# MadeManifest Calculation Engine

## Engineer Onboarding README

Welcome to the MadeManifest Calculation Engine.

This project implements a deterministic calculation core for:

- Astrology

- Human Design

- Gene Keys (derived from Human Design)

This is **not** an interpretation engine.
 The system calculates objective, reproducible results based on birth data only.

Read this document in full before you begin.

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## 1. What You Are Building

You are building an engine that:

- Converts birth data into astronomical positions

- Calculates astrological output from those positions

- Calculates Human Design Personality and Design activations

- Derives Gene Keys output from Human Design

- Contains no meaning, text, or interpretation

The engine is:

- Deterministic

- Test-driven

- Fully decoupled from content and UI

If two people provide the same input, the output must be bit-exact identical.

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## 2. What You Are Explicitly Not Building

This project does **not** include:

- Interpretation

- Psychology

- Spiritual claims

- User interface

- Coaching logic

- State detection (shadow, gift, essence)

- Birth time rectification

If you find yourself trying to add meaning, you are doing it wrong.

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## 3. Architecture at a Glance

Input (birth data)
 ↓
Time and Astronomy Layer
 ↓
Ephemeris (Swiss Ephemeris)
 ↓
Astrology Module
 ↓
Human Design Module
 ↓
Gene Keys Derivation
 ↓
Structured Output (IDs and numbers)

Content such as labels, text, and names is added later via separate dictionaries.

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# 4. Input Contract

Each calculation requires:

- `birth_date`: YYYY-MM-DD

- `birth_time`: HH:MM (seconds unknown)

- `birth_place`: name or latitude longitude

- `timezone`: IANA identifier (for example Europe/Amsterdam)

## Time policy

- Missing seconds are fixed at `00`

- All internal calculations are performed with second-level precision

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# 5. Time and Astronomy

## Timezone

- Use the IANA timezone database

- Include historical daylight saving time rules

## Conversions

- Local time → UTC

- UTC → Julian Day (UT)

This step is critical.
 Errors here invalidate everything downstream.

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# 6. Ephemeris

## Source

- Swiss Ephemeris

## Zodiac

- Tropical

## Objects (always calculate)

- Sun

- Moon

- Mercury

- Venus

- Mars

- Jupiter

- Saturn

- Uranus

- Neptune

- Pluto

- Chiron

- North Node (Mean and True)

## Derived

- Earth = Sun + 180° mod 360

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# 7. Astrology Module

- House system: Placidus

- Nodes: Mean Node

Calculate:

- Planetary positions

- Houses

- Ascendant

- Midheaven

No interpretation. Data only.

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# 8. Human Design Module

## Snapshots

- Personality: moment of birth

- Design: derived moment before birth

## Node policy

- True Node

## Design time calculation

1. Determine Sun longitude at birth

2. Target = Sun − 88° mod 360

3. Find the moment before birth when Sun equals the target

## Solver

- Bracket: birth minus 84 to 90 days

- Method: bisection

## Stop criteria

- Absolute Sun difference < 0.0001°

- Or time interval < 1 second

Rounding is allowed only at the final step.

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# 9. Mandala Mapping (Human Design and Gene Keys)

## Constants

- START = 313.25° (Gate 1 Line 1)

- GATE_WIDTH = 5.625°

- LINE_WIDTH = 0.9375°

## Interval rule

- Start inclusive

- End exclusive

## Mapping formula

r = (longitude − START + 360) % 360
gate_index = floor(r / GATE_WIDTH)
line_index = floor((r % GATE_WIDTH) / LINE_WIDTH)
line = line_index + 1
gate = gate_sequence[gate_index]

## Gate sequence

- Fixed array of 64 gates

- Not computed

- Hardcoded or configuration-driven

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# 10. Human Design Output

## Object order (mandatory)

1. Sun

2. Earth

3. North Node

4. South Node

5. Moon

6. Mercury

7. Venus

8. Mars

9. Jupiter

10. Saturn

11. Uranus

12. Neptune

13. Pluto

## Output per snapshot

- Gate

- Line

Derived structures (type, authority, profile, cross) may be calculated, but not interpreted.

# 11. Gene Keys Module

- No independent calculations

- Fully derived from Human Design output

## Version 1 scope

### Activation Sequence

- Life's Work = Personality Sun

- Evolution = Personality Earth

- Radiance = Design Sun

- Purpose = Design Earth

## Output

- Key (gate)

- Line

# 12. Content Separation (Hard Rule)

## Calculation layer

- Numbers and IDs only

- No text

- No meaning

## Content layer

- Key dictionary (1–64)

- Line overrides (optional)

- Lookup by key ID and line

If the calculation layer knows about content, the implementation is incorrect.

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# 13. Versioning and Metadata

Every output must include:

- `engine_version`

- `node_policy_per_system`

- `keys_dictionary_version`

- `key_lines_dictionary_version`

- `language`

Without this metadata, output is invalid.

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# 14. Testing

### Golden test cases

- Fixed birth input

- Fixed expected output

### JSON fixtures

- Input

- Astrology expected

- Human Design Personality expected

- Human Design Design expected

- Gene Keys expected

Any deviation must cause test failure.

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# 15. Change Policy

Changes to any of the following:

- Mandala

- Node policy

- Design time logic

- Gate mapping

Are breaking changes and require:

- An update to the Master Specification

- Revalidation of all test cases

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# 16. Where to Start

1. Implement time and ephemeris correctly

2. Match astrology output to the golden test case

3. Implement the Design time solver

4. Match Human Design activations exactly

5. Add Gene Keys derivation

6. Make all tests pass

7. Only then refactor

# Closing

If implemented correctly:

- The engine is reproducible

- Outputs are comparable to existing platforms

- Content remains fully decoupled

- The system is ready for scale and extension

This README is authoritative.