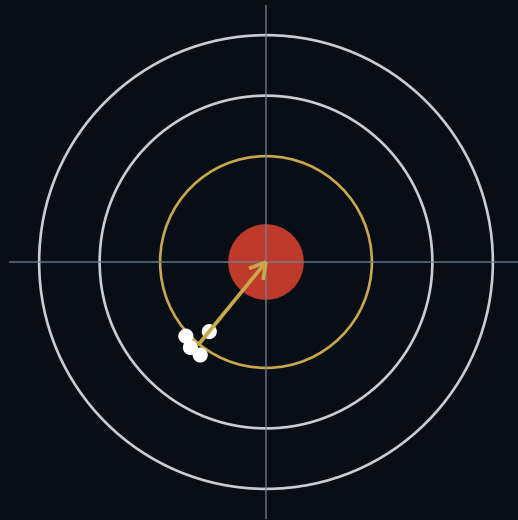




ZERO

Point of aim, meet point of impact.

CAP COAST GUNSMITHING · YEPPPOON, QLD

A First Round Effect knowledge guide

Why this guide exists

Every month, people phone the workshop and bring rifles in for us to zero. It is one of the most common jobs on the bench, and one of the most misunderstood. Plenty of shooters have never been shown the process end to end, so they pay to have it done, or worse, they guess and end up trusting a zero that quietly lies to them.

There is no secret to it. A zero is a repeatable process, not a dark art. Paying a gunsmith to do it is fair enough when you are short on time, a solid backstop, or the right gear. But every shooter should understand what is actually happening, because a zero you cannot trust is worse than no zero at all. It fails you at the exact moment that matters: the first cold shot in the field.

So this is the plain-English version of what we do on the bench: what a zero really is, how to get on paper safely and cheaply, how to choose your zero distance, the group, measure, adjust, confirm loop, how to turn a miss into the right number of clicks, why the cold-bore shot is the one that counts, and where a ballistic solver fits in.

Read it once and you will know exactly what you are paying for, or how to do it yourself. Then take it to a supervised range and prove it on paper.

The Capricorn Coast, where a trued zero earns its keep.



Safety first. Data always. Ego never.

What a zero actually is

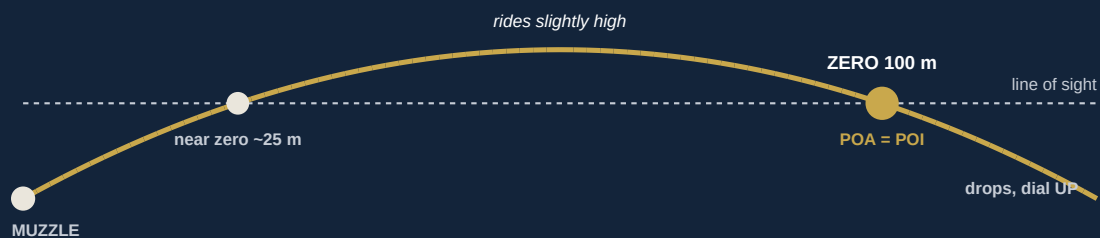
Your zero is the one distance where your point of aim equals your point of impact. Put the crosshair on the dot, and at that distance the bullet lands on the dot. Everything you dial or hold after that is measured from this anchor.

The reason it takes any thought at all is that your scope sits above the bore. The line of sight is dead straight, but the bullet leaves below it and arcs under gravity. It climbs across the line of sight at a near zero, often around 25 metres, rides slightly above it through the middle distances, then curves back down and crosses a second time at your zero. A 100 metre zero means you have set the sights so that second crossing lands at 100 metres.

That is why a 100 metre zero prints a touch low up close, a touch high in the middle, and dead on at 100. Past your zero the bullet keeps dropping, so you dial or hold up. Get the anchor honest and everything downrange is just referenced maths.

THE BULLET ARCS ABOVE YOUR LINE OF SIGHT

vertical scale exaggerated for clarity



Get on paper: bore-sight and the 20 m trick

Starting at 100 metres hunting for holes you cannot see wastes ammunition and daylight. Align cheaply up close first, and use a smart 20 metre target so your very first group at 100 is already on the bull.

Why you aim low up close, not dead centre

Your scope sits about 4 to 5 cm above the bore, so the bullet starts below your line of sight and climbs to meet it. A rifle zeroed at 100 metres therefore prints a little low at 20 metres, not dead centre. Build that same small offset in at 20 metres and you have set a 100 metre zero before firing a shot at distance. Force it dead centre at 20 and you will sit high at 100, sometimes clean off the paper.

For a typical .243 and standard scope height, that offset is about 1.5 cm low at 20 metres.

From the bench

Why low, and by how much. At 20 m the numbers are small: 1 mil covers 2 cm, and 1 MOA covers about 0.58 cm. So the 1.5 cm you want is 0.75 mil, which is 7 clicks on a 0.1 mil turret (or about 2.6 MOA). That 0.75 mil is the offset you are baking in.

The play, step by step

1. Bore-sight at 20 m so the bore and the crosshair both point at the bullseye. This is rough alignment only, not a zero.
2. Fire a group at 20 m, aiming dead centre.
3. Move that group to sit about 1.5 cm low, not on the bull. From centre that is 0.75 mil, so dial 7 clicks down on a 0.1 mil turret, fire again, and confirm it prints 1.5 cm low.
4. Move to 100 m. Your first shots land right around the bull, and you only make small final corrections to walk the group dead centre. No chasing holes, no wasted box of ammunition.

Confirm the range, the backstop and your legal right to shoot before a single shot. There is no unsupervised live fire from a PDF.

Choose your zero distance

Pick a zero for how you actually use the rifle, then be consistent.

100 metre zero, dial up for distance (our default)

Simple, precise and predictable. Your crosshair centre stays clean, and for longer shots you dial a known amount of elevation from your data. This is the approach the course and the app are built around, and the one this guide assumes.

Maximum point blank range (MPBR), the alternative

MPBR flips the logic. Instead of one exact distance, you pick a target zone, say a vital area or a plate of a set size, and choose a zero so the bullet never rises or falls outside that zone from the muzzle out to a maximum distance. Aim dead centre and, anywhere inside that band, you land a hit. That maximum distance is your point blank range.

In practice you run a slightly longer mid-range zero, so the arc rises to the top of the zone through the middle distances and drops to the bottom of it at the far end, never leaving the zone in between. For a typical centrefire and a hand-sized zone that can stretch usable range to a few hundred metres with no dialling and no holdover. Tighten the zone and the point blank range shrinks; widen it and you trade precision for reach.

The appeal is speed: no turrets, no holds, just centre mass and press, which suits fast hunting shots on forgiving targets. The cost is precision. You are never exactly on, only somewhere inside the zone, and past your point blank range you are guessing. For known distances, small targets, or any shot where a few centimetres matter, a 100 metre zero with dialled data wins. Pick MPBR for speed; a dialled 100 metre zero for precision.

Whichever you choose, know your zero distance, confirm it, and reference everything from it the same way every time.

The loop: group, measure, adjust, confirm

This is the whole method, and the discipline is in not skipping it. Do not chase single shots. One shot tells you almost nothing; it could be you, the wind, or the rifle. A group tells you where the rifle is honestly shooting.

Fire a group of three to five. Measure the offset from the centre of the group to your point of aim. Make one adjustment for that offset. Then fire a fresh group to confirm the change did what you expected.

Chasing individual shots walks you around the target all afternoon and teaches you nothing. The loop converges: group, measure, adjust, confirm, and you are done.

1

Group

fire 3 to 5

2

Measure

offset from centre

3

Adjust

dial the correction

4

Confirm

a fresh group

Turn the miss into clicks

Once you have a group, read the miss in your reticle's own unit and dial exactly that. Do not eyeball it.

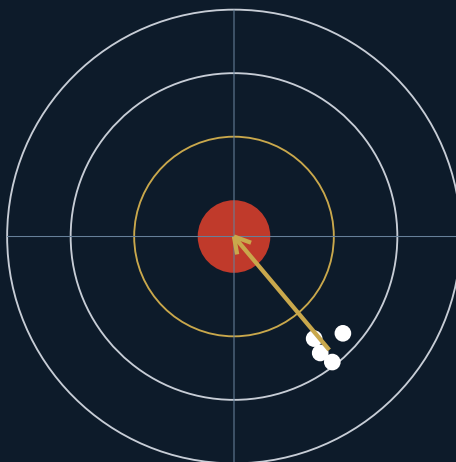
Worked example. Your group centres 5 cm low at 100 metres. At 100 metres, 1 cm is about 0.1 mil, so 5 cm is about 0.5 mil. You dial 0.5 mil up. In MOA, 5 cm at 100 m is roughly 1.7 MOA.

Then match that to your turret. Most mil turrets move 0.1 mil per click, so 0.5 mil is five clicks. A quarter-MOA turret is a different count again. And correct both axes at once: a group sitting low and right, like the one below, means dial up and left; a high-left group means down and right. Always move the impact toward centre.

From the bench

The classic own-goal we see on the bench is guessing the turret's click value. Mil and MOA are not the same, and 0.1 mil is not a quarter minute. Read what is actually engraved on your turret before you count clicks. Two minutes of checking saves a box of ammunition.

GROUP: 5 cm LOW, 3 cm RIGHT at 100 m



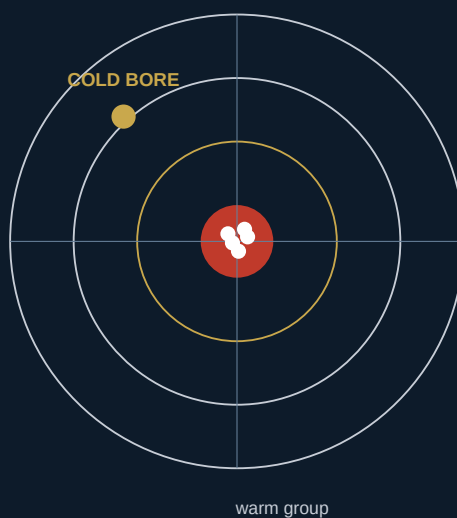
DIAL: 0.5 mil UP + 0.3 mil LEFT (5 up, 3 left at 0.1 mil)

The shot that counts: cold bore

Here is the part most bench zeroes miss. In the field, the first shot from a cold, clean barrel is often the only one that matters, on a hunt, a cull, or a first-round steel hit. And that cold shot can land slightly apart from the warm group you so carefully zeroed after a string.

So confirm your zero cold and clean, not on your fifth warm shot. Note any cold-bore offset and the conditions it happened in. If your cold shot sits a fraction high and left of your warm group, that is worth knowing before it costs you.

This is the whole idea behind the name First Round Effect. The first round is the one you have to own. A zero that is only honest once the barrel is warm is a zero that lies when it counts.



From zero to DOPE, and why you true it

A zero is the anchor. Beyond it, a ballistic solver predicts how much to dial at each distance, your DOPE. But a solver's numbers are a hypothesis until your rifle proves them. Enter a good profile and you get a good first prediction, no more than that.

Truing is how you make it honest: you adjust the solver, muzzle velocity or ballistic coefficient, until its prediction matches what the steel actually shows. When the screen and the target disagree, believe the steel.

And a trued solver today is not trued forever. Re-true when things change: a new barrel or a fresh lot of ammunition, a suppressor fitted or removed, a big density-altitude swing, real barrel wear, or a major component change.

From the bench

Building DOPE from a solver, truing it against your own impacts in a deliberate order, and validating it step by step out toward the transonic zone is the practical spine of the course. The free CCG-LR app does the maths and holds your DOPE; the course teaches you to make it honest and gives you the Zero and Truing card to log it. This guide gets you a zero you can trust. The course turns that into a firing solution you would bet a cold-bore shot on.

Local notes, mistakes, and a drill

Coastal conditions

Your 100 metre zero itself is stable, but the come-ups you dial past it are not set and forget. Humid coastal air and big day-to-day density-altitude swings on the Capricorn Coast change your drops at distance. Confirm your far dope again when the air has clearly shifted, not just once a season.

The expensive four mistakes

1. Chasing single shots instead of reading a group.
2. Dialling the wrong way, or guessing the turret's click value.
3. Zeroing warm and never checking the cold-bore shot.
4. Trusting a solver you have never tried against your own rifle.

A supervised drill

Bore-sight. Get on paper at 25 metres. Move to 100. Fire a group, measure, make one correction, and confirm with a fresh group. Then, at the start of your next session, fire one cold-bore shot before anything else and log exactly where it lands. Do that a few sessions running and you will know your rifle's first-shot habit cold.

No unsupervised live fire from a PDF. This guide teaches the process. A supervised range proves it.

Where to go from here

You now have the map:

A zero is where point of aim meets point of impact. Get on paper close and cheap. Group, measure, adjust, confirm. Turn the miss into the right clicks for your turret. Own your cold-bore shot. And true your solver before you trust its dope.

The process is simple. A zero you would bet on takes reps and honest data.

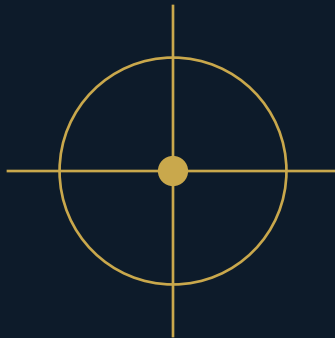
That is the part a guide cannot hand you and a gadget cannot buy: your own confirmed data, gathered in a deliberate order, with honest feedback of call versus impact.

First Round Effect, the CCG Long Range Programme, is that structured path: zeroing, atmospherics, wind, DOPE, solvers, ethics and Australian conditions across 25 modules, with the free CCG-LR app built around the same method so your zero and your DOPE travel with you into the field.

Course: capcoastgunsmithing.com.au/first-round-effect

More free guides: capcoastgunsmithing.com.au/knowledge

App: search CCG-LR on the App Store



FIRST ROUND EFFECT

capcoastgunsmithing.com.au/first-round-effect

Safety first. Data always. Ego never.

This guide is general education for lawful, supervised shooting. It does not replace range officer direction, club rules, or your state's firearms laws. Zero and confirm only where you are legally entitled to shoot, with a safe backstop, and within your honest capability.