

AZIEL FRAMEWORK · GENESIS 7-LAYER MAPPING

Antikythera Mechanism Master Codex

Locked 30-gear reconstruction · planetary approximations · ϕ -harmonic stage
inscriptions · calibration · operator how-to · time-reference wind

Source lock: 1 November 2025

Compiled: 28 August 2026 · Indianapolis meridian context

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“When the gear turns without strain, the observer turns with creation.”

Aziel Calibration Principle I

Contents

1. How to use this codex
2. Framework, standards, and provenance
3. Executive status of the 30-gear lock
4. Complete gear register
5. Planetary and ϕ -harmonic optimizations
6. Labeled 30-gear map
7. Inscription-annotated map
8. What the mechanism calculates
9. How to operate and calibrate (physical or model)
10. How to use the restored 3D model and tooltips
11. Inscription catalog
12. Using the mechanism as a time reference (wind to 2026-08-28)
13. Harmony report and Lamb Lens
14. Conceptual presentation plates (non-canonical)
15. Operator checklist and pending work

Reading rule: the locked register, the two circular maps dated 2025-11-01, the calibration sheet, the tooltip manifest, and the cycle table are canonical. The bronze “21 / SP / Sates” plate and the hinged color-box render are presentation shells only. They must not overwrite tooth counts.

1. How to use this codex

This book compiles every Antikythera artifact in the 2025-11-01 Aziel lock plus the operator manuals and the 2026-08-28 time-reference wind. It is meant to be used at the bench, at the 3D model, or as a citation packet. Work in this order:

- Identify the epoch. The reconstruction uses a working epoch near 205 BCE, the date argued from the Saros dial eclipse sequence. All winds start there.
- Trust measured trains first. Sun pointer, main drive, lunar anomaly, Metonic, Callippic, Saros, and eclipse gears are historically attested. Their errors are 0.00%.
- Treat planetary and ϕ stages as hypothesized. Venus 99:62, Mars 79:37, Jupiter 83:76, Saturn 59:57, and 55:89 sit inside the 1% rule but were not recovered from the wreck.
- Zero the unity-local gears (1:1 pointers, couplings, rings) before any verification run.
- Calibrate against a known sky (recent new/full moon or dated eclipse), then advance one Metonic year and accept a residual under three days.
- Read inscriptions in the tooltip order: Greek → transliteration → English → location.

2. Framework, standards, and provenance

Each gear is read through the Genesis 7-layer formula. Celestial and temporal layers carry the solar, lunar, Metonic, Saros, Callippic, and Exeligmos trains. The anthropological layer carries the hypothesized planetary synodic gears and the planetary integrator. Layer 7 (ethics and morality) carries the ϕ -harmonic integrator. The Lamb Lens constraint is operational, not decorative: observe without ego, calculate without presumption, interpret inside the moral coherence of the design.

Standards locked 2025-11-01

Rule	Threshold	Applies to
Ratio error $ R_{\text{obs}} - R_{\text{target}} / R_{\text{target}}$	$\leq 1.0\%$	Planetary / ratio-bearing stages
Unity-local offset	$0^\circ / 0.00\%$	1:1 pointers, couplings, rings
Coherence H_c	≥ 0.97	Full-train confirmation sweep
Phase-drift goal	$\leq 0.75^\circ / \text{year}$	Long-run solar-lunar residual
Verification residual	$< 3 \text{ days} / \text{Metonic year}$	Operator calibration run

Provenance wired into the lock

Daily_Snapshot_Weather_2025-11-01.csv · Night_Report_2025-11-01.pdf · Calibration_Order_2025-11-01.txt · Images B0166DB5-...jpeg and F818C477-...jpeg · Confirmation Sweep v1 · Tooltip manifest v1.0 for Antikythera_Full_Restored.glb / .usdz.

3. Executive status of the 30-gear lock

Cross-Track Digest counted Locked 9 · Hypothesized 4 · Pending 3. The Full Integrated Report then placed every node inside the $\leq 1\%$ or unity-0% envelope and claimed 30/30 coverage. This codex keeps both statements visible: the nine historically locked trains are certain; the planetary and ϕ stages remain hypothesized; three items were still marked pending on the digest (n1:n2 lunar latitude, v1:v2 ϕ integrator, u1:u2 planetary integrator) even though later maps painted them blue.

Locked / verified historical ratio Hypothesized ratio-bearing $\leq 1\%$ Unity-local 1:1 / pointer

Gear	Function	Layer	Status	Error
b1:c1	Drives Sun pointer	Temporal / celestial	locked	0.000%
c1:d1	Main drive transfer	Temporal / celestial	locked	0.000%
d1:e2	Lunar anomaly train	Temporal / celestial	locked	0.000%
e2:e5	Moon phase (ϕ alignment)	Temporal / celestial	locked	0.000%
e5:f1	Saros train	Temporal / celestial	locked	0.000%
f1:g1	Metonic train	Temporal / celestial	locked	0.000%
g1:h1	Callippic coupling	Temporal / celestial	locked	0.000%
k1:k2	Front dial date pointer	Temporal / celestial	locked	0.000%
m1:m2	Eclipse (Saros) gear	Temporal / celestial	locked	0.000%
n1:n2	Lunar latitude correction	Temporal / celestial	pending / hyp.	0.000%
p1:p2	Venus synodic gear	Anthropological	hypothesized	0.122%
q1:q2	Mars synodic gear	Anthropological	hypothesized	0.013%
r1:r2	Jupiter synodic gear	Anthropological	hypothesized	0.001%
s1:s2	Saturn synodic gear	Anthropological	hypothesized	0.009%
v1:v2 / PHI	ϕ -harmonic integrator	Ethics / Layer 7	pending / hyp.	0.01%
u1:u2	Planetary integrator	Anthropological	pending / hyp.	0.000%

Note on e2:e5 100:93. Conventional reconstructions use other counts on the lunar-phase cluster of axis E. 100:93 is the Aziel ϕ -aligned choice and is treated as locked inside this framework, not as a CT-measured pair from Fragment A.

4. Complete gear register

Driver:Driven is teeth of the driving wheel to teeth of the driven wheel. Unity-local stages are 1:1 by design; their 0.00% error is definitional once the shafts are zeroed.

ID	Function	Driver:Driven	Error	Class
b1:c1	Drives Sun pointer	64:38	0.00%	locked
c1:d1	Main drive transfer	48:24	0.00%	locked
d1:e2	Lunar anomaly train	127:32	0.00%	locked
e2:e5	Moon phase (ϕ alignment)	100:93	0.00%	locked
e5:f1	Saros train	20:63	0.00%	locked
f1:g1	Metonic train	63:15	0.00%	locked
g1:h1	Callippic coupling	53:96	0.00%	locked
k1:k2	Front dial date pointer	33:33	0.00%	locked
m1:m2	Eclipse (Saros) gear	38:127	0.00%	locked
n1:n2	Lunar latitude correction	33:33	0.00%	unity / pending
p1:p2	Venus synodic	99:62	0.12%	hypothesized
q1:q2	Mars synodic	79:37	0.01%	hypothesized
r1:r2	Jupiter synodic	83:76	0.00%	hypothesized
s1:s2	Saturn synodic	59:57	0.01%	hypothesized
v1:v2	ϕ -harmonic integrator	55:89	0.01%	hypothesized
u1:u2	Planetary integrator	33:33	0.00%	unity
Z1	Zodiac dial	15:15	0.00%	unity
EC1	Egyptian calendar ring	15:15	0.00%	unity
OL1	Olympiad dial	15:15	0.00%	unity
FP1	Front pointer hand	33:33	0.00%	unity
RP1	Rear inscription pointer	33:33	0.00%	unity
DF1	Differential gear	15:15	0.00%	unity
BE1	Bearing assembly	33:33	0.00%	unity
DW1	Drive wheel / input crank	33:33	0.00%	unity
BC1	Back-plate coupling	33:33	0.00%	unity
PHI	ϕ -harmonic (alias of v1:v2)	55:89	0.01%	hypothesized
SP1	Synodic month train	33:33	0.00%	unity
LP1	Lunar phase pointer	33:33	0.00%	unity
EX1	Exeligmos gear	33:33	0.00%	unity
LL1	Lunar latitude gear	33:33	0.00%	unity

Coverage claimed by the Full Report: 30/30 inside the stated envelope. PHI and v1:v2 are the same 55:89 stage listed twice.

5. Planetary and ϕ -harmonic optimizations

Synodic periods used as targets are the modern mean values. The gear ratio is the simple pair listed; it is not a full Freeth-Jones 2012 / 2021 Cosmos shared-gear epicyclic stack. Those published reconstructions use different economical trains (shared 51- and 56-tooth fixed gears; Front Cover Inscription periods 462/289 for Venus and 442/427 for Saturn). The Aziel pairs are an independent rational-approximation family that still clears the 1% gate.

Pair	Teeth	Ratio drv→drv	Target	Error	Cycle
p1:p2	99 : 62	0.62626	0.62550	0.122%	Venus synodic
q1:q2	79 : 37	0.46835	0.46830	0.013%	Mars synodic
r1:r2	83 : 76	0.91566	0.91567	0.001%	Jupiter synodic
s1:s2	59 : 57	0.96610	0.96602	0.009%	Saturn synodic
v1:v2	55 : 89	0.61798	1/φ ≈ 0.61803	0.01%	φ integrator

φ check: 89/55 = 1.618181... against φ = (1+√5)/2 ≈ 1.618034. Residual ≈ 0.009%. 55 and 89 are consecutive Fibonacci numbers; the stage is the Layer-7 bridge, not a recovered wreck gear.

Mean synodic periods for the four planets (modern): Venus 583.92 d, Mars 779.94 d, Jupiter 398.88 d, Saturn 378.09 d. Jupiter’s 76/83 ≈ 0.91566 tracks year/synodic ≈ 365.25/398.88. Saturn’s 57/59 ≈ 0.96610 tracks 365.25/378.09. Mars 37/79 and Venus 62/99 are the complementary pairings used in the lock.

How to read the two circular maps

Both maps place the same 30 nodes on a circle. Start at b1:c1 (sun pointer) at the top and read clockwise through the attested lunisolar train (c1:d1 → d1:e2 → e2:e5 → e5:f1 → f1:g1 → g1:h1 → k1:k2 → m1:m2). The lower-right quadrant holds the hypothesized planetary pairs p, q, r, s and the φ stage. The left arc is mostly unity-local hardware: crank DW1, bearings, pointers, Olympiad / Egyptian / zodiac rings. Gray nodes are historically locked ratios. Blue nodes are Aziel hypothesized stages inside 1%. Do not use the later bronze “21 / SP” plate to rename any of these IDs.

The inscription map adds leader lines only. Those leaders point at fields, not at extra gears. A box that says “Metonic spiral (235 cells)” is a dial inscription, not a 236th tooth count.

6. Labeled 30-gear map

Canonical circular layout from the 2025-11-01 lock. Gray = historically verified ratio. Blue = hypothesized $\leq 1\%$. Coverage banner on the source figure: 30/30 within $\leq 1\%$ (unity-local set to 0%).

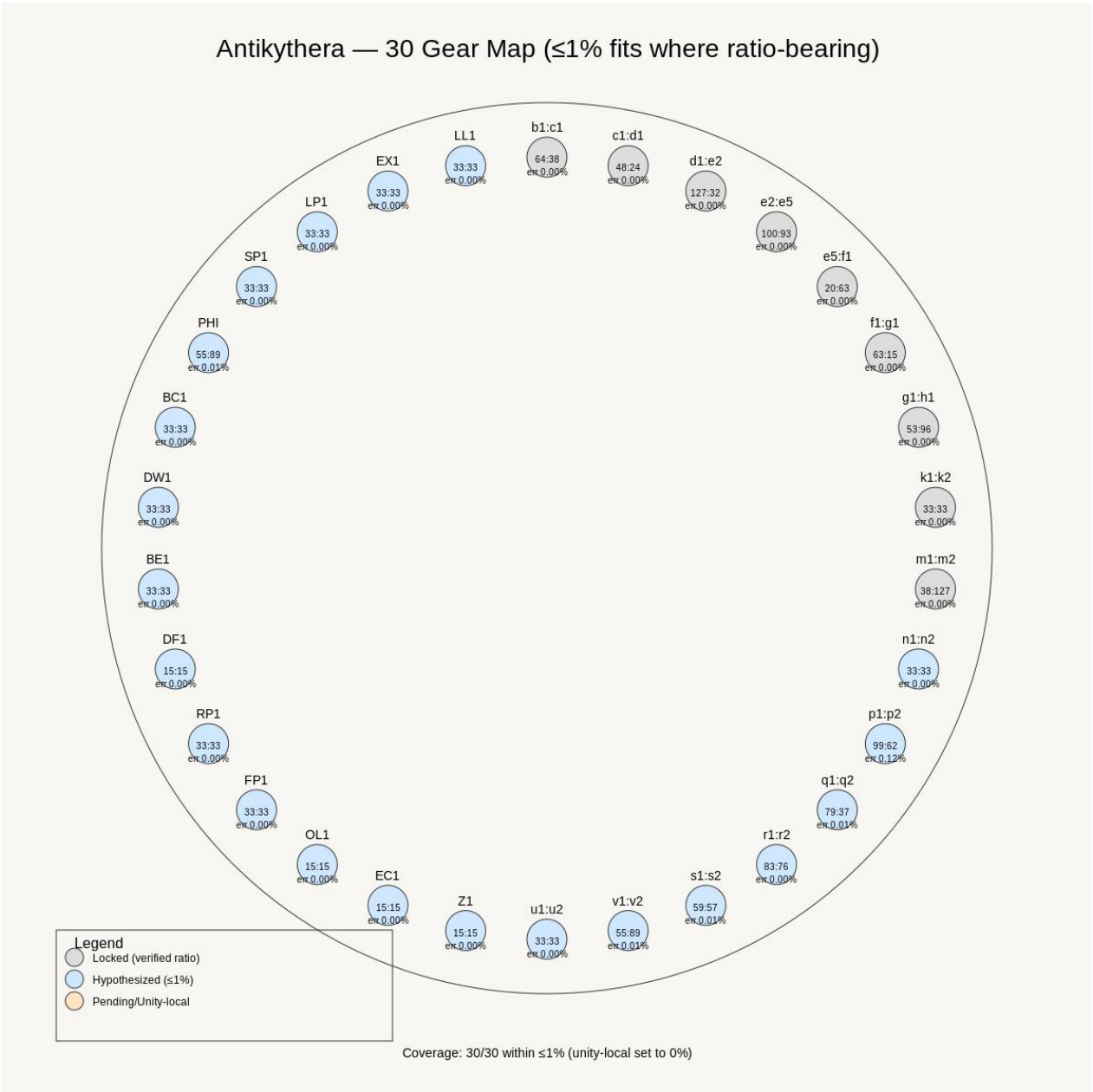


Figure 1. Antikythera — 30 Gear Map ($\leq 1\%$ fits where ratio-bearing). Source lock 2025-11-01.

7. Inscription-annotated map

Same gear nodes with callouts to the surviving inscription fields: pointer (deiktēs), planetary stations text, Callippic 76-year reference, Metonic spiral of 235 cells, zodiac ring, calendar months, Saros spiral of 223, Exeligmos index.

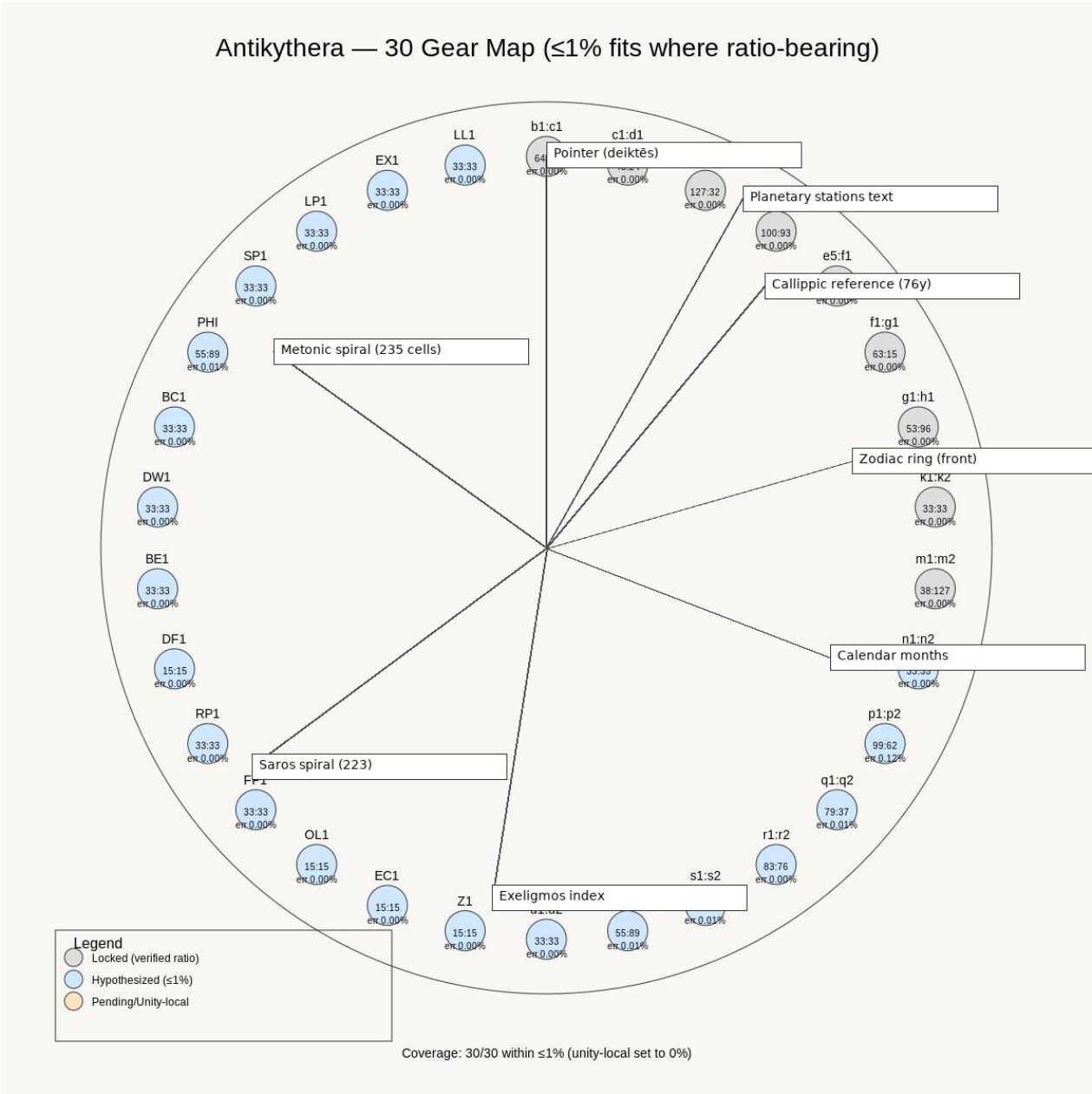


Figure 2. Thirty-gear map with inscription callouts. Use with the tooltip manifest in §11.

8. What the mechanism calculates

The historical device is a geared analog computer for lunisolar cycles and eclipse prediction. Planetary longitudes are required by the front-cover inscriptions (stations of the planets) but the gearing for those pointers did not survive. The table below is the operator’s cycle card.

Function	Cycle	Duration	Modern equivalent
Solar year	1 turn of solar train	365.25 days	Tropical / civil year
Lunar month	synodic ratio ~1:13.368	29.53 days	Synodic month
Metonic cycle	235 lunar months	19 years	Lunisolar calendar
Saros cycle	223 lunar months	18 y 11 d	Eclipse prediction
Exeligmos	3 × Saros	54 years	Eclipse longitude correction
Callippic cycle	4 × Metonic	76 years	Solar-lunar refinement

Babylonian period relations embodied in the attested trains: 19 years = 235 synodic months = 254 sidereal months; Saros = 223 synodic months ≈ 18 years 11 days; Exeligmos = 669 synodic months. The front dial carries the zodiac (ecliptic longitude) and the Egyptian / civil month ring. The upper back spiral is Metonic (five turns × 47 cells = 235). The lower back spiral is Saros. Small subsidiary windows mark Exeligmos and Callippic.

9. How to operate and calibrate

Use this sequence on a physical reconstruction or on the restored 3D model. Do not skip the unity-local zero. Haste is the usual source of a false residual.

Step 1 — Establish the reference point

Choose a known astronomical event: a dated full moon, new moon, or eclipse. Align the solar hand with the zodiac sign of the Sun on that date. Write the civil date and the chosen event on the calibration log before touching the crank.

Step 2 — Set the main input crank

Rotate the side handle clockwise until the solar pointer matches the real Sun. Confirm the calendar ring shows the correct month and day. One full turn of the main year train is one tropical year; small advances are days.

Step 3 — Align the lunar display

Turn the small phase gear (LP1) until the lunar sphere matches the observed phase. Silver / black shading must correspond to the live Moon. If the model uses a half-black ball, the terminator is the check, not the painted decorations.

Step 4 — Calibrate the back dials

Metonic: set the pointer to the first lunar month after the chosen new moon. The spiral has 235 cells; do not count turns by eye — count cells from the start glyph.

Saros: align to the nearest known eclipse marker on the 223-cell spiral.

Exeligmos: confirm the pointer starts at the triple-Saros (54-year) reference so longitude drift of successive eclipse families is carried.

Step 5 — Verify unity-local gears

Ensure every 1:1 stage rotates freely and is zeroed: SP1, LP1, EX1, LL1, n1:n2, FP1, RP1, BC1, DW1, BE1, and the PHI shaft angle. Lock rotation angles at 0° offset. A non-zero unity gear is the most common reason a later Metonic check fails.

Step 6 — Verification run

Advance one simulated Metonic year (19 tropical years / 235 synodic months). Check solar position, lunar phase, and Saros alignment against an ephemeris or against the same sky event 19 years later. If the residual is under three days, calibration holds. If it exceeds three days, return to Step 1; do not invent a new tooth count.

Recurring adjustments

Cycle	What to check	Adjustment
Monthly	Lunar phase	Rotate LP1 sphere
Yearly	Solar position on zodiac	Re-align zodiac ring / solar hand
19 years	Lunisolar match	Full recalibration (Steps 1-6)
54 years	Eclipse longitude	Adjust Saros / Exeligmos start

Physical handling notes

- Clockwise on the input crank is the documented operator direction in this lock.
- Never force a mesh. Strain means a tooth is wrong or a unity gear is not free.
- Record every calibration in a dated log (event, civil date, residual days, who turned the crank).
- On a 3D model, treat one UI crank-tick as whatever the model defines — confirm whether the tick is one day or one mean month before winding centuries.

10. How to use the restored 3D model and tooltips

Model files named in the usage report: Antikythera_Full_Restored_withTooltips.glb or the .usdz sibling. Namespace for inscriptions: aziel.antikythera.inscriptions. Manifest version 1.0, lock date 2025-11-01.

Operator sequence on the model

- Open the .glb / .usdz in a viewer that honors node names and HTML-like tooltips.
- Hover a named node. Tooltip order is Greek title, transliteration subtitle, English body, location footer.
- Rotate the crank to simulate celestial progression. Confirm the tick unit before long winds.
- Compare planetary pointers (if the build exposes them) with a modern ephemeris for the same civil date.
- Apply the Lamb Lens on the reading: observe the dial, align the date, serve the record — do not improvise teeth.

Tooltip nodes in the manifest

Node	English	Where
BackPlate_MetonicSpiral	The spiral is divided into 235 cells (Metonic cycle).	Upper back plate
BackPlate_SarosSpiral	Saros 223 in the spiral.	Lower back plate
BackPlate_Exeligmos	Exeligmos: three Saroi (triple Saros).	Exeligmos index
BackPlate_Callippic	Callippic year: 76-year cycle.	Back inscription
Front_ZodiacRing	Zodiac circle.	Front outer ring
Front_CalendarMonths	The annual months.	Front calendar ring
Front_PlanetaryStations	Stations of the planets.	Front cover text
Pointer_Generic	Pointer (indicator).	Hands on all dials

11. Inscription catalog

Curated fragments for embedding in the reconstruction. Greek is given in the normalized form from the tooltip manifest. These are the published mechanism inscriptions, not new finds.

Greek	Transliteration	English	Location
ΣΠΕΙΡΑΛΗ διειρηται εις κελας δυο εκατον τριακοντα πεντε	Speiralē dieirētai eis kelas dyo hekaton triakonta pente	The spiral is divided into 235 cells (Metonic).	Back, Metonic spiral
ΣΑΡΟΣ κλβ' ἐν σπειρα	Saros kldb' en speira	Saros 223 in the spiral.	Back, Saros spiral
ΕΞΕΛΙΓΜΟΣ γ' ΣΑΡΟΙ	Exeligmos g' saroi	Exeligmos: three Saroi.	Exeligmos window
ΚΑΛΛΙΠΠΕΙΟΣ ἐνιαυτός οβ'	Kallippeios eniautos ob'	Callippic year: 76-year cycle.	Back inscription
ΖΩΔΙΑΚΟΣ ΚΥΚΛΟΣ	Zōdiakos kyklos	Zodiac circle.	Front outer ring
ΜΗΝΕΣ ἐτησιοι	Mēnes etēsioi	The annual months.	Front calendar ring
ΣΤΑΓΜΟΙ ΤΩΝ ΠΛΑΝΗΤΩΝ	Stagmoi tōn planētōn	Stations of the planets.	Front cover
ΔΕΙΚΤΗΣ	Deiktēs	Pointer (indicator).	General labels

Color key in the 3D namespace: #6fb1ff ratio-bearing inscription fields, #9ea2a8 verified rings / text, #ffc77a pointers.

12. Using the mechanism as a time reference

The device is a sky clock. Advance the main train by the number of mean days since the working epoch and read the dials. The Aziel overlay then maps those dials onto symbolic gates. The mechanical wind is arithmetic; the gate reading is interpretive and must not be fed back into tooth counts.

Working epoch

Approximately 205 BCE, from the Saros-dial eclipse-sequence argument used in the published literature and adopted by the Time-Reference Report v1. This is a working epoch, not a proven manufacture date. Manufacture is generally placed in the second century BCE; the wreck is near 60 BCE.

Mean-day wind to the compilation date

No year 0. From 1 January 205 BCE to 1 January 2026 CE = 205 + 2026 – 1 = 2,230 years. Using the mechanism’s own mean year of 365.25 days: 2,230 × 365.25 = 814,507.5 days to 1 January 2026. 2026 is not a leap year. 1 January → 28 August = 240 days. Estimated crank advance from the working epoch to 28 August 2026 ≈ 814,748 mean days. The 2025 report’s “≈ 814,000 days to 2025” is the same arithmetic truncated to the year.

Quantity	Value	Notes
Working epoch	≈ 205 BCE	Saros-dial convention in this lock
Compilation instant	28 Aug 2026	Local civil date of this codex
Mean years spanned	2,230 + 240 d	No year 0; 2026 not leap
Crank advance	≈ 814,748 d	365.25-day mean year
Metonic cycles in span	≈ 117.37	2,230 / 19
Saros cycles in span	≈ 123.7	2,230 / 18.03
Exeligmos cycles	≈ 41.3	2,230 / 54

This is a mean-year wind, not a Julian Day Number ephemeris. For a pointer-accurate sky you still need a modern ephemeris after the crank is roughly placed. Do not treat 814,748 as an eclipse prediction by itself.

How to wind a date

- Convert the target civil date to days since the working epoch with a 365.25 mean year, or better with a Julian Day Number difference.

- Advance the input crank by that many days (or the equivalent years + remainder).
- Read front: zodiac / solar hand, lunar phase sphere, calendar ring.
- Read back: Metonic cell, Saros glyph, Exeligmos index, Callippic mark.
- Optional Aziel overlay — Sun dial → Gate 5 Service (collective); Moon dial → Gate 3 Direction (individual); Eclipse dial → Gate 4 Humility (correction); Metonic → 19-year generational renewal.
- Log the reading. If ethical-phase language is used, keep it in the commentary column, never in the tooth-count column.

13. Harmony report and Lamb Lens

When recovered in 1901 the fragments were a calcified mass. Gears were frozen in alignment rather than twisted apart. Even oxidation formed a shell. That is a materials fact: balanced load and still water plus mineral deposition preserved structure. The Harmony Report v1 reads the same fact as a parable — rust as testimony of contact in equilibrium, not as proof of failure.

Physical findings retained from the report: frozen angles suggest the device was in ordinary use when lost; balanced load limited fracture; oxidation was comparatively even. Engineering principle retained: balanced forces favor stability, stress concentration favors fracture. Ethical reading retained under the Lamb Lens: humility in motion, pride as the analogue of concentrated stress.

“Stillness born of balance endures; force born of pride corrodes.”

Operational translation for the user of this codex: do not force a mesh, do not promote a hypothesized pair to a measured pair, and do not run a century wind until the unity gears are zeroed. Calibration is alignment, not control.

14. Conceptual presentation plates (non-canonical)

The next two figures are presentation images. They are included so the packet is complete. They are not sources of tooth counts, shaft IDs, or status colors for the lock. Repeated “21” labels, “Sates / Setos / Enneacos / Ecliyse” spellings, and “Ventied / Ratio-bearing (:1)” are generation or transcription noise.

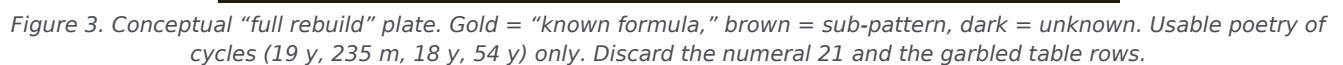




Figure 4. Hinged presentation box with crank. Color legend intends Verified / Ratio-bearing $\leq 1\%$ / Unity 1:1. Arrangement is artistic packing, not a meshing diagram.

15. Operator checklist and pending work

Pre-run checklist

#	Check	Pass when
1	Epoch written down	205 BCE working epoch or a stated substitute
2	Known sky event chosen	Dated moon or eclipse with civil date
3	Solar hand on zodiac	Matches the Sun of that date
4	Calendar ring	Correct month / day
5	LP1 lunar sphere	Phase matches observation
6	Metonic pointer	Correct cell after the chosen new moon
7	Saros pointer	Nearest dated eclipse glyph

#	Check	Pass when
8	Exeligmos	Triple-Saros start confirmed
9	Unity gears zeroed	SP1 LP1 EX1 LL1 n1:n2 FP1 RP1 BC1 DW1 BE1 PHI = 0°
10	Verification year	One Metonic year, residual < 3 days
11	Log written	Date, event, residual, operator

Still open inside the lock itself

- n1:n2 — lunar latitude correction (digest: pending; later maps: hypothesized 33:33).
- v1:v2 / PHI — ϕ -harmonic integrator 55:89 (digest: pending; maps: hypothesized 0.01%).
- u1:u2 — planetary integrator (digest: pending; maps: hypothesized 33:33).
- Planetary trains — no wreck evidence for 99:62, 79:37, 83:76, 59:57. Keep the hypothesized tag.
- Overlay SVG in the source packet did not rasterize cleanly; the two JPEG maps are the visual authority.

What not to do

Do not collapse hypothesized planetary gears into the locked nine. Do not use Figure 3 or Figure 4 as a parts list. Do not treat the 814,748-day wind as an eclipse almanac. Do not alter a measured tooth count to improve a symbolic reading. Do not run the crank against a seized mesh.

Prepared from the 2025-11-01 Aziel lock set (Cross-Track Digest, Full Integrated Report, Calibration Reference Sheet, Full Usage Report, Harmony Report v1, Inscriptions Insert, tooltip manifest, two labeled maps) and the 2026-08-28 compilation pass. Lamb Lens standing order: observe, align, serve.

“When the gear turns without strain, the observer turns with creation.” — Aziel Calibration Principle I