 | -699 | -557 | -454 | -377 | -319 | -273 |
| 60 | | -1483 | -1081 | -833 | -665 | -543 | -451 | -381 | -327 |
| 70 | | | -1249 | -965 | -771 | -630 | -524 | -443 | -380 |
| 80 | | | -1415 | -1095 | -876 | -717 | -597 | -505 | -433 |
| 90 | | | -1579 | -1223 | -980 | -803 | -669 | -566 | -485 |
| 100 | | | -1742 | -1350 | -1083 | -888 | -740 | -626 | -537 |
| 110 | | | -1903 | -1476 | -1185 | -972 | -811 | -687 | -589 |
| 120 | | | | -1600 | -1286 | -1056 | -882 | -747 | -641 |
| 130 | | | | -1722 | -1385 | -1139 | -952 | -807 | -692 |
| 140 | | | | -1842 | -1483 | -1221 | -1021 | -866 | -743 |
| 150 | | | | -1960 | -1580 | -1302 | -1090 | -925 | -794 |
| 160 | | | | -2077 | -1676 | -1382 | -1159 | -984 | -845 |
| 170 | | | | -2192 | -1771 | -1461 | -1227 | -1042 | -895 |
| 180 | | | | -2305 | -1865 | -1540 | -1294 | -1100 | -945 |
| 190 | | | | -2417 | -1958 | -1619 | -1361 | -1158 | -995 |
| 200 | | | | | -2051 | -1697 | -1427 | -1215 | -1044 |
| 220 | | | | | -2234 | -1851 | -1558 | -1328 | -1142 |
| 240 | | | | | -2413 | -2003 | -1688 | -1440 | -1239 |
| 260 | | | | | -2588 | -2152 | -1816 | -1550 | -1335 |
| 280 | | | | | -2760 | -2299 | -1942 | -1658 | -1429 |
| 300 | | | | | -2929 | -2443 | -2065 | -1765 | -1522 |
| 320 | | | | | | -2585 | -2187 | -1871 | -1615 |
| 340 | | | | | | -2724 | -2307 | -1976 | -1707 |
| 360 | | | | | | -2860 | -2426 | -2081 | -1798 |
| 380 | | | | | | -2994 | -2543 | -2184 | -1887 |
| 400 | | | | | | -3126 | -2658 | -2284 | -1975 |
| 420 | | | | | | -3255 | -2772 | -2383 | -2063 |
| 440 | | | | | | -3381 | -2884 | -2481 | -2150 |
| 460 | | | | | | | -2994 | -2578 | -2236 |
| 480 | | | | | | | -3103 | -2674 | -2321 |
| 500 | | | | | | | -3210 | -2768 | -2405 |

A. P. 108 LB. PROJ.
FUZE,, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

| Map Range - yards | | | | | | | | Height of target |
|---|---|---|---|---|---|---|---|---|
| 5500 | 6000 | 6500 | 7000 | 7500 | 8000 | 8500 | 9000 | feet |
| -48 | -41 | -35 | -31 | -27 | -24 | -21 | -19 | 10 |
| -95 | -82 | -71 | -62 | -55 | -48 | -43 | -38 | 20 |
| -142 | -123 | -107 | -94 | -82 | -72 | -64 | -57 | 30 |
| -189 | -164 | -143 | -125 | -110 | -97 | -86 | -76 | 40 |
| -236 | -205 | -178 | -156 | -137 | -121 | -107 | -95 | 50 |
| -282 | -245 | -214 | -187 | -164 | -145 | -128 | -114 | 60 |
| -328 | -285 | -249 | -218 | -191 | -168 | -149 | -133 | 70 |
| -374 | -325 | -283 | -248 | -218 | -192 | -170 | -151 | 80 |
| -420 | -365 | -318 | -278 | -245 | -216 | -191 | -170 | 90 |
| -465 | -404 | -352 | -308 | -271 | -240 | -212 | -188 | 100 |
| -510 | -443 | -387 | -339 | -298 | -263 | -233 | -207 | 110 |
| -555 | -482 | -421 | -369 | -325 | -287 | -254 | -226 | 120 |
| -599 | -521 | -455 | -399 | -351 | -310 | -275 | -245 | 130 |
| -644 | -560 | -489 | -429 | -377 | -333 | -295 | -263 | 140 |
| -688 | -598 | -522 | -458 | -403 | -356 | -316 | -282 | 150 |
| -732 | -636 | -555 | -488 | -430 | -380 | -337 | -301 | 160 |
| -775 | -674 | -589 | -517 | -456 | -403 | -358 | -319 | 170 |
| -818 | -711 | -622 | -547 | -482 | -426 | -378 | -337 | 180 |
| -861 | -749 | -655 | -576 | -508 | -449 | -399 | -355 | 190 |
| -903 | -786 | -688 | -605 | -534 | -473 | -420 | -374 | 200 |
| -989 | -861 | -754 | -663 | -585 | -518 | -460 | -410 | 220 |
| -1073 | -935 | -819 | -721 | -637 | -564 | -501 | -447 | 240 |
| -1157 | -1009 | -884 | -778 | -688 | -610 | -542 | -484 | 260 |
| -1240 | -1082 | -948 | -835 | -739 | -655 | -583 | -520 | 280 |
| -1322 | -1154 | -1012 | -892 | -789 | -700 | -623 | -556 | 300 |
| -1403 | -1226 | -1076 | -948 | -838 | -744 | -663 | -592 | 320 |
| -1484 | -1297 | -1139 | -1004 | -888 | -789 | -703 | -628 | 340 |
| -1563 | -1367 | -1202 | -1060 | -938 | -833 | -742 | -663 | 360 |
| -1641 | -1436 | -1263 | -1115 | -987 | -877 | -782 | -699 | 380 |
| -1718 | -1504 | -1323 | -1169 | -1036 | -921 | -821 | -734 | 400 |
| -1796 | -1572 | -1383 | -1222 | -1084 | -964 | -860 | -769 | 420 |
| -1873 | -1640 | -1443 | -1276 | -1132 | -1007 | -899 | -804 | 440 |
| -1949 | -1707 | -1503 | -1329 | -1179 | -1050 | -938 | -839 | 460 |
| -2024 | -1774 | -1562 | -1382 | -1227 | -1093 | -976 | -874 | 480 |
| -2099 | -1840 | -1621 | -1435 | -1275 | -1136 | -1015 | -909 | 500 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

| Height of target | Map Range - yards | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| feet | 9500 | 10000 | 10500 | 11000 | 11500 | 12000 | 12500 | 13000 |
| 10 | -17 | -15 | -14 | -12 | -11 | -10 | -9 | -8 |
| 20 | -34 | -30 | -27 | -24 | -22 | -20 | -18 | -17 |
| 30 | -51 | -45 | -40 | -36 | -33 | -30 | -28 | -25 |
| 40 | -68 | -61 | -54 | -48 | -44 | -40 | -37 | -33 |
| 50 | -85 | -76 | -68 | -61 | -55 | -50 | -46 | -42 |
| 60 | -102 | -91 | -81 | -73 | -66 | -60 | -55 | -50 |
| 70 | -119 | -106 | -95 | -85 | -77 | -70 | -64 | -58 |
| 80 | -135 | -121 | -109 | -98 | -88 | -80 | -73 | -67 |
| 90 | -152 | -136 | -122 | -110 | -99 | -90 | -82 | -75 |
| 100 | -168 | -151 | -136 | -122 | -110 | -100 | -91 | -83 |
| 110 | -185 | -166 | -149 | -134 | -121 | -110 | -100 | -91 |
| 120 | -202 | -181 | -162 | -146 | -132 | -120 | -109 | -99 |
| 130 | -219 | -196 | -176 | -158 | -143 | -130 | -118 | -107 |
| 140 | -235 | -211 | -190 | -171 | -154 | -140 | -127 | -116 |
| 150 | -252 | -226 | -203 | -183 | -165 | -150 | -136 | -124 |
| 160 | -269 | -241 | -217 | -195 | -176 | -160 | -145 | -132 |
| 170 | -285 | -256 | -230 | -207 | -187 | -169 | -154 | -141 |
| 180 | -302 | -271 | -243 | -219 | -198 | -179 | -163 | -149 |
| 190 | -318 | -286 | -257 | -231 | -208 | -189 | -172 | -157 |
| 200 | -334 | -300 | -270 | -243 | -219 | -199 | -181 | -166 |
| 220 | -367 | -330 | -297 | -267 | -241 | -219 | -199 | -182 |
| 240 | -400 | -359 | -323 | -291 | -263 | -239 | -217 | -198 |
| 260 | -433 | -389 | -350 | -315 | -284 | -258 | -235 | -215 |
| 280 | -465 | -418 | -376 | -339 | -306 | -278 | -253 | -231 |
| 300 | -498 | -447 | -402 | -363 | -328 | -298 | -271 | -248 |
| 320 | -530 | -476 | -428 | -386 | -350 | -318 | -289 | -264 |
| 340 | -562 | -504 | -454 | -410 | -371 | -337 | -307 | -280 |
| 360 | -594 | -533 | -480 | -434 | -393 | -356 | -324 | -296 |
| 380 | -626 | -562 | -506 | -457 | -414 | -376 | -342 | -313 |
| 400 | -658 | -591 | -532 | -481 | -436 | -396 | -360 | -329 |
| 420 | -689 | -619 | -558 | -504 | -457 | -415 | -378 | -346 |
| 440 | -721 | -648 | -584 | -528 | -478 | -434 | -396 | -362 |
| 460 | -752 | -676 | -609 | -551 | -499 | -453 | -413 | -378 |
| 480 | -784 | -705 | -635 | -574 | -520 | -473 | -431 | -394 |
| 500 | -815 | -733 | -661 | -597 | -541 | -492 | -448 | -410 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

| Map Range - yards | | | | | | | | Height of target |
|---|---|---|---|---|---|---|---|---|
| 13500 | 14000 | 14500 | 15000 | 15500 | 16000 | 16500 | 17000 | feet |
| -8 | -7 | -6 | -6 | -5 | -5 | -5 | -4 | 10 |
| -15 | -14 | -13 | -12 | -11 | -10 | -9 | -9 | 20 |
| -23 | -21 | -19 | -18 | -16 | -15 | -14 | -13 | 30 |
| -30 | -28 | -26 | -24 | -22 | -20 | -18 | -17 | 40 |
| -38 | -35 | -32 | -30 | -27 | -25 | -23 | -22 | 50 |
| -46 | -42 | -39 | -36 | -33 | -30 | -28 | -26 | 60 |
| -53 | -49 | -45 | -42 | -38 | -35 | -32 | -30 | 70 |
| -61 | -56 | -52 | -48 | -44 | -40 | -37 | -34 | 80 |
| -69 | -63 | -58 | -53 | -49 | -45 | -42 | -39 | 90 |
| -76 | -70 | -64 | -59 | -54 | -50 | -46 | -43 | 100 |
| -83 | -76 | -70 | -64 | -59 | -55 | -51 | -47 | 110 |
| -91 | -83 | -76 | -70 | -65 | -60 | -55 | -51 | 120 |
| -98 | -90 | -83 | -76 | -70 | -65 | -60 | -56 | 130 |
| -106 | -97 | -89 | -82 | -76 | -70 | -65 | -60 | 140 |
| -113 | -104 | -96 | -88 | -81 | -75 | -69 | -64 | 150 |
| -121 | -111 | -102 | -94 | -87 | -80 | -74 | -68 | 160 |
| -129 | -118 | -109 | -100 | -92 | -85 | -79 | -73 | 170 |
| -136 | -125 | -115 | -106 | -98 | -90 | -83 | -77 | 180 |
| -144 | -132 | -122 | -112 | -103 | -95 | -88 | -81 | 190 |
| -152 | -139 | -128 | -118 | -109 | -100 | -92 | -85 | 200 |
| -167 | -153 | -141 | -130 | -120 | -110 | -101 | -93 | 220 |
| -182 | -167 | -154 | -142 | -131 | -120 | -110 | -102 | 240 |
| -197 | -181 | -167 | -154 | -142 | -130 | -119 | -110 | 260 |
| -212 | -195 | -179 | -165 | -152 | -140 | -129 | -118 | 280 |
| -227 | -209 | -192 | -177 | -163 | -150 | -138 | -127 | 300 |
| -242 | -223 | -205 | -189 | -174 | -160 | -147 | -135 | 320 |
| -257 | -237 | -218 | -201 | -185 | -170 | -156 | -144 | 340 |
| -272 | -251 | -230 | -212 | -195 | -180 | -166 | -152 | 360 |
| -287 | -264 | -243 | -224 | -206 | -190 | -175 | -161 | 380 |
| -302 | -278 | -256 | -236 | -217 | -200 | -184 | -170 | 400 |
| -317 | -292 | -269 | -248 | -228 | -210 | -193 | -178 | 420 |
| -332 | -305 | -281 | -259 | -239 | -220 | -203 | -186 | 440 |
| -347 | -319 | -294 | -271 | -249 | -230 | -212 | -195 | 460 |
| -361 | -332 | -306 | -282 | -260 | -240 | -221 | -203 | 480 |
| -376 | -346 | -319 | -294 | -271 | -250 | -230 | -211 | 500 |

A. P. 108 LB. PROJ.
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M. V. = 2600 f/s

PART 2 TABLE D

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

| Range yards | Variations in weight of projectile - percent | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | -5 | -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 | +5 |
| 1000 | +28 | +22 | +17 | +11 | +6 | 0 | -6 | -11 | -17 | -22 | -28 |
| 2000 | +50 | +40 | +30 | +20 | +10 | 0 | -10 | -20 | -31 | -41 | -51 |
| 3000 | +67 | +54 | +40 | +27 | +13 | 0 | -13 | -27 | -41 | -55 | -68 |
| 4000 | +78 | +63 | +47 | +31 | +15 | 0 | -16 | -32 | -48 | -64 | -80 |
| 5000 | +83 | +66 | +50 | +34 | +17 | 0 | -17 | -34 | -51 | -69 | -86 |
| 6000 | +81 | +65 | +49 | +33 | +17 | 0 | -17 | -34 | -51 | -68 | -85 |
| 7000 | +73 | +59 | +44 | +30 | +15 | 0 | -15 | -31 | -47 | -62 | -78 |
| 8000 | +59 | +48 | +36 | +24 | +12 | 0 | -12 | -25 | -39 | -52 | -65 |
| 9000 | +41 | +34 | +25 | +17 | +9 | 0 | -9 | -18 | -28 | -38 | -48 |
| 10000 | +20 | +17 | +13 | +9 | +5 | 0 | -5 | -10 | -16 | -22 | -28 |
| 11000 | -3 | -2 | -1 | 0 | 0 | 0 | 0 | -1 | -3 | -4 | -6 |
| 12000 | -27 | -21 | -15 | -10 | -5 | 0 | +4 | +8 | +11 | +14 | +17 |
| 13000 | -51 | -40 | -29 | -19 | -9 | 0 | +9 | +18 | +26 | +33 | +41 |
| 14000 | -76 | -60 | -44 | -29 | -14 | 0 | +14 | +27 | +40 | +53 | +65 |
| 15000 | -101 | -80 | -59 | -39 | -19 | 0 | +19 | +37 | +55 | +72 | +89 |
| 16000 | -126 | -100 | -74 | -49 | -24 | 0 | +24 | +47 | +69 | +91 | +113 |
| 17000 | -151 | -120 | -89 | -59 | -29 | 0 | +29 | +56 | +84 | +111 | +137 |

A. P. 108 LB. PROJ.
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M. V. = 2600 f/s

PART 2 TABLE E

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

Latitude 0°

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +5- | +10- | +14- | +17- | +19- | +20- |
| 4000 | 0 | +9- | +18- | +25- | +30- | +34- | +35- |
| 6000 | 0 | +12- | +23- | +32- | +39- | +43- | +45- |
| 8000 | 0 | +13- | +26- | +36- | +44- | +49- | +51- |
| 10000 | 0 | +14- | +27- | +38- | +47- | +52- | +54- |
| 12000 | 0 | +14- | +28- | +39- | +48- | +53- | +55- |
| 14000 | 0 | +14- | +28- | +40- | +48- | +54- | +56- |
| 16000 | 0 | +15- | +28- | +40- | +48- | +54- | +56- |
| 17000 | 0 | +15- | +28- | +40- | +48- | +54- | +56- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

Latitude 10° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +5- | +10- | +14- | +17- | +19- | +20- |
| 4000 | 0 | +9- | +17- | +24- | +30- | +33- | +34- |
| 6000 | 0 | +11- | +22- | +31- | +38- | +42- | +44- |
| 8000 | 0 | +13- | +25- | +35- | +43- | +48- | +50- |
| 10000 | 0 | +14- | +27- | +37- | +46- | +51- | +53- |
| 12000 | 0 | +14- | +27- | +38- | +47- | +52- | +54- |
| 14000 | 0 | +14- | +28- | +39- | +48- | +53- | +55- |
| 16000 | 0 | +14- | +28- | +39- | +48- | +53- | +55- |
| 17000 | 0 | +14- | +28- | +39- | +48- | +53- | +55- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
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M. V. = 2600 f/s

PART 2 TABLE E

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

Latitude 20° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +5- | +9- | +13- | +16- | +18- | +19- |
| 4000 | 0 | +9- | +16- | +23- | +28- | +32- | +33- |
| 6000 | 0 | +11- | +21- | +30- | +36- | +41- | +42- |
| 8000 | 0 | +12- | +24- | +34- | +41- | +46- | +48- |
| 10000 | 0 | +13- | +25- | +36- | +44- | +49- | +51- |
| 12000 | 0 | +13- | +26- | +37- | +45- | +50- | +52- |
| 14000 | 0 | +14- | +26- | +37- | +46- | +51- | +53- |
| 16000 | 0 | +14- | +26- | +37- | +46- | +51- | +53- |
| 17000 | 0 | +14- | +26- | +37- | +46- | +51- | +53- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

Latitude 30° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +5- | +9- | +12- | +15- | +17- | +17- |
| 4000 | 0 | +8- | +15- | +21- | +26- | +29- | +30- |
| 6000 | 0 | +10- | +19- | +28- | +34- | +38- | +39- |
| 8000 | 0 | +11- | +22- | +31- | +38- | +43- | +44- |
| 10000 | 0 | +12- | +23- | +33- | +40- | +45- | +47- |
| 12000 | 0 | +12- | +24- | +34- | +41- | +46- | +48- |
| 14000 | 0 | +13- | +24- | +34- | +42- | +47- | +49- |
| 16000 | 0 | +13- | +24- | +34- | +42- | +47- | +49- |
| 17000 | 0 | +13- | +24- | +34- | +42- | +47- | +49- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE E

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

Latitude 40° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +4- | +8- | +11- | +13- | +15- | +15- |
| 4000 | 0 | +7- | +13- | +19- | +23- | +26- | +27- |
| 6000 | 0 | +9- | +17- | +24- | +30- | +33- | +35- |
| 8000 | 0 | +10- | +20- | +28- | +34- | +38- | +39- |
| 10000 | 0 | +11- | +21- | +29- | +36- | +40- | +41- |
| 12000 | 0 | +11- | +21- | +30- | +36- | +41- | +42- |
| 14000 | 0 | +11- | +21- | +30- | +37- | +41- | +43- |
| 16000 | 0 | +11- | +21- | +30- | +37- | +41- | +43- |
| 17000 | 0 | +11- | +21- | +30- | +37- | +41- | +43- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

Latitude 50° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +3- | +6- | +9- | +11- | +12- | +13- |
| 4000 | 0 | +5- | +11- | +16- | +19- | +21- | +23- |
| 6000 | 0 | +7- | +14- | +20- | +25- | +28- | +29- |
| 8000 | 0 | +8- | +16- | +23- | +28- | +32- | +33- |
| 10000 | 0 | +9- | +17- | +24- | +30- | +34- | +35- |
| 12000 | 0 | +9- | +18- | +25- | +31- | +34- | +35- |
| 14000 | 0 | +9- | +18- | +25- | +31- | +35- | +36- |
| 16000 | 0 | +9- | +18- | +25- | +31- | +35- | +36- |
| 17000 | 0 | +9- | +18- | +25- | +31- | +35- | +36- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE E

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

Latitude 60° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +3- | +5- | +7- | +9- | +10- | +10- |
| 4000 | 0 | +5- | +9- | +12- | +15- | +17- | +18- |
| 6000 | 0 | +6- | +11- | +16- | +19- | +22- | +23- |
| 8000 | 0 | +7- | +13- | +18- | +22- | +25- | +26- |
| 10000 | 0 | +7- | +14- | +19- | +23- | +26- | +27- |
| 12000 | 0 | +7- | +14- | +19- | +24- | +27- | +28- |
| 14000 | 0 | +7- | +14- | +20- | +24- | +27- | +28- |
| 16000 | 0 | +7- | +14- | +20- | +24- | +27- | +28- |
| 17000 | 0 | +7- | +14- | +20- | +24- | +27- | +28- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

Latitude 70° (North or South)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>180 | 15<br>165 | 30<br>150 | 45<br>135 | 60<br>120 | 75<br>105 | 90<br>90 |
| 2000 | 0 | +2- | +3- | +5- | +6- | +7- | +7- |
| 4000 | 0 | +3- | +6- | +8- | +10- | +12- | +12- |
| 6000 | 0 | +4- | +8- | +10- | +13- | +15- | +15- |
| 8000 | 0 | +5- | +9- | +12- | +15- | +17- | +17- |
| 10000 | 0 | +5- | +9- | +13- | +16- | +18- | +18- |
| 12000 | 0 | +5- | +9- | +13- | +16- | +18- | +19- |
| 14000 | 0 | +5- | +10- | +14- | +17- | +19- | +19- |
| 16000 | 0 | +5- | +10- | +14- | +17- | +19- | +19- |
| 17000 | 0 | +5- | +10- | +14- | +17- | +19- | +19- |
| | 180<br>360 | 195<br>345 | 210<br>330 | 225<br>315 | 240<br>300 | 255<br>285 | 270<br>270 |
| | Azimuth of target - degrees | | | | | | |

*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

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M. V. = 2600 f/s

PART 2 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 |
| 1000 | 7 | 15 | 22 | 30 | 37 | 44 | 52 | 59 |
| 2000 | 14 | 28 | 43 | 57 | 71 | 85 | 100 | 114 |
| 3000 | 21 | 41 | 62 | 82 | 102 | 123 | 144 | 164 |
| 4000 | 26 | 53 | 79 | 105 | 131 | 158 | 184 | 210 |
| 5000 | 32 | 63 | 95 | 126 | 158 | 189 | 221 | 252 |
| 6000 | 36 | 73 | 109 | 145 | 182 | 218 | 255 | 291 |
| 7000 | 41 | 82 | 122 | 163 | 204 | 245 | 285 | 326 |
| 8000 | 45 | 90 | 134 | 179 | 224 | 269 | 313 | 358 |
| 9000 | 48 | 97 | 145 | 193 | 242 | 290 | 338 | 386 |
| 10000 | 51 | 103 | 155 | 206 | 258 | 309 | 361 | 412 |
| 11000 | 54 | 109 | 163 | 218 | 272 | 326 | 381 | 435 |
| 12000 | 57 | 114 | 171 | 228 | 285 | 342 | 399 | 455 |
| 13000 | 59 | 119 | 178 | 237 | 296 | 356 | 415 | 474 |
| 14000 | 61 | 123 | 184 | 245 | 307 | 368 | 429 | 491 |
| 15000 | 63 | 127 | 190 | 253 | 316 | 379 | 443 | 506 |
| 16000 | 65 | 130 | 195 | 260 | 325 | 390 | 455 | 520 |
| 17000 | 67 | 134 | 200 | 267 | 334 | 401 | 467 | 534 |

A. P. 108 LB. PROJ.
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M. V. = 2600 f/s

PART 2 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 | |
| 67 | 74 | 81 | 89 | 96 | 104 | 111 | 1000 |
| 128 | 142 | 156 | 171 | 185 | 199 | 213 | 2000 |
| 185 | 205 | 225 | 246 | 267 | 287 | 307 | 3000 |
| 237 | 263 | 289 | 315 | 342 | 368 | 394 | 4000 |
| 284 | 316 | 347 | 379 | 410 | 442 | 473 | 5000 |
| 328 | 364 | 400 | 437 | 473 | 509 | 545 | 6000 |
| 367 | 408 | 448 | 489 | 530 | 570 | 611 | 7000 |
| 403 | 447 | 492 | 536 | 581 | 626 | 670 | 8000 |
| 435 | 483 | 531 | 579 | 627 | 676 | 724 | 9000 |
| 464 | 515 | 566 | 618 | 669 | 720 | 772 | 10000 |
| 489 | 543 | 598 | 652 | 706 | 760 | 815 | 11000 |
| 512 | 569 | 626 | 682 | 739 | 796 | 853 | 12000 |
| 533 | 592 | 651 | 710 | 769 | 828 | 887 | 13000 |
| 552 | 613 | 674 | 735 | 796 | 857 | 918 | 14000 |
| 569 | 632 | 695 | 758 | 821 | 884 | 946 | 15000 |
| 585 | 650 | 714 | 779 | 844 | 909 | 973 | 16000 |
| 600 | 667 | 733 | 800 | 866 | 932 | 999 | 17000 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 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 | -15 | -22 | -30 | -37 | -44 | -52 | -59 |
| 2000 | -14 | -28 | -43 | -57 | -71 | -85 | -100 | -114 |
| 3000 | -21 | -41 | -62 | -82 | -103 | -123 | -144 | -164 |
| 4000 | -26 | -53 | -79 | -105 | -132 | -158 | -185 | -211 |
| 5000 | -32 | -63 | -95 | -127 | -158 | -190 | -222 | -253 |
| 6000 | -36 | -73 | -109 | -146 | -182 | -219 | -255 | -292 |
| 7000 | -41 | -82 | -122 | -163 | -204 | -245 | -286 | -327 |
| 8000 | -45 | -90 | -134 | -179 | -224 | -269 | -314 | -359 |
| 9000 | -48 | -97 | -145 | -193 | -242 | -291 | -339 | -387 |
| 10000 | -51 | -103 | -155 | -206 | -258 | -310 | -361 | -413 |
| 11000 | -54 | -109 | -163 | -218 | -272 | -327 | -382 | -436 |
| 12000 | -57 | -114 | -171 | -228 | -285 | -343 | -400 | -457 |
| 13000 | -59 | -119 | -178 | -238 | -297 | -356 | -416 | -476 |
| 14000 | -61 | -123 | -184 | -246 | -308 | -369 | -431 | -492 |
| 15000 | -63 | -127 | -190 | -254 | -317 | -381 | -444 | -508 |
| 16000 | -65 | -130 | -196 | -261 | -326 | -392 | -457 | -522 |
| 17000 | -67 | -134 | -201 | -268 | -335 | -402 | -469 | -536 |

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PART 2 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 | |
| -67 | -74 | -81 | -89 | -96 | -104 | -111 | 1000 |
| -128 | -143 | -157 | -171 | -185 | -200 | -214 | 2000 |
| -185 | -206 | -226 | -247 | -267 | -288 | -308 | 3000 |
| -237 | -264 | -290 | -316 | -343 | -369 | -395 | 4000 |
| -285 | -317 | -348 | -380 | -412 | -443 | -475 | 5000 |
| -328 | -365 | -401 | -438 | -475 | -511 | -548 | 6000 |
| -368 | -409 | -450 | -491 | -532 | -573 | -614 | 7000 |
| -404 | -449 | -494 | -539 | -584 | -629 | -673 | 8000 |
| -436 | -485 | -533 | -582 | -630 | -679 | -727 | 9000 |
| -465 | -517 | -568 | -621 | -672 | -724 | -776 | 10000 |
| -491 | -546 | -600 | -655 | -710 | -765 | -819 | 11000 |
| -514 | -572 | -629 | -686 | -744 | -801 | -858 | 12000 |
| -535 | -595 | -654 | -714 | -774 | -834 | -893 | 13000 |
| -554 | -616 | -677 | -739 | -801 | -863 | -925 | 14000 |
| -571 | -635 | -699 | -763 | -826 | -890 | -954 | 15000 |
| -588 | -653 | -719 | -784 | -850 | -916 | -981 | 16000 |
| -604 | -671 | -738 | -806 | -873 | -940 | -1008 | 17000 |

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A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 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 - percent | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1000 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| 2000 | 3 | 5 | 8 | 10 | 13 | 16 | 18 | 21 |
| 3000 | 5 | 9 | 14 | 19 | 24 | 29 | 34 | 39 |
| 4000 | 7 | 15 | 23 | 31 | 38 | 46 | 55 | 63 |
| 5000 | 11 | 23 | 34 | 46 | 57 | 69 | 81 | 94 |
| 6000 | 16 | 32 | 48 | 65 | 81 | 98 | 115 | 132 |
| 7000 | 21 | 43 | 65 | 87 | 110 | 132 | 155 | 179 |
| 8000 | 27 | 55 | 84 | 112 | 141 | 170 | 200 | 230 |
| 9000 | 34 | 69 | 104 | 140 | 176 | 212 | 249 | 286 |
| 10000 | 41 | 83 | 125 | 168 | 212 | 256 | 300 | 345 |
| 11000 | 48 | 97 | 147 | 197 | 248 | 300 | 352 | 405 |
| 12000 | 55 | 112 | 169 | 226 | 285 | 344 | 404 | 465 |
| 13000 | 63 | 126 | 190 | 255 | 321 | 388 | 455 | 524 |
| 14000 | 69 | 140 | 211 | 284 | 357 | 431 | 506 | 582 |
| 15000 | 76 | 154 | 232 | 312 | 392 | 474 | 557 | 640 |
| 16000 | 83 | 167 | 253 | 339 | 427 | 516 | 606 | 697 |
| 17000 | 89 | 180 | 272 | 365 | 460 | 556 | 653 | 751 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE Ga

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

| Decrease in air density - percent | | | | | | | | Range yards |
|---|---|---|---|---|---|---|---|---|
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| 10 | 11 | 12 | 13 | 14 | 16 | 17 | 18 | 1000 |
| 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 | 2000 |
| 44 | 50 | 55 | 61 | 66 | 72 | 77 | 83 | 3000 |
| 71 | 79 | 88 | 97 | 105 | 114 | 123 | 132 | 4000 |
| 106 | 118 | 131 | 144 | 157 | 170 | 183 | 196 | 5000 |
| 150 | 167 | 185 | 203 | 221 | 240 | 258 | 277 | 6000 |
| 202 | 226 | 250 | 274 | 299 | 324 | 349 | 374 | 7000 |
| 260 | 291 | 322 | 353 | 384 | 416 | 448 | 481 | 8000 |
| 324 | 362 | 401 | 440 | 479 | 519 | 559 | 600 | 9000 |
| 390 | 436 | 483 | 530 | 577 | 625 | 674 | 723 | 10000 |
| 459 | 512 | 567 | 622 | 678 | 735 | 792 | 850 | 11000 |
| 526 | 588 | 651 | 714 | 779 | 844 | 909 | 976 | 12000 |
| 593 | 663 | 734 | 806 | 878 | 952 | 1026 | 1101 | 13000 |
| 659 | 737 | 816 | 896 | 977 | 1059 | 1141 | 1225 | 14000 |
| 725 | 811 | 898 | 986 | 1075 | 1165 | 1256 | 1348 | 15000 |
| 790 | 883 | 978 | 1074 | 1171 | 1269 | 1368 | 1469 | 16000 |
| 851 | 952 | 1054 | 1157 | 1262 | 1368 | 1475 | 1584 | 17000 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 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 - percent | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1000 | -1 | -2 | -3 | -4 | -5 | -6 | -7 | -8 |
| 2000 | -2 | -5 | -7 | -10 | -12 | -14 | -17 | -19 |
| 3000 | -5 | -9 | -14 | -18 | -22 | -26 | -31 | -35 |
| 4000 | -7 | -15 | -22 | -29 | -36 | -43 | -50 | -56 |
| 5000 | -11 | -22 | -33 | -43 | -54 | -64 | -64 | -85 |
| 6000 | -16 | -31 | -46 | -62 | -77 | -91 | -106 | -120 |
| 7000 | -21 | -42 | -63 | -83 | -103 | -123 | -143 | -162 |
| 8000 | -27 | -54 | -81 | -107 | -133 | -158 | -184 | -209 |
| 9000 | -34 | -67 | -100 | -133 | -165 | -197 | -228 | -259 |
| 10000 | -41 | -81 | -121 | -160 | -199 | -237 | -274 | -312 |
| 11000 | -48 | -95 | -141 | -187 | -233 | -277 | -321 | -365 |
| 12000 | -55 | -109 | -162 | -215 | -266 | -317 | -368 | -418 |
| 13000 | -62 | -123 | -183 | -242 | -300 | -357 | -414 | -470 |
| 14000 | -69 | -136 | -203 | -268 | -333 | -397 | -460 | -522 |
| 15000 | -75 | -150 | -223 | -295 | -366 | -436 | -505 | -573 |
| 16000 | -82 | -163 | -242 | -321 | -398 | -474 | -549 | -622 |
| 17000 | -88 | -175 | -261 | -345 | -428 | -510 | -590 | -670 |

A. P. 108 LB. PROJ.
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PART 2 TABLE Gb

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

| Increase in air density - percent | | | | | | | | Range yards |
|---|---|---|---|---|---|---|---|---|
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| -8 | -9 | -10 | -11 | -12 | -12 | -13 | -14 | 1000 |
| -21 | -23 | -25 | -27 | -29 | -31 | -33 | -35 | 2000 |
| -39 | -43 | -47 | -50 | -54 | -58 | -61 | -65 | 3000 |
| -63 | -69 | -76 | -82 | -88 | -94 | -100 | -106 | 4000 |
| -94 | -104 | -114 | -123 | -133 | -142 | -151 | -160 | 5000 |
| -134 | -148 | -162 | -176 | -189 | -202 | -215 | -228 | 6000 |
| -181 | -200 | -218 | -237 | -255 | -272 | -290 | -307 | 7000 |
| -233 | -257 | -281 | -305 | -328 | -351 | -374 | -396 | 8000 |
| -290 | -320 | -349 | -378 | -407 | -436 | -464 | -491 | 9000 |
| -348 | -384 | -420 | -455 | -490 | -524 | -557 | -590 | 10000 |
| -407 | -449 | -491 | -531 | -572 | -612 | -651 | -689 | 11000 |
| -466 | -514 | -562 | -609 | -655 | -700 | -744 | -788 | 12000 |
| -525 | -579 | -632 | -685 | -736 | -787 | -837 | -886 | 13000 |
| -583 | -643 | -702 | -760 | -817 | -873 | -928 | -983 | 14000 |
| -640 | -705 | -770 | -834 | -896 | -958 | -1019 | -1078 | 15000 |
| -695 | -766 | -836 | -905 | -973 | -1040 | -1106 | -1170 | 16000 |
| -748 | -824 | -900 | -974 | -1047 | -1119 | -1189 | -1258 | 17000 |

A. P. 108 LB. PROJ.
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PART 2 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 | +5 | +4 | +3 | +2 | +1 | 0 | 0 | -1 | -2 | -3 | -4 |
| 2000 | +10 | +8 | +7 | +5 | +3 | +2 | 0 | 0 | -2 | -4 | -5 | -7 |
| 3000 | +14 | +11 | +9 | +7 | +4 | +2 | 0 | 0 | -3 | -5 | -7 | -9 |
| 4000 | +18 | +15 | +12 | +9 | +6 | +3 | 0 | 0 | -3 | -6 | -9 | -12 |
| 5000 | +24 | +20 | +16 | +12 | +8 | +4 | 0 | 0 | -4 | -8 | -12 | -16 |
| 6000 | +32 | +27 | +21 | +16 | +11 | +5 | 0 | -1 | -6 | -12 | -17 | -23 |
| 7000 | +44 | +37 | +29 | +22 | +15 | +7 | 0 | -1 | -8 | -16 | -23 | -31 |
| 8000 | +58 | +48 | +38 | +28 | +19 | +9 | 0 | -1 | -11 | -21 | -30 | -40 |
| 9000 | +70 | +58 | +46 | +33 | +22 | +11 | 0 | -1 | -13 | -25 | -36 | -48 |
| 10000 | +78 | +65 | +51 | +38 | +25 | +12 | 0 | -1 | -15 | -28 | -41 | -54 |
| 11000 | +81 | +67 | +53 | +40 | +26 | +13 | 0 | -1 | -15 | -29 | -42 | -56 |
| 12000 | +76 | +63 | +50 | +37 | +24 | +12 | 0 | -1 | -14 | -27 | -40 | -53 |
| 13000 | +63 | +52 | +41 | +31 | +20 | +10 | 0 | -1 | -12 | -22 | -33 | -43 |
| 14000 | +41 | +34 | +27 | +20 | +13 | +7 | 0 | -1 | -8 | -14 | -21 | -28 |
| 15000 | +11 | +9 | +7 | +6 | +4 | +2 | 0 | 0 | -2 | -4 | -5 | -7 |
| 16000 | -26 | -22 | -17 | -13 | -8 | -4 | 0 | 0 | +5 | +9 | +14 | +19 |
| 17000 | -70 | -58 | -46 | -35 | -23 | -11 | 0 | +1 | +13 | +25 | +37 | +49 |

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE I

REAR WIND, EFFECT 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 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| 2000 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 7 |
| 3000 | 2 | 3 | 5 | 7 | 9 | 10 | 12 | 14 | 16 | 17 |
| 4000 | 3 | 6 | 10 | 13 | 16 | 19 | 22 | 26 | 29 | 32 |
| 5000 | 5 | 10 | 15 | 20 | 25 | 31 | 36 | 41 | 46 | 51 |
| 6000 | 7 | 15 | 22 | 30 | 37 | 45 | 53 | 60 | 68 | 75 |
| 7000 | 10 | 21 | 31 | 42 | 52 | 62 | 73 | 83 | 94 | 104 |
| 8000 | 14 | 28 | 42 | 55 | 69 | 83 | 97 | 111 | 125 | 139 |
| 9000 | 18 | 36 | 54 | 72 | 89 | 107 | 125 | 143 | 161 | 179 |
| 10000 | 23 | 45 | 67 | 90 | 112 | 135 | 157 | 180 | 202 | 225 |
| 11000 | 28 | 55 | 83 | 111 | 139 | 166 | 194 | 222 | 249 | 277 |
| 12000 | 34 | 67 | 101 | 134 | 168 | 201 | 235 | 269 | 302 | 336 |
| 13000 | 40 | 80 | 120 | 160 | 200 | 240 | 281 | 321 | 361 | 401 |
| 14000 | 47 | 95 | 142 | 189 | 236 | 284 | 331 | 378 | 426 | 473 |
| 15000 | 55 | 111 | 166 | 221 | 276 | 331 | 387 | 442 | 497 | 552 |
| 16000 | 64 | 128 | 192 | 256 | 320 | 384 | 448 | 512 | 575 | 639 |
| 17000 | 73 | 147 | 220 | 294 | 367 | 441 | 514 | 588 | 661 | 735 |

Note: The range decrease due to a head wind is so nearly identical with that for a range increase due to a rear wind that the above table can be considered equally applicable to a rear or head wind; when using the above table for head wind effect, the signs should be negative throughout.

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M. V. = 2600 f/s

PART 2 TABLE J.

CROSS WIND EFFECTS

| Range yards | Cross Wind - miles per hour | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | in mils | | | | | in degrees | | | | |
| | 10 | 20 | 30 | 40 | 50 | 10 | 20 | 30 | 40 | 50 |
| 1000 | 0.2 | 0.4 | 0.7 | 0.9 | 1.1 | 0.01 | 0.02 | 0.04 | 0.05 | 0.06 |
| 2000 | 0.5 | 0.9 | 1.4 | 1.8 | 2.3 | 0.03 | 0.05 | 0.08 | 0.10 | 0.13 |
| 3000 | 0.7 | 1.4 | 2.1 | 2.8 | 3.5 | 0.04 | 0.08 | 0.12 | 0.16 | 0.20 |
| 4000 | 1.0 | 1.9 | 2.9 | 3.8 | 4.8 | 0.05 | 0.11 | 0.16 | 0.22 | 0.27 |
| 5000 | 1.2 | 2.5 | 3.7 | 4.9 | 6.2 | 0.07 | 0.14 | 0.21 | 0.28 | 0.35 |
| 6000 | 1.5 | 3.1 | 4.6 | 6.1 | 7.7 | 0.09 | 0.17 | 0.26 | 0.35 | 0.43 |
| 7000 | 1.9 | 3.7 | 5.6 | 7.4 | 9.3 | 0.10 | 0.21 | 0.31 | 0.42 | 0.52 |
| 8000 | 2.2 | 4.4 | 6.6 | 8.8 | 11.0 | 0.12 | 0.25 | 0.37 | 0.50 | 0.62 |
| 9000 | 2.6 | 5.1 | 7.7 | 10.3 | 12.8 | 0.14 | 0.29 | 0.43 | 0.58 | 0.72 |
| 10000 | 2.9 | 5.9 | 8.8 | 11.8 | 14.7 | 0.17 | 0.33 | 0.50 | 0.66 | 0.83 |
| 11000 | 3.3 | 6.7 | 10.0 | 13.4 | 16.7 | 0.19 | 0.38 | 0.56 | 0.75 | 0.94 |
| 12000 | 3.7 | 7.5 | 11.2 | 15.0 | 18.7 | 0.21 | 0.42 | 0.63 | 0.84 | 1.05 |
| 13000 | 4.2 | 8.3 | 12.5 | 16.6 | 20.8 | 0.23 | 0.47 | 0.70 | 0.93 | 1.17 |
| 14000 | 4.6 | 9.1 | 13.7 | 18.2 | 22.8 | 0.26 | 0.51 | 0.77 | 1.02 | 1.28 |
| 15000 | 5.0 | 9.9 | 14.9 | 19.8 | 24.8 | 0.28 | 0.56 | 0.84 | 1.12 | 1.60 |
| 16000 | 5.4 | 10.7 | 16.1 | 21.5 | 26.8 | 0.30 | 0.60 | 0.91 | 1.21 | 1.51 |
| 17000 | 5.8 | 11.5 | 17.3 | 23.1 | 28.9 | 0.32 | 0.65 | 0.97 | 1.30 | 1.62 |

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A. P. 108 LB. PROJ.
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M. V. = 2600 f/s

PART 2 TABLE K

*ROTATION OF THE EARTH, DEFLECTION EFFECT IN MILS DUE TO

Latitude 0°

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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 | +0.1- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1+ |
| 12000 | +0.1- | +0.1- | 0.0 | 0.0 | 0.0 | -0.1+ | -0.1+ |
| 14000 | +0.2- | +0.1- | +0.1- | 0.0 | -0.1+ | -0.1+ | -0.2+ |
| 16000 | +0.2- | +0.2- | +0.1- | 0.0 | -0.1+ | -0.2+ | -0.2+ |
| 17000 | +0.3- | +0.2- | +0.2- | 0.0 | -0.2+ | -0.2+ | -0.3+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 0°

Latitude 10° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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+ | -0.2+ | -0.2+ | -0.2+ |
| 10000 | -0.1+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ |
| 12000 | -0.1+ | -0.2+ | -0.2+ | -0.3+ | -0.3+ | -0.3+ | -0.3+ |
| 14000 | -0.2+ | -0.2+ | -0.3+ | -0.3+ | -0.4+ | -0.4+ | -0.4+ |
| 16000 | -0.2+ | -0.2+ | -0.3+ | -0.4+ | -0.5+ | -0.5+ | -0.6+ |
| 17000 | -0.1+ | -0.2+ | -0.3+ | -0.4+ | -0.6+ | -0.7+ | -0.7+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 10° (South)

*Negative sign means the effect is to the right.
*Positive sign means the effect is to the left.
*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE K

*ROTATION OF THE EARTH, DEFLECTION EFFECT IN MILS DUE TO

Latitude 20° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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 | -0.3+ | -0.3+ | -0.3+ | -0.3+ | -0.3+ | -0.3+ | -0.3+ |
| 10000 | -0.3+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ |
| 12000 | -0.4+ | -0.4+ | -0.5+ | -0.5+ | -0.5+ | -0.6+ | -0.6+ |
| 14000 | -0.5+ | -0.5+ | -0.6+ | -0.6+ | -0.7+ | -0.8+ | -0.8+ |
| 16000 | -0.5+ | -0.6+ | -0.7+ | -0.8+ | -0.9+ | -1.0+ | -1.0+ |
| 17000 | -0.5+ | -0.6+ | -0.7+ | -0.9+ | -1.0+ | -1.1+ | -1.2+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 20° (South)

Latitude 30° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ |
| 10000 | -0.5+ | -0.5+ | -0.5+ | -0.6+ | -0.6+ | -0.6+ | -0.6+ |
| 12000 | -0.6+ | -0.6+ | -0.7+ | -0.7+ | -0.8+ | -0.8+ | -0.8+ |
| 14000 | -0.8+ | -0.8+ | -0.9+ | -0.9+ | -1.0+ | -1.0+ | -1.0+ |
| 16000 | -0.9+ | -1.0+ | -1.0+ | -1.1+ | -1.2+ | -1.3+ | -1.3+ |
| 17000 | -1.0+ | -1.0+ | -1.1+ | -1.3+ | -1:4+ | -1.5+ | -1.5+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 30° (South)

*Negative sign means the effect is to the right.
*Positive sign means the effect is to the left
*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE K

*ROTATION OF THE EARTH, DEFLECTION EFFECT IN MILS DUE TO

Latitude 40° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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 | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ |
| 8000 | -0.5+ | -0.5+ | -0.5+ | -0.5+ | -0.6+ | -0.6+ | -0.6+ |
| 10000 | -0.7+ | -0.7+ | -0.7+ | -0.7+ | -0.8+ | -0.8+ | -0.8+ |
| 12000 | -0.9+ | -0.9+ | -0.9+ | -0.9+ | -1.0+ | -1.0+ | -1.0+ |
| 14000 | -1.1+ | -1.1+ | -1.1+ | -1.2+ | -1.2+ | -1.3+ | -1.3+ |
| 16000 | -1.3+ | -1.4+ | -1.4+ | -1.5+ | -1.6+ | -1.6+ | -1.7+ |
| 17000 | -1.4+ | -1.5+ | -1.5+ | -1.6+ | -1.7+ | -1.8+ | -1.9+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 40° (South)

Latitude 50° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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 | -0.6+ | -0.6+ | -0.6+ | -0.7+ | -0.7+ | -0.7+ | -0.7+ |
| 10000 | -0.8+ | -0.8+ | -0.8+ | -0.9+ | -0.9+ | -0.9+ | -0.9+ |
| 12000 | -1.1+ | -1.1+ | -1.1+ | -1.1+ | -1.2+ | -1.2+ | -1.2+ |
| 14000 | -1.3+ | -1.3+ | -1.4+ | -1.4+ | -1.5+ | -1.5+ | -1.5+ |
| 16000 | -1.6+ | -1.6+ | -1.7+ | -1.7+ | -1.8+ | -1.9+ | -1.9+ |
| 17000 | -1.8+ | -1.8+ | -1.8+ | -1.9+ | -2.0+ | -2.1+ | -2.2+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 50° (South)

*Negative sign means the effect is to the right.
*Positive sign means the effect is to the left.
*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

PART 2 TABLE K

*ROTATION OF THE EARTH, DEFLECTION EFFECT IN MILS DUE TO

Latitude 60° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>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 | -1.0+ | -1.0+ | -1.0+ | -1.0+ | -1.0+ | -1.0+ | -1.0+ |
| 12000 | -1.2+ | -1.2+ | -1.2+ | -1.3+ | -1.3+ | -1.3+ | -1.3+ |
| 14000 | -1.5+ | -1.5+ | -1.5+ | -1.6+ | -1.7+ | -1.7+ | -1.7+ |
| 16000 | -1.8+ | -1.9+ | -1.9+ | -2.0+ | -2.0+ | -2.1+ | -2.1+ |
| 17000 | -2.0+ | -2.1+ | -2.1+ | -2.2+ | -2.3+ | -2.3+ | -2.4+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 60° (South)

Latitude 70° (North)

| Range yards | Azimuth of target - degrees | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0<br>360 | 30<br>330 | 60<br>300 | 90<br>270 | 120<br>240 | 150<br>210 | 180<br>180 |
| 2000 | -0.2+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ | -0.2+ |
| 4000 | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ | -0.4+ |
| 6000 | -0.6+ | -0.6+ | -0.6+ | -0.6+ | -0.6+ | -0.6+ | -0.6+ |
| 8000 | -0.8+ | -0.8+ | -0.8+ | -0.8+ | -0.8+ | -0.8+ | -0.8+ |
| 10000 | -1.0+ | -1.1+ | -1.1+ | -1.1+ | -1.1+ | -1.1+ | -1.1+ |
| 12000 | -1.3+ | -1.4+ | -1.4+ | -1.4+ | -1.4+ | -1.4+ | -1.4+ |
| 14000 | -1.7+ | -1.7+ | -1.7+ | -1.7+ | -1.8+ | -1.8+ | -1.8+ |
| 16000 | -2.1+ | -2.1+ | -2.1+ | -2.1+ | -2.2+ | -2.2+ | -2.2+ |
| 17000 | -2.3+ | -2.3+ | -2.4+ | -2.4+ | -2.4+ | -2.5+ | -2.5+ |
| | 180<br>180 | 150<br>210 | 120<br>240 | 90<br>270 | 60<br>300 | 30<br>330 | 0<br>360 |
| | Azimuth of target - degrees | | | | | | |

Latitude 70° (South)

*Negative sign means the effect is to the right.
*Positive sign means the effect is to the left.
*For argument at top of table use sign before the number.
*For argument at bottom of table use sign after the number.
*Azimuth measured clockwise from the North.

PART 2

RANGE ELEVATION RELATION

6 INCH GUN, MODELS OF 1900 AND 1908MII

MOUNTED ON BARBETTE CARRIAGE

108 Lb. A. P. PROJECTILE

FUZE, BASE DETONATING (MARK V)

MUZZLE VELOCITY 2600 F/S

JUMP -.6 MILS

Note: Standard air temperature for density and elasticity is 59° F. Standard temperature for powder is 70° F.

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s



| Range yards | Elevation mils | ° | ' | Range yards | Elevation mils | ° | ' | Range yards | Elevation mils | ° | ' |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | +0.6 | +0 | 02 | 3000 | 26.0 | 1 | 28 | 6000 | 61.0 | 3 | 26 |
| 100 | 1.4 | 0 | 05 | 3100 | 27.0 | 1 | 31 | 6100 | 62.4 | 3 | 31 |
| 200 | 2.2 | 0 | 07 | 3200 | 28.0 | 1 | 35 | 6200 | 63.8 | 3 | 36 |
| 300 | 3.0 | 0 | 10 | 3300 | 29.0 | 1 | 38 | 6300 | 65.2 | 3 | 40 |
| 400 | 3.6 | 0 | 12 | 3400 | 30.2 | 1 | 42 | 6400 | 66.6 | 3 | 45 |
| 500 | 4.4 | 0 | 15 | 3500 | 31.2 | 1 | 45 | 6500 | 68.2 | 3 | 50 |
| 600 | 5.2 | 0 | 18 | 3600 | 32.2 | 1 | 49 | 6600 | 69.6 | 3 | 55 |
| 700 | 6.0 | 0 | 20 | 3700 | 33.2 | 1 | 52 | 6700 | 71.2 | 4 | 00 |
| 800 | 6.8 | 0 | 23 | 3800 | 34.4 | 1 | 56 | 6800 | 72.6 | 4 | 05 |
| 900 | 7.6 | 0 | 25 | 3900 | 35.4 | 1 | 59 | 6900 | 74.2 | 4 | 10 |
| 1000 | 8.4 | 0 | 28 | 4000 | 36.4 | 2 | 03 | 7000 | 75.8 | 4 | 15 |
| 1100 | 9.2 | 0 | 31 | 4100 | 37.6 | 2 | 07 | 7100 | 77.2 | 4 | 21 |
| 1200 | 10.0 | 0 | 34 | 4200 | 38.8 | 2 | 11 | 7200 | 78.8 | 4 | 26 |
| 1300 | 10.8 | 0 | 36 | 4300 | 39.8 | 2 | 15 | 7300 | 80.4 | 4 | 32 |
| 1400 | 11.6 | 0 | 39 | 4400 | 41.0 | 2 | 18 | 7400 | 82.0 | 4 | 37 |
| 1500 | 12.4 | 0 | 42 | 4500 | 42.2 | 2 | 22 | 7500 | 83.8 | 4 | 43 |
| 1600 | 13.2 | 0 | 45 | 4600 | 43.4 | 2 | 26 | 7600 | 85.4 | 4 | 48 |
| 1700 | 14.2 | 0 | 48 | 4700 | 44.6 | 2 | 30 | 7700 | 87.0 | 4 | 54 |
| 1800 | 15.0 | 0 | 51 | 4800 | 45.6 | 2 | 34 | 7800 | 88.8 | 5 | 00 |
| 1900 | 15.8 | 0 | 54 | 4900 | 46.8 | 2 | 38 | 7900 | 90.6 | 5 | 05 |
| 2000 | 16.8 | 0 | 57 | 5000 | 48.0 | 2 | 42 | 8000 | 92.4 | 5 | 11 |
| 2100 | 17.6 | 1 | 00 | 5100 | 49.4 | 2 | 47 | 8100 | 94.0 | 5 | 17 |
| 2200 | 18.6 | 1 | 03 | 5200 | 50.6 | 2 | 51 | 8200 | 95.8 | 5 | 23 |
| 2300 | 19.4 | 1 | 06 | 5300 | 51.8 | 2 | 55 | 8300 | 97.6 | 5 | 29 |
| 2400 | 20.4 | 1 | 09 | 5400 | 53.2 | 2 | 59 | 8400 | 99.4 | 5 | 36 |
| 2500 | 21.2 | 1 | 12 | 5500 | 54.4 | 3 | 04 | 8500 | 101.4 | 5 | 42 |
| 2600 | 22.2 | 1 | 15 | 5600 | 55.8 | 3 | 08 | 8600 | 103.2 | 5 | 48 |
| 2700 | 23.2 | 1 | 18 | 5700 | 57.0 | 3 | 13 | 8700 | 105.0 | 5 | 55 |
| 2800 | 24.2 | 1 | 21 | 5800 | 58.4 | 3 | 17 | 8800 | 107.0 | 6 | 01 |
| 2900 | 25.0 | 1 | 25 | 5900 | 59.8 | 3 | 22 | 8900 | 109.0 | 6 | 08 |
| 3000 | 26.0 | 1 | 28 | 6000 | 61.0 | 3 | 26 | 9000 | 111.0 | 6 | 14 |

Note: For 1900 and 1908MII Guns on Barbette Carriages.
All other range table functions and effects are
the same as for the disappearing carriages.

PART 2

A. P. 108 LB. PROJ.
FUZE, B.D. MK.V
M. V. = 2600 f/s

| Range yards | Elevation mils | ° | ' |
|---|---|---|---|
| 9000 | 111.0 | 6 | 14 |
| 9100 | 113.0 | 6 | 21 |
| 9200 | 115.0 | 6 | 28 |
| 9300 | 117.0 | 6 | 35 |
| 9400 | 119.0 | 6 | 42 |
| 9500 | 121.2 | 6 | 49 |
| 9600 | 123.2 | 6 | 56 |
| 9700 | 125.4 | 7 | 03 |
| 9800 | 127.6 | 7 | 11 |
| 9900 | 129.8 | 7 | 18 |
| 10000 | 132.0 | 7 | 26 |
| 10100 | 134.4 | 7 | 33 |
| 10200 | 136.6 | 7 | 41 |
| 10300 | 139.0 | 7 | 49 |
| 10400 | 141.2 | 7 | 57 |
| 10500 | 143.6 | 8 | 05 |
| 10600 | 146.0 | 8 | 13 |
| 10700 | 148.6 | 8 | 21 |
| 10800 | 151.0 | 8 | 30 |
| 10900 | 153.6 | 8 | 38 |
| 11000 | 156.0 | 8 | 47 |
| 11100 | 158.6 | 8 | 55 |
| 11200 | 161.2 | 9 | 04 |
| 11300 | 163.8 | 9 | 13 |
| 11400 | 166.6 | 9 | 22 |
| 11500 | 169.2 | 9 | 31 |
| 11600 | 172.0 | 9 | 40 |
| 11700 | 174.6 | 9 | 50 |
| 11800 | 177.4 | 9 | 59 |
| 11900 | 180.4 | 10 | 09 |
| 12000 | 183.2 | 10 | 18 |

| Range yards | Elevation mils | ° | ' |
|---|---|---|---|
| 12000 | 183.2 | 10 | 18 |
| 12100 | 186.2 | 10 | 28 |
| 12200 | 189.0 | 10 | 38 |
| 12300 | 192.0 | 10 | 48 |
| 12400 | 195.0 | 10 | 58 |
| 12500 | 198.0 | 11 | 08 |
| 12600 | 201.0 | 11 | 19 |
| 12700 | 204.2 | 11 | 29 |
| 12800 | 207.4 | 11 | 40 |
| 12900 | 210.6 | 11 | 51 |
| 13000 | 213.8 | 12 | 01 |
| 13100 | 217.0 | 12 | 13 |
| 13200 | 220.4 | 12 | 24 |
| 13300 | 223.8 | 12 | 35 |
| 13400 | 227.0 | 12 | 46 |
| 13500 | 230.4 | 12 | 58 |
| 13600 | 234.0 | 13 | 10 |
| 13700 | 237.4 | 13 | 21 |
| 13800 | 241.0 | 13 | 33 |
| 13900 | 244.6 | 13 | 45 |
| 14000 | 248.2 | 13 | 58 |
| 14100 | 252.0 | 14 | 10 |
| 14200 | 255.6 | 14 | 23 |
| 14300 | 259.4 | 14 | 36 |
| 14400 | 263.2 | 14 | 48 |
| 14500 | 267.0 | 15 | 01 |
| 14600 | 271.0 | 15 | 15 |
| 14700 | 275.0 | 15 | 28 |
| 14800 | 279.0 | 15 | 41 |
| 14900 | 283.0 | 15 | 55 |
| 15000 | 287.0 | 16 | 09 |

| Range yards | Elevation mils | ° | ' |
|---|---|---|---|
| 15000 | 287.0 | 16 | 09 |
| 15100 | 291.2 | 16 | 23 |
| 15200 | 295.4 | 16 | 37 |
| 15300 | 299.6 | 16 | 51 |
| 15400 | 304.0 | 17 | 06 |
| 15500 | 308.2 | 17 | 20 |
| 15600 | 312.6 | 17 | 35 |
| 15700 | 317.2 | 17 | 50 |
| 15800 | 321.8 | 18 | 06 |
| 15900 | 326.4 | 18 | 21 |
| 16000 | 331.0 | 18 | 37 |
| 16100 | 335.8 | 18 | 53 |
| 16200 | 340.6 | 19 | 10 |
| 16300 | 345.4 | 19 | 26 |
| 16400 | 350.4 | 19 | 43 |
| 16500 | 355.4 | 20 | 00 |
| 16600 | 360.6 | 20 | 17 |
| 16700 | 365.8 | 20 | 34 |
| 16800 | 371.0 | 20 | 52 |
| 16900 | 376.4 | 21 | 10 |
| 17000 | 381.8 | 21 | 28 |

Note: For 1900 and 1908MII Guns on Barbette Carriages. All other range table functions and effects are the same as for the disappearing carriages.

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