

Galaxy King Dog

Whitepaper v1.6 (Locked Spec)

Date: 2025-12-17

Purpose. Define the on-chain rules for farming, checkpoints, payouts, charity routing, NFTs, and proof-of-play for the Galaxy King Dog arcade game on Solana, without changing gameplay.

Spec Lock Summary

- **\$420POP** is the SPL token for all mints/rewards (9 decimals).
- Entry fees go to a program-owned **Game Pool PDA**; payouts are only via hard-coded rules.
- Creator payout auto-split: **49%** to creator wallet (8qCpYyRjdG8Y1jW5fu77XZ3qkWErgABhscEuuY4mRjnr) and **51%** to Charity Pool (never passes through creator wallet).
- Charity Pool sends **20% of any incoming donations back to the Game Pool** automatically.
- Charity governance vote happens only **two times**: end Human Season and end Chaos Season. Eligibility: farmed ≥ 1 token. Quorum: **min 10,000 votes**. Duration: **99 days**. Tie \Rightarrow re-vote.
- **World Record payout cadence (locked)**: payout occurs **on every WR break** (not every 100).
- Checkpoints are **permissionless**: any caller can execute payouts ("automatic" on Solana means the payout runs inside the caller's transaction).

1. Token and Accounts

The system uses one fungible SPL token, **\$420POP** (9 decimals). Entry fees are paid in SOL (lamports). The program owns the pool accounts via PDAs; there is no withdraw authority outside programmed payouts.

Account	Type	Role / Notes
Game Pool	Program-owned PDA	Receives 100% of SOL entry fees; pays out only via programmed checkpoints.
Charity Pool	Program-owned PDA	Receives 51% of every creator payout; donates 20% back to Game Pool automa
Creator Wallet	Externally-owned	Receives 49% of creator payout: 8qCpYyRjdG8Y1jW5fu77XZ3qkWErgABhscEu
Season State	Program account	Tracks season id, mint cap, minted count, score target, top score and champion
Record State	Program account	Tracks global record, current record-holder wallet, and record-break events.

2. Proof of Play Package (PoP)

Each run produces a compact **PoP proof package**. The chain stores only hashes and a few fields; the full replay can be stored off-chain (IPFS/Arweave/HTTPS).

- **player_pubkey**: connected wallet public key (must be non-empty).
- **fee_lamports, entry_sig, entry_slot**: proves the entry fee was paid into the Game Pool.
- **score, season_id, passed**: result and gating.
- **replay_hash**: hash of deterministic replay data (seed + inputs/events).
- **version_hash**: hash of the exact game build (assets + JS bundle).
- **run_hash**: $H(\text{player_pubkey} || \text{season_id} || \text{fee_lamports} || \text{entry_sig} || \text{entry_slot} || \text{score} || \text{replay_hash} || \text{version_hash})$.

On-chain minimal record: run_hash, replay_hash, version_hash, player_pubkey, season_id, fee_lamports, score, passed, entry_sig, entry_slot, optional run_package_uri.

3. Seasons, Supply and Farming (Human Emission)

Human emission targets a total of **2.1B \$420POP**. Farming is split into **33 mint seasons** (Bitcoin halving-style). Each season has a **mint_cap**. When the cap is reached, the season ends and the next season begins. Chaos mode begins only after Human emission ends.

3.1 Mint caps per season (halving-style)

Default schedule: `season_cap[i]` halves each season. Because \$420POP is minted as whole tokens per farm, caps are clamped to a minimum of 1 token in the final seasons; any small rounding remainder is added to Season 1 to make the total exactly 2.1B.

Season	Mint cap (tokens)
S1	1,050,000,012
S2	525,000,000
S3	262,500,000
S4	131,250,000
S5	65,625,000
S6	32,812,500
S7	16,406,250
S8	8,203,125
...	...
S29	3
S30	1
S31	1
S32	1
S33	1

Total: 2,100,000,000 tokens across 33 seasons.

3.2 Mode A (bootstrap targets)

Mode A uses a fixed score threshold per season to mint 1 token. We start at 2,000 points and climb up to 40,000 points, then switch to Mode B. The exact per-season targets are a deterministic list in program config (not adjustable mid-season).

Season range	Score target (Mode A)
S1	2,000
S2	2,300
S3	2,700
S4	3,200
S5	3,800
S6	4,500

S7	5,300
S8	6,200
S9	7,200
S10	8,400
...	Smooth increase each season
S_last_ModeA	40,000

3.3 Mode B (smooth ramp, bounded)

Mode B applies a fixed, bounded ramp based only on season progress (not on a moving average):

$p = \text{minted_in_season} / \text{mint_cap_season}$ and $\text{score_target}(p) = \text{ceil}(T_base * m(p))$.

- If $p \leq 0.80$: $m(p) = 1.00$
- If $0.80 < p \leq 0.95$: $m(p)$ increases linearly up to 1.15
- If $0.95 < p \leq 1.00$: $m(p)$ increases linearly up to 1.35 (max +35%)
- The final special Human token is a separate rule: it requires a new global World Record and uses a higher fixed entry fee (~\$1 at the time of monthly update).

4. Fees and Monthly Updates

Entry fees are expressed in **fee_lamports** and stay constant until the next update. Normal target is approximately $\leq \$0.10$ (best effort). The final special Human token uses $\sim \$1$ entry fee (best effort).

Minimum fee (locked). fee_lamports will never be set below the initial floor equivalent to about 0.00027 SOL (example floor; exact lamports stored on-chain).

Monthly update process

- A bot (or admin script) reads SOL/USD and proposes a new fee_lamports.
- A 2/3 multisig (e.g., Squads) approves the on-chain instruction `set_fee_lamports(new_fee)`.
- Multisig cannot withdraw from the Game Pool or Charity Pool; it can only update parameters and pause/unpause.
- Price sources (spec): Primary Pyth SOL/USD; Secondary Switchboard SOL/USD; Tertiary a major exchange reference (Coinbase/Kraken) for human verification logs.

5. Checkpoints and Payout Distribution

A **checkpoint** is an on-chain event that triggers a payout from the Game Pool. On Solana, the program cannot start a transaction by itself; payouts are executed inside a caller's transaction. This is still "automatic" because any caller can execute it and the program enforces the rules.

5.1 How checkpoints lock (one-time execution)

- The program stores a checkpoint id and a **claimed** flag in SeasonState / RecordState.
- When the trigger condition is met, the program snapshots the winner wallet (and/or record-holder) and sets claimed=false.
- Any caller can execute the payout. The program transfers SOL from the Pool PDA to recipients and then sets claimed=true.
- If called again, the program rejects (already claimed).

5.2 Payout rules (locked)

Checkpoint	Trigger	Pool split (SOL)
Farm Season End	minted_in_season reaches mint_cap	70% retained, 20% Season Winner, 10% Creator payout (49% creator / 51% Charity Pool)
World Record Break	new global WR accepted (each time)	70% retained, 20% Record Breaker, 10% Creator payout (49% creator / 51% Charity Pool)
Human Season End	Human season final token is minted	30% required to Chaos, 40% Human Champion, 30% Creator payout (49/51 split)
Chaos Season End	Chaos final checkpoint	67% Chaos Champion, 33% Creator payout (49/51 split)

Creator auto-split. For any checkpoint that includes a creator payout, the program transfers 49% to the creator wallet and 51% to the Charity Pool directly (never through creator wallet).

Immediate vs claim. Implementations may pay immediately inside `submit_run()` when a WR is broken (recommended), and/or expose a permissionless `claim_checkpoint()` instruction as a safe fallback.

6. NFTs and Special Marked Tokens

NFTs are proof-of-achievement collectibles. One NFT is repeatable for record breaks; season and final winners receive 1/1 NFTs.

NFT file	Name (suggested)	Who receives it	Supply
baby_metatron.png	Baby Metatron	First-ever player to play (token #1 event)	1/1
season_champion_metatron.png	Season Champion Metatron	Top score at each Farm Season end checkpoint	1 per season (33 total)
record_breaker_metatron.png	Record Breaker Metatron	Every time a new global WR is accepted	Repeatable
human_metatron.png	Human Metatron	Human Season Champion (verified)	1/1
final_galaxy_metatron_defender.png	Final Galaxy Metatron Defender	Chaos Season Champion (final)	1/1

Special marked fungible tokens. Two 1-of-1 marked \$420POP tokens are planned: *Galaxy King* (Human winner + record) and *Chaos King* (Chaos winner + record).

7. Governance for Charity Operator

The charity operator is selected via on-chain voting and occurs only two times: end of Human emission and end of Chaos.

- Eligibility: wallets that farmed ≥ 1 \$420POP token.
- Voting: token-weighted by default (1 token = 1 vote unit).
- Quorum: min 10,000 votes. Duration: 99 days. Tie => re-vote.
- If a vote fails to reach quorum, funds remain in the Charity Pool until the next vote (no withdrawal).
- The chosen operator address must be on a whitelist of verified charity organizations.

8. Next Implementation Step

Wire the existing game (no gameplay changes) to: (1) connect wallet and write player_pubkey, (2) perform the entry fee transfer, (3) generate PoP package hashes, (4) call the on-chain program instructions to record runs and execute payouts/checkpoints.

Galaxy King Dog — Whitepaper Addendum v1.7

Date: 2025-12-17 | Supersedes supply/season notes in v1.6 where conflicting.

Update: Season Count & Human→Chaos Boundary

- 1) Total Farm Seasons: 33 (Bitcoin-style halving count).
- 2) Human Emission ends at Season 32.
 - Season 32 retains the 'final Human token' special rule:
the last mint requires a new World Record (WR) to be claimed.
- 3) Season 33 is the final Chaos Season with a fixed cap:
 - Season 33 Chaos cap: 300,000 \$420POP (SPL) tokens.
 - The very last Chaos token is the marked 'Chaos King' token, awarded at end-of-Chaos.

Notes:

- This does not change gameplay rules; it only changes emission/season boundaries and caps.
- Reward splits, creator/charity split (49/51), and checkpoint payout triggers remain as defined in v1.6 unless explicitly changed.

Addendum v1.7 — For implementation, treat this page as authoritative over prior season-cap wording.