# Embodied Spatial-Temporal Instrument for Situated AI Dialogue

An artistic research object replacing text prompts and keyboards with rotational mass, optical mouse sensors, magnetic field telemetry, concentric stepped dials, and physical receipt output.




## RESEARCH PREMISE

Conversational AI typically lives inside stateless text fields. This work translates prompt engineering into slow kinematic agency: two-axis continuous motion across an unconstrained 170mm globe joined with mechanical indexing of five concentric stepped date rings.

Every physical coordinate feeds a deterministic computational framework grounded in ephemeris geometry and plain-language behavioral corpora, streaming replies onto an IPS touch screen and permanent `58mm` paper tickets.

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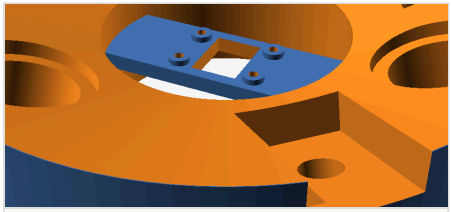
Video Demo:
https://www.thearenatheory.com/astrolobe/
Engine Chat:
https://www.thearenatheory.com/chat.html
```

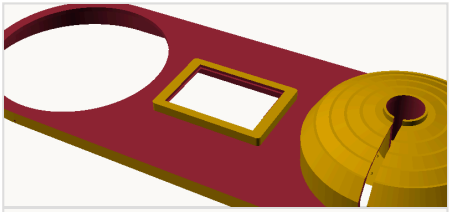
## THREE-BAY ELECTROMECHANICAL ARCHITECTURE



**Sensing Bay (Bay 01):** Ball-transfer cradle integrating dual orthogonal `PMW3360` optics (`1,000Hz`) and a central `TLV493D` 3-axis Hall datum.



**Temporal Bay (Bay 02):** Five stepped concentric rings (Year, Month, Day, Hour, Minute) resolved via `45°` camera inspection.



**Synthesis Bay (Bay 03):** Single rigid enclosure pairing microcontroller/Linux compute with display output and `58mm` thermal receipt head.

## MEDIA-ART CONTRIBUTION

Bridges tangible computing, low-level optical mouse sensor hacking (`PMW3360` lift/surface tuning), custom OpenSCAD mechanical tooling, and constrained language-model grounding that eliminates generic chatbot phrasing.

## RESIDENCY / EXHIBITION DELIVERABLES

Functional gallery plinth prototype built on site, documented open mechanical/firmware repository schematics, public playtest workshops, and live exhibition operation outputting archival visitor tickets.

## CHRONOLOGICAL TARGETS (ORDERED FROM NOVEMBER 2026 FORWARD)

| WINDOW | INSTITUTION & CITY | PROGRAM / CATEGORY | CONTACT & FIT |
|---|---|---|---|
| **Rolling Now → 2027** | **HEK · House of Electronic Arts** (Basel) | Project Calls / Partner Awards (`Pax Art Awards`, joint calls) | `office@hek.ch` · Exhibition proposals pairing custom electronic hardware with critical AI dialogue. |
| **Opens Jan 2027** (Est. Close Early Mar) | **Ars Electronica & Futurelab** (Linz) | `Prix Ars Electronica 2027` (`Interactive Art +`) · `S+T+ARTS Prize` | `electronica.art` · Tactile kinetic hardware interface + collaborative Futurelab exhibition R&D. |
| **Est. Spring Mar–Apr 2027** | **V2_ Lab for the Unstable Media** (Rotterdam) | `Summer Sessions` Residency | `v2@v2.nl` · Short intensive production residency advancing sensor precision & public test run. |
| **Est. Spring Apr 2027** | **iMAL · Center for Digital Cultures** (Brussels) | `iPO / EXTRA` & Collector Fellowship | `info@imal.org` · Experimental human-machine interaction + collector-backed production cycle. |
| **Est. Spring Apr 2027** (2026/27 closed Apr 12) | **ZKM Karlsruhe · Hertzlab** (Karlsruhe) | Hertzlab & Rauschenberg Residency Tracks | `zkm.de` · Engineering-meets-art production research bridging kinetic objects and computational prose. |
| **Est. June 1, 2027** | **V2_ Lab for the Unstable Media** (Rotterdam) | `Alex Adriaansens Residency` (Autumn Cohort) | `v2@v2.nl` · Autumn exhibition hardware fabrication & curatorial showcase. |

## SYSTEM SIGNAL CHAIN

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1. Sphere Motion → Dual PMW3360 (1,000Hz) + TLV493D
2. Time Rings → 5 Ziggurat Rings via 45° Camera
3. Telemetry Lock → (Lat, Lng, YYYY-MM-DD HH:MM)
4. Brain Ground → Ephemeris + Arena Corpus Rules
5. Physical Print → IPS Touch Screen + 58mm Paper
```

## HARDWARE MATURITY TODAY

Complete mechanical CAD suite, ball-transfer bearing cradle tolerances, optical sled test harnesses, embedded UI prototypes, and live production AI engine all operational.

Residency support specifically accelerates industrial casing finish, exhibition calibration, and continuous gallery deployment.