Plinko Audit – Execution Checklist

\tests\plinko\PlinkoAuditExecutionChecklistTests.ts

Commit–Reveal System & Seed Handling

\tests\plinko\PlinkoAuditExecutionChecklistTests.ts

423ms 5 5

Server seed commit exists before play	0ms
Server seed reveal matches commit	4ms
Client seed can be manually changed by the user	0ms
Nonce starts correctly, increments by 1 and is never reused	3ms
Game results producing algorithm is fully deterministic	416ms

Randomness & Entropy Model

\tests\plinko\PlinkoAuditExecutionChecklistTests.ts

8ms 4 4

RNG depends only on (serverSeed, clientSeed, nonce, rows)	0ms
No mixed entropy sources (drand_round and drand_randomness are null for plinko)	8ms
Mapping from RNG → bucket position is unbiased (2^32 % 2 === 0)	0ms
RNG state does not leak across rounds or users	0ms

Verifier ↔ Live Parity (Empirical Tests)

\tests\plinko\PlinkoAuditExecutionChecklistTests.ts

0ms 3 3

Live game outcomes exactly match verifier outputs	0ms
No post-RNG modification	0ms
No conditional logic based on bet size or timing	0ms

Game Logic & RTP Validation

\tests\plinko\PlinkoAuditExecutionChecklistTests.ts

11m 17.2s 5 ✓ 5

✓ Per-row HMAC bounce logic is deterministic	0ms
✓ Payout rules correctness – live win matches betAmount × apiMultiplier exactly	5ms
✓ Display table multiplier is within 2% of API multiplier (zero-edge delta)	4ms
✓ Advertised RTP matches theoretical RTP (display table, each configuration)	0ms
✓ Advertised RTP matches simulated RTP (per-config closeTo)	11m 17.2s

Plinko Game Profiles

\tests\plinko\PlinkoGameProfilesTests.ts

5ms 7 ✓ 7

✓ Every table has exactly (rows + 1) entries	1ms
✓ All multipliers are positive finite numbers	2ms
✓ Tables are symmetric (plinko is symmetric around center)	1ms
✓ Center slot has lowest multiplier in high risk (house-edge design)	0ms
✓ getMultiplier throws on invalid config	0ms
✓ All 27 configurations are defined (3 risks × 9 row counts)	1ms
✓ High risk has highest edge multipliers at position 0 for all row counts	0ms

Plinko Results Generator Tests

\tests\plinko\PlinkoResultsGeneratorTests.ts

509ms 9 ✓ 9

✓ Generator produces correct slot for all captured bets	461ms
✓ Known example: nonce=4, rows=16, high → slot 8	1ms
✓ Known example: nonce=5, rows=8, low → slot 6	0ms
✓ Known example: nonce=16, rows=16, high → slot 11	1ms
✓ Known example: nonce=26, rows=9, high → slot 7	0ms
✓ Known example: nonce=11, rows=16, medium → slot 11	0ms
✓ Result is deterministic – same inputs always produce same slot	1ms

✓	Different nonces produce different results	7ms
✓	Slot is always in valid range [0, rows]	38ms

Plinko Win Calculator Tests

\tests\plinko\PlinkoWinCalculatorTests.ts

1ms 8 ✓ 8

✓	Returns betAmount * tableMultiplier for each risk/rows/slot combination	1ms
✓	Returns 0 for bet amount 0	0ms
✓	Throws on negative bet amount	0ms
✓	Throws on invalid rows (< 8)	0ms
✓	Throws on invalid rows (> 16)	0ms
✓	Throws on bucketPosition > rows	0ms
✓	Throws on negative bucketPosition	0ms
✓	High risk gives higher variance payouts than low risk for same rows	0ms