

## Data Book Basics

By Scott Vandiver

What is a data book and Why do I need one?

I get asked this question on a regular basis during precision rifle and Guerrilla sniper classes. The short answer is a note book with information about how to use a weapon system to get hits in different weather conditions. The second part of the question is the simple fact that nobody can remember all the information needed to get the first round hits. Now this is not about hitting a 24" target at 100 yards; if that is all you expect out of your rifle don't waste your time with a data book. If you have set higher goals for you and your rifle then get ready to learn a few things about keeping a data book.

There are many ways to keep the data you gather about your rifle. I have seen some elaborate data books and some guys use index cards. In the last few years computer programs have come out. Now they have apps for smartphone that can handle plenty of data storage. I am not an IT wiz so I will only say the 2 programs I have used are ATRAG and the SHOOTER programs both do what they claim. The ATRAG system has a feature called Truing that allows a shooter to True the program to his weapon system. Shooter is a program that calculates the settings base on use input but can't be trued like the ATRAG can.

To get started with the data book is not hard. The first option is to just buy a small notebook and start writing down information. The second option is to buy an inexpensive data book like the one from VooDoo tactical. The third option is to get a small binder type data book that you can customize to your mission. I like the Modular Sniper Data Book by US Tactical Supply. One thing I like about this book is it comes with 20+ pages of preloaded information. This information includes ballistic tables for standard military rounds, target sizes for ranging. Also included are Mil-dot information, formulas for wind, temperature, altitude, and angle fire. A rules page and conversions for just about everything a shooter needs. There are different types of pages for gathering data for your rifle and mission as well. A zero page, alpha data sheets, stationary target, unknown distance, moving target, target dimension, barrel logs are also included.

At the Guerilla Sniper class last May I used the information in my data book to help Gabe set up the 50 bmg he brought for the class to shoot. Since he had just received the rifle we bore sighted it at a 500 yard target. I then referenced the data book for information on the correct adjustments to hit a target at 1100+ yards. Since we were shooting at the side of a mountain behind the backstop the first round was low. After a few corrections students were nailing the target. I did not have any specific data on his rifle or ammunition, nor did I have data from my own 50BMG. I used the data printed in the book to get on target. Who knows you may get an opportunity to shoot some ones really nice rifle and the additional data printed in the book helped that day.

To start your own data book you need to track or keep up with what you are doing. First things to enter in your log are the rifle sight/scope and ammo you are using. If you can get a ballistic table from the ammo manufacture get one and put in in the notebook.

Now record the date and time of the shooting session. Record the weather conditions, temperature, humidity, barometric pressure, and wind speed and direction as well as lighting conditions. Write down the altitude since it can affect the bullet's trajectory. This is the base line for the days training or practice session. If the weather changes, keep a record of it. I have seen the temperature, humidity and pressure all change drastically when a weather front rolls in. Combined they can change the trajectory of a bullet 3 MOA or more. At the 600 yard mark 3 moa is 18 inches; that is enough to miss a target completely.

The first step is to verify/ check your zero against the previous zero. Document the location of the called shot and the location of the actual hit. The first shot of the day should be documented as a cold bore shot. Also document if the bore was clean or if it was fouled. If you have any type of muzzle device on the gun document it as well. I'm talking about flash hider, muzzle brakes or suppressors, especially if you shoot the rifle with and without a "device". This information can be important in making a first round hit for a Guerrilla Sniper.

Once you get the zero write in in the log book so you can return the scope or sights to your base zero. If you have turrets that can be reset now is the time to reset them to zero and write down the exact hash mark so you can return to zero at any time. For Iron sights many shooters put a witness mark on the sight drum so they have a "zero point" Whether you zero at 100 or 200 depends on the distance you are most likely to shoot. In the US most police use a 100 yard zero since the average police sniper shot is around 75 yards. The military use 200 yards normally, but some guys use 500 yards. There are new scopes out now that are designed to zero at 100 and use the specially designed reticle to hold over and never dial the elevation. Regardless of your equipment writing down the zero information in the data book is important for future reference.

Once the initial zero is obtained, start moving back and increasing the distance to target. Depending on time I would start gathering data at 50 yard increments from 100 yards back. Check the factory data for a starting place then verify with live fire and record exactly what adjustments you made to get a good hit. All adjustments should be made from your base zero every time. When you change position return to zero and start over. This prevents stacking adjustments on top of each other. An example would be when you set the rifle for 300 yards and then move to 600 yards and add the 600 yard elevation to the 300 yard elevation already on the rifle. Since the bullet drop is an increasing curve adding 300 yard dope and 600 yard dope will not be the same as 900 yard dope. Write down how many clicks it took to come up from zero to get a hit at your current distance then write down the reading on the scope dial and be sure to include any full revolutions. Complete the data collection back as far as the weapon system will stay supersonic. Once the round becomes transonic it will start losing stability. Once that happens; data collection is worthless because the trajectory is not consistent.

This is where a scope with numbers and revolution marks pays off. Economy scopes save a few dollars by eliminating these marks on the scopes. That may be ok for a brush gun or a 22 but not for a precision rifle.

Wind correction and data books are a different beast. The ammo manufactures ballistic tables normally don't include wind corrections. For this information there are ballistic calculators online. I try to get data for the distances I have in 5mph and 10mph winds. This will allow me to add the info to get 15 or 20 mph info. Just like elevation data you will need wind data for different ammo and different calibers. Wind effects bullets differently than gravity. Gravity is a constant force but wind is variable from shot to shot. Another problem with wind is judging how hard it is blowing; not just where you are but all along the bullets path. Reading the wind at the shooters position alone is just as bad as only reading the wind at the target. If you only read the wind at one location read it at 3/4 the distance to the target. This is wind has most of the effect on the bullet path since the bullet has slowed down. In a linear sense the wind closest to the shooter would affect the trajectory the most. However things that happen effect the bullet path more, the first thing is the wind effect is not liner but a cumulative effect more like an decreasing radius curve. Adding to the curve is the fact that the bullet is slowing down as it travels. Shooting in the wind can be a nightmare when there are 2 different crosswinds or the trajectory takes the bullet 120 inches in the air. I was making 900 yard shots on a flat range, the wind was dead calm at our location and the grass was not moving anywhere between me and the target. I fired the first round and missed 1 mil right. The spotter could see bullet trace and the wind was pushing the bullet at the top of the arc of flight. Reading wind takes years of practice and the best way to learn is to shoot in the wind. There are a few tricks like reading the terrain and looking in different directions to pick up the wind angle, watching the trace see what the bullet is doing. Another thing that helped me learn some wind calling was to work with a experienced spotter shooter team. I was on the spotting scope watching the same wind and I made a call then listened to see what the professionals called. Remember to take good notes on wind effects and wind calling, include this in your data book.

Once I have several range visits in my data book I put the info into an computerized spreadsheet this lets me keep up with the info and compare the impact shifts when the weather changes or if I change ammo. If I change guns I can see that difference as well. Having the info on a spread sheet also allows me to customize a range card to the load or the weather. Having multiple methods of storing data is important. I use a Smart phone a data book, a wrist band, a computer and info taped to the gun. So I will always have the info I need. I have memorized some of the elevation adjustment just in case.

It takes time, energy and money to gather the information to compile a data book. If you want to continue learning a data book will definitely help improve the learning curve. Professional shooters of all types use data books so they don't have to relearn or estimate what the rifle will do. They refer to the data book make the adjustments and make the shot. Remember hits are more exciting than misses and nobody can miss fast enough to win.

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