Terminal Ballistics Research July 2017 Blog

Hi everybody, I hope that each of you are very well. To Our U.S readers, I would like to wish you all the best for your 4th of July festivities.

As per usual, I have waited to post a blog until I have something worth saying. I find the internet is just so full of dribble these days. In any case, I hope that the following blog has some meat on its bones for you and that you might take away something of value.

9.3 caliber research

Steph and I have finally uploaded my 9.3 caliber research to the website Knowledge Base. My experience with this cartridge goes back many years and it is a huge relief to finally have my notes made into (hopefully) readable documents. These articles are not however for the romantic minded. I do not share the same views as others on the 9.3 bore. Or perhaps more accurately, I find that while many theories on the 9.3 are sound, they do not translate effectively into reality. Still, these cartridges have great potential if we can get past fantasies.

The list includes (Please click on links to view):

9.3x57 Mauser

9.3x62

9.3x64 Brenneke (and wildcats)

9.3x66 (stub article)

Email hell

One thing that I am sad to report is that my email loading has of late, been too much to cope with. Even at the lowest part of the year, we are still seeing around 100,000 new visitors to the site per month. I simply cannot keep up with the mail and questions generated from these visits. I do very much enjoy reading my mail from hunters, industry members, cops and soldiers. But unfortunately, I am reaching a point where I cannot continue this. Lately it has left me no room to continue research or update the website Knowledge base which is the one thing I know you all want and need. Therefore, I will be backing off my email replies for the foreseeable future.

Video learning

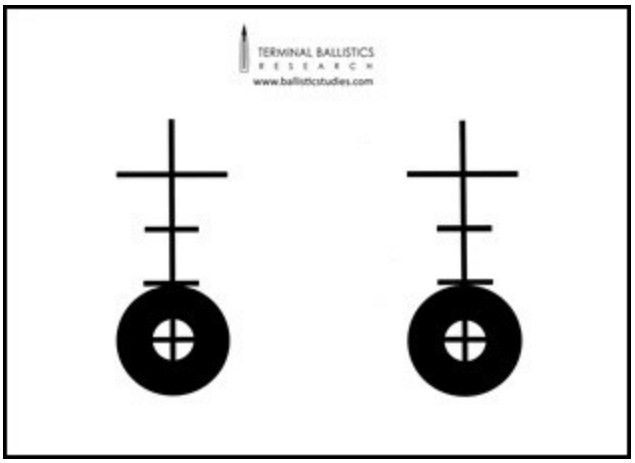
There are now five films in our video learning series. These first five videos are centered around Tikka T3 lite rifle. However, the first video in the series can be used by anyone who wishes to learn how to obtain optimum accuracy from a light weight high recoiling rig. Following this, the video series delves into bedding the Tikka rifle along with bedding tips for the Sako models A7

and 85. Each video has a written explanation of its content to help the viewer decide which video applies to them. These videos work in conjunction with the book series and in time we will have more videos on various subjects including dedicated long range shooting technique. Our videos are hosted with Vimeo, rental only (3 months). If you wish to view these videos, **please click here** to view our video shopping pages. The links on our shopping pages will redirect you to the Vimeo rental pages.

Positioning optics (Sightron) prior to test shooting the Tikka T3.

Targets

Recently it has come to my attention that our Three inch targets have not formatted nicely when downloaded and that the three inch line is instead 2.8”. Following a long day arguing with my computer and its software, I believe I now have a better format that should prove more accurate when downloaded. If you have downloaded this target previously, I suggest you delete it and try the latest. **You can download the latest PDF version of our targets by clicking here.**



Three inch double target, naturally drawing the eye to the center when shooting.

A superior rifle stock

As some of you will know, I have for some time now been testing the Precision Platforms rifle stocks. Clive Judd, CEO of Precision Platforms approached me a few years ago, having followed my work and found himself in agreement with my shooting methods. Having used various poorly fitted rifle stocks and after breaking one during a hunt, Clive found his calling. For the next several years, his life goal was to create a rifle stock boasting optimum ergonomic qualities and strength. But Clive did not want to create a stock based simply on his 'opinion' of what worked best. Instead, he spent the following years exploring gun stock design using a solid scientific approach.

Clive consolidated biomechanical theory, made his prototypes and then tested each in the field, over and over again. This was a process that would drive many folks to despair, testing the smallest and seemingly insignificant factors against factory control stocks. It was a slow and arduous process that would test his patience to the very end. One can imagine just how difficult this was given the diversity of human body types (the customers who will eventually use the stocks) versus the various shooting methods folk employ.

The end result is a flagship stock design that works incredibly well. At first glance, one can easily see its appeal for prone long range shooting. But there is much more to it than that. The stock is well suited to offhand snap shots, placing both hands firmly where they need to be in order to get the shot away while taming recoil. This is the sort of stock that can be used to tame a big thumper.

From the prone position the shooter has several options. A key factor is the extra-long forend. If the shooter has to drop down and shoot fast over a pack, the long forend ensures that the barrel remains clear over the pack. I cannot over emphasize how important this is when the heat is on and a shot has to be taken quickly in the hills - away from the 'take all the time you need' pace of a rifle range. The forend is wide for a good grip, but not 'silly wide'. By the same token, if a

bipod is fitted, the shooters triangle is lengthened for increased stability. There are many pluses to this forend design.

The pistol grip on this stock suits a variety of hand sizes, actually achieving a truly good one size fits all. It is vastly different to other grips and once you have handled it, it is hard to go back to others. I think this is one of the areas of the stock that I have been most impressed with as it is here that I can see Precision Platforms willingness and courage to do what's right - not just follow the sheep and do what everybody else has been doing. The grip is such that it places you in a naturally firm hold without 'air pockets' or having to muscle the grip. This is extremely useful when shooting the magnums.

The recoil qualities of the stock are excellent. The stock recoils back in a straight line and felt recoil with my .338 Edge unbraked has been fine (see video) both prone and offhand.

The stock also features side mount sling attachments. This position helps a great deal when shooting, allowing the shooter to load the sling while minimizing rotational forces under recoil. This is another factor which aids accuracy in the magnums. The sling position also makes for a snug carry when the rifle is shouldered.

The list goes on.

Cutting to the chase, the stock is what I would call a No-Bullshit design. It has no bits of this or that jutting out of it that will cause you to get hung up when tramping through heavy timber. It features all of the elements needed for good shooting and nothing more. To be sure, a pile of add-ons would increase its market appeal among those who like whistles and bells. But here again we see how Precision Platforms has made the hard decisions and done what is right rather than what is easy. Clive (along with his wife and team) have been actively employed by the NZ Army for many years now and Clive knows the difference between 'tactical' and 'practical'. In the future, there may well be stock add-on options for those who insist on such things. But I want my readers to be clear on the fact that this first flagship design is the real deal.

The first Precision Platforms stocks were made of laminate timber and these will remain available for the foreseeable future. But as I type these words, not far from an Army base here in NZ, the first carbon fiber Precision Platforms stocks are about to leave the assembly line. These first stocks will be inletted for the M700 and its clones. In time, we will see other options including a much needed recoil reducing stock for the Tikka T3 and a stock to suit the Howa (Weatherby Vanguard). As time passes, more will be added to the list.

If you are looking for a new stock, please consider the Excellent Precision Platforms Apex design. Clive's tough decisions and hard yards deserve to be supported. Note that I have uploaded video footage of the Apex Hunter including slow motion footage so that its recoil taming properties can be studied in detail.

To view the Precision Platforms Apex Hunter stocks, please visit www.precision-platforms.com

To view my video footage of the Precision platforms rifle stock in action, please visit https://youtu.be/D50hQluX9hY.

Color options for the carbon fiber Apex Hunter.

Long bullets, short magazines versus long range killing

Over the last year I have noticed that many of the new projectiles are much longer than ever before. Yet at the same time gun magazine lengths are getting shorter, whether by rifle design or as a result of the current trend towards detachable magazines for a tactical rifle look. Each week I have been receiving mail and phone calls from guys who are running into these problems. Now, more than ever, we need to be careful when gun shopping if we wish to utilize long range bullets. If you are shooting a long magnum cartridge, a Remington action or one of its clones makes a lot of sense. This is one time where you might have to put your tactical cravings aside and settle for something that actually works.

In some instances it is possible to house long bullets such as the ELD-M bullets in an action with a 3.5" magazine. The jump may be long in either the 7mm Rem Mag or .300 Win Mag calibers, but by neck sizing our hand loads, we can obtain optimum concentricity. This helps guide the bullet true to the bore during the jump. **But as a general rule, I find that the faster the cartridge, the more finicky it can prove to be if we do not have full control over seating depths.** Mild cartridges such as the .308 Win and 7mm-08 can typically handle plenty of jump.

But in the magnums, we have a better of obtaining excellent accuracy if we can experiment with bullet jump close to the lands and then back off from there. If you do not have this flexibility within the magazine, then you will be forced to experiment with powders alone as a means to effect harmonics. That or single feed - something which is all very well at the range but a total pain in the butt when the weather is less than ideal and your hands become caked in mud while getting into position.

In other instances, the long bullets are simply a no-go, the magazine lengths are simply far too short for the longest / heaviest of bullets within a given caliber. Again, this mostly applies to the magnums. I have gone to great efforts to cover these factors in the book series but do consider the fact that as bullets continue to get longer, you may need an extra 40 to 80 thou (1-2mm) magazine space for smooth magazine feeding.

A .300 Win Mag case with an ELD-M, displayed as it would sit if seated to suit a Tikka T3 rifle magazine. As described in the book series, this is a deal breaker. I would urge all of my readers to be mindful of these factors.

Latest gun trends

Those of you who have read my book, Hunting Cartridges Second Edition will by now have seen the edition of the 6.5 Creedmoor. This has become a major hit and it certainly has merit, but it is no magical cartridge. Yesterday a man told me that he had bought a Creedmoor rifle because it shoots so much flatter than his .30-06. Talk about a stab to the heart. Sure, if you want to play the computer plotted trajectory game and sight your rifle in dead on at 100 yards so that its lined up to shoot lower than a snake's butt at 200 yards, then yes, the two cartridges are different. But when it comes to practical shooting, there is no great difference between the two with hand loads. The .30-06 can be loaded with a 200-208gr bullet at 2600fps and in some rifles, up to 2700fps and a bit. The Creedmoor goes around 2700 to 2750fps with the same BC but with a bunch less bullet weight and energy. One produces clean kills but is best described as modest at

long ranges, the other is hits hard and causes folk to make statements such as “holy shit”. I’ll let you guess which is which.

Then came an email from an older experienced hunter in the deep south of New Zealand. A tale of woe, his 6.5 loaded with factory rounds was not tackling the very large bodied Red deer in his location (close to moderate range shooting). Like many, he thought he must be doing something wrong. After all, the guys in the gun rags can tackle anything with a 6.5, just like Walter Bell did yes? My reply was polite but short and to the point. He had employed a low powered cartridge firing a small bullet which simply wasn’t effective on big game when snap shooting from various angles. It’s just physics.

The point I wish to make here is that just because something is new, it doesn’t mean to say that it’s a whole bunch better than what came before it. And yes, there are great break throughs. But it’s up to you to use your common sense and sort wheat from chaff. The Creedmoor is a light caliber. It has great strengths but it also has its limitations. It is a better factory ammo option than either the 6.5x55 or .260 Rem which are both commonly underloaded, but like its kin, it is still a very mild cartridge. If you disagree and favor the Bell approach, I dare you to stand and face an enraged bull cattle beast with the 6.5 as I have. Moments like this really cut through the crap.

The new Ruger Precision chambered in 6.5 Creedmoor is a nice rifle to be sure. But again, it is not magical and needs to be treated like any other rifle. Having a tactical configuration or vertical pistol grip does not automatically make it shoot better than another rig. I woke up with a vertical grip yesterday morning and it didn’t seem to make any difference at the range later on.

The one thing I see time and again with the Ruger Precision rifle is folk leaving the muzzle brake on during the barrel break in phase. This blocks off any view of the muzzle, leaving the shooter unable to study and observe copper fouling, making the shooter completely reliant on solvent patch readings. All very well - unless you are using a product like KG which won’t turn a patch blue. In some instance I have seen folk using very weak solvents in copious amounts that do nothing more than collect in the brake, leaving all of the copper still in the bore.

Either get your head in the game or get out of it. Simply having the latest tactical rifle in the latest chambering will not make you an amazing shooter. The gun range is not a beauty pageant. There is no Miss Operator of the year.

A good many Creedmoor rifles will never really reach their potential simply because the bores are caked with both carbon and copper, having never been properly inspected or cleaned. Groups sizes in these rifles start at around 1.5” without a good break in, based on what I have seen so far. Over time, these groups will grow, not shrink. If you have a hankering for the Ruger Precision, go for it. The .308 chambering is an especially versatile option. But do make sure that you take a step by step approach -without the right mindset, you may just find your buddy outshooting you with his five dollar Ruger American.

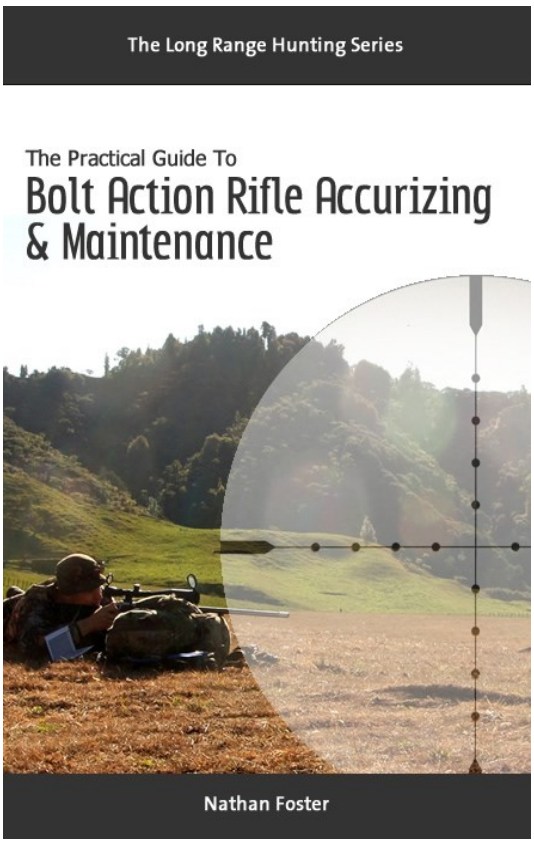
A step by step approach to rifle accuracy

I was reading an article on the internet just recently. At the top of the article was a sentence stating - this article should take approximately 8 minutes to read. This I assume is in case I have a poor attention span. If it were a mountain trek and the sign read - this trek will take 8 hours to complete, I would need to be cautious and well prepared with water, food and protective clothing. But to give me a warning that I might suffer some horrible fate of boredom after 8 minutes is to put it bluntly, taking the piss. Either the author is good or he or she is not. This leads me to my next point of concern that I hope serves you well.

Since the completion of my book series, many shooters from around the world have achieved great success. And yes, I could rave on about this and how great it has been to be able to deliver the goods but there is one thing that you must understand. I can only lead a horse to water. Owning the books is not the same as reading them and following the steps. And by reading, I don't mean just the bits that you think suit you. The books are written in a step by step order and if you do not follow these in order, you may simply waste a whole bunch of your own time and money.

If you want the rewards, then you have to stay the course.

When we started making tutorial videos a short while ago, I found that to deliver the goods, each video needed to be quite long. The Tikka series alone is 4.5 hours. Internet research experts would have me believe that folk cannot handle this and prefer 2 to 3 minute videos. Yet when I look over the statistics, we are seeing multiple full watch throughs.



The trouble is, if the content of an article or video is rubbish, then sure, you'll lose interest in a few minutes. This is not an end viewer / new generation problem. Shitty content is the problem. I also lose interest pretty quick when I see some guy shooting over a tripod, tying a rope around his gun, then down to his foot, telling the viewer it aids control and gives him a tactical advantage. If sitting up like a prairie dog on a leash is a tactical advantage, then count me out. The books I have written and videos we have made require you to focus and do the hard yards. The irony is**, if you slow down at the beginning, you will fast track your success.**

If you want to do well in this game, set aside quiet time for yourself to read the books through, one at a time. Start with the fundamental rifles book, then read the formative sections of the Cartridges book, after which you can jump to the cartridges which take your fancy. Following this you can put the info to use in Accurizing book. This particular book is critical in the order of the steps. The more closely you follow the steps, the more time you will save in the long run.

After this comes the reloading book, again designed to make life simple, then finally we bring it all together in the shooting book. This last book is designed help you achieve success under real world hunting conditions when the pressure is on.

A client takes a first look at his bedding job after the break out. It is a great result and after the clean up, this will serve as an outstanding platform for accuracy.

7mm 180 grain ELD-M.

By now, many of you will be aware of Hornady's new 7mm 180gr ELD-M. It's the A-MAX that many of us waited several years for. Lately I have been using this bullet in the 7mm Rem Mag and 7mm Practical. Please take note that this bullet can develop higher pressures than the Berger VLD. You'll get the velocities but you need to drop powder charges when starting out. If you are switching from a 160-162 grain bullet to the 180 grain, go down at least 6 grains, not simply 2 grains (based on 1 grain per 10 grains bullet as is common in the manuals and proves safe when using start loads). Start way down low, then come up. You may find that the sweet spot is 4.5 grains lower than where it was when you were using a 162 grain pill.

It is also important to understand that being such a long bullet, the tip (rather than the ogive) may contact the button of the seating stem within your seating die. If the button touches the bullet tip rather than the ogive, it will play merry hell with concentricity during seating and you will see fliers downrange. If you have such issues that need to be remedied, the options are to contact your die maker and ask for a stem suitable for match style bullets or failing this, you may need to have your existing stem altered (drilled) by a gunsmith.

The 180 grain ELD-M is a hard hitting pill. All I can say about its performance is wow. That should be enough for most of you. It meets and exceeds all of my expectations as predicted in the Cartridges book second edition which was released just before this bullet became publicly available. It does however need a good deal of magazine space, boasting max OAL's of around 88.3mm (3.476") in the Rem Mag (and therefore .280 Rem and AI) and up to 93mm when using the Manson Reamer Practical (3.661"), leaving around 1mm or 40 thou for smooth feeding (and a wee bit of room for throat wear) when using the M700 and factory box magazine (non-detachable). I can tell you that it took a good deal of back and forth to ensure that the Manson fixed throat reamer would suit the new ELD-M prior to actually being able to handle and measure the new pills. Fortunately, we nailed the throat design. The ELD-M has to my way of thinking optimized the Practical. A gentle stroke of the trigger results in a horrendous thump followed by two sets of hooves pointing straight up in the air. It doesn't get any better than this.

I suggest that you do not chase every ounce of velocity with this pill. If velocities are down by 50fps from where you hoped they would be, then leave well enough alone. If your Rem Mag yields 2800fps, so be it. If your Practical yields 3000fps, so be it. This bullet will still deliver the goods and boy oh boy does it cheat the wind, putting a lot of other combos to shame. Dave Emary and his team at Hornady really have made an outstanding bullet.

As for the G1 BC, I suggest trying the following (as per Hornady's basic predictions):

2500fps and above = .777

2230fps to 2500fps = .748

1400fps to 2230fps = .731

You will need to tweak these to suit your individual rifle and twist rate but so far, these BC's appear to be close to Hornady's predictions and as a basic guide to the 9.25 (factory rifles) and 9 twist magnums. Those who wish to shoot to extreme ranges will want to drop another .3 at 1500fps. If you do not have a ballistics calculator that allows for multiple BC's, I would suggest setting the G1 BC to .750 (the 8 twist rifles average out at a BC of around .810). This will put you slightly high when shooting at around 600 to 700 yards but it is better to strike high than to have a potential and ever increasing low POI error. Do keep in mind that there is no substitute for actual down range field testing of the individual rifle. Also keep in mind that at very long ranges, small errors in turret calibration become much more exaggerated. It is very important that you take this on board and not be too quick to blame all ills on the BC.

The 7mm 180gr ELD-M is a hard hitting bullet. I shot this feral goat out at 300 yards, taking out both shoulders.

.30 Caliber 225 grain ELD-M

For those who need a heavy pill for large game, the .30 caliber 225 grain ELD-M packs a massive punch. A few weeks ago I went for a hunt with my buddy Kelvin. It was a wet day, hard rain in the early part of the day but it eased up to showers and sleet later. We got into position in the evening and no sooner had I pulled out the binos, I found a pig and it was all on. The wind was terrible along with rain and sleet. I kept an ongoing dialogue of wind and range as the pig moved from spot to spot, each position too dicey for a clean shot but I needed to stay in the zone if we were to be successful in this weather. This is the same rifle Kelvin was using in the video I made featuring the Precision Platforms stock, but now with the 225gr ELD-M loaded to 2700fps.

As the sun came down, it flared the lens, made worse by head on sleet. We covered and uncovered the rifle often, to ensure the muzzle would be protected. How I would have loved a brew of coffee in the cold but again, I needed to stay on task.

Finally, the sun passed over the ridge in front of us allowing a clearer view of the valley below, the wind backed off for a moment and the boar turned broadside, bang, holy hell that hit hard. Nice shot Kelvin.

The 225 grain bullet hit hard and created a massive internal wound. This was another four legs in the air moment, though the pig soon rolled and round as pigs are, he kept rolling until he hit a creek at the bottom of a small gut. This is yet another bullet that gives its user great confidence however COAL's are a concern. My Winchester suffers a good deal of jump and even if this bullet were housed in the Remington 700, some will have throats of a length that place the max COAL just over mag length at around 94.5mm or 3.720". This will dictate around 1mm / 40 thou jump or more for smooth magazine feeding. As previously suggested, I seldom like being forced to single feed, especially in adverse weather conditions. If you wish to try this bullet, you may have to experiment with a good deal of bullet jump. If you can make it work for you, the payoff is fantastic downrange performance. I find both the 7mm 180 and .30 cal 225 grain bullets to be fairly well behaved. Of the two, the 7mm bullet requires extra caution with regards to pressures while the 30 cal bullet appears to be less so, though one should still act with caution. If using 220 grain bullet data in lieu of any other information, be sure to start with the book minimum.

Pressure factors aside, I would not call either of these finicky bullets and if you are having major troubles with accuracy, I would suggest looking to other factors such as bedding, before making any assumptions about the bullet. Also, as previously discussed regarding the 7mm bullet, pay close attention to your seating stem. If the seating button is too shallow, it will contact the tip of the bullet rather than the ogive, resulting in poor concentricity.

The G1 BC of the 225 grain bullet is pretty much identical to the 180 grain 7mm pill. In a regular 10 twist bore, plug the following into your calculator (In Sierra, use Edit custom bullet / advanced tab):

2500fps and above = .777

2230fps to 2500fps = .748

1400fps to 2230fps = .731

And again, if you wish to use a single G1 BC to very long ranges, I suggest plugging in .750.

Kelvin’s pig. The 30 Cal 225 grain ELD-M is immensely effective.

Knife making

If you are interested in custom knives, you might like to take a look at a knife which is currently been made for one very lucky and grateful me. The knife is being made by Australian knife maker Warrick Edmonds, owner of Riflebird knives. Warrick has kindly chosen to do this as a way of giving something back for the time I have put into helping others. This is the second knife Warrick has made for me, the first had a 52100 carbon steel blade while this second model will be made from corrosion resistant CPMS35VN.

My 52100 carbon steel Bowie.

There is no need for me to push Warrick's products here as being a custom knife maker, he has a steady client base and being in the custom game, one can only work on one knife at a time. However, I still wish to share my gratitude. Furthermore, I have found the video and blog of the process very interesting and I am sure some of you would enjoy viewing this process. If you would like to see a knife maker in action, Warrick's blog shows the step by step grinding process. I am really looking forwards to seeing how the knife turns out as the process unfolds.

This Bowie profile knife is a general purpose design. This is a design that I can use in the bush for all-round work. It is reminiscent of the early knives carried by NZ pioneers. U.S and Canadian viewers will see the similarities between this and their own pioneer Bowie knives.

http://www.riflebirdknives.com/nathan_fosters_knife.html

Well, I have waffled on long enough. I hope you have found this blog post useful. If not, well perhaps I have at the very least bored you into a much needed restful sleep.

All the best, Nathan.