AURORA WARLORDS

Mathematical Model Summary - canonical commit 32

Engineering mathematics for the current 5x3, 20-payline ruleset. The default reel strips contain 16 stops each, allowing exhaustive enumeration of all **1,048,576** stop combinations. This document is pre-certification engineering evidence, not a laboratory certificate or regulatory approval.

Executive metrics

Metric	Result	Method
Total theoretical RTP	97.108387%	Exact + recursive feature expectation
Base-game RTP	54.172516%	Exact exhaustive
Free-spin outcome RTP	93.461990%	Exact exhaustive
Base-round hit frequency	71.666718%	Exact exhaustive, 20 lines
Feature trigger frequency	4.876900%	Exact exhaustive
E[Free Spins] / outcome	0.314784	Exact exhaustive
Base single-spin payout SD	1.249x bet	Exact exhaustive
Full-session payout SD	3.538x bet	1,000,000-session simulation
Max base single spin	52.00x bet	Exact exhaustive, 20 lines
Max free single spin	54.00x reference bet	Exact exhaustive, 20 lines

Feature-value formula: Total RTP = B + F x R / (1 - F), where B is base RTP, F is expected Free Spins granted per outcome, and R is payout expectation of one Free Spin. Retriggers use the same strip distribution and therefore form a convergent recursive series.

Rules, paytable and feature

Game format	5 reels x 3 visible rows
Active paylines	1-20 selectable; fixed line patterns
Total virtual bet	EUR 0.05 - EUR 5.00
Line wins	Left-to-right, longest 3 / 4 / 5 match
WILD	Substitutes for line-pay symbols except SCATTER
SCATTER	Pays anywhere
Free Spins	3 / 4 / 5 scatters -> 6 / 10 / 15 spins
Free-spin multiplier	2x line wins
Retrigger	Enabled with the same SCATTER rules

Line-pay multipliers

Symbol	3	4	5
EMBER	2	6	14
COIN	3	7	18
RUNE	3	9	24
CRYSTAL / DARIAN	5	14	40
CROWN	7	24	70
AURORA / ARIA	10	35	120
WILD / KAEL	12	60	240

Scatter / feature

Visible SCATTER	Award	Free Spins
3	2x total bet	6
4	10x total bet	10
5+	50x total bet	15

Payline scaling and volatility evidence

Lines	Total RTP	Hit frequency	Max base spin	Max FS spin
1	97.108387%	11.270714%	240.00x	480.00x
5	97.108387%	32.235813%	58.00x	101.60x
10	97.108387%	49.439621%	54.00x	58.00x
15	97.108387%	61.098289%	52.67x	55.33x
20	97.108387%	71.666718%	52.00x	54.00x

1,000,000-session Monte Carlo check

Simulation metric	Result
Full-session simulated RTP	97.105950%
Full-session payout SD	3.538x bet
Median total payout	0.25x bet
95th percentile	3.80x bet
99th percentile	16.45x bet
99.9th percentile	44.30x bet
Max observed in 1M sessions	178.75x bet
Max feature spins observed	136 spins

Max-win caveat: The exact single-spin maxima above are finite. The current feature permits recursive retriggers without an intrinsic total-feature-spin cap, so a cumulative theoretical feature maximum is not finite. A regulated deployment should apply the target-market prize/cycle constraints at the host/platform boundary.

Workbook companion: Aurora_Warlords_Math_Model.xlsx contains all 20 payline variants, reel strips, paylines, payout buckets, scatter distribution and methodology.