Gongs used for long-range shooting.

The scenic range near Broederstroom.

Photos by Sean Pirie.

Long-Range Shooting

by **PHILLIP HAYES**

Where to start?

CURRENTLY, LONG-RANGE SHOOTING is *the* topic in shooting circles, and rifles to satisfy this demand are selling like the proverbial hotcakes. I invested in just such a rifle, but soon realized that if you want to successfully ring steel gongs at ranges of 1 000m and longer with your first shot, it takes more than just a good rifle and scope to attain success.

I spent thousands of Rands on reloading, then burned it all away on the range without improving my consistency, and soon realised that if I cannot see where I'm hitting, or in most instances, by how much I'm missing, I'll never be able to improve my hit rate as I do not know what to correct. The whole process left me rather frustrated. Of course a spotter would help, but I prefer to shoot alone when I can.

Then I was invited to attend an introductory shooting course with Long Range Shooting SA near Broederstroom. The one-day course began with a morning filled with theory, and then we spent the afternoon on the range, putting theory into practice.

The course, with its highly experienced instructor Sean Pirie, tackled topics such as the rifle, what to choose in terms of a stock, action, trigger, barrel, scope, bases and rings, and how to handle scope shadow and its effect on shot placement. He discussed other equipment you need for long-range shooting, like a wind-meter, range-finder, spotting scope, bipod and chronograph, but you do not need these items to complete the course.

Much emphasis was placed on your custom long-range load. Here, consistency is the key to success, as erratic velocities will have a seriously adverse effect at ranges in excess of 1km. According to the manual provided, a 1-grain error in your powder charge can result in a velocity difference of up to 70fps (in my rifle this will result in a 49-inch difference in point of impact at 1 000 yards). A 1-grain difference in case weight can result in an 8fps discrepancy. However, a 1-grain difference in bullet weight will cause minimum deviation. According to Sean, only ammunition with a mean spread of 35fps or less is acceptable for long-range shooting. The smaller this number, the better, and some successful long-range shooters deem an extreme spread of just 12fps as maximum.

Sean also discussed basic long-range ballistics: how elevation, barometric pressure, temperature, humidity, velocity, ballistic coefficient, Coriolis Effect and gyroscopic spin drift all affect the bullet's trajectory.

GYROSCOPIC SPIN IS the deflection caused by the bullet's spin. A right-hand rifling twist will cause a deflection to the right – this can be up to 12 inches at 1 000 yards. The Coriolis Effect is how the earth's rotation causes the target effectively to rise up in the west and drop away in the east. A rising target (shooting west) will cause your point of impact to be lower, while the opposite is true for shooting east. Shooting north or south has no effect on the point of impact. For successful first-time hits at long range, these two factors must be taken into account, and a good ballistic App – and the skills to use it effectively – are a must. Sean tackled this with practical advice on which Apps to use and explained which information within the applications is crucial to good results.

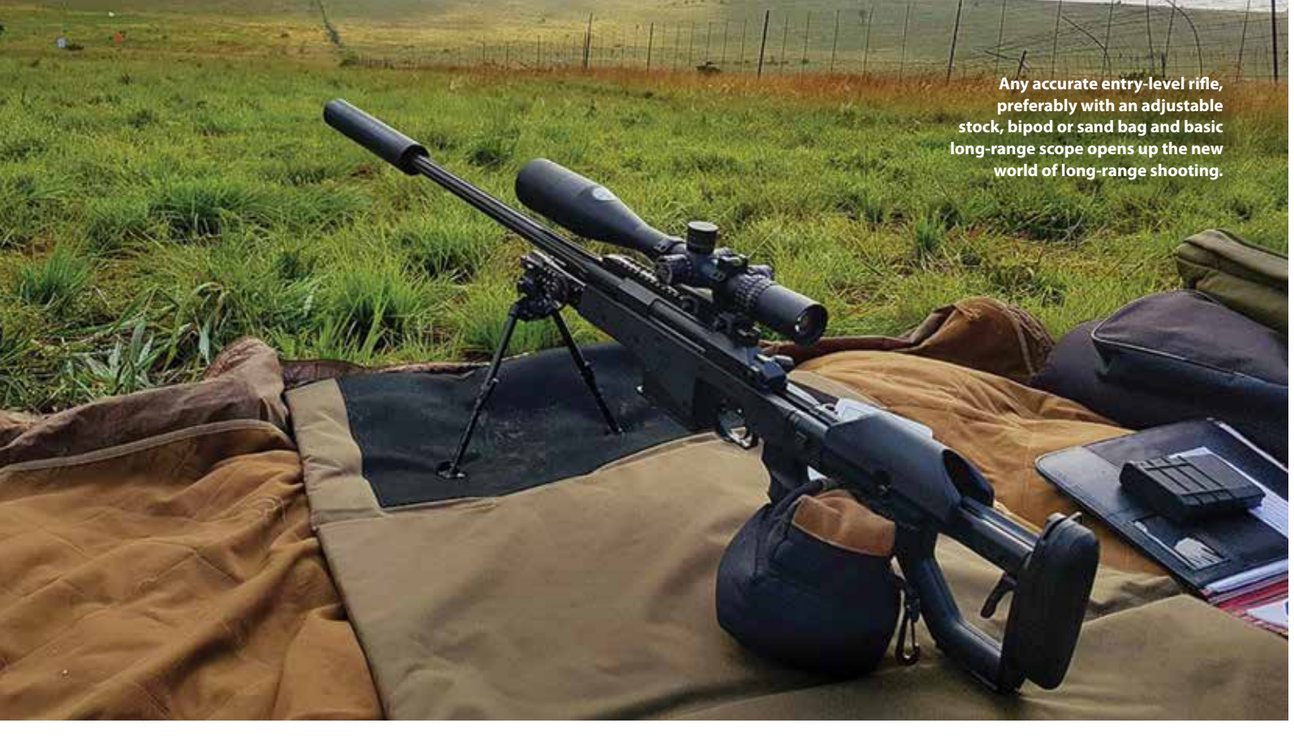
He also spent time explaining the difference between MOA and MRAD, and how to use these systems with a scope. Scopes with reticles and adjustments in either MOA or MRAD are freely available locally. However, it's not really important which system you choose; it's important to learn to use your chosen system properly. For example, some scopes have MOA adjustment on the turret but an MRAD calibrated reticle.

Rifle, scope, ammunition and shooting position are topics discussed during the long-range course.

Avoid these and choose a scope where both the turret adjustment and reticle sub-tensions are calibrated similarly.

Sean pointed out that the precision of your zero at 100m, your estimation of wind speed and direction, and your estimation of distance have a far greater effect on your long-range shooting ability than any other factors. So it's imperative to zero properly; a one inch error at 100m will be 10 times greater at 1 000 metres. As for wind speed and direction, on the excellent range we used during the course, you shoot over a valley and the wind direction and speed at 400m were definitely not the same as at 1km. Also, the near wind deflection has greater impact at 1 000m than the far wind.

A storm was building up and the wind on the range was blowing strongly. At the 900 yard target the wind was fish-tailing and I realised that this is one of the most difficult wind conditions to handle, but Sean managed to guide me on target. Judging wind successfully is a complex process that merits an entire course in itself, but the introductory course



Any accurate entry-level rifle, preferably with an adjustable stock, bipod or sand bag and basic long-range scope opens up the new world of long-range shooting.

imparts enough information at least to get you on target under most circumstances – that's if you spend the time practising what you've been taught.

Estimation of an unknown distance is vital; if you misjudge the range, a first hit on a target is simply not possible. For this reason, Sean fully explains the use of your scope's sub-tensions to range a target of known size.

SOME OF THE most valuable information imparted concerns the way you hold your rifle so as to see where you hit. I adhered to the advice and am now able to see my bullets striking (or missing) most of the time. For me, adapting to this new shooting position and the different grip for my trigger-hand is the toughest part, and will require a lot more practice to perfect. The traditional way of shooting, ingrained by military training and years of hunting, simply does not work for successful long-range shooting.

I've now also learned that if my first shot misses, I probably made one of three mistakes: I failed to properly zero my rifle, I ignored the changing environmental conditions or I'm not comfortable in my shooting position. Of these, ignoring changes in wind speed and direction poses my biggest challenge. Sean added that a clean barrel and an error in parallax also contribute to first-shot misses.

Another invaluable lesson is that you must know the muzzle velocity of your load. I measured mine over an old Chrony, taking the average of 10 shots. Well, it was out by about 170fps, and I was shooting low when using the elevation adjustment data obtained from a ballistic App. Several adjustments to the velocity were required before I could use the ballistic information effectively. Like most other mistakes made when shooting at long range, this error is costly, as you use up valuable time and waste expensive premium or custom grade target bullets, powder and primers while also putting wear on your cartridge cases – all because of a simple error in information. I now have an upgraded chronograph and check the readings against the actual trajectory when working up a new load.

During the course, I was able to shoot out to 900 yards only, as a severe thunderstorm stopped proceedings (we were supposed to finish at 1 500m). However, the period from when we checked the zero at 100m, to the last shot that hit the humanoid sized steel plate down in the valley at 900 yards (shooting into a fish-tailing wind that really pummelled us) was some of the most enjoyable time I've ever spent on a range.

THE LESSONS LEARNED during that day have already saved me money, and could have saved me a lot more, had I taken the course before I started out in long-range shooting. I now have far more confidence; I am able to analyse each shot and can take corrective measures. Of course, I still have a lot to learn, but I'm finally on the right track.

The long-range course I attended is just one of several that Sean conducts. Once you've mastered the basics there are more advanced courses to challenge your abilities. This is money well spent and I cannot think of a better way to start out in this sport. Potentially, it can save you a great deal of money and time, not just in getting on target, but in determining which equipment is best for you. For more information contact Sean on 083-383-7390 or email him at info@longrangeshootingsa.co.za.