Thinking of entering the world of ELR?

BY BRENDAN FIKE

In the first part of a two-part series, we take a closer look at the requirements to enter the world of Extreme Long Range (ELR) shooting. Just know that it is highly addictive; you have been warned!

We often field questions from shooters interested in getting into ELR, like: [1] What calibre is the best for ELR, as I only want to buy once and not have to first invest in a trainer rifle? [2] What scope is the best for ELR? [3] What MOA picatinny rail should I use? [4] Which angular measurement system is better, Minute of Angle (MOA) or milliradians (mrad or mil)?

Apart from calibre, scope, picatinny rail cant and angular measurement systems, there is a whole host of factors that need to be taken into account. Join us for an informative rundown of some of the most important.

APTITUDE

ELR demands precision, consistency, and a constant evolution of testing for refinement. In fact, it never ends, which is probably one of the reasons why we never get tired of it. I have some friends who just couldn't be bothered putting in all the effort, and who say I am being too pedantic. These personality types rather want instant gratification and outstanding results, with the least amount of effort.
Well, as with anything, this isn't a realistic expectation, and most probably will limit them ever reaching their true ELR potential. Every person needs to decide how far they want to challenge themselves. Some are never content at the level they're at, while others are happy to burn powder and send a lot of rounds downrange in the hope to get a hit or two.

ELR is far more than squeezing a trigger and mastering fundamentals.

To really excel in this sport, one needs to be a perfectionist, have an enquiring technical mind, and be practical. Above all, one needs to be willing to immerse themselves in internal and external ballistics, and try to understand all of the factors affecting a bullet's flight, and how these are calculated. ELR is far more than squeezing a trigger and mastering fundamentals.

Besides the known calculated effects, there is actually a whole host of observed phenomena that still have not been accounted for. The various G7 drag curves derived from doppler radar testing are only most accurate for the particular rifle set-up the projectile was shot out of during that test. Each rifle leaves its specific rifling distortion on a bullet, like a fingerprint.
Thus the data from that particular test rifle most probably will not be the same as your specific set-up. You start to observe these effects in ELR, and especially ULR distances. At other times you will witness unexplained occurrences while shooting. For example, you may have trued and verified your ballistic solver, and be on target consistently.

The next day you go out to the same range at the same time, in practically identical environmental conditions, and somehow your elevation is consistently way off target. Why? This is where an enquiring mind will start looking for answers. Could there be a low unseen inversion layer on one of the days, resulting in your bullet traversing through the warmer, less-dense air above the colder dense air closer to the ground? I don't know; just thinking out loud.

Eduardo Abril de Fontcuberta concurs that the ballistic solvers currently being utilised are missing something. But with more shooters observing these phenomenon at ELR and ULR distances, this will most certainly eventually provide enough data to more closely identify the cause of these observed phenomena, so that our solvers can evolve to become more smart in their predictions.

EXPERIENCE

If you are considering entering the world of ELR, there is not much sense in starting off with a Super Magnum calibre. The larger the blast, the larger the recoil; the longer the barrel, the more difficult it is to successfully practice and master the fundamentals required. Typically, it is much more beneficial to start off with a smaller calibre to, firstly, hone your fundamentals of marksmanship to a point where you are comfortable, confident, and shooting accurately beyond the supersonic capability of your chosen calibre/cartridge set-up.

There are many lessons to be learnt along the way

There are many lessons to be learnt along the way that will stand you in good stead later on when you step up to a Super Magnum or big bore. When shooting at this level, the fundamentals should come naturally, similar to muscle-memory theory. You should not have to focus a lot on them for each and every shot. Rather, your attention should be freed up to tackle additional challenges that the particular range or environmental conditions have in store for you and your spotter.

ACCURISE ONE OF YOUR OWN RIFLES

Our South African firearm licensing woes may deter you from purchasing an interim starter rifle, or re-barrelling an existing firearm. Perhaps consider taking one of your existing rifles and kitting it out as a LR/ELR platform. You can use its barrelled action and have it blueprinted and trued. I always have a gunsmith inspect the barrel recut the crown, as this is essential to accuracy. Consider switching to an aluminium chassis such as Gun Warrior, MDT, Ballistic Beast, or the various other conventional stock offerings on the market like McMillan, GRS, and those from some great local custom stock manufacturers.

Look for a suitable muzzle brake, bipod, rear bag, scope, bubble level, and bag rider, etc. Deciding to keep your licenced barrel, you then need to select bullet and powder components to suit the twist and length of the barrel. I did this with my old 243 Win Musgrave Model 80 that my dad bought for me when I was five years' old. A farmer sold it as he was not getting any form of accuracy from it. My dad had a quick look at it, and found the two action or stock mounting bolts were loose. After torqueing those down and free-floating the barrel, this rifle was a shooter of note.

I recently accurised this rifle even further, still in its original wood stock, by glass bedding the action, pillar bedding the action screw holes, installing and bedding a 20 MOA picatinny rail, recutting the crown, installing a bipod picatinny rail to the fore-end, and mounting a 90 MOA/26 mil tactical scope. From there all I concentrated on was developing a consistent load that gave sub-moa accuracy with low Extreme Spread (ES), as I wanted to use the same load for hunting and LR shooting.

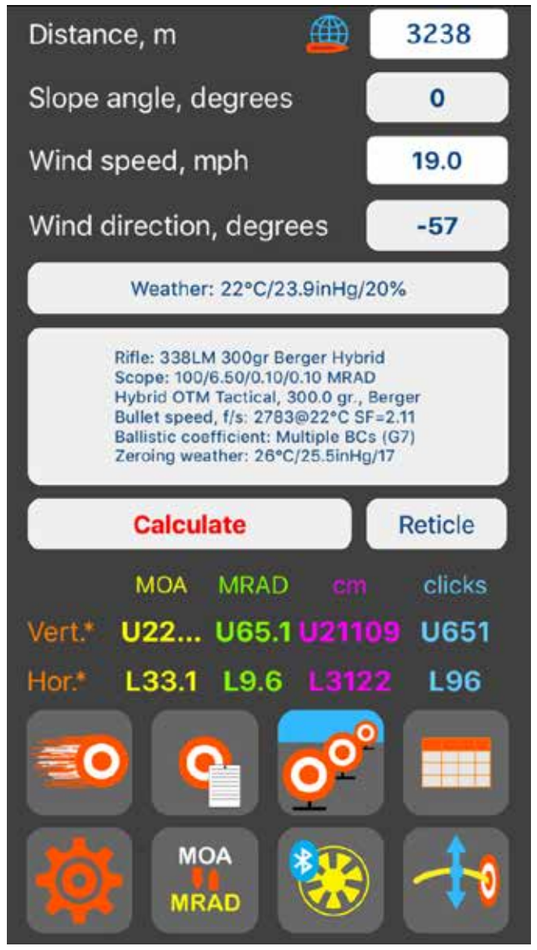
I have shot this rifle out to a mile (I must admit that the little non-VLD 95 gr Berger Classic Hunter bullets out of a 1:10 twist were not very stable at this range, but still got there, except for a few that fell short of the target due to instability). Recently I shot them out to 1 200 m without any problem. I am 100% confident in this rifle being able to engage targets at 500 m to 700 m with first-round hits. Hence I limit myself to a safe 500 m shot when hunting plains game. The marksmanship fundamentals of shoot this rifle are the same as on a Super Magnum rifle, except that this little 243 Win has no recoil to speak of, no massive blast, and is also very cheap to shoot a great deal. There is no substitute for trigger time.

PRECISION RELOADING AND LOAD DEVELOPMENT CONSIDERATIONS

You need to get all the precision reloading equipment together, along with the premium brass, bullets, powder, and primers needed to ensure your reloads have a low double-digit or, better yet, single-digit ES.

The further you shoot, the lower you want this ES to be, as velocity spread becomes more pronounced at distance. Consistency is key, and in ELR it is everything.

▲ A 100m group like this doesn't necessarily equate to a 900m group like the image on the right.
The 100m group could be achieved with an ES of 150fps, which however would result in a 0.9mils / 3.09MOA vertical dispersion @900m in a 338LM.
A chronograph is thus essential to monitor velocity consistency before selecting your load.



An understanding of the various factors your Ballistic Program is correcting for is hugely advantageous.
Here is a recent successful firing solution for a 3238m (2.02 mile) shot.

You will have to spend some time testing various components, and find out what works for your particular rifle set-up. Spend a lot of time talking to experienced shooters; YouTube is another source of information; internet forums and social media discussions are also interesting. However, do not take what you read and hear as fact. Rather use it as a guideline and verify it for yourself. In any event, reloading preparation, procedures and processes are exactly the same for a smaller calibre as for a Super Magnum calibre. The goal is exactly the same.

A quality chronograph such as a Magnetospeed or LabRadar is essential for ELR. All my other chronographs have found themselves at the bottom of the rubbish bin, and good riddance to them! These are obviously used during load development but, more importantly, their main function is to keep checking for any changes in your barrel or reloads that affect your expected muzzle velocity. It's so surprising to hear from shooters wanting assistance with their load development who don't even have a chronograph, and thus have no idea what their average muzzle velocity actually is, or their velocity spread.

Secondly, they are unable to spot velocity fluctuations during load development, which is key to selecting a good ELR load. You need accuracy combined with a low standard deviation (SD) and a low ES. You can have a beautiful textbook five-shot one-hole group at 100 m with a scary ES of 150 fps. Without a chronograph, you would probably be fooled into the false belief that you now have a perfectly-tuned load.

Only try and shoot it north of 500 m, and you will see strange vertical dispersion. In some cases, the variance is enough to miss the entire target, when the previous shot was where it was supposed to be.

Often what happens is the shooter makes a ballistic correction based on the last shot's impact, only to have the following shot be way off again. I refer to this as 'chasing one's tail'. It is a pointless exercise, with the only outcome being frustration, confusion, and shattered confidence.

A chronograph is an essential piece of ELR kit

With each shot's velocity analysed, one can then decide if the impact you saw downrange was a true reflection, or if vertical dispersion was caused by a higher or lower velocity than what the ballistic solver was expecting. Some shooters view a chronograph as an expensive 'nice to have', something one can just quickly borrow to measure the velocity of that 'magical' 100 m load you have developed, and you are set for the life of that firearm. Well, in reality it's essential ELR kit. Without it, you are really not taking this sport seriously, and will not achieve anywhere near the true potential of your set-up.

Premium components add consistency to your reloads

There are those shooters who weight-sort brass. There are those who sit for hours volume-sorting them with syringe in hand, ending up with sore backs and water everywhere. Firstly, I have proven over and over again that weight-sorting brass is a pointless exercise. I have had brass varying as much as 6 gr to 7 gr from the average brass batch weight, but producing exactly the same muzzle velocity as the rest of the brass.

Volume sorting is too tedious for me, and not the most accurate system either.
Rather when shooting, I batch cases according to the velocity they produced: Batch 1 for velocities lower than expected; Batch 2 for velocities as expected; and Batch 3 for velocities higher than expected.

You need to be prepared to invest in some essential ELR kit if you are serious about progressing in ELR

The lower and higher cases get tested again with the same load, and if they produce the same velocity variance, they get permanently classed accordingly, and the load is adjusted to cater for the difference in internal volume.

STARTER ELR RIFLE

If you do consider building a starter rifle, consider capable calibres like the various 7 mm (RemMag, RSAUM, Shehane), 300s (WinMag, WSM, Norma) or 338s (Lapua, Norma). These are fantastic options, and are cheaper to shoot than the Super Magnums. You can push these rifles way beyond their supersonic capability deep into the sub-sonic range. Use the Miller stability formula as a guide to select the correct projectile in relation to the barrel twist, velocity, and atmospheric pressure regions you will be shooting in. The fundamentals needed to become proficient with these calibres will stand you in good stead when you decide to step up to a Super Magnum.

COST AND COMPONENT AVAILABILITY

To become proficient at ELR, you need to put in the regular range time. Jumping right up to the Super Magnums with solid bullets means each shot will cost about R60-R100/reload, versus a smaller calibre at anything between R18-R35/reload. Now at R60-R100/shot, you will not shoot as much as you would the R25-R35/shot rifle.
A very real problem is availability of components. Super Magnums burn a lot of powder, and shoot expensive projectiles. Importers do not seem to be able to keep up with the demand. One therefore has to buy in bulk when components are available, and be prepared to part with vast sums of money. Another problem is the limitation on the quantity of nitrocellulose propellants one can legally store in a premises.

I cannot afford to practice and still compete

A Super Magnum devours tins of powder without much shame, so we always end up rationing powder, as the importers are unable to maintain a reliable stockholding. As I write this, I am down to my last two tins of Retumbo, with no relief until October, according to the word on the street. I therefore cannot afford to practice and still compete in upcoming competitions. I have had to decide which competitions to skip, and to prioritise the ones I know I have enough powder to shoot. Not a great situation at all. Whereas if I was shooting a smaller, less powder-hungry calibre, I would probably still be able to attend all the ELR shoots and put in some practice.

SELECTING A SUITABLE ELR CALIBRE

Selecting a calibre to shoot ELR is quite a personal decision, based on prior experience, information from research carried out, and the opinions of ELR shooters you have spoken to. At the end of the day, you will make up your own mind, having taken all of the above into consideration. Yes, probably the most popular ELR calibre at present is the .375.

My personal decision to build a Super Magnum 338 variant (33XC) does not mean it is the best ELR rifle. By no means. I have personal reasons why I decided to go this route, knowing it certainly has its disadvantages. However, I want to explore its advantages, and hence for me it might be the best choice. My reasoning is to use a super-efficient monolithic bullet in a moderate calibre at speeds between 3 200 fps to 3 300 fps. It will have much less recoil and concussion compared to the 375, 408, 416 and 50BMG. It will also be more comfortable to shoot, especially in a competition situation where a stage requires 15 to 20 shots within a finite period. Shooter fatigue is very real.

If I was forced to recommend a calibre, a good place to start would be one of the 375 variants. This is based on personal experience, and by considering the many favourable ELR results achieved worldwide over the last few years, coupled with it still being fairly moderate enough to shoot accurately without destroying the dentist's artwork. There are a whole host of bullet manufacturers offering 375 bullets nowadays, so there is a lot to choose from.

As already stated above, there are many factors to consider. It is not as easy as buying a calibre and sailing off into the ELR sunset. I hope this assists in giving readers a more holistic picture of what additional factors you need to consider when making that all-important decision. •