

BT 12-R-3

**FIRING TABLES**

FOR

6 IN. BENCH SEACOAST MISS AND

WEISS

FIRING

TABLES SHOWN IN THE

WEISS

TABLES OF DATA

1911

FT 12-F-3

# FIRING TABLES

FOR  
GUN, 12-INCH, SEACOAST, M1888  
AND M1895  
FIRING  
PROJECTILE (SHOT), A. P., 975-LB.  
WITH  
FUZE, B. D., MK. X

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The following firing tables (FT 12-F-3) for the Gun, 12 inch Seacoast, M1888 and M1895, firing 975 lb., A.P. Projectile (Shot), are published for the information and guidance of all concerned. These firing tables contain the same data as FT 12-F-3, dated April 15, 1934, but in revised form.

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

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GUN, 12", SEACOAST, M1888 and M1895

	B.C.		Ry.		M1896		M1897		M1897		M1901	
	M1917	M1918	M1918	M1918	L.F.*	L.F.*	L.F.*	A.G.L.	L.F.*	L.F.*	L.F.*	L.F.*
Total traverse, degrees	360°	10°	170°	360°	0°	0°	0°	170°	0°	0°	0°	170°
Minimum elevation	0°	-5°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°
Maximum elevation	35°	38°	15°	12°	15°	15°	12°	15°	12°	15°	15°	15°
Traverse, 1 turn traversing handwheel, fast motion	2° 31.0'		2° 11.2'	1° 5.8'	1° 18.6'	1° 18.6'	1° 5.8'	2° 11'	1° 5.8'	2° 11'	2° 11'	2° 11'
Traverse, 1 turn traversing handwheel, slow motion	0° 04.3'	0° 05'	0° 7.3'	0° 8'	0° 8'	0° 8'	0° 8'	0° 7.3'	0° 8'	0° 7.3'	0° 7.3'	0° 7.3'
Change in elevation, 1 turn elevating handwheel, fast motion	1° 35.0'											
Change in elevation, 1 turn elevating handwheel, slow motion	0° 20.0'	0° 34.9'	0° 22.5'	0° 24.4'	0° 24.4'	0° 24.4'	0° 24.4'	0° 22.5'	0° 24.4'	0° 27.5'	0° 27.5'	0° 27.5'

\*Stops provided to limit traverse to emplacement requirements

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Air density at battery, (59°F. and 29.53 in. 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 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 mills (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 10 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 principle 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 adjoining 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 distance 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. In other cases see tables B and C. The word "change" in the readings (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 guns designed with trunnion 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 effect 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 correction. 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 clockwise from the north.

Tables B and C are for use when the target is below or above the level of the gun. For example in the table for target below gun, (Table B), for any given map range and height of target, the quantity appearing as the "range effect" is the distance by which the map range for the given target exceeds the "range to level points", 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 of every 10 feet per second 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 cant of the carriage axle, by changing the angle of departure, has some effect upon the range, that effect is here disregarded; for, at low elevations, a fairly large cant will produce only a very small change in the angle of departure, and at high elevations, where a large cant will produce a somewhat larger change in angle of departure than at low elevations, it requires a quite large change in departure to produce a small change in range.

Among the symbols and abbreviations used are the following:

ω	(read: "omega"), meaning the quadrant angle of fall for gun and target at the same level.
P.E.	probable error
R	right
L	left
lb.	pound
°	degrees
min.	minutes
sec.	seconds
m	mils
in.	inches
ft.	feet
yd.	yards
fps	feet per second
mph	miles per hour
F.	Fahrenheit
m.d.p.	meteorological datum plane
%	percent
M.V.	muzzle velocity
V-V.	velocity adjustment

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

Each further increase by unity in the symbol of the altitude zone corresponds to an increase of 6000 feet in altitude above the m.d.p. It is evident that no confusion can arise from using for 10, 11, 12, etc., the symbols 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 indicates the direction from which the ballistic

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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 the 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 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

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effects on range and deflection. Standard panoramic sights for Coast Artillery are designed to utilize azimuths in laying for direction.

When standard Coast Artillery instruments are not available, it is necessary to prepare firing data by computation, 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

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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 Range" 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.

D. Materiel Corrections are determinable, for a given range, when the weight and the markings of the projectile and the relatively permanent characteristics of the particular piece and powder lot are known. These corrections consist of those for (1) variations from normal in weight of projectile, (2) estimated change in muzzle velocity, ( $V-V_0$ ), due to the conditions of the piece or of the powder when the powder is at standard powder temperature (70°F.). The correction on account of variation in weight of projectile is usually obtained from Part 2, Table D, for any given marking. The estimated change in muzzle velocity is called the velocity adjustment,  $V-V_0$ , and is made by reference to the record of performance of the particular piece and powder lot, or 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 of the battery, ballistic range wind, and ballistic cross wind, as given in or obtained from the meteorological message. In the absence of such information it will ordinarily be necessary

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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 1E.

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 in Part 2, Table A, and the corresponding angle of elevation is read from either column (2) or (3). The deflection effects when added algebraically give the total deflection effect and a change of sign gives the deflection corrections to be used with the panoramic sight.

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

The following example illustrates the use of the tables:  
Given: Gun, 12", M1895, Tabular Muzzle Velocity = 2275 fps.

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Data as to Position:

Altitude of battery = 450 ft. above sea level.  
 Map range to target = 15840 yards.  
 Height of target = -432 ft (432 ft. below gun).  
 Azimuth of target (measured clockwise from the North) = 437 mils (24.6°).  
 Latitude of the gun = 42° North.

Data as to Materiel:

Weight of projectile = 965 lb. (1% below normal).  
 Preliminary velocity adjustment (V-V<sub>o</sub>) = -18 fps (18 fps below tabular velocity).

Weather Data:

Temperature of powder = 62°F.  
 Meteorological message: MSL MSL 30162 0620799  
 1620898 2600997 3591195 4600992

Required: Quadrant elevation and deflection setting.

Solution: The tables found in 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 15840 yards and a height of target of -432 ft. a range effect of..... +495 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..... +31 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..... +21 yd.

In a similar manner, from Fb, we find the effect on range for an estimated decrease of -18 fps in muzzle velocity to be..... -200 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 70°F., a correction must be introduced. The effect on muzzle velocity is obtained from Part 1I, and is -15 s. The effect on range thus occasioned is found in the same manner as above from Table Fb, to be..... -167 yd.

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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 2970 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.

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 mph
Ballistic density (for group "3")	95%

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 mph as the wind velocity we have corresponding to 5463 mils a range component, W<sub>x</sub> of..... -6.6 mph and a cross component, W<sub>y</sub>, of..... -8.8 mph

The components of 1 mph are added to the corresponding components of 10 mph to obtain the components of 11 mph.

Entering Table I, we find the effect on range for -6.6 mph range wind (the negative sign here indicates a head wind to be..... -30 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.

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Entering Table H, we find the temperature (elasticity) effect on range for a temperature of 61°F., (or 2°F. above the normal temperature of 59°F.) to be..... -4 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..... 94%.

Entering Table Ga, we find the effect on range for the ballistic air density of 94% (or 6% below normal) to be +251 yd.

The total range effect is now obtained by adding the separate range effects algebraically. It has the value of 95+31+21-200-167-30-4+251 = ..... +397 yd.

The total range correction is obtained by merely changing the sign of the total effect. It is..... -397 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 15840 yd. -397 i.e. .... 15443 yd.

The elevation corresponding to the corrected range 15443 yd. is found in either columns 2 or 3 of Table A. It ..... 208.0 ft

The deflection effects are found in a similar manner.

The deflection effect due to a -8.8 mph cross wind (from left to right) is found from Table J to be..... -2 ft

The drift is found from columns (13) or (15) to be -6 ft

The deflection effect due to rotation of the earth for latitude of 42° north and an azimuth of 24.6° is found from Table K to be..... -1 ft

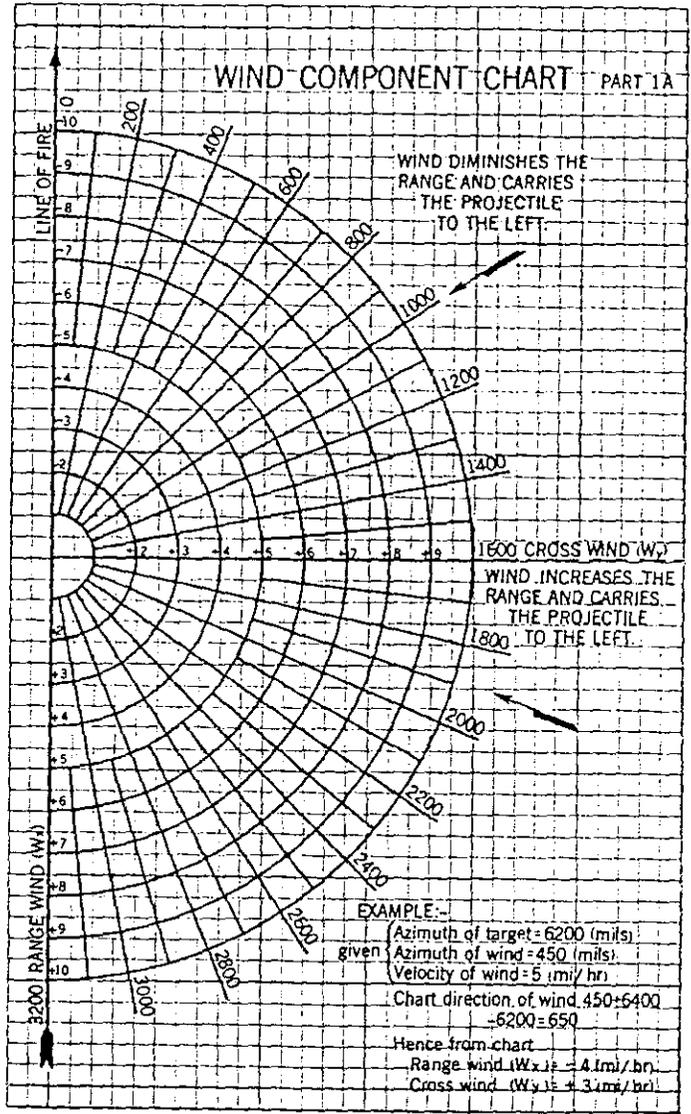
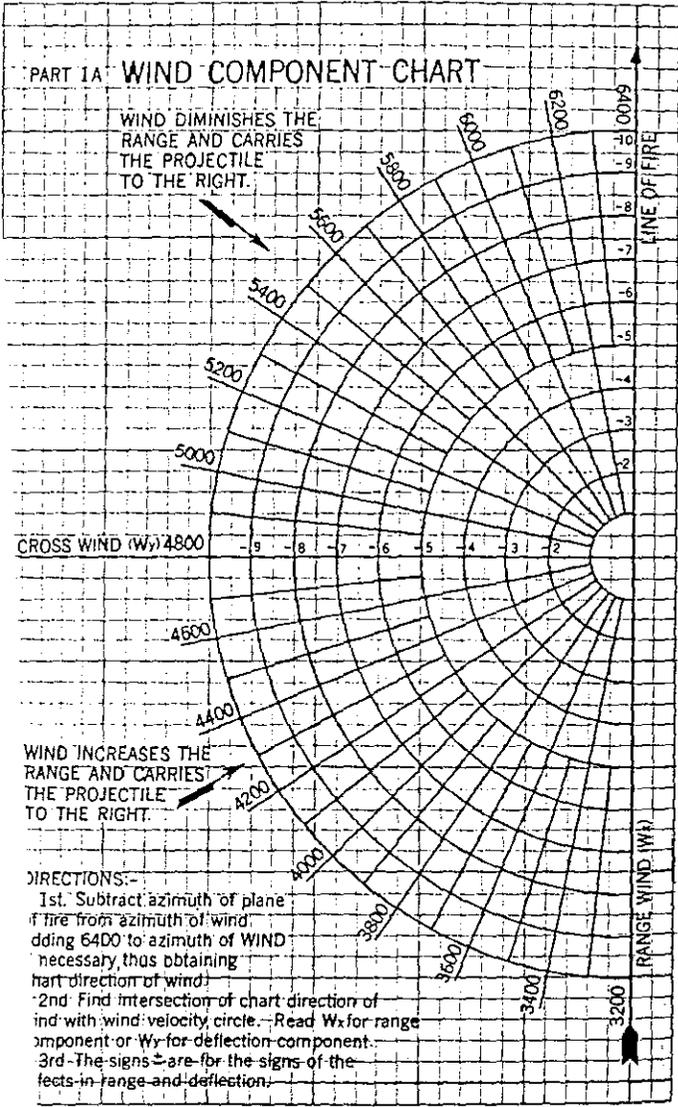
The total deflection effect is obtained by adding algebraically the separate deflection effects. It has the value 2-6-1 = ..... -9 ft

The total deflection correction is obtained by merely changing the sign of the total deflection effect. It is +9 ft

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The deflection set off at the gun will be +9 mils (9 mils to the left) when the target is used as aiming point. For any other aiming point 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 +9 mils in deflection is the same as a correction of -9 mils in azimuth. The azimuth setting then is 437 mils -9 mils = ..... 428 ft

PART 1  
GUN, 12 INCH, SEACOAST, M1888 AND M1895  
FIRING  
975 LB., A.P., PROJECTILE (SHOT)  
FUZE, B.D., MK.X



PART 1B.

ISOTHERMIC FORMULA

0.2° F. = DECREASE IN TEMPERATURE FOR 100 FT. INCREASE IN ALTITUDE  
 0.2° F. = INCREASE IN TEMPERATURE FOR 100 FT. DECREASE IN ALTITUDE

DENSITY FORMULA

0.2% = DECREASE IN AIR DENSITY FOR 100 FT. INCREASE IN ALTITUDE  
 0.2% = INCREASE IN AIR DENSITY FOR 100 FT. DECREASE IN ALTITUDE

PART 1C

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

YARDS TO METERS

PART 1D

1 meter = 1.0936 yd.

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

METERS TO YARDS

PART 1E

ANGULAR CONVERSION TABLE - DEGREES TO MILS

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

PART 1F

NATURAL TRIGONOMETRIC FUNCTIONS

Mils	N. Sin	N. Cos	N. Tan	N. Cot
0	0.0000	1.0000	0.0000	-
50	.0491	.9988	.0491	20.355
100	.0980	.9952	.0985	10.153
150	.1467	.9892	.1483	6.741
200	.1951	.9808	.1989	5.027
250	.2430	.9700	.2505	3.992
300	.2903	.9559	.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	.9559	.2903	3.297	.3033
1350	.9700	.2430	3.992	.2505
1400	.9808	.1951	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

"Prob" =  $\frac{2}{K} \int_0^t e^{-t^2} dt$  where  $\frac{t}{4.78956} = \text{Factor}$

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

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

Example:

Given: Zone, normal to line of fire, 40 yd. wide, 60 yd. from center of impact.  
Probable error in range, 50 yd.

To determine probable proportion of hits in zone.

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

Prob. = .82

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

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

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

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

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

TABLE OF SLOPE COEFFICIENTS

sin w/sin (w+n)

w %	n, positive (relative forward slope)										
	1 10	2 20	3 31	5 51	10 102	15 152	20 201	30 297	40 388	50 472	1,600
50	.81	.71	.62	.50	.33	.25	.20	.15	.12	.10	.05
100	.93	.83	.77	.66	.50	.40	.34	.28	.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	.95	.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

w %	-n, positive (relative reverse slope)									
	1 10	2 20	3 31	5 51	10 102	15 152	20 201	30 297	40 388	50 472
50	1.25	1.69	2.57	2.03						
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	1.06	1.11	1.19	1.29	1.41

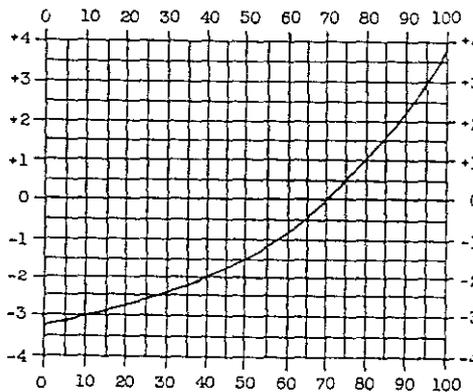
Slope with respect to line of site (percent and mils)(n = s+300). Directions. Multiply range probable error (from range table) by coefficient shown above. Here w denotes the angle of fall (measured to line of site)(for practical purposes equal to the range table angle of fall which is its value for s=300 ft., i.e., for a level trajectory); n', the quadrant angle 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=s+300), the slope relative to the line of site. NOTE: The quadrant angle of fall, -s+300. EXAMPLE: Given target on reverse slope between our lines 130 ft., and 140 ft., mean distance between contours 100 ft., site = -20 mils, (s = 280), angle of fall (tabulated) 0 mils, range probable error (in range table) = 83 yards. n' (in percent) = 100  $\frac{(130-140)}{67}$  = -15(%) or -152 mils, n' = 100 - 152 = -152(-20) = -132 mils. Interpolating between 1.67 (for 100 mils) and 2.52 (for 152 mils), slope coefficient = 1.67 +  $\frac{30}{50}$  (2.52 - 1.67) = 2.18. Hence, range probable error to be used = 2.18 x 83 = 181 yards.

CHART FOR PERCENTAGE CHANGE IN MUZZLE VELOCITY

FOR TEMPERATURE OF POWDER DIFFERENT FROM NORMAL

$$\left[ \frac{\Delta v}{v} = .00867 (2^{.032t} - 4.73) \right]$$

PERCENTAGE CHANGE IN MUZZLE VELOCITY



PERCENTAGE CHANGE IN MUZZLE VELOCITY

TEMPERATURE - DEGREES FAHRENHEIT

DIRECTIONS: - Enter chart with temperature of powder. Follow vertical line to the curve, and from there the horizontal line to either edge of the chart where the percentage change in the muzzle velocity may be read.

EXAMPLE: - Suppose temperature of powder = 59°F., and muzzle velocity (standard) = 2250 f/s. Then change in muzzle velocity is -0.9% = -.009 x 2250 = -20 f/s approximately. Muzzle velocity to be expected = 2250 minus 20 = 2230 f/s.

## PART 2

GUN, 12 INCH, SEACOAST, M1888 AND M1895

975 LB., A.P., PROJECTILE (SHOT)

FUZE, B.D., M.X

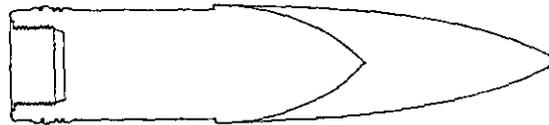
MUZZLE VELOCITY = 2275 fps (693.4 m/s)

JUMP = -0.4 MILS

TABLES A - K INCLUSIVE

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

## DRAWING OF PROJECTILE



DRAWING OF BAND AND BAND SEAT

422047 O - 42 - 3

FT 12-F-3

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil	deg	min	mil	min		
0	0.4	0 01	0.9	3.2	105.6	31.3	0	2275
100	1.4	0 04	1.0	3.2	105.2	31.2	0	
200	2.2	0 08	1.0	3.2	104.8	31.1	0	
300	3.2	0 11	1.0	3.2	104.4	30.9	1	
400	4.2	0 14	1.0	3.2	104.0	30.8	2	2242
500	5.2	0 17	1.0	3.3	103.6	30.7	2	
600	6.2	0 21	1.0	3.3	103.2	30.6	3	
700	7.2	0 24	1.0	3.3	102.8	30.5	4	
800	8.2	0 27	1.0	3.3	102.4	30.3	5	
900	9.0	0 31	1.0	3.3	102.0	30.2	6	
1000	10.0	0 34	1.0	3.3	101.6	30.1	8	2211
1100	11.0	0 37	1.0	3.3	101.2	30.0	10	
1200	12.0	0 41	1.0	3.3	100.8	29.9	12	
1300	13.0	0 44	1.0	3.4	100.4	29.7	14	
1400	14.0	0 47	1.0	3.4	100.0	29.6	16	2180
1500	15.0	0 51	1.0	3.4	99.7	29.5	18	
1600	16.0	0 54	1.0	3.4	99.3	29.4	20	
1700	17.0	0 58	1.0	3.4	98.9	29.3	22	
1800	18.0	1 01	1.0	3.4	98.5	29.2	25	
1900	19.0	1 05	1.0	3.4	98.1	29.1	28	
2000	20.0	1 08	1.0	3.5	97.7	28.9	31	2150
2100	21.2	1 11	1.0	3.5	97.4	28.8	34	
2200	22.2	1 15	1.0	3.5	97.0	28.7	37	
2300	23.2	1 18	1.0	3.5	96.6	28.6	40	
2400	24.2	1 22	1.0	3.5	96.2	28.5	44	2120
2500	25.4	1 25	1.0	3.5	95.8	28.4	48	
2600	26.4	1 29	1.0	3.5	95.4	28.3	52	
2700	27.4	1 33	1.0	3.6	95.0	28.1	56	
2800	28.4	1 36	1.1	3.6	94.6	28.0	60	
2900	29.4	1 40	1.1	3.6	94.2	27.9	65	
3000	30.6	1 43	1.1	3.6	93.8	27.8	70	2090

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coeffi- cient (15)	Probable error in R D (16) (17)		Time of flight (18)	Range (19)
mil	deg min		1 on—	mil		deg	yd		
0	0 00		0	0.00	12.43	28	0	0	0
1	0 03	933						0.1	100
2	0 07	496						0.3	200
3	0 11	323						0.4	300
4	0 14	248						0.5	400
5	0 17	199	0	0.00	12.43	29	0	0.7	500
6	0 21	165						0.8	600
7	0 24	142						1.0	700
8	0 28	124						1.1	800
9	0 31	110						1.3	900
10	0 35	99	0	0.00	12.44	31	0	1.4	1000
11	0 38	90						1.6	1100
12	0 42	82						1.7	1200
13	0 46	75						1.9	1300
14	0 49	70						2.0	1400
16	0 53	65	0	0.00	12.44	32	1	2.1	1500
17	0 56	61						2.3	1600
18	1 00	57						2.4	1700
19	1 04	54						2.6	1800
20	1 07	51						2.7	1900
21	1 11	48	0	0.00	12.45	33	1	2.8	2000
22	1 15	46						3.0	2100
23	1 18	44						3.1	2200
24	1 22	42						3.3	2300
25	1 26	40						3.4	2400
27	1 30	38	-1	-0.05	12.46	34	1	3.5	2500
28	1 34	36						3.7	2600
29	1 38	35						3.8	2700
30	1 41	34						4.0	2800
31	1 45	33						4.1	2900
32	1 49	32	-1	-0.05	12.47	36	1	4.2	3000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

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 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil	deg	min	rd	yd		
3000	30.6	1 43	1.1	3.6	93.8	27.8	70	2090
3100	31.6	1 47	1.1	3.6	93.5	27.7	75	2061
3200	32.8	1 51	1.1	3.6	93.1	27.6	80	
3300	33.8	1 54	1.1	3.6	92.7	27.5	85	
3400	34.8	2 01	1.1	3.7	92.3	27.3	90	2061
3500	36.0	2 05	1.1	3.7	91.9	27.2	96	
3600	37.0	2 05	1.1	3.7	91.5	27.1	102	
3700	38.2	2 09	1.1	3.7	91.1	27.0	108	2031
3800	39.2	2 13	1.1	3.7	90.7	26.9	114	
3900	40.4	2 17	1.1	3.7	90.3	26.8	120	
4000	41.6	2 20	1.1	3.8	89.9	26.6	127	2002
4100	42.6	2 24	1.1	3.8	89.6	26.5	134	2002
4200	43.8	2 28	1.1	3.8	89.2	26.4	141	
4300	45.0	2 32	1.1	3.8	88.8	26.3	148	
4400	46.0	2 36	1.1	3.8	88.4	26.2	155	1944
4500	47.2	2 39	1.1	3.8	88.0	26.1	163	
4600	48.4	2 43	1.1	3.9	87.6	26.0	171	
4700	49.4	2 47	1.1	3.9	87.2	25.8	179	1973
4800	50.6	2 51	1.1	3.9	86.8	25.7	187	
4900	51.8	2 55	1.2	3.9	86.4	25.6	195	
5000	53.0	2 59	1.2	3.9	86.0	25.5	204	1944
5100	54.0	3 03	1.2	3.9	85.7	25.4	213	
5200	55.2	3 07	1.2	4.0	85.3	25.3	222	
5300	56.4	3 11	1.2	4.0	84.9	25.2	231	1944
5400	57.6	3 15	1.2	4.0	84.5	25.0	241	
5500	58.8	3 19	1.2	4.0	84.1	24.9	251	
5600	60.0	3 23	1.2	4.0	83.8	24.8	261	1915
5700	61.2	3 27	1.2	4.0	83.4	24.7	271	
5800	62.4	3 31	1.2	4.1	83.0	24.6	281	
5900	63.6	3 35	1.2	4.1	82.6	24.5	292	1915
6000	64.8	3 39	1.2	4.1	82.2	24.4	303	

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

Part 2, Table A.

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coeffi- cient (15)	Probable error in R D0 (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
32	1 49	32	-1	-0.05	12.47	36	1	4.2	3000
33	1 53	31						4.4	3100
34	1 56	30						4.5	3200
35	2 00	29						4.7	3300
36	2 04	28						4.8	3400
38	2 08	27	-1	-0.05	12.47	37	1	4.9	3500
39	2 12	26						5.1	3600
40	2 16	25						5.2	3700
41	2 20	24						5.4	3800
43	2 25	24						5.5	3900
44	2 30	23	-1	-0.05	12.48	39	1	5.6	4000
46	2 34	22						5.8	4100
47	2 39	22						5.9	4200
48	2 43	21						6.0	4300
50	2 48	21						6.2	4400
51	2 52	20	-1	-0.05	12.49	40	2	6.3	4500
53	2 57	20						6.5	4600
54	3 01	19						6.6	4700
55	3 06	19						6.8	4800
57	3 11	18						6.9	4900
58	3 15	18	-1	-0.05	12.50	42	2	7.1	5000
59	3 20	17						7.3	5100
61	3 25	17						7.4	5200
62	3 30	16						7.6	5300
64	3 34	16						7.7	5400
65	3 39	16	-1	-0.05	12.50	43	2	7.9	5500
67	3 44	15						8.0	5600
68	3 49	15						8.2	5700
69	3 54	15						8.3	5800
71	3 59	14						8.5	5900
72	4 04	14	-1	-0.05	12.51	45	2	8.7	6000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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 1 min change in elev (6) (7)		Maximum ordinate (8) ft	Terminal velocity (9) ft/s	
	yd	mil	deg	min	mil	min			yd
6000	64.8	3	39	1.2	4.1	82.2	24.4	303	1915
6100	66.0	3	43	1.2	4.1	81.8	24.2	314	1886
6200	67.2	3	47	1.2	4.1	81.5	24.1	325	
6300	68.6	3	51	1.2	4.2	81.1	24.0	337	
6400	69.8	3	55	1.2	4.2	80.0	23.9	349	1886
6500	71.0	4	00	1.2	4.2	80.4	23.8	361	
6600	72.2	4	04	1.3	4.2	80.1	23.7	373	
6700	73.4	4	08	1.3	4.2	79.7	23.6	386	
6800	74.8	4	12	1.3	4.3	79.3	23.5	399	1858
6900	76.0	4	17	1.3	4.3	79.0	23.4	412	
7000	77.2	4	21	1.3	4.3	78.6	23.3	425	
7100	78.6	4	25	1.3	4.3	78.3	23.2	439	1830
7200	79.8	4	29	1.3	4.3	77.9	23.1	453	
7300	81.0	4	34	1.3	4.4	77.6	23.0	467	
7400	82.4	4	38	1.3	4.4	77.2	22.9	481	1830
7500	83.6	4	43	1.3	4.4	76.9	22.8	495	
7600	85.0	4	47	1.3	4.4	76.5	22.7	510	
7700	86.2	4	51	1.3	4.4	76.2	22.6	525	
7800	87.6	4	56	1.3	4.5	75.8	22.5	540	1803
7900	89.0	5	00	1.3	4.5	75.5	22.4	556	
8000	90.2	5	05	1.3	4.5	75.2	22.3	572	
8100	91.6	5	09	1.3	4.5	74.8	22.2	588	1776
8200	93.0	5	14	1.3	4.5	74.5	22.1	605	
8300	94.2	5	18	1.3	4.5	74.2	22.0	622	
8400	95.6	5	23	1.4	4.6	73.9	21.9	639	1776
8500	97.0	5	27	1.4	4.6	73.5	21.8	656	
8600	98.2	5	32	1.4	4.6	73.2	21.7	674	
8700	99.6	5	36	1.4	4.6	72.9	21.6	692	
8800	101.0	5	41	1.4	4.7	72.5	21.5	710	1750
8900	102.4	5	46	1.4	4.7	72.2	21.4	728	
9000	103.8	5	50	1.4	4.7	71.9	21.3	746	

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall (10)	Slope of fall (11)		Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Dn (16) (17)		Time of flight (18) sec	Range (19) yd	
	mil	deg min	mil	deg		yd	yd			
72	4	04	14	-1	-0.05	12.51	45	2	8.7	6000
74	4	09	14						8.8	6100
75	4	14	13						9.0	6200
77	4	19	13						9.1	6300
78	4	25	13						9.3	6400
80	4	30	13	-1	-0.10	12.52	46	2	9.5	6500
81	4	35	13						9.6	6600
83	4	41	12						9.8	6700
85	4	46	12						9.9	6800
86	4	52	12						10.1	6900
88	4	57	12	-2	-0.10	12.53	48	2	10.3	7000
89	5	02	11						10.4	7100
91	5	08	11						10.6	7200
92	5	13	11						10.7	7300
94	5	19	11						10.9	7400
96	5	25	11	-2	-0.10	12.53	49	3	11.1	7500
98	5	30	10						11.2	7600
99	5	36	10						11.4	7700
101	5	42	10						11.5	7800
103	5	48	9.8						11.7	7900
105	5	54	9.7	-2	-0.10	12.54	51	3	11.9	8000
106	6	00	9.5						12.0	8100
108	6	06	9.3						12.2	8200
110	6	12	9.2						12.3	8300
112	6	18	9.0						12.5	8400
114	6	24	8.9	-2	-0.10	12.54	52	3	12.7	8500
115	6	30	8.8						12.8	8600
117	6	36	8.6						13.0	8700
119	6	43	8.5						13.2	8800
121	6	49	8.4						13.4	8900
123	6	56	8.2	-2	-0.10	12.55	54	3	13.6	9000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Range	Elevation		Change in elev for 100 yd change in range		Change in range for 1 mil 1 min change in elev		Maximum ordinate	Terminal velocity
	(1)	(3)	(4)	(5)	(6)	(7)		
9000	103.8	5 50	1.4	4.7	71.9	21.3	746	1750
9100	105.2	5 55	1.4	4.7	71.6	21.2	765	1725
9200	106.6	6 00	1.4	4.7	71.3	21.1	784	
9300	108.0	6 04	1.4	4.8	71.0	21.0	804	
9400	109.4	6 09	1.4	4.8	70.7	20.9	824	1700
9500	110.8	6 14	1.4	4.8	70.4	20.8	844	
9600	112.2	6 19	1.4	4.8	70.0	20.7	864	
9700	113.6	6 24	1.4	4.8	69.7	20.6	885	1676
9800	115.0	6 29	1.4	4.9	69.4	20.6	906	
9900	116.6	6 33	1.4	4.9	69.1	20.5	928	
10000	118.0	6 38	1.5	4.9	68.8	20.4	950	1700
10100	119.4	6 43	1.5	4.9	68.5	20.3	972	1652
10200	120.8	6 48	1.5	4.9	68.2	20.2	995	
10300	122.4	6 53	1.5	5.0	67.9	20.1	1018	
10400	123.8	6 58	1.5	5.0	67.6	20.0	1041	1629
10500	125.4	7 03	1.5	5.0	67.3	19.9	1065	
10600	126.8	7 08	1.5	5.0	67.0	19.9	1089	
10700	128.2	7 13	1.5	5.1	66.7	19.8	1113	1607
10800	129.8	7 18	1.5	5.1	66.4	19.7	1138	
10900	131.2	7 23	1.5	5.1	66.1	19.6	1163	
11000	132.8	7 28	1.5	5.1	65.8	19.5	1189	1652
11100	134.4	7 34	1.5	5.2	65.5	19.4	1215	1629
11200	136.0	7 39	1.5	5.2	65.2	19.3	1241	
11300	137.4	7 44	1.5	5.2	64.9	19.2	1268	
11400	139.0	7 49	1.6	5.2	64.6	19.1	1295	1607
11500	140.4	7 54	1.6	5.2	64.3	19.1	1323	
11600	142.0	8 00	1.6	5.3	64.0	19.0	1351	
11700	143.6	8 05	1.6	5.3	63.7	18.9	1379	1607
11800	145.2	8 10	1.6	5.3	63.4	18.8	1403	
11900	146.8	8 16	1.6	5.3	63.1	18.7	1437	
12000	148.4	8 21	1.6	5.4	62.9	18.6	1467	1607

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall		Slope of fall	Deflection due to drift		Ballistic coefficient	Probable error in R DR		Time of flight	Range
(10)	(11)	(12)	(13)	(14)		(15)	(16)		
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
123	6 56	8.2	-2	-0.10	12.55	54	3	13.6	9000
125	7 02	8.1						13.7	9100
127	7 09	8.0						13.9	9200
129	7 15	7.8						14.1	9300
131	7 22	7.7						14.3	9400
133	7 29	7.6	-2	-0.15	12.55	55	3	14.5	9500
135	7 36	7.5						14.6	9600
137	7 42	7.4						14.8	9700
139	7 49	7.3						15.0	9800
141	7 56	7.2						15.2	9900
143	8 03	7.1	-2	-0.15	12.56	57	4	15.4	10000
145	8 10	7.0						15.5	10100
147	8 17	6.9						15.7	10200
149	8 24	6.8						15.9	10300
151	8 31	6.7						16.1	10400
153	8 38	6.6	-3	-0.15	12.56	59	4	16.3	10500
155	8 45	6.5						16.4	10600
157	8 52	6.4						16.6	10700
160	8 59	6.3						16.8	10800
162	9 07	6.2						17.0	10900
164	9 15	6.1	-3	-0.15	12.57	61	4	17.2	11000
166	9 22	6.1						17.3	11100
169	9 29	6.0						17.5	11200
171	9 37	5.9						17.7	11300
173	9 44	5.8						17.9	11400
175	9 52	5.7	-3	-0.15	12.57	62	4	18.1	11500
177	9 59	5.7						18.3	11600
180	10 07	5.6						18.5	11700
182	10 15	5.5						18.7	11800
184	10 23	5.5						18.9	11900
187	10 31	5.4	-3	-0.20	12.57	64	4	19.1	12000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Range (1)	Elevation		Change in elev for 100 yd change in range		Change in range for 1 mil 1 min change in elev		Maxi- mum ordinate (8)	Termi- nal veioc- ity (9)
	(2)	(3)	(4)	(5)	(6)	(7)		
	yd	mil deg min	mil	min	yd	yd		
12000	148.4	8 21	1.6	5.4	62.9	18.6	1467	1607
12100	150.0	8 26	1.6	5.4	62.6	18.5	1497	1536
12200	151.6	8 32	1.6	5.4	62.3	18.4	1528	
12300	153.2	8 37	1.6	5.4	62.0	18.4	1559	
12400	154.9	8 43	1.6	5.5	61.7	18.3	1590	1556
12500	156.4	8 48	1.6	5.5	61.5	18.2	1622	
12600	158.0	8 54	1.6	5.5	61.2	18.1	1654	
12700	159.6	8 59	1.6	5.5	60.9	18.0	1687	1555
12800	161.4	9 05	1.7	5.6	60.6	18.0	1720	
12900	163.0	9 10	1.7	5.6	60.3	17.9	1754	
13000	164.8	9 16	1.7	5.6	60.0	17.8	1788	1555
13100	166.4	9 22	1.7	5.6	59.8	17.7	1823	1545
13200	168.0	9 27	1.7	5.7	59.5	17.6	1858	
13300	169.8	9 33	1.7	5.7	59.2	17.5	1894	
13400	171.4	9 39	1.7	5.7	58.9	17.5	1930	1545
13500	173.2	9 45	1.7	5.8	58.6	17.4	1966	
13600	174.8	9 50	1.7	5.8	58.4	17.3	2003	
13700	176.6	9 56	1.7	5.8	58.1	17.2	2040	1526
13800	178.4	10 02	1.7	5.8	57.8	17.1	2078	
13900	180.0	10 08	1.7	5.9	57.5	17.0	2117	
14000	181.8	10 14	1.8	5.9	57.2	16.9	2156	1526
14100	183.6	10 20	1.8	5.9	57.0	16.9	2198	1507
14200	185.4	10 26	1.8	6.0	56.7	16.8	2236	
14300	187.0	10 32	1.8	6.0	56.4	16.7	2277	
14400	188.8	10 38	1.8	6.0	56.1	16.6	2318	1507
14500	190.6	10 44	1.8	6.0	55.8	16.5	2359	
14600	192.4	10 50	1.8	6.1	55.5	16.4	2401	
14700	194.2	10 56	1.8	6.1	55.2	16.4	2443	1489
14800	196.0	11 02	1.8	6.1	55.0	16.3	2486	
14900	198.0	11 08	1.8	6.2	54.7	16.2	2530	
15000	199.8	11 15	1.8	6.2	54.4	16.1	2574	1489

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall		Slope of fall	Deflection due to drift		Ballistic coefficient	Probable error in R		Time of flight	Range
(10)	(11)	(12)	(13)	(14)		(16)	(17)		
mil	deg min	1 on—	mil	deg		yd	yd		
187	10 31	5.4	-3	-0.20	12.57	64	4	19.1	12000
189	10 39	5.3						19.3	12100
192	10 47	5.3						19.5	12200
194	10 55	5.2						19.7	12300
197	11 03	5.1						19.9	12400
199	11 11	5.1	-3	-0.20	12.57	66	4	20.1	12500
201	11 19	5.0						20.3	12600
204	11 27	4.9						20.5	12700
206	11 35	4.9						20.7	12800
308	11 43	4.6						20.9	12900
211	11 52	4.8	-4	-0.20	12.58	68	5	21.1	13000
213	12 00	4.7						21.3	13100
216	12 09	4.6						21.5	13200
219	12 17	4.6						21.7	13300
221	12 26	4.5						21.9	13400
224	12 34	4.5	-4	-0.20	12.58	70	5	22.1	13500
226	12 43	4.4						22.3	13600
229	12 51	4.4						22.5	13700
231	13 00	4.3						22.7	13800
234	13 08	4.3						22.9	13900
236	13 17	4.2	-4	-0.25	12.59	72	5	23.2	14000
239	13 26	4.2						23.4	14100
241	13 35	4.1						23.6	14200
244	13 44	4.1						23.8	14300
247	13 53	4.1						24.0	14400
249	14 02	4.0	-5	-0.25	12.59	74	5	24.2	14500
252	14 11	4.0						24.4	14600
255	14 20	3.9						24.6	14700
257	14 29	3.9						24.8	14800
260	14 38	3.8						25.0	14900
263	14 48	3.8	-5	-0.30	12.60	76	5	25.3	15000

\*This is the proving ground probable error.

P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 V. = 2275 fps

Part 2. Table A.

Range	Elevation			Change in elev for 100 yd change in range		Change in range for 1 mil 1 min change in elev		Maximum ordinate	Terminal velocity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	yd	mil	deg min	mil	min	yd	yd		
15000	199.8	11	15	1.8	6.2	54.4	16.1	2574	1489
15100	201.6	11	21	1.9	6.2	54.2	16.1	2619	1472
15200	203.4	11	27	1.9	6.3	53.9	16.0	2664	
15300	205.4	11	33	1.9	6.3	53.7	15.9	2710	
15400	207.2	11	39	1.9	6.3	53.4	15.8	2756	1472
15500	209.2	11	46	1.9	6.4	53.1	15.7	2803	
15600	211.0	11	52	1.9	6.4	52.9	15.7	2850	
5700	213.0	11	59	1.9	6.4	52.6	15.6	2898	1455
5800	214.8	12	05	1.9	6.5	52.3	15.5	2946	
5900	216.8	12	12	1.9	6.5	52.0	15.4	2995	
6000	218.8	12	18	1.9	6.5	51.7	15.3	3045	1455
6100	220.6	12	25	2.0	6.6	51.5	15.3	3095	1439
6200	222.6	12	31	2.0	6.6	51.2	15.2	3146	
6300	224.6	12	38	2.0	6.6	51.0	15.1	3197	
6400	226.6	12	45	2.0	6.7	50.7	15.0	3249	1439
6500	228.6	12	51	2.0	6.7	50.4	14.9	3301	
6600	230.6	12	58	2.0	6.7	50.2	14.9	3354	
6700	232.6	13	05	2.0	6.8	49.9	14.8	3407	1424
6800	234.6	13	12	2.0	6.8	49.7	14.7	3461	
6900	236.6	13	19	2.0	6.8	49.4	14.6	3516	
7000	238.6	13	25	2.0	6.9	49.1	14.5	3571	1424
7100	240.6	13	32	2.1	6.9	48.9	14.5	3627	1410
7200	242.8	13	39	2.1	6.9	48.6	14.4	3683	
7300	244.8	13	46	2.1	7.0	48.4	14.3	3740	
7400	246.8	13	53	2.1	7.0	48.1	14.3	3798	1410
7500	249.0	14	00	2.1	7.1	47.8	14.2	3856	
7600	251.0	14	07	2.1	7.1	47.6	14.1	3915	
7700	253.2	14	14	2.1	7.1	47.3	14.0	3974	1397
7800	255.2	14	22	2.1	7.2	47.1	14.0	4034	
7900	257.4	14	29	2.1	7.2	46.9	13.9	4094	
8000	259.6	14	36	2.2	7.2	46.6	13.8	4155	1397

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

Part 2. Table A.

Angle of fall		Slope of fall	Deflection due to drift		Ballistic coefficient	Probable error in R		Time of flight	Range
(10)	(11)	(12)	(13)	(14)		(16)	(17)		
mil	deg min	1 on 100	mil	deg	yd	yd	sec	yd	
263	14 48	3.8	-5	-0.30	12.60	76	5	25.3	15000
266	14 57	3.7						25.5	15100
269	15 07	3.7						25.7	15200
271	15 16	3.7						25.9	15300
274	15 26	3.6						26.1	15400
277	15 36	3.6	-5	-0.30	12.60	78	5	26.4	15500
280	15 46	3.5						26.6	15600
283	15 56	3.5						26.8	15700
286	16 06	3.5						27.0	15800
289	16 16	3.4						27.2	15900
292	16 26	3.4	-6	-0.35	12.61	80	6	27.5	16000
295	16 36	3.4						27.7	16100
298	16 46	3.3						27.9	16200
301	16 56	3.3						28.1	16300
304	17 07	3.2						28.3	16400
307	17 17	3.2	-6	-0.35	12.61	82	6	28.6	16500
310	17 28	3.2						28.8	16600
313	17 38	3.1						29.0	16700
317	17 49	3.1						29.3	16800
320	17 59	3.1						29.5	16900
323	18 10	3.0	-7	-0.35	12.61	84	6	29.8	17000
326	18 21	3.0						30.0	17100
329	18 32	2.98						30.2	17200
333	18 43	2.95						30.5	17300
336	18 54	2.92						30.7	17400
339	19 05	2.89	-7	-0.40	12.61	86	6	30.9	17500
342	19 16	2.86						31.2	17600
346	19 27	2.83						31.4	17700
349	19 38	2.80						31.6	17800
353	19 50	2.77						31.9	17900
356	20 01	2.74	-7	-0.40	12.61	88	6	32.1	18000

\*This is the proving ground probable error.

P. 975 LB. PROJ. (SHOT)  
E, B.D., MK.X  
V. = 2275 fps

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 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	mil	deg min	mil	min	yd	yd		
3000	259.6	14 36	2.2	7.2	46.6	13.8	4155	1397
3100	261.8	14 43	2.2	7.3	46.4	13.7	4216	1384
3200	263.8	14 51	2.2	7.3	46.1	13.7	4278	
3300	266.0	14 58	2.2	7.4	45.9	13.6	4341	
4000	268.2	15 05	2.2	7.4	45.7	13.5	4405	1384
4500	270.4	15 13	2.2	7.4	45.4	13.5	4470	
5000	272.6	15 20	2.2	7.5	45.2	13.4	4536	
7000	274.8	15 28	2.2	7.5	44.9	13.3	4602	1372
8000	277.0	15 35	2.2	7.6	44.7	13.2	4668	
9000	279.4	15 43	2.3	7.6	44.4	13.2	4735	
10000	281.6	15 51	2.3	7.6	44.2	13.1	4802	1372
100	283.8	15 58	2.3	7.7	43.9	13.0	4870	1361
200	286.0	16 06	2.3	7.7	43.7	12.9	4949	
300	288.4	16 13	2.3	7.8	43.4	12.9	5009	
400	290.6	16 21	2.3	7.8	43.2	12.8	5079	1361
500	293.0	16 29	2.3	7.8	43.0	12.7	5150	
600	295.4	16 37	2.3	7.9	42.7	12.7	5222	
700	297.6	16 45	2.4	7.9	42.5	12.6	5295	1352
800	300.0	16 53	2.4	8.0	42.3	12.5	5369	
900	302.4	17 01	2.4	8.0	42.1	12.5	5444	
1000	304.8	17 09	2.4	8.1	41.9	12.4	5520	1352
00	307.2	17 17	2.4	8.1	41.6	12.3	5596	1344
00	309.6	17 25	2.4	8.1	41.4	12.3	5673	
00	312.0	17 33	2.4	8.2	41.2	12.2	5751	
00	314.4	17 41	2.4	8.2	41.0	12.1	5830	1344
00	316.8	17 50	2.5	8.3	40.8	12.1	5910	
00	319.4	17 58	2.5	8.3	40.5	12.0	5990	
30	321.8	18 06	2.5	8.4	40.3	11.9	6070	1336
30	324.2	18 14	2.5	8.4	40.1	11.9	6150	
30	326.8	18 23	2.5	8.5	39.9	11.8	6235	
30	329.2	18 32	2.5	8.5	39.7	11.8	6320	1336

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R D (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd	sec	yd
356	20 01	2.74	-7	-0.40	12.61	88	6	32.1	18000
359	20 12	2.72						32.3	18100
363	20 23	2.69						32.6	18200
366	20 35	2.66						32.8	18300
369	20 46	2.64						33.1	18400
373	20 58	2.61	-8	-0.45	12.61	90	6	33.3	18500
376	21 10	2.58						33.5	18600
380	21 21	2.56						33.8	18700
383	21 33	2.53						34.0	18800
387	21 45	2.51						34.3	18900
390	21 57	2.48	-8	-0.45	12.62	93	7	34.5	19000
394	22 09	2.46						34.7	19100
397	22 21	2.43						35.0	19200
401	22 33	2.41						35.2	19300
404	22 45	2.38						35.5	19400
408	22 57	2.35	-9	-0.50	12.62	95	7	35.7	19500
411	23 09	2.24						36.0	19600
415	23 21	2.32						36.2	19700
419	23 33	2.29						36.5	19800
422	23 46	2.27						36.7	19900
426	23 58	2.25	-9	-0.50	12.62	97	7	37.0	20000
429	24 10	2.23						37.2	20100
433	24 22	2.21						37.5	20200
437	24 35	2.19						37.7	20300
441	24 47	2.17						38.0	20400
445	25 00	2.15	-10	-0.55	12.62	100	7	38.3	20500
448	25 12	2.13						38.5	20600
452	25 25	2.10						38.8	20700
455	25 37	2.08						39.0	20800
459	25 50	2.06						39.3	20900
463	26 03	2.04	-10	-0.55	12.62	102	7	39.6	21000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
 JZ2, B.D., MK.X  
 M.V. = 2275 fps

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 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)		
	yd	mil	deg	min	mil	min			yd	yd
									ft	f/s
21000	329.2	18 32	2.5	8.5	39.7	11.8	6320	1336		
21100	331.8	18 40	2.5	8.6	39.4	11.7	6405	1329		
21200	334.2	18 48	2.5	8.6	39.2	11.6	6490			
21300	336.8	18 57	2.6	8.7	39.0	11.6	6675			
21400	339.4	19 06	2.6	8.7	38.8	11.5	6665	1329		
21500	342.0	19 15	2.6	8.7	38.6	11.4	6755			
21600	344.6	19 23	2.6	8.8	38.4	11.4	6845			
21700	347.2	19 32	2.6	8.8	38.2	11.3	6940	1329		
21800	349.8	19 41	2.6	8.9	38.0	11.3	7030			
21900	352.4	19 50	2.6	8.9	37.8	11.2	7125			
22000	355.0	19 59	2.7	9.0	37.6	11.1	7215	1323		
22100	351.8	20 08	2.7	9.0	37.3	11.1	7310	1318		
22200	360.6	20 17	2.7	9.1	37.1	11.0	7405			
22300	363.2	20 26	2.7	9.1	36.9	10.9	7500			
22400	365.8	20 35	2.7	9.2	36.7	10.9	7600	1318		
22500	368.6	20 44	2.7	9.2	36.5	10.8	7700			
22600	371.4	20 53	2.8	9.3	36.3	10.8	7800			
22700	374.0	21 03	2.8	9.3	36.1	10.7	7905	1318		
22800	376.8	21 12	2.8	9.4	35.9	10.6	8010			
22900	379.6	21 22	2.8	9.5	35.7	10.6	8115			
3000	382.6	21 31	2.8	9.5	35.5	10.5	8220	1313		
3100	385.4	21 41	2.8	9.6	35.2	10.4	8325	1310		
3200	388.2	21 50	2.9	9.6	35.0	10.4	8435			
3300	391.0	22 00	2.9	9.7	34.8	10.3	8545			
3400	394.0	22 10	2.9	9.8	34.6	10.3	8655	1310		
3500	397.0	22 19	2.9	9.8	34.4	10.2	8765			
3600	399.8	22 29	2.9	9.9	34.1	10.1	8875			
3700	402.8	22 39	2.9	10.0	33.9	10.0	8990	1308		
3800	405.6	22 49	3.0	10.0	33.7	10.0	9105			
3900	408.6	22 59	3.0	10.1	33.5	9.9	9225			
4000	411.8	23 09	3.0	10.1	33.3	9.9	9350	1308		

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M.V. = 2275 fps

Part 2. Table A.

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coefficient (15)	Probable error in R Df (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on—	mil	deg		yd	yd		
463	26 03	2.04	-10	-0.55	12.62	102	7	39.6	21000
467	26 16	2.03						39.9	21100
470	26 28	2.01						40.1	21200
474	26 41	1.99						40.3	21300
478	26 54	1.97						40.6	21400
482	27 07	1.95	-11	-0.60	12.62	104	8	40.9	21500
486	27 20	1.93						41.1	21600
489	27 32	1.92						41.4	21700
493	27 45	1.90						41.7	21800
497	27 58	1.88						42.0	21900
501	28 11	1.87	-11	-0.60	12.62	107	8	42.3	22000
505	28 24	1.85						42.5	22100
509	28 37	1.83						42.8	22200
512	28 50	1.82						43.1	22300
516	29 03	1.80						43.4	22400
520	29 16	1.78	-12	-0.65	12.62	109	8	43.7	22500
524	29 29	1.77						43.9	22600
528	29 43	1.75						44.2	22700
532	29 56	1.74						44.5	22800
536	30 10	1.72						44.8	22900
540	30 23	1.70	-12	-0.70	12.62	112	8	45.1	23000
544	30 36	1.69						45.4	23100
548	30 50	1.67						45.7	23200
552	31 03	1.66						46.0	23300
556	31 17	1.65						46.3	23400
560	31 30	1.63	-13	-0.70	12.62	115	8	46.6	23500
564	31 43	1.62						46.9	23600
568	31 57	1.60						47.2	23700
572	32 10	1.59						47.5	23800
576	32 24	1.57						47.8	23900
580	32 38	1.56	-13	-0.75	12.62	118	8	48.1	24000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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 1 min change in elev (6) (7)		Maxi- mum ordinate (8)	Termi- nal veloc- ity (9)
	yd	mil deg min	mil min	yd yd	ft	1/s		
24000	411.8	23 09	3.0	10.1	33.3	9.9	9350	1308
24100	414.8	23 20	3.0	10.2	33.0	9.8	9470	1306
24200	417.8	23 30	3.0	10.3	32.8	9.7	9590	
24300	420.8	23 40	3.1	10.4	32.6	9.7	9715	
24400	422.8	23 50	3.1	10.4	32.4	9.6	9840	1306
24500	427.0	24 01	3.1	10.5	32.2	9.5	9970	
24600	430.0	24 11	3.1	10.5	32.0	9.5	10100	
24700	433.2	24 22	3.2	10.6	31.8	9.4	10230	1305
24800	436.4	24 33	3.2	10.7	31.5	9.3	10360	
24900	439.6	24 44	3.2	10.8	31.3	9.3	10495	
25000	442.8	24 54	3.2	10.9	31.0	9.2	10630	1305
25100	446.0	25 05	3.3	11.0	30.8	9.1	10765	1306
25200	449.2	25 16	3.3	11.1	30.5	9.0	10905	
25300	452.6	25 28	3.3	11.1	30.3	9.0	11045	
25400	455.8	25 39	3.3	11.2	30.1	8.9	11185	1306
25500	459.2	25 50	3.4	11.3	29.8	8.8	11330	
25600	462.6	26 01	3.4	11.4	29.6	8.8	11475	
25700	466.0	26 13	3.4	11.5	29.3	8.7	11625	1308
25800	469.4	26 25	3.4	11.6	29.1	8.6	11775	
25900	472.8	26 36	3.5	11.7	28.8	8.5	11925	
26000	476.4	26 48	3.5	11.8	28.5	8.4	12080	1308
26100	480.0	27 00	3.5	11.9	28.3	8.4	12235	1310
26200	483.6	27 12	3.6	12.0	28.0	8.3	12390	
26300	487.2	27 24	3.6	12.1	27.8	8.2	12550	
26400	490.8	27 36	3.6	12.3	27.5	8.1	12710	1310
26500	494.4	27 49	3.7	12.4	27.2	8.1	12875	
26600	498.2	28 01	3.7	12.5	26.9	8.0	13060	
26700	502.0	28 14	3.8	12.7	26.6	7.9	13205	1313
26800	505.8	28 27	3.8	12.8	26.3	7.8	13375	
26900	509.6	28 40	3.8	13.0	26.0	7.7	13545	
27000	513.4	28 53	3.9	13.1	25.7	7.6	13720	1313

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Angle of fall (10) (11)		Slope of fall (12)	Deflection due to drift (13) (14)		Ballistic coeffi- cient (15)	Probable error in R D1 (16) (17)		Time of flight (18)	Range (19)
mil	deg min	1 on--	mil	deg		yd	yd	sec	yd
580	32 38	1.56	-13	-0.75	12.62	118	8	48.1	24000
584	32 51	1.55						48.4	24100
588	33 04	1.53						48.7	24200
592	33 18	1.52						49.0	24300
596	33 32	1.51						49.3	24400
600	33 46	1.50	-14	-0.80	12.61	121	9	49.6	24500
604	34 00	1.48						49.9	24600
609	34 14	1.47						50.2	24700
613	34 28	1.46						50.5	24800
617	34 42	1.44						50.8	24900
621	34 56	1.43	-14	-0.80	21.61	124	9	51.2	25000
625	35 10	1.42						51.5	25100
629	35 24	1.41						51.8	25200
634	35 39	1.39						52.1	25300
638	35 53	1.38						52.4	25400
642	36 08	1.37	-15	-0.85	12.61	127	9	52.8	25500
646	36 22	1.36						53.1	25600
651	36 37	1.34						53.5	25700
655	36 51	1.33						53.8	25800
660	37 06	1.32						54.2	25900
664	37 21	1.31	-16	-0.90	12.60	130	9	54.5	26000
669	37 36	1.30						54.8	26100
673	37 51	1.29						55.2	26200
677	38 06	1.28						55.5	26300
682	38 21	1.26						55.9	26400
686	38 36	1.25	-16	-0.90	12.60	133	9	56.2	26500
691	38 51	1.24						56.6	26600
695	39 06	1.23						56.9	26700
700	39 22	1.22						57.3	26800
704	39 37	1.21						57.6	26900
709	39 53	1.20	-17	-0.95	12.59	137	9	58.0	27000

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Range	Elevation		Change in elev for 100 yd change in range		Change in range for 1 mil 1 min change in elev		Maxim ordinate	Terminal velocity
	(1)	(2)	(4)	(5)	(6)	(7)		
	yd	mil deg min	mil	min	yd	yd		
27000	513.4	28 53	3.9	13.1	25.7	7.6	13720	1313
27100	517.4	29 06	3.9	13.3	25.4	7.5	13295	1317
27200	521.4	29 20	4.0	13.4	25.1	7.4	14070	
27300	525.4	29 33	4.0	13.6	24.8	7.3	14245	
27400	529.4	29 47	4.1	13.8	24.5	7.3	14420	1317
27500	533.6	30 01	4.1	13.9	24.2	7.2	14600	
27600	537.8	30 15	4.2	14.1	23.9	7.1	14800	
27700	542.0	30 30	4.3	14.3	23.5	7.0	15000	1317
27800	546.4	30 44	4.3	14.6	23.2	6.9	15200	
27900	550.8	30 59	4.4	14.8	22.8	6.8	15400	
28000	555.4	31 14	4.5	15.1	22.4	6.6	15600	1323
28100	559.8	31 30	4.5	15.3	22.1	6.5	15800	1330
28200	564.4	31 45	4.6	15.6	21.7	6.4	16000	
28300	569.2	32 01	4.7	15.9	21.3	6.3	16200	
28400	574.0	32 17	4.8	16.2	20.9	6.2	16400	1330
28500	579.0	32 34	4.9	16.5	20.5	6.1	16700	
28600	584.0	32 51	5.0	16.8	20.1	6.0	16900	
28700	589.0	33 08	5.1	17.2	19.7	5.8	17200	1339
28800	594.2	33 25	5.2	17.6	19.2	5.7	17400	
28900	599.4	33 43	5.3	18.0	18.8	5.6	17600	
29000	604.8	34 02	5.5	18.5	18.3	5.4	17900	1339
29100	610.4	34 20	5.6	18.9	17.9	5.3	18200	1350
29200	616.0	34 39	5.7	19.3	17.5	5.2	18500	
29300	621.8	34 58	5.8	19.7	17.1	5.1	18800	
29400	627.8	35 18	6.0	20.3	16.6	4.9	19000	1350
29500	633.8	35 39	6.2	21.1	16.0	4.7	19300	
29600	640.2	35 01	6.5	21.9	15.4	4.6	19600	
29700	646.8	35 23	6.8	22.9	14.7	4.4	19900	1364
29800	653.8	35 46	7.2	24.3	13.9	4.1	20300	
29900	661.2	37 11	7.7	26.	13.0	3.9	20700	
30000	669.2	37 39	8.3	28.	12.0	3.6	21100	1364
30100	677.8	38 09					21600	1368

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

Part 2. Table A.

Range	Angle of fall		Slope of fall	Deflection due to drift		Ballistic coefficient	Probable error in R D <sup>1</sup>		Time of flight	Range
	(10)	(11)		(13)	(14)		(16)	(17)		
	mil	deg min		1 on--	mil		deg	yd		
709	39	53	1.20	-1'	-0.95	12.59	137	9	58.0	27000
713	40	08	1.19						58.3	27100
719	40	24	1.17						58.7	27200
723	40	39	1.16						59.1	27300
727	40	55	1.15						59.5	27400
732	41	11	1.14	-18	-1.00	12.57	141	10	59.9	27500
737	41	27	1.13						60.3	27600
742	41	43	1.12						60.7	27700
746	41	59	1.11						61.1	27800
751	42	15	1.10						61.5	27900
756	42	32	1.09	-18	-1.05	12.55	145	10	61.9	28000
761	42	49	1.08						62.3	28100
765	43	05	1.07						62.7	28200
771	43	22	1.06						63.1	28300
776	43	39	1.05						63.5	28400
781	43	56	1.04	-19	-1.05	12.51	150	10	64.0	28500
786	44	13	1.03						64.4	28600
791	44	31	1.02						64.9	28700
796	44	48	1.01						65.3	28800
802	45	06	1.00						65.8	28900
807	45	24	0.99	-20	-1.10	12.46	155	10	66.3	29000
812	45	42	0.98						66.8	29100
818	46	00	0.97						67.3	29200
823	46	19	0.96						67.8	29300
829	46	38	0.94						68.3	29400
835	46	58	0.93	-21	-1.15	12.40	160	10	68.9	29500
841	47	19	0.92						69.5	29600
847	47	40	0.91						70.1	29700
854	48	02	0.90						70.7	29800
861	48	25	0.89						71.4	29900
868	48	40	0.87	-22	-1.20	12.32	166	11	72.1	30000
876	49	17	0.86	-22	-1.20	12.30	168	11	72.9	30100

\*This is the proving ground probable error.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	1000	1500	2000	2500	3000	3500	4000
-10	338	221	163	129	106	89	76
-20	673	444	327	258	212	178	153
-30		668	491	388	318	268	230
-40		892	656	518	425	358	307
-50		1117	822	648	532	448	384
-60		1343	988	779	639	538	462
-70			1155	910	747	629	540
-80			1323	1042	855	720	618
-90			1492	1175	963	811	696
-100			1661	1309	1072	902	774
-110			1820	1443	1181	994	852
-120				1578	1290	1086	931
-130				1713	1400	1178	1010
-140				1849	1510	1270	1089
-150				1985	1621	1363	1168
-160				2122	1732	1456	1248
-170				2259	1843	1549	1328
-180				2397	1955	1643	1409
-190					2067	1737	1489
-200					2179	1831	1570
-220					2404	2020	1732
-240					2630	2210	1895
-260					2857	2401	2059
-280						2594	2224
-300						2788	2391
-320						2983	2558
-340						3179	2726
-360						3377	2896
-380							3067
-400							3240
-420							3414
-440							3589
-460							3765
-480							3942
-500							

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	4500	5000	5500	6000	6500	7000	7500
-10	67	59	52	47	42	38	35
-20	133	117	104	94	85	77	70
-30	200	176	157	141	127	115	105
-40	267	235	209	188	170	154	140
-50	335	295	262	235	212	192	175
-60	402	354	315	283	255	231	210
-70	469	413	368	330	298	270	246
-80	537	473	421	378	341	309	282
-90	606	533	474	425	384	348	317
-100	674	594	528	473	427	387	353
-110	742	654	581	521	470	426	388
-120	811	714	635	569	513	465	423
-130	879	775	689	617	556	504	459
-140	948	836	743	665	600	544	495
-150	1017	896	797	714	644	583	531
-160	1086	956	850	762	687	623	567
-170	1155	1017	904	810	731	662	603
-180	1225	1078	958	859	775	702	639
-190	1295	1139	1013	908	819	741	675
-200	1365	1201	1068	957	863	781	711
-220	1505	1324	1177	1055	951	861	783
-240	1646	1447	1286	1153	1040	942	856
-260	1788	1571	1396	1252	1129	1022	929
-280	1931	1696	1507	1351	1218	1102	1002
-300	2075	1822	1618	1450	1307	1183	1076
-320	2219	1948	1730	1550	1397	1265	1150
-340	2364	2075	1842	1650	1487	1346	1224
-360	2510	2202	1955	1751	1578	1429	1299
-380	2657	2330	2068	1852	1669	1511	1374
-400	2805	2459	2182	1954	1761	1594	1449
-420	2953	2588	2296	2056	1853	1677	1524
-440	3102	2718	2411	2159	1945	1761	1600
-460	3252	2849	2526	2262	2038	1845	1676
-480	3403	2980	2642	2366	2131	1929	1753
-500	3555	3112	2759	2470	2225	2014	1830

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	8000	8500	9000	9500	10000	10500	11000
-10	32	29	27	25	24	22	20
-20	64	59	54	50	47	44	41
-30	96	88	82	76	71	66	61
-40	128	118	109	101	94	88	82
-50	161	148	137	126	117	110	103
-60	193	178	164	152	141	131	123
-70	225	207	191	177	165	154	144
-80	258	237	219	203	189	176	164
-90	290	267	246	228	212	198	184
-100	323	297	274	254	238	220	205
-110	355	326	301	279	260	242	225
-120	387	355	329	305	284	264	246
-130	420	386	356	330	307	286	266
-140	453	416	384	356	331	308	287
-150	486	446	412	381	354	330	307
-160	519	477	440	407	378	352	328
-170	552	507	468	433	402	374	349
-180	585	538	496	459	426	397	370
-190	618	568	524	485	450	419	391
-200	651	598	552	511	474	442	412
-220	716	658	608	563	522	486	453
-240	782	719	664	615	571	531	495
-260	849	780	720	667	619	576	537
-280	916	842	777	719	667	621	579
-300	983	903	833	771	716	666	621
-320	1050	964	889	823	764	711	663
-340	1118	1026	946	876	813	758	705
-360	1186	1088	1003	928	862	802	747
-380	1254	1150	1060	981	911	847	789
-400	1322	1213	1118	1034	960	893	832
-420	1391	1276	1176	1087	1009	939	875
-440	1460	1339	1233	1140	1058	984	917
-460	1529	1402	1291	1194	1108	1030	960
-480	1599	1465	1349	1247	1157	1076	1002
500	1669	1529	1407	1301	1207	1122	1045

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	11500	12000	12500	13000	13500	14000	14500
-10	19	18	17	16	15	14	14
-20	38	36	34	32	30	28	27
-30	57	54	51	48	45	42	40
-40	77	72	68	64	60	56	53
-50	96	90	84	79	75	70	66
-60	115	108	102	96	90	84	79
-70	134	125	119	111	105	98	92
-80	153	143	135	127	120	112	105
-90	172	161	151	143	135	126	118
-100	192	179	168	158	149	140	132
-110	211	197	185	173	163	154	145
-120	230	215	202	189	178	168	159
-130	249	233	219	205	193	182	172
-140	268	251	236	221	208	196	185
-150	287	269	253	237	223	210	198
-160	306	287	270	253	238	224	211
-170	325	305	287	269	253	238	224
-180	345	323	304	285	268	252	238
-190	365	341	321	301	283	266	251
-200	385	360	338	317	298	280	264
-220	424	397	372	349	328	308	290
-240	463	433	406	381	358	336	317
-260	502	470	440	413	388	365	344
-280	541	506	474	445	418	393	370
-300	580	543	509	478	449	422	397
-320	619	580	544	510	479	451	424
-340	658	616	578	543	510	479	451
-360	698	653	613	575	540	508	478
-380	737	690	647	607	570	536	505
-400	777	727	682	640	601	565	532
-420	817	764	716	672	631	594	560
-440	856	801	751	705	662	623	587
-460	896	838	786	738	693	652	614
-480	936	876	821	770	723	680	641
-500	976	913	856	803	754	709	668

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	15000	15500	16000	16500	17000	17500	18000
-10	13	12	11	11	10	10	9
-20	25	24	23	21	20	19	18
-30	38	36	34	32	30	29	27
-40	51	48	46	43	40	38	36
-50	63	60	57	54	51	48	46
-60	75	72	68	64	61	58	55
-70	88	84	79	75	71	67	64
-80	100	95	90	85	81	77	73
-90	113	107	101	96	91	86	82
-100	125	118	112	107	101	96	92
-110	137	130	123	118	111	106	101
-120	150	142	134	127	121	115	110
-130	162	154	145	138	131	124	119
-140	175	166	157	149	141	134	128
-150	187	178	168	159	151	144	137
-160	200	189	179	170	162	154	147
-170	212	201	190	181	172	164	156
-180	225	213	202	192	183	174	166
-190	237	225	213	203	193	183	174
-200	250	237	225	214	203	193	184
-220	274	261	248	235	223	212	202
-240	300	284	270	257	244	232	221
-260	325	308	292	278	264	251	239
-280	350	332	315	300	285	270	257
-300	375	356	338	321	305	290	276
-320	400	379	360	343	326	320	295
-340	425	403	383	364	346	329	313
-360	451	427	406	386	367	348	331
-380	477	451	428	407	387	368	350
-400	502	475	451	429	408	387	368
-420	528	499	474	451	429	407	387
-440	553	523	496	472	449	426	405
-460	579	547	519	494	470	446	424
-480	605	572	542	515	490	465	442
-500	630	596	565	537	511	485	461

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	18500	19000	19500	20000	20500	21000	21500
-10	9	9	8	8	7	7	7
-20	17	17	16	15	14	13	13
-30	26	25	24	23	22	20	20
-40	35	34	32	30	29	27	26
-50	44	42	40	38	36	34	32
-60	52	50	47	45	43	41	39
-70	61	58	55	52	50	47	45
-80	69	66	63	60	57	54	52
-90	78	75	71	67	64	61	58
-100	87	83	79	75	71	68	65
-110	96	91	87	82	78	74	71
-120	104	99	95	90	85	81	77
-130	113	107	103	98	92	88	84
-140	122	116	111	105	100	95	91
-150	131	124	119	112	107	102	97
-160	139	133	127	120	114	109	104
-170	148	141	135	128	121	116	110
-180	158	150	143	136	129	123	117
-190	166	158	151	143	136	129	123
-200	175	167	159	151	143	136	130
-220	193	184	175	166	157	149	143
-240	210	200	191	181	172	163	156
-260	228	217	207	196	186	177	169
-280	245	234	223	212	201	191	182
-300	263	251	239	227	215	204	195
-320	281	268	255	242	230	218	208
-340	298	284	270	257	244	232	221
-360	316	301	286	272	258	245	234
-380	333	317	302	287	273	259	247
-400	351	334	318	303	288	273	260
-420	369	351	334	318	302	287	273
-440	386	367	350	333	317	301	286
-460	403	384	366	348	331	314	299
-480	421	401	382	364	346	328	312
-500	439	418	398	379	360	342	325

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	22000	22500	23000	23500	24000	24500	25000
-10	6	6	6	6	5	5	5
-20	12	12	11	11	11	10	10
-30	19	18	17	17	16	15	15
-40	25	24	23	22	21	20	20
-50	31	30	29	27	26	25	24
-60	37	35	34	33	31	30	29
-70	43	41	40	38	36	35	34
-80	49	47	45	43	41	40	39
-90	56	53	51	49	47	45	44
-100	62	59	57	54	52	50	48
-110	68	65	63	60	57	55	52
-120	74	71	68	65	63	60	57
-130	80	77	73	70	68	65	62
-140	87	83	79	76	73	70	67
-150	93	89	85	81	78	75	71
-160	99	95	91	87	83	80	76
-170	105	101	96	92	88	85	81
-180	112	107	102	97	93	90	86
-190	118	113	108	102	98	95	91
-200	124	119	114	108	104	100	96
-220	136	130	125	119	114	110	105
-240	148	142	136	130	125	120	115
-260	161	154	148	141	135	130	124
-280	174	166	159	152	146	140	133
-300	186	178	170	163	156	150	143
-320	199	190	181	173	166	160	153
-340	211	202	193	184	177	170	163
-360	223	213	204	195	187	180	172
-380	236	225	215	206	198	190	182
-400	248	237	227	217	208	200	191
-420	260	249	238	228	219	210	201
-440	273	261	250	239	229	220	210
-460	285	273	261	250	240	230	220
-480	298	285	273	261	250	240	230
-500	410	297	284	272	261	250	239

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE B

TARGET BELOW GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	25500	26000	26500	27000	28000	29000	30000
-10	5	5	4	4	4	4	3
-20	10	9	8	8	7	7	5
-30	15	13	12	12	11	10	8
-40	19	18	17	16	15	13	11
-50	23	22	21	20	18	16	14
-60	28	26	25	24	21	19	17
-70	33	31	29	28	25	23	20
-80	38	36	34	32	29	26	23
-90	42	40	38	36	32	29	26
-100	46	44	42	40	36	33	29
-110	50	48	46	44	39	36	32
-120	55	53	50	48	43	39	35
-130	59	57	54	52	46	42	37
-140	64	61	58	56	50	46	40
-150	68	65	62	60	54	49	43
-160	73	70	67	64	58	52	46
-170	77	74	71	68	61	55	49
-180	82	78	75	72	65	59	52
-190	86	82	79	75	68	62	55
-200	91	87	83	79	72	66	58
-220	100	96	91	87	79	72	64
-240	109	105	100	95	87	79	69
-260	118	113	108	103	94	85	75
-280	127	122	116	111	101	92	81
-300	137	131	125	119	109	99	87
-320	146	140	133	127	116	106	93
-340	156	149	142	135	123	112	98
-360	165	157	150	143	130	119	104
-380	174	166	159	151	138	125	110
-400	183	175	167	159	145	132	116
-420	192	184	175	167	152	139	122
-440	201	193	184	175	160	145	127
-460	210	201	192	183	167	152	133
-480	220	210	200	191	175	158	139
-500	229	219	209	199	182	165	145

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	1000	1500	2000	2500	3000	3500	4000
10	-334	-220	-162	-128	-105	-89	-76
20	-663	-438	-324	-256	-210	-177	-152
30		-655	-485	-383	-315	-265	-228
40		-870	-646	-510	-419	-353	-303
50		-1084	-806	-636	-523	-440	-378
60		-1297	-965	-762	-627	-528	-454
70			-1123	-887	-730	-615	-529
80			-1281	-1012	-833	-702	-604
90			-1438	-1136	-935	-788	-678
100			-1594	-1260	-1037	-874	-752
110			-1750	-1383	-1139	-960	-826
120			-1905	-1506	-1240	-1046	-899
130				-1628	-1341	-1131	-973
140				-1750	-1442	-1216	-1046
150				-1871	-1542	-1301	-1119
160				-1992	-1642	-1385	-1192
170				-2112	-1741	-1469	-1265
180				-2232	-1840	-1553	-1337
190					-1939	-1637	-1410
200					-2038	-1721	-1482
220					-2234	-1887	-1626
240					-2429	-2052	-1768
260					-2623	-2216	-1909
280						-2378	-2049
300						-2539	-2189
320						-2699	-2328
340						-2858	-2466
360						-3015	-2603
380							-2739
400							-2875
420							-3010
440							-3144
460							-3277
480							-3409
500							-3539

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	4500	5000	5500	6000	6500	7000	7500
10	-66	-58	-52	-47	-42	-38	-35
20	-132	-117	-104	-93	-84	-76	-70
30	-199	-175	-156	-140	-126	-114	-105
40	-264	-233	-207	-186	-168	-152	-139
50	-330	-291	-259	-232	-209	-190	-174
60	-396	-349	-310	-278	-251	-228	-208
70	-462	-407	-362	-325	-293	-266	-243
80	-527	-465	-414	-371	-335	-304	-277
90	-592	-522	-465	-417	-377	-342	-312
100	-657	-580	-516	-463	-418	-379	-346
110	-722	-638	-568	-509	-459	-416	-381
120	-786	-695	-619	-554	-500	-454	-415
130	-851	-752	-670	-600	-541	-492	-449
140	-915	-809	-720	-645	-582	-529	-483
150	-979	-866	-771	-691	-623	-566	-517
160	-1043	-922	-821	-736	-664	-603	-551
170	-1107	-978	-872	-782	-705	-640	-585
180	-1170	-1034	-922	-827	-746	-677	-619
190	-1233	-1090	-972	-872	-787	-715	-653
200	-1296	-1146	-1022	-917	-823	-752	-687
220	-1422	-1257	-1121	-1007	-909	-826	-755
240	-1547	-1368	-1220	-1096	-990	-900	-822
260	-1671	-1479	-1319	-1185	-1071	-973	-889
280	-1794	-1589	-1418	-1274	-1151	-1046	-956
300	-1917	-1698	-1516	-1362	-1231	-1119	-1023
320	-2039	-1807	-1614	-1450	-1311	-1192	-1090
340	-2161	-1915	-1711	-1538	-1390	-1264	-1156
360	-2282	-2023	-1808	-1625	-1469	-1336	-1222
380	-2403	-2131	-1904	-1712	-1548	-1408	-1288
400	-2523	-2239	-2001	-1799	-1627	-1480	-1354
420	-2642	-2346	-2097	-1885	-1705	-1552	-1420
440	-2761	-2452	-2192	-1971	-1783	-1623	-1485
460	-2879	-2558	-2287	-2057	-1861	-1694	-1550
480	-2997	-2663	-2382	-2143	-1939	-1765	-1615
500	-3114	-2767	-2476	-2228	-2016	-1835	-1680

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	8000	8500	9000	9500	10000	10500	11000
10	-32	-29	-27	-25	-24	-22	-20
20	-64	-59	-54	-50	-47	-44	-41
30	-96	-89	-82	-76	-71	-66	-61
40	-128	-118	-109	-101	-94	-88	-82
50	-160	-147	-136	-124	-118	-110	-102
60	-191	-176	-163	-152	-142	-132	-123
70	-223	-205	-190	-177	-165	-154	-143
80	-254	-234	-217	-202	-188	-175	-163
90	-286	-263	-244	-227	-211	-197	-183
100	-318	-293	-271	-252	-234	-218	-203
110	-350	-322	-298	-277	-258	-240	-224
120	-381	-351	-325	-302	-281	-262	-244
130	-413	-380	-352	-327	-304	-284	-265
140	-444	-409	-379	-352	-327	-305	-285
150	-475	-438	-406	-377	-351	-327	-305
160	-506	-467	-433	-402	-374	-348	-325
170	-538	-496	-460	-427	-397	-370	-345
180	-569	-525	-486	-452	-420	-391	-365
190	-600	-554	-513	-477	-443	-413	-385
200	-631	-582	-539	-501	-466	-434	-405
220	-693	-639	-592	-550	-512	-477	-445
240	-755	-697	-645	-600	-558	-520	-485
260	-817	-754	-698	-649	-603	-563	-525
280	-879	-811	-751	-698	-649	-605	-565
300	-940	-868	-804	-747	-695	-647	-604
320	-1001	-924	-855	-795	-740	-690	-644
340	-1062	-981	-909	-844	-785	-732	-683
360	-1123	-1037	-961	-893	-831	-774	-723
380	-1184	-1094	-1014	-942	-876	-816	-762
400	-1245	-1150	-1066	-990	-921	-858	-801
420	-1306	-1206	-1118	-1038	-966	-900	-841
440	-1366	-1262	-1170	-1087	-1011	-942	-880
460	-1426	-1318	-1222	-1135	-1056	-984	-919
480	-1486	-1373	-1274	-1184	-1101	-1026	-958
500	-1546	-1429	-1326	-1232	-1146	-1068	-998

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	11500	12000	12500	13000	13500	14000	14500
10	-19	-18	-17	-16	-15	-14	-14
20	-38	-36	-34	-32	-30	-28	-27
30	-57	-54	-51	-48	-45	-42	-40
40	-76	-71	-67	-63	-60	-56	-53
50	-95	-89	-84	-79	-74	-70	-66
60	-114	-107	-101	-95	-89	-84	-79
70	-133	-125	-118	-111	-104	-98	-92
80	-152	-143	-135	-128	-119	-112	-105
90	-171	-161	-151	-142	-134	-126	-118
100	-190	-178	-167	-157	-148	-139	-131
110	-209	-196	-184	-173	-163	-153	-145
120	-228	-214	-200	-188	-177	-167	-158
130	-247	-232	-217	-204	-192	-181	-171
140	-266	-249	-233	-219	-207	-195	-184
150	-285	-267	-250	-235	-222	-209	-197
160	-304	-284	-266	-250	-236	-222	-210
170	-323	-302	-283	-266	-251	-236	-223
180	-341	-319	-299	-281	-265	-250	-236
190	-360	-337	-316	-297	-280	-264	-248
200	-378	-354	-332	-312	-294	-277	-262
220	-416	-389	-365	-343	-323	-305	-288
240	-453	-424	-398	-374	-352	-332	-314
260	-491	-459	-431	-405	-381	-359	-340
280	-528	-494	-464	-435	-410	-387	-366
300	-565	-529	-496	-466	-439	-414	-392
320	-602	-564	-529	-497	-468	-442	-418
340	-639	-599	-562	-528	-497	-469	-443
360	-676	-633	-594	-558	-526	-496	-469
380	-713	-668	-626	-588	-554	-523	-495
400	-750	-703	-659	-619	-583	-550	-521
420	-787	-737	-691	-649	-611	-577	-547
440	-824	-772	-724	-680	-640	-605	-573
460	-860	-806	-756	-710	-669	-632	-598
480	-897	-841	-789	-741	-698	-659	-624
500	-934	-875	-821	-771	-726	-686	-650

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS.

Height of target feet	Map range - yards						
	15000	15500	16000	16500	17000	17500	18000
10	-13	-12	-11	-11	-10	-10	-9
20	-26	-24	-23	-21	-20	-19	-18
30	-38	-36	-34	-32	-30	-29	-27
40	-50	-48	-45	-42	-40	-38	-36
50	-62	-59	-56	-53	-50	-48	-46
60	-75	-71	-67	-64	-61	-58	-55
70	-87	-83	-79	-75	-71	-67	-64
80	-100	-95	-90	-85	-81	-77	-73
90	-112	-107	-101	-96	-91	-86	-82
100	-124	-118	-112	-106	-101	-96	-91
110	-137	-130	-123	-117	-111	-106	-99
120	-149	-141	-134	-127	-121	-115	-109
130	-162	-153	-146	-138	-131	-125	-118
140	-174	-165	-157	-149	-141	-134	-128
150	-187	-177	-168	-160	-151	-144	-137
160	-199	-189	-179	-170	-161	-153	-146
170	-212	-201	-190	-181	-171	-163	-156
180	-224	-212	-201	-191	-181	-173	-165
190	-236	-224	-212	-202	-191	-183	-174
200	-248	-235	-223	-212	-201	-192	-183
220	-275	-259	-246	-233	-221	-211	-201
240	-298	-282	-268	-254	-241	-230	-220
260	-323	-305	-290	-275	-261	-249	-238
280	-347	-329	-312	-296	-281	-268	-256
300	-371	-352	-334	-317	-301	-287	-274
320	-396	-375	-356	-338	-321	-306	-292
340	-420	-399	-379	-359	-341	-325	-310
360	-445	-422	-401	-380	-361	-344	-328
380	-469	-445	-423	-401	-381	-363	-347
400	-494	-469	-445	-422	-401	-382	-365
420	-519	-492	-467	-443	-421	-401	-383
440	-543	-515	-489	-464	-441	-420	-401
460	-567	-538	-511	-485	-461	-439	-419
480	-592	-562	-533	-506	-481	-458	-437
500	-617	-585	-555	-527	-501	-477	-455

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS.

Height of target feet	Map range - yards						
	18500	19000	19500	20000	20500	21000	21500
10	-9	-9	-8	-8	-7	-7	-7
20	-17	-17	-16	-16	-14	-13	-13
30	-26	-25	-24	-23	-21	-20	-19
40	-34	-33	-32	-30	-28	-27	-26
50	-43	-41	-39	-37	-35	-34	-32
60	-52	-49	-47	-44	-42	-40	-39
70	-60	-57	-55	-52	-50	-47	-45
80	-69	-66	-63	-60	-57	-54	-52
90	-78	-74	-71	-67	-64	-61	-58
100	-87	-83	-79	-75	-71	-68	-64
110	-95	-91	-87	-83	-78	-75	-71
120	-104	-99	-95	-90	-85	-81	-77
130	-113	-108	-103	-98	-93	-88	-84
140	-122	-116	-111	-105	-100	-95	-90
150	-131	-125	-119	-113	-107	-102	-97
160	-140	-133	-127	-120	-114	-108	-102
170	-149	-141	-135	-128	-121	-115	-110
180	-157	-149	-142	-135	-128	-122	-116
190	-166	-158	-150	-143	-135	-129	-123
200	-174	-166	-158	-150	-142	-135	-129
220	-192	-183	-174	-165	-157	-149	-142
240	-209	-199	-189	-180	-171	-162	-155
260	-227	-215	-205	-195	-185	-176	-168
280	-247	-232	-221	-210	-199	-189	-180
300	-261	-248	-236	-224	-213	-202	-193
320	-278	-265	-252	-239	-227	-216	-206
340	-296	-282	-268	-254	-241	-229	-219
360	-313	-298	-283	-269	-256	-243	-232
380	-331	-315	-299	-284	-270	-256	-244
400	-348	-331	-315	-299	-284	-270	-257
420	-365	-348	-331	-314	-298	-283	-270
440	-382	-364	-346	-329	-312	-297	-293
460	-399	-380	-361	-343	-326	-310	-296
480	-417	-397	-377	-358	-340	-324	-309
500	-434	-413	-393	-373	-354	-337	-321

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	22000	22500	23000	23500	24000	24500	25000
10	-6	-6	-6	-6	-5	-5	-5
20	-12	-12	-11	-11	-11	-10	-10
30	-18	-17	-17	-17	-16	-15	-15
40	-24	-23	-22	-22	-21	-20	-20
50	-30	-29	-28	-27	-26	-25	-24
60	-36	-35	-34	-32	-31	-30	-29
70	-43	-41	-39	-38	-36	-35	-34
80	-49	-47	-45	-43	-41	-40	-39
90	-55	-53	-51	-49	-47	-45	-44
100	-61	-59	-57	-54	-52	-50	-48
110	-68	-65	-63	-61	-58	-55	-53
120	-74	-71	-68	-65	-63	-60	-57
130	-80	-77	-74	-71	-68	-65	-62
140	-86	-83	-79	-76	-73	-70	-67
150	-93	-89	-85	-82	-78	-75	-72
160	-99	-95	-91	-87	-83	-80	-76
170	-105	-101	-97	-92	-88	-85	-81
180	-115	-106	-102	-97	-92	-90	-86
190	-117	-112	-108	-103	-98	-95	-91
200	-123	-118	-113	-108	-103	-99	-95
220	-136	-130	-125	-119	-114	-109	-105
240	-148	-141	-136	-130	-124	-119	-114
260	-160	-153	-147	-141	-135	-129	-124
280	-172	-165	-158	-152	-145	-139	-133
300	-184	-176	-169	-162	-155	-148	-142
320	-197	-188	-180	-173	-165	-158	-151
340	-209	-200	-191	-183	-175	-168	-161
360	-221	-211	-202	-194	-186	-178	-170
380	-233	-223	-214	-205	-196	-188	-180
400	-245	-235	-225	-216	-206	-197	-189
420	-257	-246	-236	-226	-216	-207	-198
440	-270	-258	-247	-237	-227	-217	-208
460	-282	-270	-258	-247	-237	-227	-217
480	-294	-281	-269	-258	-247	-237	-227
500	-306	-293	-281	-269	-257	-246	-236

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE C

TARGET ABOVE GUN - RANGE EFFECTS IN YARDS

Height of target feet	Map range - yards						
	25500	25000	26500	27000	28000	29000	30000
10	-5	-5	-4	-4	-4	-4	-3
20	-10	-10	-8	-8	-7	-7	-5
30	-15	-14	-12	-12	-11	-10	-8
40	-19	-18	-17	-16	-15	-13	-11
50	-23	-22	-21	-20	-19	-16	-14
60	-28	-26	-25	-24	-21	-19	-17
70	-33	-31	-29	-28	-25	-23	-20
80	-38	-36	-34	-32	-29	-26	-23
90	-42	-40	-38	-36	-32	-29	-26
100	-46	-44	-42	-40	-36	-33	-29
110	-50	-48	-46	-44	-40	-36	-32
120	-55	-53	-50	-48	-43	-39	-35
130	-60	-57	-54	-52	-47	-43	-38
140	-64	-61	-58	-56	-50	-46	-40
150	-69	-66	-63	-60	-54	-49	-43
160	-73	-70	-67	-64	-58	-52	-46
170	-78	-74	-71	-68	-62	-56	-49
180	-82	-78	-75	-72	-65	-59	-52
190	-87	-83	-79	-76	-69	-62	-55
200	-91	-87	-83	-79	-72	-65	-58
220	-100	-96	-91	-87	-79	-72	-64
240	-109	-104	-99	-95	-87	-78	-69
260	-118	-113	-108	-103	-94	-85	-75
280	-127	-122	-116	-111	-101	-92	-81
300	-136	-131	-125	-119	-109	-98	-87
320	-145	-139	-133	-127	-116	-105	-93
340	-154	-148	-141	-135	-124	-111	-98
360	-163	-157	-150	-143	-131	-118	-104
380	-172	-165	-158	-151	-138	-124	-109
400	-181	-174	-166	-159	-145	-131	-115
420	-190	-182	-174	-167	-152	-137	-121
440	-199	-191	-183	-175	-159	-143	-126
460	-208	-200	-191	-182	-166	-150	-132
480	-217	-208	-199	-190	-173	-156	-137
500	-226	-217	-207	-198	-180	-163	-143

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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	+27	+21	+16	+11	+5	0	-5	-11	-16	-21	-27
2000	+49	+39	+29	+20	+10	0	-10	-20	-29	-39	-49
3000	+68	+54	+41	+27	+14	0	-14	-27	-41	-54	-68
4000	+84	+67	+51	+34	+17	0	-17	-34	-51	-67	-84
5000	+98	+78	+59	+39	+20	0	-20	-39	-59	-78	-98
6000	+109	+87	+65	+44	+22	0	-22	-44	-65	-87	-109
7000	+118	+95	+71	+47	+24	0	-24	-47	-71	-95	-118
8000	+126	+101	+76	+50	+25	0	-25	-50	-76	-101	-126
9000	+132	+105	+79	+53	+26	0	-26	-53	-79	-105	-132
10000	+135	+108	+81	+54	+27	0	-27	-54	-81	-108	-135
11000	+136	+108	+81	+54	+27	0	-27	-54	-81	-108	-136
12000	+134	+107	+80	+54	+27	0	-27	-54	-80	-107	-134
13000	+131	+104	+78	+52	+26	0	-26	-52	-78	-104	-131
14000	+125	+100	+75	+50	+25	0	-25	-50	-75	-100	-125
15000	+117	+94	+70	+47	+24	0	-24	-47	-70	-94	-117
16000	+107	+85	+64	+43	+21	0	-21	-43	-64	-85	-107
17000	+96	+78	+57	+38	+19	0	-19	-38	-57	-78	-96
18000	+83	+66	+50	+33	+17	0	-17	-33	-50	-66	-83
19000	+69	+55	+42	+28	+14	0	-14	-28	-42	-55	-69
20000	+56	+44	+33	+22	+11	0	-11	-22	-33	-44	-56
21000	+43	+34	+25	+17	+9	0	-9	-17	-25	-34	-43
22000	+30	+24	+18	+12	+6	0	-6	-12	-18	-24	-30
23000	+18	+15	+11	+7	+4	0	-4	-7	-11	-15	-18
24000	+7	+6	+4	+3	+1	0	-1	-3	-4	-6	-7
25000	-4	-3	-2	-1	-1	0	+1	+1	+2	+3	+4
26000	-14	-11	-8	-5	-3	0	+3	+5	+8	+11	+14
27000	-24	-19	-14	-9	-5	0	+5	+9	+14	+19	+24
28000	-33	-26	-20	-13	-7	0	+7	+13	+20	+26	+33
29000	-40	-32	-24	-16	-8	0	+8	+16	+24	+32	+40
30000	-43	-35	-26	-17	-9	0	+9	+17	+26	+35	+43
30100	-44	-35	-26	-17	-9	0	+9	+17	+26	+35	+44

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE E

\*ROTATION OF THE EARTH, EFFECTS IN YARDS OF RANGE DUE TO  
Latitude 0°

Range yards	Azimuth of target - degrees							
	0 180	15 165	30 150	45 135	60 120	75 105	90 90	
2000	0	+5-	+9-	+12-	+15-	+17-	+18-	
4000	0	+9-	+17-	+24-	+29-	+33-	+34-	
6000	0	+13-	+25-	+35-	+42-	+48-	+49-	
8000	0	+17-	+32-	+45-	+55-	+62-	+64-	
10000	0	+20-	+38-	+54-	+66-	+74-	+77-	
12000	0	+23-	+43-	+61-	+75-	+84-	+87-	
14000	0	+25-	+47-	+67-	+82-	+92-	+95-	
16000	0	+26-	+50-	+71-	+88-	+98-	+101-	
18000	0	+27-	+53-	+75-	+92-	+102-	+106-	
20000	0	+28-	+55-	+78-	+95-	+106-	+110-	
22000	0	+29-	+57-	+80-	+98-	+109-	+113-	
24000	0	+30-	+58-	+82-	+100-	+112-	+116-	
26000	0	+31-	+59-	+83-	+102-	+114-	+118-	
28000	0	+30-	+58-	+82-	+100-	+112-	+116-	
30000	0	+28-	+55-	+77-	+94-	+105-	+109-	
30100	0	+28-	+54-	+76-	+94-	+104-	+108-	
	180 360	195 345	210 330	225 315	240 300	255 285	270 270	

\*For argument at top of tables use the sign that is before the number.  
\*For argument at bottom of tables use the sign that follows the number.  
\*Azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE E

\*ROTATION OF THE EARTH, EFFECTS IN YARDS OF RANGE DUE TO  
Latitude 10° (North or South)

Range yards	Azimuth of target - degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+5-	+9-	+13-	+15-	+17-	+18-
4000	0	+9-	+17-	+24-	+29-	+32-	+34-
6000	0	+12-	+24-	+35-	+42-	+47-	+49-
8000	0	+16-	+31-	+45-	+54-	+61-	+63-
10000	0	+19-	+37-	+54-	+65-	+73-	+78-
12000	0	+22-	+43-	+61-	+74-	+83-	+86-
14000	0	+24-	+47-	+66-	+81-	+90-	+94-
16000	0	+25-	+50-	+70-	+86-	+96-	+100-
18000	0	+27-	+52-	+74-	+90-	+101-	+104-
20000	0	+28-	+54-	+77-	+93-	+105-	+108-
22000	0	+29-	+56-	+79-	+96-	+108-	+111-
24000	0	+30-	+57-	+81-	+99-	+110-	+114-
26000	0	+30-	+58-	+82-	+101-	+112-	+116-
28000	0	+30-	+57-	+81-	+99-	+110-	+114-
30000	0	+28-	+54-	+76-	+93-	+104-	+107-
30100	0	+28-	+53-	+75-	+92-	+103-	+106-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of target - degrees						

or argument at top of tables use the sign that is before the number.  
or argument at bottom of tables use the sign that follows the number.  
Azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+4-	+8-	+12-	+15-	+16-	+17-
4000	0	+8-	+16-	+23-	+28-	+31-	+32-
6000	0	+12-	+23-	+33-	+40-	+45-	+46-
8000	0	+16-	+30-	+43-	+52-	+58-	+60-
10000	0	+19-	+36-	+51-	+63-	+70-	+72-
12000	0	+21-	+41-	+58-	+71-	+79-	+82-
14000	0	+23-	+45-	+65-	+77-	+86-	+89-
16000	0	+25-	+48-	+67-	+82-	+92-	+95-
18000	0	+26-	+50-	+70-	+86-	+96-	+100-
20000	0	+27-	+52-	+73-	+89-	+100-	+103-
22000	0	+27-	+53-	+75-	+92-	+103-	+106-
24000	0	+28-	+54-	+77-	+94-	+105-	+109-
26000	0	+29-	+55-	+78-	+96-	+107-	+111-
28000	0	+28-	+54-	+77-	+94-	+105-	+109-
30000	0	+27-	+51-	+72-	+89-	+99-	+102-
30100	0	+26-	+51-	+72-	+88-	+98-	+101-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of target - degrees						

\*For argument at top of tables use the sign that is before the number.  
\*For argument at bottom of tables use the sign that follows the number.  
\*Azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE E

\*ROTATION OF THE EARTH, EFFECTS IN YARDS OF RANGE DUE TO  
Latitude 30° (North or South)

Range yards	Azimuth of target - degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+4-	+8-	+11-	+14-	+15-	+16-
4000	0	+8-	+15-	+21-	+26-	+28-	+30-
6000	0	+11-	+21-	+30-	+37-	+41-	+43-
8000	0	+14-	+27-	+39-	+48-	+53-	+56-
10000	0	+17-	+33-	+47-	+58-	+64-	+67-
12000	0	+19-	+38-	+53-	+65-	+73-	+75-
14000	0	+21-	+41-	+58-	+71-	+79-	+82-
16000	0	+23-	+44-	+62-	+76-	+84-	+87-
18000	0	+24-	+46-	+65-	+80-	+89-	+92-
20000	0	+25-	+48-	+67-	+83-	+92-	+95-
22000	0	+25-	+49-	+69-	+85-	+95-	+98-
24000	0	+25-	+50-	+71-	+87-	+97-	+100-
26000	0	+26-	+51-	+72-	+88-	+99-	+102-
28000	0	+26-	+50-	+72-	+87-	+97-	+100-
30000	0	+24-	+47-	+67-	+82-	+91-	+94-
30100	0	+24-	+47-	+66-	+81-	+90-	+94-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of target - degrees						

or argument at top of tables use the sign that is before the number.  
or argument at bottom of tables use the sign that follows the number.  
Azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

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						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+4-	+7-	+10-	+12-	+13-	+14-
4000	0	+7-	+13-	+19-	+23-	+25-	+26-
6000	0	+10-	+19-	+27-	+33-	+36-	+38-
8000	0	+13-	+24-	+35-	+42-	+47-	+49-
10000	0	+15-	+29-	+42-	+51-	+56-	+59-
12000	0	+17-	+33-	+47-	+58-	+64-	+67-
14000	0	+19-	+36-	+51-	+63-	+70-	+73-
16000	0	+20-	+39-	+55-	+67-	+75-	+77-
18000	0	+21-	+41-	+58-	+70-	+78-	+81-
20000	0	+22-	+42-	+60-	+73-	+81-	+84-
22000	0	+22-	+43-	+61-	+75-	+84-	+87-
24000	0	+23-	+44-	+63-	+77-	+86-	+89-
26000	0	+23-	+45-	+64-	+78-	+87-	+90-
28000	0	+23-	+44-	+63-	+77-	+86-	+89-
30000	0	+22-	+42-	+59-	+72-	+81-	+83-
30100	0	+21-	+41-	+59-	+72-	+80-	+83-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of target - degrees						

\*For argument at top of tables use the sign that is before the number.  
\*For argument at bottom of tables use the sign that follows the number.  
\*Azimuth measured clockwise from North.

P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 V. = 2275 fps

PART 2 TABLE E

\*ROTATION OF THE EARTH, EFFECTS IN YARDS OF RANGE DUE TO  
 Latitude 50° (North or South)

Range yards	Azimuth of target - degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+3-	+6-	+8-	+10-	+11-	+12-
4000	0	+6-	+11-	+15-	+19-	+21-	+22-
6000	0	+8-	+16-	+22-	+27-	+31-	+32-
8000	0	+11-	+21-	+29-	+35-	+40-	+41-
10000	0	+13-	+25-	+35-	+43-	+48-	+49-
12000	0	+14-	+28-	+40-	+49-	+54-	+56-
14000	0	+16-	+31-	+43-	+53-	+59-	+61-
16000	0	+17-	+33-	+46-	+56-	+63-	+65-
18000	0	+18-	+34-	+48-	+59-	+66-	+68-
20000	0	+18-	+35-	+50-	+61-	+68-	+71-
22000	0	+19-	+36-	+51-	+63-	+70-	+73-
24000	0	+19-	+37-	+53-	+65-	+72-	+75-
26000	0	+20-	+38-	+54-	+66-	+73-	+76-
28000	0	+19-	+37-	+53-	+65-	+72-	+75-
30000	0	+18-	+35-	+50-	+61-	+68-	+70-
30100	0	+18-	+35-	+49-	+60-	+67-	+69-
	120 360	195 345	210 330	225 315	240 300	255 285	270 270
	Azimuth of target - degrees						

or argument at top of tables use the sign that is before the number.  
 or argument at bottom of tables use the sign that follows the number.  
 azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

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						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+2-	+4-	+6-	+8-	+9-	+9-
4000	0	+4-	+8-	+12-	+15-	+17-	+17-
6000	0	+6-	+12-	+17-	+21-	+24-	+25-
8000	0	+8-	+16-	+22-	+27-	+31-	+32-
10000	0	+10-	+19-	+27-	+33-	+37-	+38-
12000	0	+11-	+22-	+31-	+38-	+42-	+43-
14000	0	+12-	+24-	+34-	+41-	+46-	+47-
16000	0	+13-	+25-	+36-	+44-	+49-	+50-
18000	0	+14-	+26-	+37-	+46-	+51-	+53-
20000	0	+14-	+27-	+39-	+43-	+53-	+55-
22000	0	+15-	+28-	+40-	+49-	+55-	+57-
24000	0	+15-	+29-	+41-	+50-	+56-	+58-
26000	0	+15-	+29-	+42-	+51-	+57-	+59-
28000	0	+15-	+29-	+41-	+50-	+56-	+58-
30000	0	+14-	+27-	+30-	+47-	+53-	+55-
30100	0	+14-	+27-	+38-	+47-	+52-	+54-
	180 360	195 345	210 330	225 315	240 300	255 285	270 270
	Azimuth of target - degrees						

\*For argument at top of tables use the sign that is before the number.  
 \*For argument at bottom of tables use the sign that follows the number.  
 \*Azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE E

\*ROTATION OF THE EARTH, EFFECTS IN YARDS OF RANGE DUE TO  
 Latitude 70° (North or South)

Range yards	Azimuth of target - degrees						
	0 180	15 165	30 150	45 135	60 120	75 105	90 90
2000	0	+2-	+3-	+4-	+5-	+6-	+6-
4000	0	+3-	+6-	+8-	+10-	+11-	+12-
6000	0	+4-	+8-	+12-	+15-	+16-	+17-
8000	0	+6-	+11-	+15-	+19-	+21-	+22-
10000	0	+7-	+13-	+18-	+23-	+25-	+26-
12000	0	+8-	+15-	+21-	+26-	+28-	+30-
14000	0	+8-	+16-	+23-	+28-	+31-	+33-
16000	0	+9-	+17-	+24-	+30-	+33-	+35-
18000	0	+9-	+18-	+26-	+31-	+35-	+36-
20000	0	+10-	+19-	+27-	+33-	+36-	+38-
22000	0	+10-	+19-	+27-	+34-	+37-	+39-
24000	0	+10-	+20-	+28-	+34-	+38-	+40-
26000	0	+10-	+20-	+28-	+35-	+39-	+40-
28000	0	+10-	+20-	+28-	+34-	+38-	+40-
30000	0	+10-	+19-	+26-	+32-	+36-	+37-
30100	0	+10-	+18-	+26-	+32-	+36-	+37-
	180	195	210	225	240	255	270
	360	345	330	315	300	285	270
	Azimuth of target - degrees						

or argument at top of tables use the sign that is before the  
 number.  
 or argument at bottom of tables use the sign that follows the  
 number.  
 azimuth measured clockwise from North.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE Fa

MUZZLE VELOCITY, EFFECT 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	8	17	25	34	42	50	58	67
2000	16	33	49	66	82	98	115	132
3000	24	49	73	98	122	146	171	196
4000	32	65	97	130	162	194	226	259
5000	40	81	121	161	201	241	281	321
6000	48	96	144	191	239	287	335	383
7000	55	111	166	221	276	331	387	443
8000	62	125	187	250	312	374	437	500
9000	69	139	208	277	346	415	485	554
10000	76	152	228	303	379	455	531	607
11000	82	165	247	329	411	494	576	659
12000	88	177	266	354	443	532	621	710
13000	94	189	284	379	474	569	665	760
14000	100	201	302	403	504	605	707	809
15000	106	213	320	427	534	641	749	857
16000	112	225	337	450	563	676	790	904
17000	118	236	354	473	592	711	831	950
18000	124	247	371	495	620	745	870	995
19000	130	259	388	518	648	779	910	1040
20000	135	270	405	540	676	813	949	1085
21000	141	281	422	563	704	846	988	1130
22000	146	292	439	585	732	880	1027	1175
23000	151	303	455	607	760	913	1067	1220
24000	157	314	472	630	788	947	1107	1266
25000	163	326	489	653	817	982	1147	1313
26000	169	338	507	677	847	1018	1189	1361
27000	175	351	526	702	878	1055	1233	1411
28000	182	364	546	728	911	1095	1279	1464
29000	189	378	567	756	945	1136	1328	1520
30000	196	393	590	787	984	1183	1383	1584
30100	197	395	593	791	990	1190	1391	1593

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Fa

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

Range yards	Increase in muzzle velocity - feet per second						
	90	100	110	120	130	140	150
1000	75	83	91	100	108	117	125
2000	149	165	181	198	215	232	249
3000	221	246	270	295	321	346	371
4000	292	325	357	390	424	457	490
5000	362	403	444	485	526	567	608
6000	432	481	530	578	627	676	725
7000	499	555	612	668	724	781	837
8000	563	626	690	753	816	880	943
9000	624	694	765	835	905	975	1045
10000	683	760	837	914	991	1067	1144
11000	742	825	909	992	1075	1158	1242
12000	800	889	979	1069	1159	1249	1339
13000	856	952	1048	1144	1241	1338	1434
14000	911	1013	1116	1218	1321	1424	1527
15000	965	1074	1182	1291	1400	1508	1618
16000	1018	1132	1246	1361	1476	1591	1708
17000	1070	1190	1310	1430	1551	1672	1792
18000	1120	1246	1372	1498	1625	1752	1878
19000	1171	1303	1435	1567	1699	1831	1964
20000	1222	1359	1497	1635	1772	1910	2049
21000	1272	1415	1558	1702	1845	1989	2133
22000	1323	1471	1620	1769	1918	2067	2217
23000	1374	1528	1682	1837	1992	2147	2302
24000	1426	1586	1746	1907	2068	2229	2390
25000	1479	1645	1810	1978	2145	2312	2480
26000	1533	1705	1877	2051	2225	2399	2573
27000	1589	1768	1948	2128	2308	2489	2670
28000	1649	1835	2022	2209	2397	2585	2773
29000	1713	1908	2101	2296	2492	2688	2884
30000	1785	1986	2189	2393	2597	2802	3007
30100	1795	1998	2202	2407	2613	2819	3025

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Fb

MUZZLE VELOCITY, EFFECT 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	-8	-16	-24	-33	-41	-49	-57	-66
2000	-16	-32	-48	-65	-81	-97	-113	-130
3000	-24	-48	-72	-96	-120	-144	-168	-192
4000	-32	-64	-96	-128	-160	-191	-223	-254
5000	-40	-80	-119	-159	-199	-238	-277	-316
6000	-48	-95	-142	-190	-237	-283	-330	-377
7000	-55	-110	-164	-219	-273	-327	-382	-436
8000	-62	-124	-185	-247	-309	-370	-431	-493
9000	-69	-137	-205	-274	-343	-411	-479	-547
10000	-75	-150	-225	-301	-376	-450	-525	-599
11000	-81	-163	-245	-327	-408	-488	-569	-650
12000	-88	-176	-264	-352	-439	-525	-612	-699
13000	-94	-188	-282	-376	-469	-562	-655	-748
14000	-100	-200	-300	-400	-499	-598	-697	-796
15000	-106	-212	-318	-424	-529	-634	-738	-843
16000	-112	-224	-335	-447	-558	-669	-779	-889
17000	-118	-235	-352	-470	-587	-703	-819	-935
18000	-123	-246	-369	-492	-615	-737	-858	-980
19000	-128	-257	-385	-514	-642	-770	-897	-1024
20000	-134	-268	-402	-536	-670	-803	-936	-1068
21000	-139	-279	-418	-556	-697	-835	-974	-1112
22000	-145	-290	-435	-580	-725	-868	-1012	-1156
23000	-151	-301	-452	-603	-753	-902	-1051	-1200
24000	-156	-312	-469	-625	-781	-936	-1090	-1244
25000	-162	-323	-485	-647	-809	-970	-1130	-1289
26000	-168	-335	-503	-671	-838	-1004	-1170	-1335
27000	-174	-347	-521	-695	-868	-1040	-1211	-1382
28000	-180	-359	-539	-719	-898	-1076	-1253	-1429
29000	-186	-371	-557	-743	-928	-1112	-1295	-1478
30000	-194	-387	-581	-775	-968	-1159	-1350	-1541
30100	-195	-389	-584	-779	-973	-1166	-1358	-1549

P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Fb

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

Range yards	Decrease in Muzzle Velocity - feet per second						
	90	100	110	120	130	140	150
1000	-74	-82	-90	-98	-106	-114	-122
2000	-146	-162	-178	-194	-210	-226	-242
3000	-216	-240	-264	-288	-311	-335	-359
4000	-286	-318	-349	-380	-411	-443	-474
5000	-356	-395	-433	-472	-510	-549	-588
6000	-424	-470	-516	-562	-608	-655	-701
7000	-490	-544	-597	-651	-704	-758	-812
8000	-554	-615	-675	-736	-797	-858	-919
9000	-615	-683	-750	-817	-885	-952	-1020
10000	-673	-748	-822	-895	-969	-1043	-1117
11000	-730	-811	-891	-971	-1051	-1131	-1211
12000	-786	-873	-959	-1045	-1131	-1217	-1303
13000	-841	-934	-1026	-1118	-1210	-1302	-1394
14000	-895	-994	-1092	-1190	-1288	-1386	-1484
15000	-948	-1053	-1157	-1261	-1365	-1469	-1573
16000	-1000	-1111	-1221	-1331	-1440	-1550	-1660
17000	-1051	-1168	-1284	-1399	-1514	-1629	-1745
18000	-1102	-1224	-1345	-1466	-1586	-1707	-1828
19000	-1152	-1279	-1405	-1531	-1657	-1783	-1909
20000	-1201	-1334	-1465	-1596	-1728	-1859	-1990
21000	-1250	-1388	-1525	-1662	-1799	-1935	-2072
22000	-1300	-1443	-1585	-1728	-1870	-2012	-2154
23000	-1349	-1498	-1646	-1794	-1941	-2089	-2236
24000	-1399	-1554	-1707	-1860	-2013	-2166	-2318
25000	-1449	-1609	-1768	-1926	-2084	-2242	-2400
26000	-1500	-1665	-1829	-1992	-2156	-2319	-2482
27000	-1553	-1723	-1892	-2060	-2229	-2397	-2565
28000	-1606	-1782	-1956	-2130	-2304	-2477	-2650
29000	-1661	-1842	-2022	-2202	-2382	-2561	-2740
30000	-1731	-1919	-2106	-2293	-2400	-2666	-2852
31000	-1740	-1929	-2118	-2306	-2494	-2681	-2869

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Ga

AIR DENSITY, EFFECT IN YARDS OF RANGE, DUE TO DECREASE IN  
(59°F. and 29.5 \* in.)

Range yards	Decrease in air density - per cent							
	1	2	3	4	5	6	7	8
1000	0	1	1	2	2	2	3	3
2000	1	2	3	4	5	6	7	8
3000	2	4	6	8	10	12	14	16
4000	3	7	10	13	17	20	23	27
5000	5	10	15	20	25	30	36	41
6000	7	14	22	29	36	43	51	58
7000	10	19	29	39	49	58	68	78
8000	12	25	37	50	63	75	88	101
9000	15	31	46	62	78	94	109	125
10000	19	37	56	75	94	114	133	152
11000	22	45	67	90	112	135	158	181
12000	26	52	79	105	132	158	185	212
13000	30	60	91	122	152	183	214	246
14000	35	69	104	139	175	210	246	281
15000	39	79	118	158	198	238	278	319
16000	44	88	133	178	223	268	313	359
17000	49	99	148	198	249	299	350	401
18000	54	109	164	220	276	332	389	446
19000	60	121	181	243	305	367	429	492
20000	66	132	199	266	334	402	471	540
21000	71	143	216	289	363	437	512	588
22000	77	155	233	312	392	473	554	636
23000	83	167	251	336	421	508	596	684
24000	89	178	268	359	450	542	636	731
25000	94	189	285	382	479	577	677	777
26000	100	200	302	404	507	612	717	823
27000	105	211	318	427	536	646	757	869
28000	111	222	335	449	564	679	796	914
29000	116	233	351	470	591	712	834	958
30000	121	243	366	491	617	744	872	1001

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Ga

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

Range yards	Decrease in air density - per cent							
	9	10	11	12	13	14	15	16
1000	4	4	4	5	5	5	6	6
2000	9	10	11	12	12	13	14	15
3000	18	20	22	23	25	27	29	31
4000	30	34	37	40	44	47	51	54
5000	46	51	56	62	67	72	78	83
6000	66	73	81	88	96	104	111	119
7000	88	98	109	119	129	139	150	160
8000	114	127	140	153	166	179	193	206
9000	141	158	174	190	206	223	239	256
10000	172	191	211	231	251	271	291	311
11000	204	228	251	275	298	322	346	370
12000	239	267	294	322	349	377	405	433
13000	277	309	340	372	404	436	469	501
14000	317	353	390	426	463	500	537	574
15000	360	401	442	483	525	567	609	651
16000	405	451	498	545	592	639	686	734
17000	453	504	556	609	661	714	768	821
18000	503	560	618	677	735	794	853	913
19000	556	619	684	748	813	879	945	1011
20000	610	680	751	822	894	966	1039	1112
21000	664	741	818	896	975	1054	1134	1214
22000	719	802	886	971	1056	1142	1229	1316
23000	773	863	953	1044	1136	1229	1323	1417
24000	826	922	1019	1116	1215	1314	1414	1515
25000	878	980	1083	1187	1292	1397	1504	1611
26000	930	1039	1148	1258	1369	1481	1593	1707
27000	982	1097	1212	1328	1445	1564	1683	1803
28000	1033	1154	1275	1397	1521	1646	1771	1898
29000	1083	1209	1336	1465	1594	1725	1857	1990
30000	1132	1264	1397	1531	1666	1803	1941	2080

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE Gb

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

Range yards	Increase in air density - per cent							
	1	2	3	4	5	6	7	8
1000	0	-1	-1	-2	-2	-3	-3	-4
2000	-1	-2	-3	-4	-4	-6	-7	-8
3000	-2	-4	-6	-8	-10	-12	-14	-16
4000	-3	-7	-10	-13	-16	-20	-23	-26
5000	-5	-10	-15	-20	-25	-30	-34	-39
6000	-7	-14	-21	-28	-35	-42	-49	-56
7000	-10	-19	-29	-38	-47	-57	-66	-75
8000	-12	-25	-37	-49	-61	-73	-85	-97
9000	-15	-31	-46	-61	-76	-91	-105	-120
10000	-19	-37	-55	-74	-92	-110	-128	-146
11000	-22	-44	-66	-88	-109	-131	-152	-174
12000	-26	-52	-77	-103	-128	-154	-179	-204
13000	-30	-60	-90	-119	-149	-178	-207	-236
14000	-34	-69	-103	-136	-170	-204	-237	-270
15000	-39	-78	-116	-155	-193	-231	-268	-306
16000	-44	-87	-131	-174	-217	-259	-302	-344
17000	-49	-97	-146	-194	-241	-289	-336	-383
18000	-54	-108	-161	-215	-257	-320	-372	-424
19000	-60	-119	-178	-236	-294	-352	-409	-466
20000	-65	-130	-194	-258	-321	-384	-446	-508
21000	-71	-141	-211	-280	-348	-416	-483	-550
22000	-76	-152	-227	-301	-375	-448	-520	-592
23000	-82	-163	-243	-323	-402	-480	-558	-635
24000	-87	-174	-260	-345	-429	-513	-596	-677
25000	-93	-185	-277	-367	-457	-546	-633	-720
26000	-98	-196	-293	-389	-484	-578	-671	-763
27000	-104	-207	-309	-410	-510	-609	-708	-805
28000	-109	-217	-325	-431	-536	-640	-743	-845
29000	-115	-228	-340	-451	-561	-670	-778	-884
30000	-120	-238	-355	-471	-586	-700	-812	-923

P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE Gb

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

Range yards	Increase in air density - per cent							
	9	10	11	12	13	14	15	16
1000	-4	-5	-5	-6	-6	-7	-7	-8
2000	-10	-11	-13	-15	-15	-16	-18	-19
3000	-18	-20	-22	-24	-27	-29	-31	-33
4000	-29	-33	-36	-39	-42	-46	-49	-52
5000	-44	-49	-54	-58	-63	-68	-72	-77
6000	-63	-69	-76	-83	-89	-96	-102	-109
7000	-84	-93	-102	-111	-120	-129	-138	-147
8000	-108	-120	-132	-143	-155	-166	-178	-189
9000	-135	-149	-164	-178	-193	-207	-221	-235
10000	-164	-181	-199	-216	-234	-251	-268	-285
11000	-195	-216	-237	-258	-279	-299	-320	-340
12000	-229	-253	-278	-302	-327	-351	-375	-399
13000	-265	-293	-322	-350	-378	-406	-434	-462
14000	-303	-336	-369	-401	-433	-465	-497	-529
15000	-343	-380	-417	-454	-491	-527	-563	-599
16000	-386	-427	-469	-510	-551	-591	-632	-672
17000	-429	-476	-522	-567	-613	-658	-702	-747
18000	-475	-526	-577	-627	-677	-727	-776	-825
19000	-522	-578	-633	-688	-743	-797	-851	-904
20000	-569	-629	-689	-749	-808	-867	-925	-983
21000	-616	-682	-746	-811	-874	-937	-1000	-1062
22000	-663	-734	-803	-872	-940	-1008	-1075	-1141
23000	-711	-786	-860	-933	-1006	-1078	-1150	-1220
24000	-758	-838	-917	-996	-1073	-1150	-1226	-1301
25000	-806	-891	-975	-1059	-1141	-1222	-1303	-1383
3000	-854	-944	-1033	-1121	-1208	-1295	-1381	-1465
4000	-901	-996	-1090	-1183	-1275	-1366	-1456	-1545
5000	-946	-1046	-1144	-1242	-1338	-1433	-1528	-1621
6000	-990	-1094	-1197	-1299	-1400	-1499	-1598	-1695
7000	-1033	-1142	-1250	-1356	-1461	-1565	-1668	-1769

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

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	+3	+2	+2	+2	+1	0	0	0	-1	-1	-2	-2
2000	+6	+5	+4	+3	+2	+1	0	0	-1	-2	-4	-5
3000	+10	+9	+7	+5	+3	+2	0	0	-2	-4	-6	-8
4000	+15	+13	+10	+8	+5	+2	0	0	-3	-5	-8	-11
5000	+21	+17	+14	+10	+7	+3	0	0	-4	-7	-11	-14
6000	+27	+22	+18	+13	+9	+4	0	0	-5	-9	-14	-18
7000	+34	+28	+22	+17	+11	+5	0	-1	-6	-12	-18	-23
8000	+42	+34	+27	+20	+13	+6	0	-1	-8	-15	-22	-28
9000	+50	+41	+33	+24	+16	+8	0	-1	-9	-18	-26	-34
10000	+59	+49	+39	+29	+19	+9	0	-1	-11	-21	-31	-41
11000	+68	+57	+45	+33	+22	+10	0	-1	-13	-24	-36	-47
12000	+78	+65	+51	+38	+25	+12	0	-1	-15	-28	-41	-54
13000	+88	+73	+58	+43	+28	+13	0	-1	-16	-31	-46	-61
14000	+98	+81	+65	+48	+32	+15	0	-2	-18	-35	-51	-68
15000	+107	+89	+71	+53	+35	+16	0	-2	-20	-38	-56	-75
16000	+116	+96	+76	+57	+37	+18	0	-2	-22	-41	-61	-81
17000	+123	+102	+81	+60	+39	+19	0	-2	-23	-44	-65	-85
18000	+129	+107	+85	+63	+41	+20	0	-2	-24	-46	-68	-89
19000	+134	+111	+88	+66	+43	+20	0	-2	-25	-48	-71	-93
20000	+138	+115	+91	+68	+44	+21	0	-2	-26	-49	-73	-96
21000	+140	+117	+93	+69	+45	+21	0	-2	-26	-50	-74	-98
22000	+141	+117	+93	+69	+45	+22	0	-2	-26	-50	-74	-98
23000	+140	+116	+92	+69	+45	+21	0	-2	-26	-50	-73	-97
24000	+136	+113	+90	+67	+44	+21	0	-2	-25	-49	-72	-95
25000	+129	+107	+86	+64	+42	+20	0	-2	-24	-46	-68	-90
26000	+117	+98	+78	+58	+38	+18	0	-2	-22	-42	-62	-82
27000	+100	+83	+66	+49	+32	+15	0	-2	-19	-35	-52	-69
28000	+74	+62	+49	+37	+24	+11	0	-1	-14	-26	-39	-51
29000	+38	+32	+23	+19	+12	+6	0	-1	-7	-14	-20	-26
30000	-22	-16	-14	-11	-7	-3	0	0	+4	+8	+11	+15
30100	-34	-28	-23	-17	-11	-5	0	+1	+6	+12	+18	+24

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 .P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK. X  
 V. = 2275 fps

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	2	2	2
2000	1	1	2	2	2	3	3	4	4	5
3000	1	2	3	4	4	5	6	7	8	9
4000	2	3	5	6	7	9	10	12	13	15
5000	2	5	7	9	11	14	16	18	20	23
6000	3	7	10	13	16	19	22	25	29	32
7000	4	9	13	17	22	26	30	34	39	43
8000	6	12	17	23	29	35	40	46	52	57
9000	8	15	22	30	38	45	52	60	68	75
10000	10	19	28	38	48	57	66	76	86	95
11000	12	23	34	46	58	70	81	93	105	116
12000	14	28	41	55	69	83	96	110	124	138
13000	16	32	48	64	80	96	112	128	144	160
14000	18	37	55	73	91	110	128	147	165	183
15000	21	42	62	83	103	124	143	166	187	207
16000	23	47	70	93	116	140	163	186	210	233
17000	26	52	78	104	130	157	183	209	235	261
18000	29	58	87	116	146	175	204	234	263	292
19000	32	65	97	130	163	196	228	261	293	326
20000	36	73	109	145	182	218	254	290	327	363
21000	40	81	121	161	202	242	282	322	363	403
22000	45	90	134	179	224	268	313	357	402	447
23000	49	99	148	195	247	296	346	395	444	494
24000	54	109	163	217	271	326	380	434	489	543
25000	59	119	178	238	297	356	416	475	535	594
26000	65	129	194	259	324	388	453	518	582	647
27000	70	140	211	281	351	421	491	562	632	702
28000	76	152	228	304	380	456	532	608	684	760
29000	82	165	247	329	411	494	576	658	741	823
30000	90	180	270	360	450	540	630	720	810	900
31000	91	182	273	364	454	545	636	727	818	909

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 A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK. X  
 M. V. = 2275 fps

PART 2 TABLE J

CROSS WIND EFFECTS

Range yards	in mils					in degrees				
	Cross Wind - miles per hour									
	10	20	30	40	50	10	20	30	40	50
1000	0.1	0.2	0.3	0.4	0.5	0.01	0.01	0.02	0.02	0.03
2000	0.2	0.4	0.6	0.8	1.0	0.01	0.02	0.03	0.04	0.06
3000	0.3	0.6	0.9	1.2	1.5	0.02	0.03	0.05	0.07	0.08
4000	0.4	0.8	1.2	1.6	2.0	0.02	0.04	0.07	0.09	0.11
5000	0.5	1.0	1.5	2.0	2.5	0.03	0.06	0.08	0.11	0.14
6000	0.6	1.2	1.9	2.5	3.1	0.03	0.07	0.10	0.14	0.17
7000	0.7	1.4	2.2	2.9	3.6	0.04	0.08	0.12	0.16	0.20
8000	0.8	1.6	2.5	3.3	4.1	0.05	0.09	0.14	0.18	0.23
9000	0.9	1.9	2.8	3.8	4.7	0.05	0.11	0.16	0.21	0.26
10000	1.1	2.1	3.2	4.2	5.3	0.06	0.12	0.18	0.24	0.30
11000	1.2	2.4	3.5	4.7	5.9	0.07	0.13	0.20	0.27	0.33
12000	1.3	2.6	3.9	5.2	6.5	0.07	0.15	0.22	0.29	0.37
13000	1.4	2.9	4.3	5.8	7.2	0.08	0.16	0.24	0.32	0.40
14000	1.6	3.2	4.7	6.3	7.9	0.09	0.18	0.27	0.35	0.44
15000	1.7	3.4	5.1	6.9	8.6	0.10	0.19	0.29	0.38	0.48
16000	1.8	3.7	5.5	7.4	9.2	0.10	0.21	0.31	0.41	0.52
17000	2.0	4.0	5.9	7.9	9.9	0.11	0.22	0.33	0.44	0.56
18000	2.1	4.2	6.3	8.4	10.5	0.12	0.24	0.35	0.47	0.59
19000	2.2	4.4	6.7	8.9	11.1	0.12	0.25	0.37	0.50	0.62
20000	2.3	4.7	7.0	9.4	11.7	0.13	0.26	0.39	0.53	0.66
21000	2.5	4.9	7.4	9.8	12.3	0.14	0.28	0.42	0.55	0.69
22000	2.6	5.2	7.7	10.3	12.9	0.15	0.29	0.44	0.58	0.73
23000	2.7	5.4	8.1	10.8	13.5	0.15	0.30	0.46	0.61	0.76
24000	2.8	5.7	8.5	11.3	14.2	0.16	0.32	0.48	0.64	0.80
25000	3.0	5.9	8.9	11.8	14.8	0.17	0.33	0.50	0.67	0.83
26000	3.1	6.2	9.2	12.3	15.4	0.17	0.35	0.52	0.69	0.87
27000	3.2	6.4	9.6	12.8	16.0	0.18	0.36	0.54	0.72	0.90
28000	3.3	6.6	10.0	13.3	16.6	0.19	0.37	0.56	0.75	0.93
29000	3.5	6.9	10.4	13.9	17.3	0.19	0.39	0.58	0.78	0.97
30000	3.7	7.4	11.0	14.7	18.4	0.21	0.41	0.62	0.83	1.03
31000	3.7	7.4	11.2	14.9	18.6	0.21	0.42	0.63	0.84	1.05

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 .P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO Latitude 0°

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	+0.1-	+0.1-	0.0	0.0	0.0	-0.1+	-0.1+
12000	+0.1-	+0.1-	0.0	0.0	0.0	-0.1+	-0.1+
14000	+0.1-	+0.1-	+0.1-	0.0	-0.1+	-0.1+	-0.1+
16000	+0.2-	+0.1-	+0.1-	0.0	-0.1+	-0.1+	-0.2+
18000	+0.2-	+0.2-	+0.1-	0.0	-0.1+	-0.2+	-0.2+
20000	+0.3-	+0.2-	+0.1-	0.0	-0.1+	-0.2+	-0.3+
22000	+0.3-	+0.3-	+0.2-	0.0	-0.2+	-0.3+	-0.3+
24000	+0.4-	+0.4-	+0.2-	0.0	-0.2+	-0.4+	-0.4+
26000	+0.6-	+0.5-	+0.3-	0.0	-0.3+	-0.5+	-0.6+
28000	+0.8-	+0.7-	+0.4-	0.0	-0.4+	-0.6+	-0.8+
30000	+1.2-	+1.0-	+0.6+	0.0	-0.6+	-1.0+	-1.2+
30100	+1.3-	+1.1-	+0.6-	0.0	-0.6+	-1.1+	-1.3+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	Azimuth of target - degrees						
	Latitude 0°						

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 that is before the number.  
 For argument at bottom of table use sign that follows the number.  
 Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO Latitude 10° (North)

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
6000	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+	-0.1+
8000	-0.1+	-0.1+	-0.1+	-0.2+	-0.2+	-0.2+	-0.2+
10000	-0.1+	-0.1+	-0.2+	-0.2+	-0.2+	-0.2+	-0.3+
12000	-0.1+	-0.1+	-0.2+	-0.2+	-0.3+	-0.3+	-0.3+
14000	-0.2+	-0.2+	-0.2+	-0.3+	-0.3+	-0.4+	-0.4+
16000	-0.2+	-0.2+	-0.2+	-0.3+	-0.4+	-0.5+	-0.5+
18000	-0.2+	-0.2+	-0.3+	-0.4+	-0.5+	-0.5+	-0.6+
20000	-0.2+	-0.2+	-0.3+	-0.4+	-0.5+	-0.6+	-0.7+
22000	-0.1+	-0.2+	-0.3+	-0.5+	-0.6+	-0.8+	-0.8+
24000	-0.1+	-0.2+	-0.3+	-0.5+	-0.8+	-0.9+	-1.0+
26000	-0.0+	-0.1+	-0.3+	-0.6+	-0.9+	-1.1+	-1.2+
28000	+0.1-	-0.0+	-0.3+	-0.7+	-1.1+	-1.4+	-1.5+
30000	+0.4-	+0.2-	-0.2+	-0.8+	-1.4+	-1.8+	-2.0+
30100	+0.4-	+0.2-	-0.2+	-0.8+	-1.4+	-1.9+	-2.1+
	180 180	150 210	120 240	90 270	60 300	30 330	0 360
	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 the sign that is before the number.  
 \*For argument at bottom of table use the sign that follows the number.  
 \*Azimuth measured clockwise from the North.

P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO  
 Latitude 20° (North)

Range yards	Azimuth of target - degrees							
	0 360	30 330	60 300	90 270	120 240	150 210	180 180	180 180
2000	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*
4000	-0.1*	-0.1*	-0.1*	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*
6000	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*	-0.3*	-0.3*
8000	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.4*	-0.4*
10000	-0.3*	-0.3*	-0.3*	-0.4*	-0.4*	-0.4*	-0.5*	-0.5*
12000	-0.4*	-0.4*	-0.4*	-0.5*	-0.5*	-0.5*	-0.5*	-0.5*
14000	-0.4*	-0.4*	-0.5*	-0.5*	-0.6*	-0.6*	-0.6*	-0.6*
16000	-0.5*	-0.5*	-0.6*	-0.6*	-0.7*	-0.7*	-0.8*	-0.8*
18000	-0.5*	-0.6*	-0.6*	-0.7*	-0.8*	-0.9*	-0.9*	-0.9*
20000	-0.6*	-0.6*	-0.7*	-0.8*	-0.9*	-1.0*	-1.1*	-1.1*
22000	-0.6*	-0.7*	-0.8*	-0.9*	-1.1*	-1.2*	-1.3*	-1.3*
24000	-0.7*	-0.7*	-0.9*	-1.1*	-1.3*	-1.4*	-1.5*	-1.5*
26000	-0.7*	-0.7*	-1.0*	-1.2*	-1.5*	-1.7*	-1.8*	-1.8*
28000	-0.6*	-0.7*	-1.0*	-1.4*	-1.8*	-2.1*	-2.2*	-2.2*
30000	-0.5*	-0.6*	-1.0*	-1.6*	-2.2*	-2.6*	-2.7*	-2.7*
30100	-0.5*	-0.6*	-1.0*	-1.6*	-2.2*	-2.6*	-2.8*	-2.8*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360	0 360

Azimuth of target - degrees  
 Latitude 20° (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 that is before the number.  
 For argument at bottom of table use the sign that follows the number.  
 Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
 FUZE, B.D., MK.X  
 M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO  
 Latitude 30° (North)

Range yards	Azimuth of target - degrees							
	0 360	30 330	60 300	90 270	120 240	150 210	180 180	180 180
2000	-0.1*	-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*	-0.2*
6000	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.4*	-0.4*
8000	-0.4*	-0.4*	-0.4*	-0.4*	-0.4*	-0.4*	-0.5*	-0.5*
10000	-0.5*	-0.5*	-0.5*	-0.6*	-0.6*	-0.6*	-0.6*	-0.6*
12000	-0.6*	-0.6*	-0.6*	-0.7*	-0.7*	-0.7*	-0.7*	-0.7*
14000	-0.7*	-0.7*	-0.7*	-0.8*	-0.8*	-0.8*	-0.9*	-0.9*
16000	-0.6*	-0.6*	-0.6*	-0.9*	-0.9*	-1.0*	-1.0*	-1.1*
18000	-0.9*	-0.9*	-0.9*	-1.0*	-1.1*	-1.1*	-1.2*	-1.2*
20000	-1.0*	-1.0*	-1.1*	-1.2*	-1.3*	-1.4*	-1.4*	-1.4*
22000	-1.1*	-1.1*	-1.2*	-1.4*	-1.5*	-1.6*	-1.7*	-1.7*
24000	-1.2*	-1.2*	-1.4*	-1.6*	-1.8*	-1.9*	-2.0*	-2.0*
26000	-1.3*	-1.3*	-1.5*	-1.8*	-2.1*	-2.3*	-2.3*	-2.3*
28000	-1.3*	-1.4*	-1.7*	-2.1*	-2.4*	-2.7*	-2.8*	-2.8*
30000	-1.3*	-1.4*	-1.8*	-2.3*	-2.9*	-3.2*	-3.4*	-3.4*
30100	-1.3*	-1.4*	-1.8*	-2.4*	-2.9*	-3.3*	-3.5*	-3.5*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360	0 360

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 the sign that is before the number.  
 \*For argument at bottom of table use sign that follows the number.  
 \*Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO  
Latitude 40° (North)

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*	-0.1*
4000	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*
6000	-0.4*	-0.4*	-0.4*	-0.4*	-0.4*	-0.4*	-0.4*
8000	-0.5*	-0.5*	-0.6*	-0.6*	-0.6*	-0.6*	-0.6*
10000	-0.7*	-0.7*	-0.7*	-0.7*	-0.7*	-0.8*	-0.8*
12000	-0.8*	-0.8*	-0.8*	-0.9*	-0.9*	-0.9*	-0.9*
14000	-0.9*	-0.9*	-1.0*	-1.0*	-1.1*	-1.1*	-1.1*
16000	-1.1*	-1.1*	-1.1*	-1.2*	-1.2*	-1.3*	-1.3*
18000	-1.2*	-1.2*	-1.3*	-1.4*	-1.4*	-1.5*	-1.5*
20000	-1.4*	-1.4*	-1.5*	-1.6*	-1.7*	-1.7*	-1.8*
22000	-1.5*	-1.6*	-1.7*	-1.8*	-1.9*	-2.0*	-2.1*
24000	-1.7*	-1.7*	-1.9*	-2.0*	-2.2*	-2.3*	-2.4*
26000	-1.9*	-1.9*	-2.1*	-2.3*	-2.6*	-2.7*	-2.8*
28000	-2.0*	-2.1*	-2.3*	-2.7*	-3.0*	-3.2*	-3.3*
30000	-2.1*	-2.2*	-2.6*	-3.0*	-3.5*	-3.8*	-3.9*
30100	-2.1*	-2.2*	-2.6*	-3.1*	-3.6*	-3.9*	-4.0*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360

Azimuth of target - degrees

Latitude 40° (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 the sign that is before the number.  
For argument at bottom of table use sign that follows the number.  
Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO  
Latitude 50° (North)

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*	-0.2*
4000	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*	-0.3*
6000	-0.5*	-0.5*	-0.5*	-0.5*	-0.5*	-0.5*	-0.5*
8000	-0.7*	-0.7*	-0.7*	-0.7*	-0.7*	-0.7*	-0.7*
10000	-0.8*	-0.8*	-0.8*	-0.9*	-0.9*	-0.9*	-0.9*
12000	-1.0*	-1.0*	-1.0*	-1.0*	-1.1*	-1.1*	-1.1*
14000	-1.1*	-1.1*	-1.2*	-1.2*	-1.3*	-1.3*	-1.3*
16000	-1.3*	-1.3*	-1.4*	-1.4*	-1.5*	-1.5*	-1.5*
18000	-1.5*	-1.5*	-1.6*	-1.6*	-1.7*	-1.7*	-1.7*
20000	-1.7*	-1.7*	-1.8*	-1.9*	-1.9*	-2.0*	-2.0*
22000	-1.9*	-1.9*	-2.0*	-2.1*	-2.2*	-2.3*	-2.4*
24000	-2.1*	-2.2*	-2.3*	-2.4*	-2.6*	-2.7*	-2.8*
26000	-2.4*	-2.4*	-2.6*	-2.8*	-3.0*	-3.1*	-3.2*
28000	-2.6*	-2.7*	-2.9*	-3.2*	-3.4*	-3.6*	-3.7*
30000	-2.8*	-2.9*	-3.2*	-3.6*	-4.0*	-4.3*	-4.4*
30100	-2.8*	-3.0*	-3.2*	-3.6*	-4.1*	-4.4*	-4.5*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360

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 the sign that is before the number.  
\*For argument at bottom of table use the sign that follows the number.  
\*Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO Latitude 70° (North)

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.2*	-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	-0.9*	-0.9*	-1.0*	-1.0*	-1.0*	-1.0*	-1.0*
12000	-1.1*	-1.1*	-1.2*	-1.2*	-1.2*	-1.2*	-1.2*
14000	-1.3*	-1.3*	-1.4*	-1.4*	-1.4*	-1.4*	-1.4*
16000	-1.5*	-1.5*	-1.6*	-1.6*	-1.6*	-1.7*	-1.7*
18000	-1.7*	-1.8*	-1.8*	-1.8*	-1.9*	-1.9*	-1.9*
20000	-2.0*	-2.0*	-2.0*	-2.1*	-2.2*	-2.2*	-2.2*
22000	-2.2*	-2.3*	-2.3*	-2.4*	-2.5*	-2.6*	-2.6*
24000	-2.5*	-2.6*	-2.6*	-2.7*	-2.9*	-3.0*	-3.0*
26000	-2.8*	-2.9*	-3.0*	-3.1*	-3.3*	-3.4*	-3.4*
28000	-3.2*	-3.2*	-3.4*	-3.6*	-3.8*	-3.9*	-4.0*
30000	-3.5*	-3.5*	-3.8*	-4.1*	-4.4*	-4.6*	-4.7*
30100	-3.5*	-3.6*	-3.8*	-4.1*	-4.5*	-4.7*	-4.8*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360

Azimuth of target - degrees

Latitude 60° (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 the sign that is before the number.
- \*For argument at bottom of table use the sign that follows the number.
- \*Azimuth measured clockwise from the North.

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 2 TABLE K

\*ROTATION OF THE EARTH, DEFLECTION EFFECTS IN MILS DUE TO Latitude 50° (North)

Range yards	Azimuth of target - degrees						
	0 360	30 330	60 300	90 270	120 240	150 210	180 180
2000	-0.2*	-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*	-0.9*	-0.9*	-0.9*	-0.9*
10000	-1.0*	-1.0*	-1.0*	-1.1*	-1.1*	-1.1*	-1.1*
12000	-1.2*	-1.2*	-1.2*	-1.3*	-1.3*	-1.3*	-1.3*
14000	-1.4*	-1.4*	-1.5*	-1.5*	-1.5*	-1.5*	-1.5*
16000	-1.7*	-1.7*	-1.7*	-1.7*	-1.8*	-1.8*	-1.8*
18000	-1.9*	-1.9*	-2.0*	-2.0*	-2.0*	-2.1*	-2.1*
20000	-2.2*	-2.2*	-2.2*	-2.3*	-2.3*	-2.4*	-2.4*
22000	-2.5*	-2.5*	-2.6*	-2.6*	-2.7*	-2.7*	-2.7*
24000	-2.8*	-2.9*	-2.9*	-3.0*	-3.1*	-3.1*	-3.1*
26000	-3.2*	-3.2*	-3.3*	-3.4*	-3.5*	-3.6*	-3.6*
28000	-3.6*	-3.6*	-3.7*	-3.9*	-4.0*	-4.1*	-4.1*
30000	-4.0*	-4.1*	-4.2*	-4.4*	-4.6*	-4.8*	-4.8*
30100	-4.1*	-4.1*	-4.3*	-4.5*	-4.7*	-4.9*	-4.9*
	180 180	150 210	120 240	90 270	60 300	30 330	0 360

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 the sign that is before the number.
- \*For argument at bottom of table use the sign that follows the number.
- \*Azimuth measured clockwise from the North.



A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
I. V. = 2275 fps

PART 3

Range yards	Elevation			Range yards	Elevation			Range yards	Elevation		
	mils	o	'		mils	o	'		mils	o	'
0	-1.2	0	-04	3000	29.6	1	40	6000	64.0	3	36
100	-0.2	0	-01	3100	30.6	1	43	6100	65.2	3	40
200	+0.8	0	+03	3200	31.6	1	47	6200	66.4	3	44
300	1.8	0	06	3300	32.6	1	50	6300	67.6	3	48
400	2.8	0	09	3400	33.8	1	54	6400	68.8	3	52
500	3.8	0	13	3500	35.0	1	58	6500	70.2	3	57
600	4.8	0	16	3600	36.0	2	02	6600	71.4	4	01
700	5.6	0	19	3700	37.0	2	05	6700	72.6	4	05
800	6.6	0	22	3800	38.2	2	09	6800	74.0	4	10
900	7.6	0	25	3900	39.4	2	13	6900	75.4	4	15
1000	8.6	0	29	4000	40.6	2	17	7000	76.8	4	19
1100	9.6	0	32	4100	41.8	2	21	7100	78.0	4	23
1200	10.6	0	36	4200	43.0	2	25	7200	79.2	4	27
1300	11.6	0	39	4300	44.2	2	29	7300	80.4	4	31
1400	12.6	0	43	4400	45.2	2	33	7400	81.8	4	36
1500	13.6	0	47	4500	46.2	2	36	7500	83.2	4	41
1600	14.8	0	50	4600	47.4	2	40	7600	84.4	4	45
1700	15.8	0	53	4700	48.6	2	44	7700	85.6	4	49
1800	16.8	0	57	4800	49.8	2	48	7800	87.0	4	54
1900	17.8	1	00	4900	51.0	2	52	7900	88.4	4	58
2000	19.0	1	04	5000	52.0	2	56	8000	89.8	5	03
2100	20.0	1	07	5100	53.2	3	00	8100	91.0	5	07
2200	21.0	1	11	5200	54.4	3	04	8200	92.4	5	12
2300	22.0	1	14	5300	55.6	3	08	8300	93.6	5	16
2400	22.8	1	17	5400	56.8	3	12	8400	95.0	5	21
2500	23.8	1	21	5500	58.0	3	16	8500	96.4	5	25
2600	24.8	1	24	5600	59.2	3	20	8600	97.8	5	30
2700	25.0	1	28	5700	60.4	3	24	8700	99.0	5	34
2800	27.2	1	32	5800	61.6	3	28	8800	100.4	5	39
2900	28.4	1	36	5900	62.8	3	32	8900	102.0	5	44
3000	29.6	1	40	6000	64.0	3	36	9000	103.4	5	49

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. = 2275 fps

PART 3

Range yards	Elevation			Range yards	Elevation			Range yards	Elevation		
	mils	o	'		mils	o	'		mils	o	'
9000	103.4	5	49	12000	148.4	8	21	15000	200.6	11	17
9100	104.8	5	54	12100	150.0	8	26	15100	202.4	11	23
9200	106.2	5	59	12200	151.6	8	32	15200	204.2	11	29
9300	107.6	6	03	12300	153.2	8	37	15300	206.0	11	35
9400	109.0	6	08	12400	154.8	8	43	15400	207.8	11	41
9500	110.4	6	13	12500	156.4	8	48	15500	209.6	11	48
9600	112.0	6	18	12600	158.2	8	54	15600	211.6	11	54
9700	113.4	6	23	12700	159.8	8	59	15700	213.6	12	01
9800	114.8	6	28	12800	161.4	9	05	15800	215.4	12	07
9900	116.2	6	32	12900	163.2	9	11	15900	217.4	12	14
10000	117.6	6	37	13000	165.0	9	17	16000	219.2	12	20
10100	119.2	6	42	13100	166.8	9	23	16100	221.2	12	27
10200	120.6	6	47	13200	168.4	9	28	16200	223.2	12	33
10300	122.0	6	52	13300	170.0	9	34	16300	225.4	12	41
10400	123.6	6	57	13400	171.8	9	40	16400	227.4	12	48
10500	125.0	7	02	13500	173.6	9	46	16500	229.4	12	54
10600	126.4	7	07	13600	175.2	9	51	16600	231.4	13	01
10700	128.0	7	12	13700	176.8	9	57	16700	233.4	13	08
10800	129.4	7	17	13800	178.6	10	03	16800	235.6	13	15
10900	131.0	7	22	13900	180.4	10	09	16900	237.6	13	22
11000	132.6	7	28	14000	182.2	10	15	17000	239.4	13	28
11100	134.2	7	34	14100	184.0	10	21	17100	241.4	13	35
11200	135.8	7	39	14200	185.8	10	27	17200	243.6	13	42
11300	137.4	7	44	14300	187.6	10	33	17300	245.6	13	49
11400	139.0	7	49	14400	189.2	10	39	17400	247.6	13	56
11500	140.4	7	54	14500	191.0	10	45	17500	249.8	14	03
11600	142.0	8	00	14600	192.6	10	51	17600	251.8	14	10
11700	143.6	8	05	14700	195.2	10	58	17700	254.2	14	18
11800	145.2	8	10	14800	196.8	11	04	17800	256.4	14	26
11900	146.8	8	16	14900	198.6	11	10	17900	258.6	14	33
12000	148.4	8	21	15000	200.6	11	17	18000	260.8	14	40

A.P. 975 LB. PROJ. (SHOT)  
FUZE, B.D., MK.X  
M. V. - 2275 Ips

PART 3

Range yards	Elevation			Range yards	Elevation		
	mils	o	'		mils	o	'
18000	260.8	14	40	21000	331.2	18	38
18100	263.0	14	47	21100	333.6	18	46
18200	265.2	14	55	21200	336.0	18	54
18300	267.2	15	02	21300	338.6	19	03
18400	259.4	15	09	21400	341.2	19	12
18500	271.6	15	17	21500	344.0	19	21
18600	273.8	15	24	21600	346.6	19	30
18700	276.0	15	32	21700	349.4	19	39
18800	278.2	15	39	21800	352.0	19	48
18900	280.6	15	47	21900	354.6	19	57
19000	283.0	15	55	22000	357.2	20	06
19100	285.4	16	03				
19200	287.6	16	11				
19300	289.8	16	18				
19400	292.2	16	26				
19500	294.4	16	34				
19600	296.8	16	42				
19700	299.2	16	50				
19800	301.6	16	58				
19900	304.0	17	06				
20000	306.4	17	14				
20100	308.8	17	22				
20200	311.2	17	30				
20300	313.6	17	38				
20400	316.2	17	47				
20500	318.8	17	56				
20600	321.2	18	04				
20700	323.6	18	12				
20800	326.2	18	21				
20900	328.8	18	30				
21000	331.2	18	38				