

# Lucy Manifesto v0.1 Gate Package

The Lucy Manifesto Project

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## 1 Intent

This document consolidates the v0.1 gate logic and artifacts for the Lucy revitalization effort. It is based on the cleaned source material and translates author intent into an engineering baseline.

## 2 Core Position

- Lucy is a developmental intelligence platform, not a scripted robot product.
- Intelligence must emerge from embodied sensorimotor loops.
- Distributed, low-power compute is the preferred implementation path.

## 3 Manifesto v0.1 Summary

- Preserve body-first intelligence and biologically meaningful sensing/actuation.
- Move from PIC-era distributed control to GA144 manycore distributed runtime.
- Prioritize calibration, reflex loops, and stable closed-loop behavior before symbolic features.
- Keep scope to torso/head/arms for v0.1; defer full biped and production design.

## 4 Target Outcome

The v0.1 documents and gate criteria are oriented toward a single idealized outcome: **Lucy Mk-II**. This figure is the integration target that aligns architecture, requirements, and tests.



*Lucy Mk-II prototype concept*

## 5 Requirements Baseline

### Functional

- R1: Execute distributed real-time control/perception on GA144 fabric.
- R2: Deterministic message passing between sensor, motor, and integration modules.
- R3: Calibration and closed-loop control for at least 3–4 controllable DoF.
- R4: Reduced, contrast-focused vision preprocessing output.
- R5: Banded audio features and directional cue output from dual microphones.
- R6: Virtual-muscle style command interface at high level.
- R7: Timestamped telemetry for sensor, motor, and safety events.

## **Safety**

- S1: Joint range enforcement.
- S2: Current/thermal guard enforcement where available.
- S3: Watchdog-triggered safe-mode behavior on timeout/comm failure.
- S4: Repeatable startup calibration with fail-safe abort on invalid calibration.

## **Non-Functional**

- N1: Stable control-loop timing sufficient to avoid baseline oscillation.
- N2: Graceful degradation under non-critical module failure.
- N3: Externalized configuration/calibration parameters.
- N4: Full requirement-to-test traceability.

## **6 GA144 Architecture (v0.1)**

- M1 Sensor Ingest
- M2 Perception Preprocess
- M3 Integration/Reflex
- M4 Motor Interface
- M5 Safety Supervisor
- M6 Telemetry

## **Messaging Model**

- Deterministic message passing with fixed schemas.
- Control-relevant messages include timestamp, source ID, sequence, and payload version.

## **Startup and Safety**

- Startup phases: hardware check, sensor sanity, calibration, closed-loop readiness.
- Failure classes: recoverable transient, degraded operation, fatal/safe-stop.

## 7 Test Strategy (v0.1)

### Validation Targets

Target	Required Tests	Pass Condition
VT1	IT-01, ST-01	Stable 3–4 DoF closed-loop baseline control without unstable oscillation.
VT2	IT-02, ST-02	Consistent orient-to-sound response from directional cues.
VT3	IT-03, ST-03	Consistent fixation/tracking behavior using reduced vision path.
VT4	IT-04, ST-04	Repeatable startup calibration with comparable calibration metrics.

### Exit Criteria

- VT1–VT4 pass with reproducible evidence.
- No unresolved critical safety defects.
- Requirement traceability matrix complete and current.

## 8 Gate Artifacts

- docs/manifesto-v0.1.md
- docs/requirements.md
- docs/architecture-ga144.md
- docs/test-strategy.md