

EXTERIOR BALLISTICS PROGRAM

Version 3.1

by  
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## INTRODUCTION

The purpose of this program is to give the hunter, target shooter, and reloader a way to obtain detailed information about their loads.

This program has been written using existing formulas and adapted to the TI-99/4A Computer. Your ballistic program will give you all the information you will need to determine what loads will give you the best performance. As with many ballistics tables, your results may not always agree with your usual sources. However, the answers yeilded will be accurate to about 2% with rifle as well as pistol ammunition.

## OPERATION

The program is easy to run. The computer will ask you for the information it needs in order to execute the calculations. The first thing you must do is depress the Alpha-Lock key. Load the program into the computer per the instructions that came with the unit. Now RUN the program.

There are two tables of constants that can be used in calculating then the ballistic properties of your bullet. One is the British Tables of 1909, the other is the Ingalls Tables. You have the option of which set to use. ENTER I or B.

The next data the computer will ask for is wind information. The first input it will want is the wind speed in miles per hour. If you have no wind variables, then enter 0. ENTER wind speed. If you did not enter 0 the computer will now ask for the crosswind angle. Crosswind angle is determined by the angle of the wind to an imaginary line that extends to the right of the shooter and is perpendicular to the line of sight (see fig. 1). Therefore, 0 degrees would

be a direct crosswind from the right, and 180 a direct crosswind from the left, of the shooter.

The next input needed will be the bullet weight in grains. ENTER the bullet weight.

Next enter the diameter of the bullet in inches. Example .224, measurement, use the information on the bullet box. ENTER the bullet diameter.

The computer will now ask for the ballistic coefficient. You can find the coefficient of most bullets in a good reloading manual. If you can't find, or don't know the coefficient, then enter 0 for the coefficient. ENTER the ballistic coefficient. If you entered 0 for the coefficient the computer will ask for the factor of form. The factor of form is a numerical designation relating to the shape of the bullet. You must know the coefficient or the factor of form to perform the calculations. ENTER factor of form.

You will now be asked if you will be shooting in Non Standard Conditions (i.e. Non Sea Level). ENTER Y or N. If you selected Y you will be asked to input Temperature, Barometric Pressure, and Altitude above sea level. ENTER the requested information.

You now need to tell the computer to what range you want the tables tabulated to. While any range may be selected, 500 and 1000 yards are best for rifle rounds and 100 yards for most pistol rounds. ENTER table range.

Now ENTER the muzzle velocity. You may enter any velocity under 5000 feet per second.

Is your bullet a boattail? If the ballistic coefficient you entered earlier included the boattail configuration or your bullet does not possess one, enter N. Otherwise enter Y.

The computer will ask you to stand by while it performs the computations. This period can last up to three minutes, depending on how far out you want the tables tabulated. If this seems like a long time take heart in the fact it would take weeks for you to perform these same calculations with pencil and paper. When the computer completes the task it will give you the option of three tables to choose from. If this is your first run ENTER 1.

Your computer has now generated a table giving you remaining velocity, energy, and time of flight at the given ranges. At the bottom of the display you will see given the factor of form, ballistic coefficient, modified coefficient, and sectional density. The ballistic coefficient given is the coefficient at sea level while the modified coefficient is the actual coefficient for your situation (remember temperature, pressure, and altitude?!?). Also at the bottom you are asked which table you want to go to. ENTER 2.

The computer has now made a table showing drift, height, and drop at the given ranges. Below that it gives you a recap of your windage data and if the drift is to the right or left. ENTER 3.

This is the beginning of the trajectory table. ENTER at what range your weapon is sighted in at. NOTE: the range you input must match one of the given ranges. Now enter (in inches) how far above the barrel your sights are mounted (i.e. 1.5, .5). A table is now generated that shows how far above or below the line of sight the bullet is at the given ranges. Therefore, if your sighted on at 200 yards, by looking at the figure at 500 yards you can see how high you have to hold to be on at 500 yards! ENTER M.

A menu is now displayed. By entering the number to the

left you may go back and change any one input and the computer will recalculate the answers using that changed input.

The printer routine in this program was written for a Gemini 10X printer. The program routes output to "PIO". The OPEN statement is located on line 1500 and may be changed to suit your printer. The block graphic code in lines 1530 and 1560 may need modification if you don't have a Gemini.

This program is offered as fairware and if you like it please send 10 dollars to:

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NOTE: The calculation for wind correction only measures deflection from the line of sight. The program will not compensate for changes in velocity due to wind angle.