

AUSTRALIAN Shooter

THE MAGAZINE FOR SPORTING SHOOTERS

TIMING CAN BE EVERYTHING
Joseph Nugent in the right place at the right time



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Hunting with a 'new' Martini – shaking, not stirred

Joe
Norris

I spotted the Martini on a used gun site and despite the fact I really couldn't afford it, made an offer for the rifle. Fortunately the seller agreed to let it go at my price and after transferring the funds and applying for a permit to acquire, I waited somewhat impatiently for everything to arrive.

My initial impression when I finally got hold of it was that it hadn't seen much use since being rebarrelled to 45/70 Government, as the barrel looked almost new. The Martini-Henry entered service with the British Empire in 1871 and was chambered in the new self-contained small arm cartridge at that time, the

577/450. These cartridges were loaded with 85 grains of black powder behind a 480gr paper-patched lead bullet and developed a muzzle velocity of about 1350fps. Accounts from the battlefield say the recoil generated by these rifles could cause the troops' noses to bleed during rapid

fire, considered to be 12 rounds a minute. The original cartridges were loaded with wrapped brass foil serving as the case and after it was discovered they could stick in the chamber, drawn brass cases were made. With the advent of shorter and lighter carbine rifles there was also a lighter recoiling

The Martinis with cartridges.



Far left: Unusual back sight; conversion marks and date of when it was altered to .303; original marks and date of manufacture of the Martini when it was a 577-450.

Cartridges for Joe's Martinis - from left the original wrapped brass 577-450 carbine round, drawn brass 577-450, .303 and 45-70.



cartridge designed with a 415gr bullet and 75gr of black powder and patched with red paper to identify them. The British even made incendiary cartridges for the 577/450 designed to shoot down military observation balloons and there were buckshot loads developed as well. The 577/450 was no slouch when it came to long-range either and was known as the 900-yard target load, early Maxim machine guns also chambered in this calibre before the coming of the .303. The Martini-Henry started life as the invention of American designer Henry O. Peabody, his format modified by Friedrich von Martini in Switzerland and renamed the Peabody-Martini. The British adopted the

action and added a barrel rifled with the system of Scottish gunmaker Alexander Henry then christened it the Martini-Henry. My rifle started life in 1885 as an MK3 and was chambered originally in the standard 577/450 calibre. I don't know if it was ever issued in that calibre but in 1897 it was rebarrelled into the then new military round the .303 and became a Martini-Enfield. In 1898 it was issued to the New Zealand military and at some point after that was sold out of service into the civilian market. I'd love to know the dates and would invite anyone with knowledge of when this happened to contact me. At some point, someone like me (a self-confessed 'single shot tragic' in the

words of John Dunn) decided to give the old girl new life and rebarrelled it in 45/70 Government. They also fitted a rather unusual back sight with finger adjustment for both elevation and windage, although a lock screw must be loosened before the windage can be adjusted (the back sight can also be lifted to become a ladder sight for extreme range). I was smitten with the rifle the moment I picked it up. It's not light, due to the weight of the barrel, but comes to the shoulder nicely though I needed to check the sights so took it out to the old airstrip near my place to become acquainted with it. First thing I noticed was it didn't recoil anywhere near as much as I thought it would



Joe's Martinis - from top the 577-450, .303 carbine and 45-70.

which was a pleasant surprise. Bullets were striking way off to the left and when I tried to adjust the windage I needed a screwdriver to loosen off the lock screw. Once I had the windage sorted and found out where to hold the front sight in the wide notch of the back sight to hit at 100m, I was able to blow up ant beds out to 250m without a problem.

I found I needed to put the thumb of my trigger hand on the recessed chequered indentation on the back of the action or I tended to belt myself in the nose with my

thumb when firing. This also happens to me when using a SMLE .303 so I believe the stock is too short for me - a small price to pay.

Time for a walk

As my place was in the grip of severe drought and dams were drying up I had to constantly check the water for bogged cattle as well as continually top up the supplement lick stations, so I put the Martini in the ute and carried it with me in case I came across a pig or wild dog. I was

attending the lick station when I spotted a young stag coming to drink at the distant dam and, thinking a feed of venison would make a pleasant change, grabbed the Martini and a handful of fat cartridges and snuck away from the vehicle into a feeder gully so I'd have the wind right and the deer wouldn't spot me.

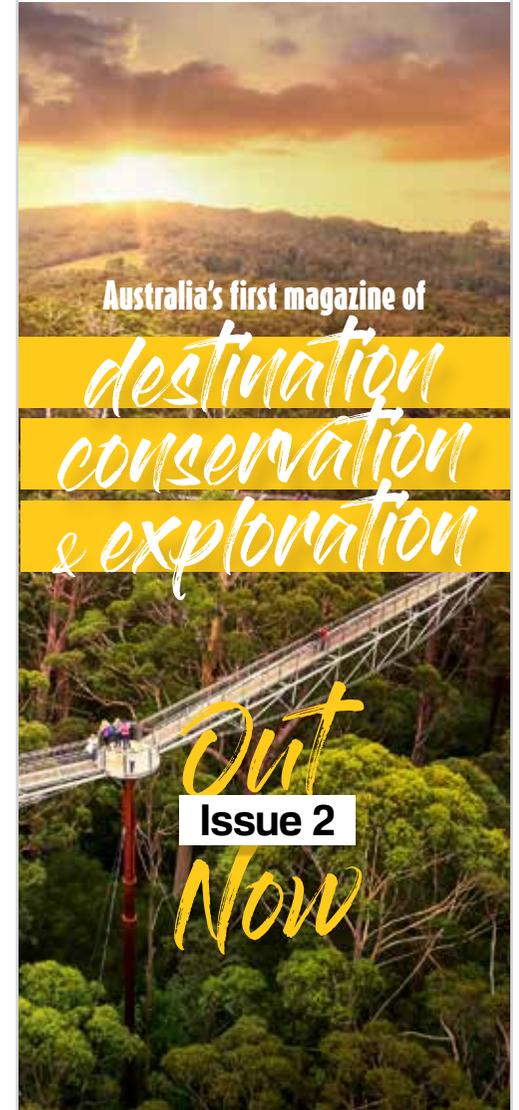
Hugging the bottom of the gully and crouching low I made it to about 500m from the dam where the deer was headed before I ran out of gully. The drought meant there was no cover except the

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ever-present ant beds and box trees, so it became a game of lining up the deer with a tree or ant bed between us and scurrying there, aligning another and repeating the process until I'd closed the gap.

The stag walked to the water to drink so I started to 'bum crawl' (my knees are gone) and by this stage there were no more trees to hide behind as we were in a hole that's normally full of water. Thankfully there are some large rocks we had to work around when we built the dam so I was able to sneak a bit closer but was still 150m from the stag.

When I made it to the rocks I thought I'd have to take the shot from there but wasn't comfortable with a live target at that distance. I've never had any trouble finishing off an ant bed if I don't hit it properly with the opening shot but didn't want to risk wounding a deer so sat wondering how I was going to creep closer.

Then as I was contemplating a 120m shot, the deer started to make his way around the water's edge in my direction, slowly sniffing the mud. I was willing him to keep moving while staying out of sight behind my rock and as he made his way closer to my comfortable shooting range I found myself shaking with excitement, unusual for me but probably because I really wanted the stalk to be successful with my new rifle.

I had to calm myself down by taking deep breaths until I had the shakes under control and at 70m the deer must have sensed something wasn't right as he froze and stared intently in my direction.

I knew the wind was right as I could see the dust he kicked up as he walked but as we were in the dam hole itself, there could have been a random eddy swirl back towards the deer. Even so, he wasn't coming any closer.

The stag was on high alert as he stood three-quarters on to me and I held the sights on his near side front shoulder, meaning the bullet would exit his back ribs on the off side after passing through the vitals. I was completely calm as I took the pressure on the surprisingly good trigger of my new Martini and as it broke the big projectile was on its way - I was using Federal Power-Shok 300gr loads and the stag was pole-axed.

As I didn't have my camera I had to carry the deer back to the vehicle so I could photograph the outcome of my first shot in anger so to speak, before taking him home to process into meals for the family.

I now have Martinis in 577/450, .303, 45/70 and Cadet Martinis in 300 long, .22 and .310. I'm impressed with the action and am focused on buying a Hornet and 12-gauge to round out my collection. Then there's all the other chamberings - 222 rimmed, 218, .357 and perhaps a .444 would be nice - I'm going to need a bank loan!

Back sight in the raised ladder configuration showing adjustment knobs.



Peace of mind

from eye in the sky

David
Thom

Times have certainly changed where firearms are concerned. I remember back in the 1960s growing up in a small town in the Riverina how we had access to firearms and ammunition. As a teenager I had two guns - a .22 for shooting rabbits and an old army Enfield 303 for blowing away feral pigs. These guns lived with me in my bedroom and when you needed more ammo you just nipped down to the local fish and chip shop, no age limit. Shooting was a wonderful pastime enjoyed by myself and friends, both male and female. We even went so far as to pool our savings and buy an old jeep so we could go spotlighting. We started our own little business shooting and selling

pairs of rabbits, earning a whopping 50c a pair and could land around 50 pairs a night. The fun part was sneaking out of town without the local police knowing, though I suspect they actually knew but turned a blind eye. From this we learned respect for firearms and farmers' livestock properties and how to conduct ourselves on other people's land. All in all it made us into responsible young adults and kept us out of trouble. No one was ever hurt by firearm mismanagement, in fact farmers would seek us out to shoot on their properties just to keep the feral numbers down. Funny, but no one was supposed to know we were enjoying this great little adventure. Farm-

ers did this because they realised we had respect for their assets and always 'shut the gate, mate'. Which brings us to today. Over time, governments have introduced strenuous requirements for owning and using firearms. The storage of guns and ammunition is a real concern for shooters and farmers and the penalties for a firearm going missing are more onerous on the owner than the thief. Firearms are stored in an approved, lockable security cabinet which will meet regulations in your state, but what else can be done to improve security and give peace of mind? This is a question many firearm owners face regularly and the vast majority are responsible people who

comply with government legislation. But we read regularly in the media that crime is on the increase, so what can be done? While it's impossible to prevent crime, remaining vigilant and implementing constant prevention strategies will work to lower the possibility of theft occurring. Sporting shooters who live in urban communities are one group who face challenges on how to ensure their gun storage locker is secure while they're at work or away from home. Farmers are another at-risk group, mostly due to the isolation and ease of access to farms and the portable nature not only of firearms, but also high value of livestock and farming machinery. Hobby farms





are also at high risk of theft as owners are often absent while such premises are usually not located within close proximity to neighbours.

Security cameras have become popular with some firearm owners to provide the next level of coverage to monitor assets and lower insurance premiums, and an array of technologies and innovations can be used to help in the delivery of security camera assistance nationally.

With a guiding hand from providers, security cameras and recorders can be set up to ensure all images collected are clear, day and night. One firm at the forefront of the security business is WifiPlus whose director Steve Brady has a background in the Australian armed forces and telecommunications industry. Both video and still images come in to play and once the cameras have been logistically installed can give round-the-clock coverage

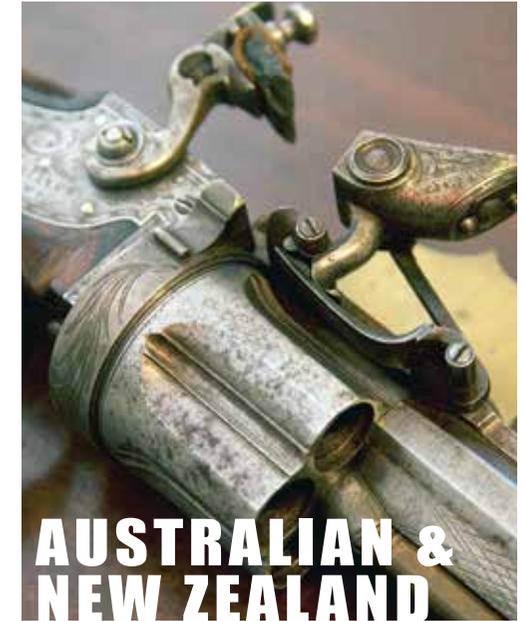
across key zones on any property with remote visual access. Cameras can be run on battery or solar power and some models are even infrared which allows them to operate effectively in complete darkness. Infrared can be either visible (dull red glow) or invisible (no-glow) while the camera is doing its work and programmed access zones can be drawn up for recording, so results are limited to a specific area. Images are stored on a recorder with alerts sent direct to mobile phones, while remote access to vision can be made through mobile phones or other devices. Riverina farmer China Gibson has been a firearms owner for more than 40 years and has seen many changes over time with licensing requirements. "There will always be trespassers on property," he said. "If a thief steals firearms, the owner can face a number of issues and that's where there's

Security cameras can act as a deterrent; scanning the surrounds.

value in having cameras - you can monitor several areas on the property. "Cameras are something we have to do so that problems with 'uninvited guests' are reduced and they also help to meet the firearm owner's security obligations. Signs at property entrances are also advisable. "One major issue is the value of stock - we have to protect them - and the other is that many rural shooters now have four-wheel drive utes. The wrong kind of people can unfortunately give everyone a bad name so locked gates and cameras help the situation."

Security cameras are a genuine ally in the fight against crime, with more and more firearm owners relying on them as a 'third eye' which also gives additional peace of mind. It may not be too far into the future when cameras will be a compulsory part of the domestic and rural landscapes and while they haven't stopped crime in its tracks, they have had a major impact in detection and follow-up.

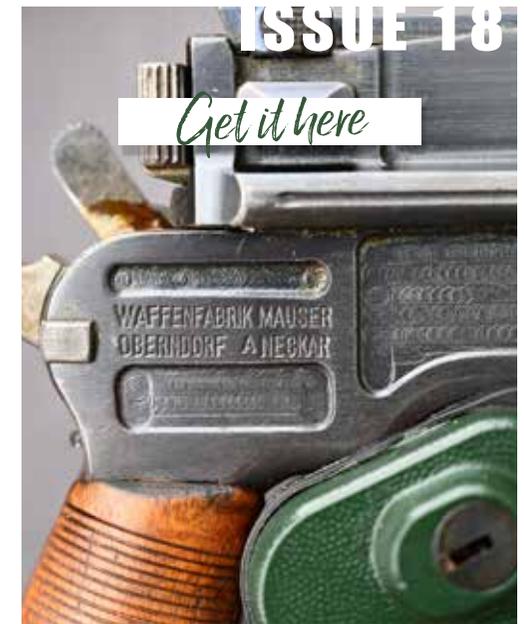
Ask yourself this: Would you feel more reassured knowing your property and firearms were under 24/7 security camera surveillance? More at wifiplus.com.au



HANDGUN

ISSUE 18

Get it here



Water you waiting for!

Jerry can joy for less than \$20

Ben Unten

Sometimes you come across something so simple and effective you wonder how you ever managed without it. Well I discovered this trick on-line, built it, used it and fell in love with it, so I thought I'd share the joy for all those shooters and hunters out there who've ever struggled to maintain a flowing fresh water supply in the field.

I keep a 20L jerry can of fresh water in the tray of my ute (having sold my previous 'Lux which had the 'OASIS' - Overland Adventure Survival Irrigation System, an under-tray water carrier). But jerry cans can pose a couple of problems like the tap being knocked around and damaged and having to tie it down and untie it to drag the darn thing around the back of the tray to use it (which I do at least a dozen times a day). But this little trick has solved all that.

What you'll need.





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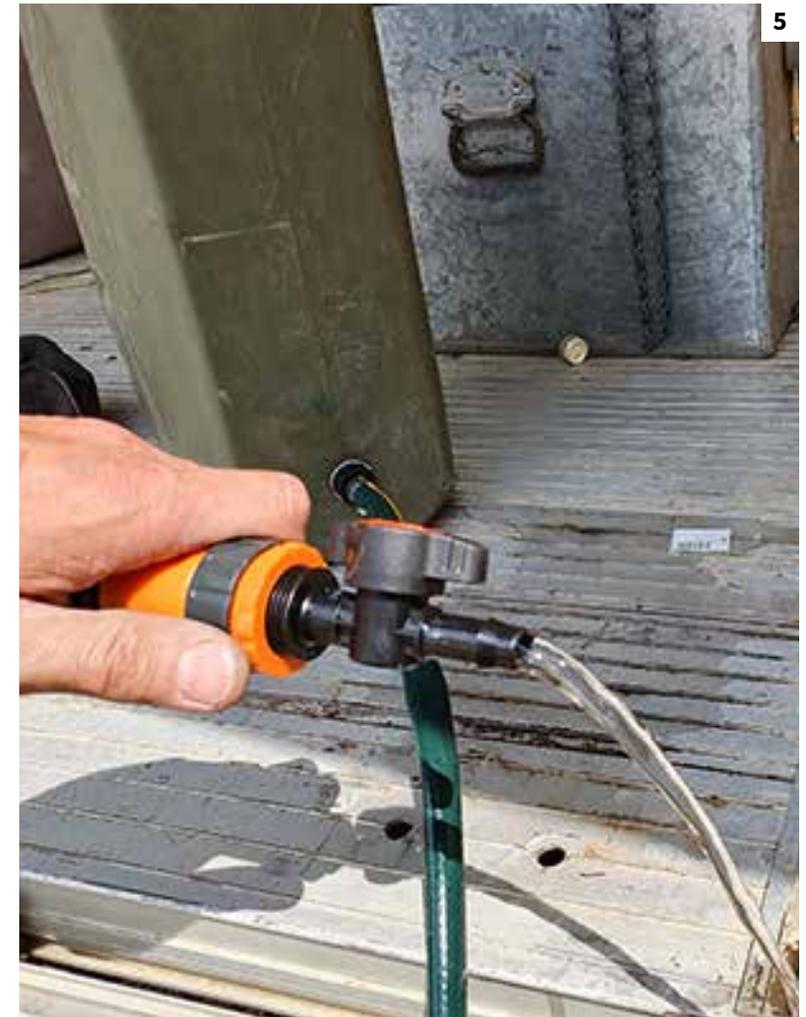


3



4

- 1: Put thread tape on the male thread.
- 2: Screw into jerry can bung.
- 3: Slide on hose and tighten clamp.
- 4: Screw tap straight into hose fitting.



5

- 5: Turn on tap and you're done.

You will need:

- A 20mm male thread to 13mm barb;
- 2m length of garden hose (those with fittings supplied are cheaper);
- A 20mm male thread to barb with tap;
- 6mm-16mm hose clamp;
- Thread tape.

All these items are available from most hardware stores and you should end up with enough change from \$20 to buy a small coffee - you may have to add a few bob from under the ashtray if you like fancy coffee.

How to:

1. Wrap some thread tape round the male 20mm thread opposite the 13mm barb and screw into the bung hole on your jerry can. Don't overtighten as they're only plastic threads.
2. Take the fittings off one end of the garden hose, slide the hose clamp on and push the hose on to the 13mm barb.
3. Slide the hose clamp up and gently tighten it.
4. Cut the hose to length.
5. Screw the 20mm thread with tap into

the hose fitting at the other end. There should be a rubber washer inside the hose tap fitting which should prevent leakage but you can also add thread tape to the male thread if you wish.

That's it! Make sure the jerry can is able to breathe by loosening the top cap then just turn the tap on and off as required.

An added bonus is you can actually fill your jerry can using the same hose. Just disconnect the tap from the hose, insert a standard hose joiner, plug in a hose connected to mains water and voila (which is French for 'You beauty'). Just beware of overfilling, especially if the jerry can is in the back of your wagon.



Tools *of the* trade

Don
Gilchrist

It's all very well to have a good gun and great projectiles, but to control the variables that will affect accuracy there must be a way of precisely measuring them. Chasing ever greater accuracy the shooter will require an assortment of tools, so this is about what is needed, when, why and how.

These measurements have to be exact and repeatable and tools to make them

are worthy of analysis. The individual tools are not expensive, but they must be sophisticated enough to tell you what you need to know in order to advance your shooting. Tools necessary for every handloader include a press on which can be installed the dies that remove old fired primers (decapping) and re-size the spent cartridge case ready to receive the powder as well as seating the new projectile with preci-

sion and a set of scales to measure the desired powder charge.

The basics: press, dies, calipers and scales

I use a Hornady Lock-N-Load press because I find the bushing mounts convenient when changing dies. I shoot only two cartridges but that still adds up to seven dies. The bushing system seems to have tight tolerances and yet allows easy

changeover. However, the dies will not fit into the box they came in after the bushing is installed.

My scales are basic RCBS. Every time I look at the specifications of scales they always seem to say plus/minus 0.1 grain irrespective of the price or technology, which is the same accuracy I already have. I use a powder thrower to give me the load and add the balance using a powder trickler.

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Calipers are essential and I like the electronic ones. You can measure in inches or millimetres at the touch of a button as well as a useful zeroing switch in scoring and tallying your test targets for grouping. Always carry spare batteries.

Dies

My dies are the Redding Competition Neck Die Set. This includes neck, seating and body dies. Redding's neck bushing system features a sliding sleeve which controls the body of the case to maintain body-neck concentricity. The bushing is a precise collar that squeezes the neck, expanded by firing, back to give the required grip on the bullet. I use the Titanium Nitride (TiN) bushings so that there is no need for case lube. I wipe the outside of the neck with carbon solvent before putting the case through to minimise the accumulation of abrasive fouling but they need regular cleaning and lubrication. The length of neck resized is controlled by a micrometer. I don't play with this too much. Neck resizing tends to cause 'doughnuts' as brass flows under the stress of repeated firing and resizing. The neck bushing ensures the 'doughnut' is on the inside where it cannot interfere with chambering in precision rifle chambers. In centrefire I mainly shoot 6BR which has a small flash hole. Redding dies should come with the appropriate decapping pin. Standard pins are 1.7mm diameter and the flash hole in quality 6BR brass is 1.5mm. The bushings allow neck tension but are sourced separately and while the



The dies that come with the Redding Competition Neck Die Set installed on Hornady bushings. From left: neck die, seating die and body die.

Hornady Lock-N-Load press and the sort of box needed once the bushings are fitted to the dies.



TiN bushings cost more they save you time and aggravation.

The contemporary thought is 0.001" less than the diameter of a loaded cartridge provides appropriate neck tension for competition shooting. Redding part numbers are in the thousandths of the internal diameter of the bushing in inches; my 6BR Lapua brass has a loaded neck diameter of 0.270" so the appropriate bushing is Redding 269, for one thou of neck tension. The Redding seating die also has a sliding sleeve that centres the case and neck, maximising concentricity of the case, neck and seated bullet, and a micrometer bullet seating stem. In accuracy shooting seating depth is an important

variable and once you have found what your chamber and barrel shoots best with it is critical to precisely reproduce it. The Redding Competition Neck Die Set also comes with a body die. After repeated firings the case and neck are going to stretch and eventually the case base to shoulder length will reach the head-spacing limits of your chamber. It will show up as difficulty chambering a round or extracting a spent case. This is the time to 'bump' the shoulders back by 0.002". The case base to neck measurement will also have stretched and part of the neck rim may be impinging on the neck-shoulder of the chamber and that will probably be asymmetrical. This has the effect of partial-



ly crimping one side of the neck onto the body of the bullet and risking an inconsistent release of the bullet when fired.

Specialised tools: case base to ogive

The relationship between the ogive (pointy bit) of the bullet in one of your loaded rounds and start of the rifling in the barrel is a major factor in gaining maximum accuracy.

If you give the bullet a running start before it reaches the rifling, that is called a 'jump'. Many projectiles go best when they are partially engaged with the rifling before the bullet is fired. This is called 'jamming' the bullets. It can only be determined by trial and error.

To explore this facet you will need an instrument which assesses the base to ogive measurement of your bullet and chamber. Hornady's Stoney Point Gauge allows you to introduce a specially prepared case into your chamber with a particular bullet quite deep in the loose neck. It is best to use a fire-formed case because any case will stretch to fit your chamber after it has

Basic RCBS scales with a powder trickler. The steel angle makes the trickler much more stable in the confined loading area. The scales are at eye height to reduce parallax and well illuminated.

been fired and the difference between a stock case and a fire-formed one can be significant. When the shoulders of the prepared case are up against the head-spacing shoulder of your chamber, the push-rod can gently move the bullet into the throat of the chamber until the rifling is felt. The push-rod can be locked off and the entire special case and the bullet can be removed and a measurement made from the base of the case to a reference plane on the ogive of the bullet. This measurement can be transferred to your seating die and gives the micrometer number.



When using that bullet, seated with that seating die, set to that number, in that press, for that gun, then a bullet so seated will have its ogive just in contact with the rifling. The bullet is then said to be 'at the lands' with no jam and no jump.

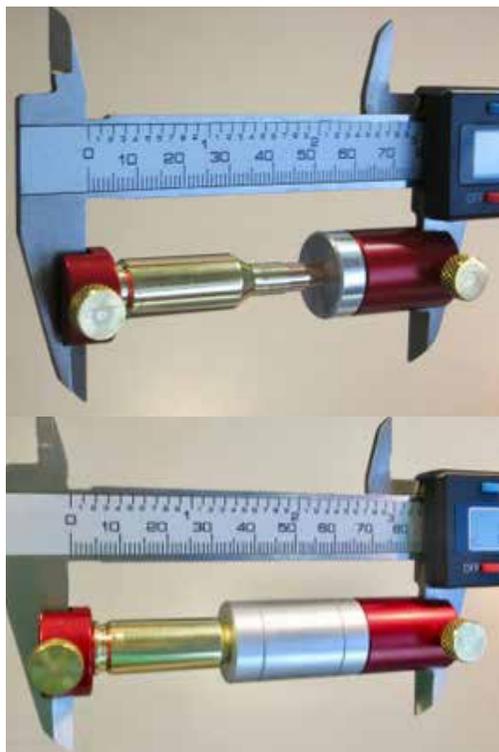
To transfer the measurement on the Stoney Point Gauge to the seating die I use a fire-formed case with a drilled-out primer pocket. This case will have quite a lot of neck tension. Wind your seating die back and seat the bullet in the drilled-out case and compare with the base to ogive that came from the Stoney Point Gauge. If

Stoney Point Gauge with prepared case and bullet being inserted into the chamber; calipers in the Gauge cut-out measure the distance from the case base to the ogive with the bullet touching the rifling; the prepared case for the cartridge is partially installed on the Stoney Point Gauge. Apart from threading the base the neck is expanded to allow the bullet to slide freely.

it is still too long wind the seating die down and push the bullet further in. Keep going until you have a base to ogive equal to the measurement from the Stoney Point Gauge and note the value. Set so, the seating die gives you a bullet seated "at the lands". Carefully record the micrometer setting for that bullet. Just tap out the bullet with a rod through the drilled-out primer pocket and it is ready to use again. It is precarious to generalise, but for longer ranges many accuracy champions use the latest long, low drag, boat-tail, target bullets jamming the rifling by up to 0.025". The measurement of the bullet and case comparators are only reference numbers so the shooter can set up their dies, to match their chamber and adjust the seating depth of that particular bullet. Every bullet type, weight and brand must have the measurements done all over again and recorded.

Comparing bullets

Once the Stoney Point Gauge has been used to set up your seating die it is not a



The useful anvil accessory on the stationary arm of the caliper can enable any loaded or test round to have its case base to ogive checked after the caliper is zeroed.

The case/cartridge comparator allows measurement of the base to shoulder dimension. When cases are becoming stretched and hard to chamber this measurement is used to set up the body die.



From left: A specially prepared case for the Stoney Point Gauge; drilled out fire-formed case for setting up dies; unfired Lapua 6BR case demonstrating the small flash hole.



A drilled out fire-formed case in use. The case needs some neck tension and the vice should not be too tight.

big stretch to use part of it to check bullet seating in loaded rounds. Hornady offers a small accessory called an anvil that screws on to the stationary arm of your calipers. The anvil makes it easy to hold the case base square in the caliper jaws but it does mean the calipers will need to be re-zeroed. I bought two so that there is always one with both my bullet comparator/Stoney Point Gauge and case comparator (headspacing).

Headspacing and its proxies

It is important that the reloader understands chambers, cases and cartridges are made to an industry standard. This means that standard rounds and cases

are smaller than standard chambers. But the accuracy shooter wants his brass conforming to his particular chamber. This happens automatically in the process of firing and is called fire-forming. Once complete, the precision shooter will do the minimum amount of resizing before reloading, usually bushing neck sizing and only occasional body sizing, so prolonging case life and improving consistency. Headspace is defined as the distance from the closed bolt face to a reference line on the chamber shoulder, not the base of the case to a place on the case shoulder. The cartridge comparator only acts as a proxy for that rifle's defined headspace. When a shooter starts to find more than

average resistance when chambering a round it is time to check the body of the case with the case comparator. The shoulders of the case will probably need to be bumped back inside the available headspace. Before you can bump the shoulders back, the body die will need to be set up. Take one of the spent cases which was difficult to chamber and use a case comparator. This measures from the base to a reference plane on the shoulder of the case. Once again the measurement is just so the body die can be set up. Keep screwing the body die down into the press bit by bit, checking with your case comparator, until it pushes back the



Universal decapping die with its Hornady bushing. Care must be taken that the pin fits the flash hole of the case.



Lyman case length trimmer set to the magic case length of 1.555" for 6BR.

shoulders of your sticky case by 0.002". Tighten the lock ring on the body die and you will be set up to 'bump' the shoulders back to a pre-determined value inside the headspace. Once it is done, you are good to go.

Not only will the shoulders be stretched by firing, so too will the case overall length (COAL) from base to neck rim, so this exercise will probably also involve shortening the neck and squaring it off. A case length trimmer will have a way of centering the base and holding it against the rotation of the cutter. My Lyman trimmer uses a cam lock and a spring-loaded ball engaging the primer pocket of the case, so it must be decapped first. At the other end is a pilot that exactly centres the cutter against the mouth of the neck which is the same diameter as the bullet the case will fire. The decapping must be

done without resizing the neck for the pilot to do its job without messing with the neck tension. Take out the neck bushing when decapping or use a universal decapping die. If you shoot 6BR or 6PPC the universal die decapping pin will be too big for the small 1.5mm flash hole. I carefully turned mine down freehand using a small bench grinder although you could contact the manufacturer for the correct 1.5mm decapping pin and install it into the die yourself. With 6BR the magic COAL is 1.555" so I just leave my case trimmer set to that and when some become tight I trim them back, squared off at the same time. The mouth of the neck will need to be chamfered inside and out and polished so that bullets are not scored when seated. I use a Lyman set that has inside and outside chamfer cutters, large and small primer pocket cleaners and primer pocket

Lyman kit with everything the benchrester needs for neck chamfering, primer pocket uniforming and cleaning. Plus a bit of Scotch-Brite to finish the neck off.

A competition powder thrower with micrometer adjustment stem mounted on its base plate.



uniformers plus a couple for crimped primer reloading. The final finish is just a quick rotation against a Scotch-Brite pot scourer. What I have covered might be considered the basic benchrester's tool kit. The next level brings things to the shooting sports where ultimate accuracy is the aim.

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VISIT NOW

Caldwell Ballistic Precision Chronograph Premium Kit

Don
Caswell

Measurement of muzzle velocity is important to handloaders and for any hunter keen to determine the best load in their rifle, and while new technologies are evolving for the measurement of projectile velocity, the original know-how of optical sensing is still a competitive solution and attractively priced.

Australian Shooter was given the chance to review the Caldwell Ballistic Precision Chronograph Premium Kit courtesy of Nioa and it couldn't have arrived at a better time for me. Apart from weekly testing of various loads and different factory ammo in rifles I review, I'd just begun

an extensive campaign of testing air rifle pellets and the weather in far north Queensland wasn't helping in my efforts to measure the muzzle velocity of several hundred shots from my air rifle.

The LED lighting in the diffuser screens of the Caldwell meant I could make use of my evenings and conduct testing under cover in the shed. This proved a great advantage as measuring air gun pellet speeds is a challenge for any chronograph but the LED screens on the Caldwell did it faultlessly. The reliability of measurement on air rifle pellets was matched with the higher velocity projectiles from centre-fire rifles as well.

Set up and ready to record projectile velocities - the Caldwell Ballistic Precision Chronograph.





Contents of the Caldwell Ballistic Precision Chronograph Premium Kit.

So just what do you gain from the Caldwell Ballistic Precision Chronograph Premium Kit? The package contains the following:

- Caldwell Ballistic Precision Chronograph.
- Two 16-LED lit diffuser screens.
- Adjustable tripod for mounting the chronograph.
- Battery pack to hold the four AA batteries (not included) for the IR lights.
- A 'Y' splitter cable for the lights.
- AC power cord with 220V adaptor for light panels.
- 25ft audio jack cable.
- Custom carry bag for the whole kit.

The Caldwell Ballistic Precision

Chronograph is factory calibrated to an accuracy of +/- 0.25 per cent and for a projectile travelling at 3000fps that equates to measurement uncertainty of +/- 7.5fps (there's a switch on the unit which allows the user to choose between fps or mps). The chronograph is powered by a single 9V battery (not included) or via the power cable adaptor and the front panel has a large LED display that can be read at some distance. There's also the option to run the 25ft audio jack cable from the chronograph to your mobile phone and view the results first-hand and a free, downloadable app can be installed to give advanced

data access on your mobile. Just search for Caldwell Ballistic Chronograph and download through the app store on your mobile phone.

The app includes current velocity measurement, data logs, any notes and weather conditions, data which can be easily sent via email or SMS, and the mobile phone app has a pre-loaded database that includes most brands and bullet types. If your favourite projectile is not represented you can enter specific data for any projectile not included in the database. The app will record shot string data which can be either exported to an Excel spreadsheet or simply messaged

to your PC and for a shot string, the app records the following:

- Average velocity.
- Standard deviation of velocity measurements.
- Slowest measured velocity in the string.
- Fastest measured velocity in the string.
- Spread of velocity measurements.
- A calculation of the true muzzle velocity, not just the measured velocity.
- Kinetic energy of each measured velocity.
- Weather conditions - ambient temperature and barometric pressure.

Like all optical chronographs, the Caldwell has diffuser screens to enhance detection of the bullet's passage over the sensors. Unlike most other chronographs though, the Caldwell features a panel of 16 high output LED microlights in each wide diffuser panel which enable the unit to detect a projectile's passage in low-light conditions, such as indoors at night. The tripod that comes with the Premium Kit allows the chronograph to be positioned in the range of 16" to 51" (40 to 130cm) above ground level.

Specifications for the Caldwell Ballistic Precision Chronograph state it can measure projectile velocities from 1 to 9000fps, including not only projectiles and pellets but also arrows and slingshot pellets. The operating temperature is rated at 20 to 120 degrees F (-7 to 49C). The Caldwell Ballistic Precision Chronograph Premium Kit is available from most gunshops with a retail price starting around the \$350 mark but shop around.

When timing can be everything

Joseph Nugent

It's hard to know how much of a successful hunt is technique and how much comes down to luck but regardless, one particular roar clearly demonstrated that simple timing can be a make or break factor.

Once again April came around and as usual the plan was to head out to our property early in the season in order to put some venison in the freezer and, with luck, a trophy for the wall. It was the first time we'd hunted this area since mid-summer after a lightning strike had started a large bushfire which burnt through half our estate before it was contained.

Joseph with his well-timed 10-pointer.





One wallow,
three days,
four stags.



Pre-roar
evidence
of deer.

While quite frightening at the time, the fire proved a real boon for us as it cleared out 20 years of accumulated deadfall, underbrush and lantana. Consequently our acreage was not only more open and conducive to hunting than ever before, but after a few showers of rain the land recovered beautifully, producing the greenest grass in the district. Our trail cameras and the obvious tracks which abounded indicated deer had taken a liking to our lush pastures and were moving through the land regularly and in good numbers. As school holidays began we prepared for our hunt, heading to the property to

start a three-day adventure. On arrival we decided we'd try our luck at some stand hunting so we didn't put our scent through the ground we intended to stalk the following day. The plan for the first afternoon was for dad and I to sit on different sides of a ridge, overlooking the adjacent creek lines and grassy meadows opened up by the fire. We agreed to watch and listen for any activity and return to camp at last light. Our efforts were exciting but unsuccessful and as the afternoon wore on we knew the temperature hadn't dropped enough for the stags to be in full throat and only heard four or five roaring sporadically.

One of them was close by, set up in a stand of trees down the ridge from me but unfortunately on the neighbouring property and, as the light began to fade, I decided to have some fun with him. In a bid to catch a glimpse of the stag, I started to respond to his roars. To my surprise I aroused his interest as he'd roar then walk a little closer towards me. Alas he didn't cross the fence line and I never saw him and before I knew it night had fallen and it was time to head back to the shed. Next morning most of the few roaring stags seemed to be holding on one of the adjacent expanses and only two sounded

like they'd be on the furthest reaches of our block. As a result we decided to do a large loop around the left of the surrounds towards them, walking some of the newly burnt land in the hope of encountering some opportunistic deer out feeding on the fresh grass. All was quiet as we walked the ridges, dad positioned on the ridge top with me further down the gully in order to cover maximum ground. As I made my way up a steep slope I heard a loud bark, an alarm call by red deer off to my right, so I decided to make my way round the spur to where the roar had come from.



A quality stag inspecting a wallow.

As I hadn't heard anything else I figured the deer may still be around, monitoring my next move. Almost immediately came an eruption of movement atop the adjacent ridgeline, unfortunately not a deer but a pair of wild dogs trotting down the face of the crest. Perhaps the stag had been reacting to them. This was so frustrating and had happened regularly during the past three years without fail. Usually wild dogs would be shot on sight but taking one this early in the hunt would likely ruin the rest of the morning's stalk and with one of our target stags still giving an occasional groan, I reluctantly let them make their way into the creek line and headed back up the spur. After the episode with the wild dogs we continued to walk the ridges and check likely spots such as wallows and grass-filled meadows but to no avail. We reached our

top corner fence, the area we thought a stag had been roaring from earlier and decided to circle back around, using the same tactics but hunting closer to the fence line as we made for home. By now it was almost 9am, the stags on the other property had all gone quiet and it was beginning to heat up noticeably. I had more or less given up finding a deer and on the stalk home followed a path close to the fence with a few stands of lantana to my right and open burnt land to my left. I'd just crested a small hill with a meadow below it when a loud roar came from a stand of thick, unburnt lantana. Although I



A small herd of deer in unburnt country.

couldn't see the animal I hoped he'd step into view so cycled my Tikka T3x chambered in .270 and stood in place, waiting for a shot to present itself. The bushes shook and rustled as the stag let out one more roar before stepping out of the shrubbery. I raised my rifle and fired a shot into his shoulder which toppled him in an instant, the 130gr Nosler ballistic tip projectile doing an exceptional job at around 60m. As we were primarily after venison I'd sighted and fired instinctively and hadn't had a chance to accurately gauge the stag's size and, walking over with excitement, was pleasantly surprised to count 10 perfect points.

While he wouldn't be the highest scoring stag in the world he was a neat, symmetrical 10 - a healthy animal with tall beams and a nice coat. I was lucky to have taken him as a minute sooner he probably wouldn't have been there in plain sight, a minute later and he'd have disappeared into the cover of a creek line. If it wasn't for his well-timed roar I'd have walked past the lantana and spooked him immediately. This one really did come down to a question of timing - I was simply in the right place at the right time.

Firearms engineering as an exact science

Simon Winchester is a prolific English-American author and journalist who has written some 27 books covering a wide range of topics. His book under review here by **Geoff Smith** is a well-documented study of how engineering, with increasing precision, has changed the face of our world during the past 240-odd years.

Explaining the route of radical innovations

Imagine you're a gunner on a naval ship in the late 18th century. The battle is raging, your 32-pounder long gun is loaded and you're lining up in readiness to fire. You ignite the priming charge and . . . boom! Your gun blows apart and kills you. This apparently all-too-common scenario led John 'Iron Mad' Wilkinson to patent a new way to make cannon barrels. Instead of casting them hollow he cast them solid then precisely machined the interior barrel to an accuracy of "the thickness of an English shilling". This was the starting point, many say, of the Industrial Revolution, as Wilkinson's techniques were quickly adopted by James Watt and Matthew Bolton in the manufacture of efficient steam engines. The prologue of Winchester's book is a delightfully personal testament to his father's work as an engineer and how he used to bring items home to show young Simon. His father, he said, was engaged in turning shapeless lumps of hard metal into objects of beauty and utility and he discusses the

difference between precision and accuracy using rifle shooting as his model.

Each chapter is prefaced with a level of tolerance, the first being 0.1", or the thickness of an English shilling. This chapter talks about John Wilkinson but there are brief fascinating asides, such as the Antikythera clockwork instrument made more than 2000 years ago which accurately plotted the movements of the moon and then known planets, and to John Harrison the clock-maker, whose work enabled the accurate determination of longitude by sailors during the 18th century. It was the steam engine though, which really marked the beginning of the Industrial Revolution.

The second chapter, now at a tolerance of 1/10,000", introduces Joseph Bramah and Henry Maudslay. Bramah invented a variety of things including flushing toilets, but was mostly famous for his locks, although his apprentice Maudslay went on to become renowned for inventing and improving machines, including the micrometer which enabled measurements of thickness down to 1/10,000".

Although the wooden treadle lathe had been known for several thousand years, Maudslay's were made from steel and included the leadscrew and slide rest, his factory for machine making of pulley blocks for ships operating right up to 1965. He introduced the concept of precise interchangeability of parts, which was soon to become important in gunmaking and also subject to protests as workers realised machinery was taking their jobs.

At a tolerance of 1/100,000" the third chapter moves to the US War of Independence where, at the Springfield Armoury, they realised that if a single component broke then

the whole rifle became useless unless parts were identical and replaceable.

Until that time guns were made individually and each was unique. This concept had been realised previously in France but their revolution had seen the idea lost in 'The Terror'. The American Eli Whitney, described as something of a rogue, had become famous for inventing cotton gin before becoming heavily involved in gunmaking. At this time Hall, Blanchard and North introduced various machines to expedite gunmaking at the Harpers Ferry works, inventing and using drop forges, templates, gauges and copy lathes to mass produce guns which were identical, using few individual workers and minimal hand-fitting tasks.

The book catalogues names which remain familiar to shooters as factories were established in Connecticut. Joseph Whitworth, now most famous for his eponymous thread form and formerly apprenticed to Maudslay, had a stand at the Great Exhibition in London's Hyde Park in 1851 in which he had a micrometer that could measure down to one-millionth of an inch. Queen Victoria, on July 2, 1860, opened the Grand Rifle Match at Wimbledon by accurately firing a .45 calibre Whitworth rifle at a target 400 yards away.

At the US Battle of Spotsylvania four years later, General John Sedgwick famously said of the far-off enemy: "They couldn't hit an elephant at that distance." Seconds later he was killed by a shot to his head from a distant Whitworth rifle.

Chapter five covers divergence from firearms to the fledgling automobile industry, contrasting the techniques of the two prominent Henrys - Royce, whose hand-made cars were expensively out of reach of

mere mortals and Ford, whose far cheaper production line cars were accessible to the world at large. Ford, allegedly, watching pigs being "dismantled" at a slaughter house, conceived the idea of the production line by applying it in reverse. The book continues with increasing levels of precision to explore flight, photography, GPS and precision timekeeping. The origins of the transistor, then the integrated circuit and computer chips and the machines and personalities that made them are explored in some detail. By this time the orders of precision are so far removed from "the thickness of an English shilling" as to defy the imagination.

The technical content concludes with LIGO, the interferometer which can measure the distance between us and Alpha Centauri A, some 4.3 light years or 26 trillion miles, to an accuracy of the diameter of a human hair. In short, this is a breathtaking book which will be of great interest to shooters with a bent towards engineering.

• *Exactly - How precision engineers changed the modern world* by Simon Winchester (Collins, London, 2018) - paperback, illustrated in black and white, 396 pages.

