Audit Notes — Reproducible Acoustic Package, rev. 4

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These notes accompany `forensic_acoustic_package_r4.zip`. They record what the two independent audits found, what was changed in response, and the corrections log kept during the analysis. Full detail, data tables and scripts are in the package (`docs/results_v5.md`, `scripts/`).

Revision history (from the package README)

Revision 4 responds to the auditor's note on revision 2: manifest regenerated and verified against the zip; file provenance corrected (only 2.MOV and IMG_6368 are device originals); "high-frequency dominated" qualified; Cam 7's role stated accurately; bound-violation robustness quantified by Monte Carlo over timing and camera positions; the 247° association re-tested with 200 trials under two null models.

Revision 3 added the auditor's follow-up note: the Cam 8 alternate-offset sign corrected (it makes Cam 8 later, not earlier); the low-band loop closure stated fairly (4.5 ms); and a model-free single-wavefront bound test (results §8a) showing that the Cam 7 and Canon first-arrival picks cannot be the same wavefront as the Cam 6/Cam 11/2.MOV/IMG_6368/Cam 8 group.

Revision 2 responded to the audit itself. Changes: Cam 7 synchronized (its event is at 25.35 s, not 7.91 s); degrees of freedom corrected in all fits; bearing restated as a feasibility interval; a stationary-source model reported alongside the projectile model; seven-camera late-arrival association with null test; Cam 8 offset ambiguity documented as unexplained. Details: `docs/results_v3.md`, Appendix A, items C13–C17.

Status of the website's earlier acoustic claims

Where the exhibits on the site (Sections 08–12, 23 and the acoustic download cards) conflict with the package, the package governs. The specific items withdrawn or restated are listed in the page's revision notice and revision log (10 Nov 2026).

APPENDIX A — CORRECTIONS MADE DURING THE SESSION

Recorded so that the path to the results is auditable.

#	what was stated	what was wrong	corrected to
C1	Canon CH2 "unclipped" (methods R1)	14 full-scale samples at four instants	CH2 clipped; CH3 used (3 samples)
C2	Firing point selected from absolute shock–blast intervals at 2.MOV	onset-definition sensitivity (~10 ms) equals the separation between candidate windows; also the "blast" was later reassigned	withdrawn; replaced by multi-camera first-arrival inversion (§8)
C3	IMG_6368 first arrival anomalous (LF ramp)	onset pick landed on an LF ramp 3.5 ms after the HF crack	consistent HF criterion applied to all files
C4	Second arrival at the tent phones identified as the	sync-free intervals and multilateration show it is not from the rooftop	reassigned to a late event of undetermined origin (§11–

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	muzzle blast		12)
C5	Late event "localized to the van"	a true time was passed where a relative time was expected (2.MOV 51 ms late in the fit)	re-fit; event is from the SW, range unconstrained, p ≈ 0.05 (§12)
C6	Late event "at the pond / terminal impact" from a four-camera point fit	range is degenerate with cameras all on one side; five cameras give a plane wave	stated as bearing only, with two compatible explanations (§12)
C7	"Canon shortest interval" proposed as a sufficient discriminator	the rear-wall echo has the same qualitative pattern; later, Canon first arrival found anomalous	Canon excluded from geometry fit (§10)
C8	2.MOV lateness attributed to PA-correction systematic	Cam 8, 14.5 m from PA, shows the same lateness	PA systematic retained as one candidate; position error added
C9	IMG_6368 chained offset sign	−1.2855 − 6.6272 written for +6.6272 − 1.2855	fixed in results.py; IMG true first arrival +54.7 ms
C10	Late-arrival association by hand-picked "dominant" peaks	selection was mine, not the data's	exhaustive combination search with null test (§12)
C11	Cam 8 offset "8.627 ± 0.005 over 12 blocks"	re-derivation shows a second candidate (8.583) in the low bands, 44 ms away	8.627 retained on the strength of the ≥500 Hz bands and the Cam 11→Cam 8 loop; alternative documented (§5)
C12	Precursor test first run with a zero-phase filter	zero-phase filtering spreads the first arrival backward and manufactures a precursor	causal filter (§15)
C13	Cam 7 "cannot be synchronized"; Cam 7 analysed at 7.913 s	wrong event: the shot is at 25.350 s; PA sync works at 2.MOV = Cam 7 − 16.8878 (offset supplied by third-party audit, verified; loop closes to 4 ms). All revision 1–2 Cam 7 statements (self-relative description, precursor exceedance) were about the wrong event	§3–5, §7, §15
C14	χ^2 "on 3 dof" for fits with three free parameters to three data	dof = 0; significance statements invalid	§8 recomputed with dof stated per fit
C15	Bearing "61° ± 3°"	width from $\Delta\chi^2 = 1$ on an exactly-determined fit, dependent on an unstated rifle-velocity prior	feasibility interval 60–66° (rifle v) / 60–80° (any v), under a model that does not fit (§8)
C16	Projectile model presented as the fit to the first arrivals	a stationary source fits the same data equally; timing alone does not establish a moving source	§8 item 2
C17	Cam 8 alternative offset attributed to "another PA path"	direct paths from the four mapped speakers span only ~16 ms, not 44 ms (third-party audit)	cause open; 8.627 preferred by HF loop closure (0.2 ms vs 4.5 ms), not eliminated by it
C18	"The alternative would move the Cam 8 first arrival 44 ms earlier" (CHECKLIST, §5, C11)	sign error: the smaller offset makes the arrival 44 ms *later* (+99 ms) (auditor follow-up)	corrected throughout; §8a shows the alternate fails the Cam 6–Cam 8 bound by 48 ms
C19	LF-path loop "inconsistent by 12 ms"	compared an LF link against an HF link; the LF triangle closes to 4.5 ms on its own	§5
C20	Cam 7 treated as a fitted camera with a 24 ms residual	its pick violates the single-wavefront bound against three cameras; not the same arrival	§8a; Cam 7 excluded from geometry
C21	Package revision 2 shipped with revision 1's manifest (five files failed, results_v3.md absent)	manifest regenerated into the wrong directory	revision 3 manifest verified against zip contents; revision 4 likewise (auditor's R2 note, item 1)

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C22	"Every first arrival is high-frequency dominated"	IMG_6368 is LF-dominated over 20 ms (0.314 vs 0.112), Cam 6 balanced	"high-frequency triggered"; per-camera balance tabulated (§3)
C23	Cam 6, Cam 11 described as device originals; CHECKLIST A2 said Cam 7 "does not enter synchronized results"	6.mp4/11.mp4/8.mp4 are transcoded copies (Lavf tags, 128 kb/s AAC); Cam 7 entered R6 and R7 in revision 2	§1 provenance column; CHECKLIST A2 rewritten
C24	"$p < 0.025$" for the 247° association from 0/40 shuffles	0/40 gives only a 95% upper bound of 7.2% on the exceedance probability	§12 restated with 200-trial results and the upper bound