

MISSOURI AIRGUNS

Ultimate Airgun Setup Checklist

Free printable checklist + compact zeroing guide

MissouriAirguns.us

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Airgun Setup & Zeroing — Printer-Friendly Guide

Compact, one-page reference for range use. (Free resource — Missouri Airguns)

Safety first

Ensure the gun is empty and safe before doing anything. Remove pellets and magazines, check air pressure, keep the muzzle pointed in a safe direction, and wear eye protection during live fire.

Tools to have ready

Torque driver / Allen keys	Bubble level or level app
Chronograph	Stable rest (sandbags)
Targets with aiming point	Pellets — test 3+ brands/weights

1 — Quick visual & mechanical check

- Inspect bore for obstructions (bore light or safe pull-through).
- Hand-tighten stock bolts and rail screws; plan to torque to spec.
- Inspect air cylinder / bottle for damage or leaks.

2 — Mount the scope correctly

- Fit base and rings per manufacturer instructions.
- Set scope to max magnification to position eye relief (~3 in guideline).
- Level rifle & reticle.
- Torque ring screws incrementally in an X pattern to manufacturer values.

3 — Bore-sighting

Use a laser bore sighter or remove bolt and align barrel at 10–15 yd to bring initial shots on paper and save pellets.

4 — Chronograph baseline

Place chronograph 1–3 ft from muzzle (follow chrony manual). Fire 5–10 shots and record average velocity and spread (SD or ES). Log results.

5 — Choose a zero distance

Common zeros: 25 yd or 50 yd. Beginners can start at 10–15 yd for initial adjustments then move back.

6 — The zeroing process (practical)

- Fire a 3–5 shot group from a stable rest, aim at the same point.
- Measure horizontal & vertical offset from aim point to group center.
- Convert offset to clicks (see example below) and dial elevation/windage, then confirm with another group.

MOA conversion example (shows math)

Example: scope = 1/4 MOA per click, zero = 25 yd, group is 0.5" low. 1 MOA at 100 yd = 1.00" → at 25 yd, 1 MOA = 0.25". 1/4 MOA per click at 25 yd = $0.25" \div 4 = 0.0625"$ per click. Clicks needed = $0.5" \div 0.0625" = 8$ clicks up.

7 — Pellet testing routine

Test 3+ pellet brands/weights. For each: record 5-shot group size, average FPS, and SD/ES. Prefer pellets with smallest groups and low spread.

8 — Check at a second distance

After zeroing, test POI at a secondary distance (e.g., zero at 25 yd, test at 50 yd) to note trajectory and required holdovers.

9 — Foot-pounds calculation (math shown)

Formula: $FPE = (\text{velocity}^2 \times \text{pellet grains}) / 450240$ Example: 25 gr pellet at 850 ft/s 1) $850^2 = 722,500$ 2) $722,500 \times 25 = 18,062,500$ 3) $18,062,500 \div 450,240 \approx 40.10 \rightarrow \sim 40.1$ FPE

10 — Quick troubleshooting

• POI shifts after tightening rings: loosen and re-torque evenly. • Inconsistent chronograph readings: check placement and ambient light. • High SD: try other pellets, check regulator/fill.

Printable Quick Checklist (tick when done):

- ☐ Visual inspection & bore clear
- ☐ Scope mounted, leveled, torqued to spec
- ☐ Bore-sighted for first shots
- ☐ Chronographed (5–10 shots) — log avg & spread
- ☐ Pellet testing (3+ pellets) — record groups & choose best
- ☐ Final zero confirmed at primary and secondary distances

Prepared for Missouri Airguns — Branded cover + guide