Galaxy King Dog

Whitepaper v1.3

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Project: Galaxian■style arcade game with on■chain, verifiable high■score checkpoints and transparent pool payouts on Solana.

Key constants (locked)

- **Fungible token**: $420POP (SPL), 9 decimals.
- **Creator wallet** (49% of creator payout): **8qCpYyRjdG8Y1jW5fu77XZ3qkWErgABhscEuuY4mRjnr**.
- **Creator split**: whenever a creator payout occurs, program splits it: 49% → creator wallet, 51% → Charity Pool (never passes through creator wallet).
- **Charity feedback**: Charity Pool auto■routes 20% of any incoming donations back to the Game Pool (remaining 80% stays in Charity Pool).
- **Charity governance**: only 2 votes total (end of Human Season + end of Chaos). Eligible voters: wallets that have farmed ≥1 $420POP. Vote duration: 99 days. Quorum: ≥10,000 votes. Tie: re■vote.

1. Proof of Play (PoP) — On■chain proof package

- Each paid run produces a compact on■chain package (no full replay stored on■chain).
- On■chain fields (minimum): **run_hash**, **replay_hash**, **version_hash**, **player_pubkey**, **season_id**, **fee_lamports**, **entry_sig**, optional **entry_slot**, **score**, and **passed**.
- Hash binding: run_hash = H(player_pubkey || season_id || fee_lamports || entry_sig || entry_slot || score || replay_hash || version_hash).

Important implementation note: Solana programs cannot “push” payouts by themselves; transfers occur when a transaction calls the program. Therefore, all “automatic payouts” are implemented as *permissionless claim* instructions: anyone may call **claim_checkpoint_reward(checkpoint_id)**, and the program validates the stored winner and transfers the exact amounts.

2. Entry fees

- Entry fee is a fixed **fee_lamports** per season until updated.
- Fees start low and may rise up to ~≤ $0.10 equivalent as demand increases (season■by■season).
- **Monthly update**: an off■chain bot proposes a new fee based on SOL/USD; a multisig approves and submits the on■chain update.

Price sources to cite in spec (3): Pyth SOL/USD feed (primary), Switchboard SOL/USD feed (secondary), CoinGecko SOL price (off■chain reference/check).

3. Pools and payout splits (checkpoint mechanics)

- **Game Pool**: program■owned PDA that collects 100% of entry SOL fees; no withdraw authority outside coded rules.
- **Checkpoint triggers**: (A) end of a Farm Season (mint_cap reached), (B) World Record milestones (e.g., every 100 records), (C) end of Human Season, (D) end of Chaos Season.
- **Farm Season end payout**: 70% stays in Game Pool, 20% → season winner, 10% → creator payout (auto■split 49% creator / 51% Charity Pool).
- **World Record milestone payout** (every 100 records): 20% → record breaker, 10% → creator payout (49/51 split), 70% remains in Game Pool.
- **Human Season end payout**: 40% → Human Champion, 30% → creator payout (49/51 split), 30% carried into Chaos (stays in Game Pool).
- **Chaos Season end payout**: 67% → Chaos Champion, 33% → creator payout (49/51 split).

4. Seasons / Modes / Supply (locked)

Total $420POP emission target: 2,100,000,000 tokens (2.1B).

Total Mint Seasons: 33 (Bitcoin■style eras).

• Seasons 1–32: Human emission (Farming).

• Season 33: Chaos (final) — mints the last token only (special rule).

Mint caps per season (halving■style, exact sum = 2.1B):

Rule: cap[1]=1,050,000,000. For s=2..31: cap[s]=max(1, floor(cap[1]/2^{s-1})). Season 32 is adjusted by the remainder so that Seasons 1–32 sum to 2,099,999,999. Season 33 cap = 1.

Season	Mint cap ($420POP)
1	1,050,000,000
2	525,000,000
3	262,500,000
4	131,250,000
5	65,625,000
6	32,812,500
7	16,406,250
8	8,203,125
9	4,101,562
10	2,050,781
11	1,025,390
12	512,695
13	256,347
14	128,173
15	64,086
16	32,043
17	16,021
18	8,010
19	4,005
20	2,002
21	1,001
22	500
23	250
24	125
25	62
26	31

27	15
28	7
29	3
30	1
31	1
32	13
33	1

4.1 Score targets (Mode A → Mode B transition)

Mode A (bootstrap): fixed targets for the early seasons (Season 1 starts at 2,000 and ramps smoothly to 40,000).

Season	Score target (Mode A)
1	2,000
2	2,300
3	3,000
4	3,900
5	5,100
6	6,600
7	8,600
8	11,100
9	14,400
10	18,700
11	24,300
12	31,500
13	40,000

Mode B (smooth, bounded): from the season after Mode A completes, the target increases deterministically by +3% per season (rounded up to the nearest 100), until the end of Season 32. This avoids within■season target "jumping" and prevents simple threshold■timing exploits.

Formula: for Season $s \geq (\text{len(ModeA)}+1)$, $\text{target}[s] = \text{ceil}(\text{target}[s-1] \times 1.03 / 100) \times 100$. The **last token** (Season 33 cap=1) is separate: it requires a new World Record and uses the $1■equivalent fee rule.

5. NFTs and milestone rewards (locked filenames)

- **baby_metatron.png** — first■ever player reward.
- **season_champion_metatron.png** — Season Champion (repeatable each season).
- **record_breaker_metatron.png** — Record Breaker (repeatable each new WR).
- **human_metatron.png** — Human Season Champion (1/1).
- **final_galaxy_metatron_defender.png** — Final Chaos Champion (1/1).

6. Admin scope (multisig can’t steal)

- Multisig is used only to approve: **set_fee_lamports** (monthly), **pause**/**unpause** (safety), and optionally **update charity whitelist** (if a whitelist is used).
- Multisig has **no withdraw authority** over the Game Pool PDA.
- Any payout can only be claimed per rules and only to the winner address stored on■chain for that checkpoint, plus the hardcoded creator/charity split.

Appendix A — On■Chain Winner Selection & Automatic Payout Claims

This appendix makes explicit how the **Season Winner** and **World■Record (WR) Breaker** receive their shares in a fully on■chain, non■custodial way. No gameplay changes are required.

A1. On■chain state (what the program stores)

SeasonState: { season_id, mint_cap, minted_count, score_target, best_score, best_player_pubkey, best_slot, closed, claimed }
WorldRecordState: { record_score, record_holder_pubkey, record_slot, record_count }
Pool PDA: program■owned account holding the SOL entry fees (no withdraw authority).

A2. How the winner / record holder is determined

submit_run (PoP submit): when a verified run is submitted, the program updates:
• **Season winner candidate**: if score > best_score for the active season, set best_score/best_player_pubkey and store the earliest slot as tie■breaker.
• **World record**: if score > record_score, set record_score/record_holder_pubkey and increment record_count.
Only runs that pass PoP validation (entry fee + hashes + verifier/attestation per spec) can update these states.

A3. Checkpoints and payout execution

End■of■Farm■Season checkpoint: when minted_count reaches mint_cap for that season, the season is closed and the winner is snapshotted as SeasonState.best_player_pubkey.
WR checkpoint: each accepted new WR can mint the WR token; additionally, every 100th record (record_count % 100 == 0) creates a payout checkpoint per constitution.
End■Human■Season and **End■Chaos■Season**: winners are snapshotted the same way (best score among eligible wallets).

A4. “Automatic” distribution via permissionless claims

Payouts are not pushed by an admin. Instead the program exposes claim instructions that **anyone** can call; the transfer destinations are computed on■chain and locked to the stored winner/record■holder plus the fixed creator/charity split.
Example claim calls (names illustrative):

```
claim_season_reward(season_id) → 70% stays in Pool, 20% → Season Winner, 10% → Creator payout (auto■split 49% Creator Wallet / 51% Charity Pool)
claim_wr_checkpoint(record_count) → 70% stays, 20% → WR Breaker, 10% → Creator payout (auto■split 49/51) claim_human_season_end() → 40% → Human Champion, 30% → Creator payout (auto■split 49/51), 30% carried to Chaos claim_chaos_season_end() → 67% → Chaos Champion, 33% → Creator payout (auto■split 49/51)
```

A5. Safety notes

• The multisig/bot cannot withdraw from the Game Pool; it can only update fee parameters and charity allow■lists as specified.
• Each checkpoint has a **claimed** flag, so payouts can happen at most once.
• Tie handling: higher score wins; if equal, earliest slot/entry_slot wins (deterministic).