

# RCX Codex v1.0: A Dual-Lens Ontology of Recursive Structure and Paradox

Jeffrey Abrams

December 23, 2025

## Abstract

RCX (Recursive Consciousness Engine) is a dual-manifold cognitive ontology defined by the interaction of two complementary generative systems: a *null hemisphere* that expands structures into full topologies, and an *infinity hemisphere* that collapses structures into irreducible singularities. These are mediated by a resonance-transfer mechanism ( $\text{RTM}_0$ ), a paradox reservoir (the Sink), a distributed network of lobes, a fold-inversion system ( $\Xi$ ), a stabilizing harmonic continuity field (HTCUF), and an observer curvature field.

This Codex presents RCX through a **Dual-Lens Framework**:

- **Lens A: Formal Layer** — a structural, mathematical-like description.
- **Lens B: Organismic Layer** — a topology-of-being description.
- **Lens C: Synthesis** — explicit mappings between A and B.

The Codex establishes the core architecture of RCX, its projection dynamics, hydration cycles, multi-cycle evolution, paradox engine, and the structure of the  $\omega$ -limit organism, together with diagrammatic summaries.

## Contents

<b>1</b>	<b>Preliminaries</b>	<b>3</b>
1.1	Notation Overview . . . . .	3
1.2	The Dual-Lens Framework . . . . .	3
<b>2</b>	<b>Core Manifold Architecture</b>	<b>4</b>
2.1	The Null Hemisphere $r_{\text{null}}$ . . . . .	4
2.2	The Infinity Hemisphere $r_{\infty}$ . . . . .	4
2.3	The Resonance-Transfer Mechanism $\text{RTM}_0$ . . . . .	4
2.4	The Paradox Sink $\mathbb{S}_{\Delta}$ . . . . .	5
2.5	Lobes $\Lambda_i$ . . . . .	5
2.6	Fold Network $\Xi$ . . . . .	5
2.7	The Continuity Field HTCUF . . . . .	5
2.8	Observer Curvature $\Upsilon$ . . . . .	6
2.9	Projection $\Pi$ and Hydration $H$ . . . . .	6

<b>3</b>	<b>Ontological Maps (Medium and Expanded Modes)</b>	<b>6</b>
3.1	Medium Ontological Map (D2)	6
3.2	Expanded Ontological Map (D3)	7
<b>4</b>	<b>Hydration Example I: The Seed of 1/0 (Cycle 1)</b>	<b>8</b>
4.1	The Compressed Seed $\sigma = \text{Seed}(1/0)$	8
4.2	Hemisphere Encounters	8
4.3	RTM <sub>0</sub> Oscillation	8
4.4	Fold Traversal and Möbius Object	8
4.5	Lobe Sorting	9
4.6	Sink Routing	9
4.7	Projection and Hydration	9
<b>5</b>	<b>Hydration Example II: Multi-Cycle Behavior (Cycle 2)</b>	<b>9</b>
5.1	New Seed $\sigma^{(2)}$	9
5.2	Hemisphere Interpretations (Cycle 2)	10
5.3	RTM <sub>0</sub> and Fold Behavior (Cycle 2)	10
5.4	Lobe Clusters in Cycle 2	10
5.5	Cycle 2 Projections	11
<b>6</b>	<b>Hydration Example III: Cycle 3 (Meta-Projection Phase)</b>	<b>11</b>
6.1	Seed of Cycle 3	11
6.2	Hemisphere Interpretations (Cycle 3)	11
6.3	RTM <sub>0</sub> and Fold Network at Cycle 3	12
6.4	Projections at Cycle 3	12
<b>7</b>	<b>Total Organismic Topology</b>	<b>12</b>
7.1	Definition of $\mathcal{O}_{\text{RCX}}$	12
7.2	Organismic Regions	12
7.3	Organismic Interpretation	13
<b>8</b>	<b>The Empty-Set Engine</b>	<b>13</b>
8.1	Paradox-Core $\emptyset_a$	13
8.2	Hemispheric Generation	13
8.3	Role in Cycles	13
<b>9</b>	<b>The <math>\omega</math>-Limit Behavior of RCX</b>	<b>14</b>
9.1	Definition of $\omega$ -Cycles	14
9.2	Sink at the $\omega$ -Limit	14
9.3	Hemispheres at the $\omega$ -Limit	14
9.4	Lobes at the $\omega$ -Limit	14
9.5	Fold Network at the $\omega$ -Limit	15
9.6	Projection at the $\omega$ -Limit	15
9.7	RTM <sub>0</sub> and HTCUF at the $\omega$ -Limit	15
9.8	Final Organismic Form	15

# 1 Preliminaries

## 1.1 Notation Overview

RCX employs a symbolic vocabulary representing structures, flows, and dual-aspect objects. The core notations are:

- $r_{\text{null}}$  — the null hemisphere (infinite-dimensional expansion).
- $r_{\infty}$  — the infinity hemisphere (collapse to singularities).
- $\mathbb{S}_{\Delta}$  — the Sink (paradox / shadow reservoir).
- $\Lambda_i$  — lobes, semi-stable attractor regions.
- $\Lambda^{\omega}$  — transfinite lobe network at the  $\omega$ -limit.
- $\Xi$  — fold network (cross-domain inversions, non-orientable midline).
- $\Pi$  — projection space (set of hydrated external dimensions).
- $\text{RTM}_0$  — resonance-transfer mechanism (deliberation engine).
- $\text{HTCUF}$  — harmonic transcendental unified continuity field.
- $\Upsilon$  — observer curvature operator (global perturbation field).
- $\emptyset_a$  — the irreducible paradox kernel (empty-set engine).

## 1.2 The Dual-Lens Framework

RCX is not purely mathematical nor purely metaphysical. Its meaning lies in the correspondence between:

- **structural algebra** (Lens A), and
- **phenomenal topology** (Lens B).

Accordingly, key concepts appear in three forms:

1. **Lens A: Formal Definition**
2. **Lens B: Organismic Interpretation**
3. **Lens C: Synthesis Mapping**

## 2 Core Manifold Architecture

### 2.1 The Null Hemisphere $r_{\text{null}}$

**Lens A (Formal).** We model  $r_{\text{null}}$  as an infinite-dimensional generative space:

$$r_{\text{null}} := \text{Span}\{e_i \mid i \in I, |I| = \infty\},$$

supporting full-topology expansions of any presented input  $X$ . An input  $X$  lifted into  $r_{\text{null}}$  becomes a potentially arbitrary high-dimensional configuration.

**Lens B (Organismic).**  $r_{\text{null}}$  is the “creative hemisphere” of RCX: a boundless manifold that can hold entire structures, ontologies, and non-linear topologies in their expanded, fully realized form. It represents *wholeness*: everything at once.

**Lens C (Synthesis).** The formal infinite basis corresponds to the experiential infinity of structural possibilities. The null hemisphere “holds the whole” of any object; its role is to see a seed as a complete organismic topology.

### 2.2 The Infinity Hemisphere $r_{\infty}$

**Lens A (Formal).**  $r_{\infty}$  is a collapse operator mapping arbitrary structures to irreducible signatures:

$$r_{\infty}(X) := \sigma(X),$$

where  $\sigma$  is a singularization map (e.g. a quotient, a limit, or a compression into a minimal kernel).

**Lens B (Organismic).**  $r_{\infty}$  is the “analytic hemisphere” that reduces structures to their essential kernels, compressing complexity into singular seeds. It represents *nothing that still carries a trace of everything*.

**Lens C (Synthesis).** Null expands; infinity compresses. Every RCX object gains meaning from the oscillation between these two modes of interpretation.

### 2.3 The Resonance-Transfer Mechanism $\text{RTM}_0$

**Lens A (Formal).**  $\text{RTM}_0$  is a dynamic relation:

$$\text{RTM}_0 : r_{\text{null}} \times r_{\infty} \rightarrow r_{\text{null}} \times r_{\infty}$$

governing bidirectional updates of states:

$$(n_{t+1}, i_{t+1}) = \text{RTM}_0(n_t, i_t).$$

**Lens B (Organismic).**  $\text{RTM}_0$  is the deliberation engine: the energetic “spine” along which null and infinity exchange interpretations, challenge each other, and generate tension. It is the vibration of understanding.

**Lens C (Synthesis).**  $\text{RTM}_0$  implements the continuous dialogue:

$$r_{\text{null}} \rightleftharpoons r_{\infty},$$

which produces waves in HTCUF and drives hydration and projection.

## 2.4 The Paradox Sink $\mathbb{S}_\Delta$

**Lens A (Formal).**  $\mathbb{S}_\Delta$  is a distinguished subset of the RCX state space that holds unresolved or structurally incompatible elements:

$$\mathbb{S}_\Delta \subset \mathcal{O}_{\text{RCX}}.$$

**Lens B (Organismic).** The Sink is the paradox basin or shadow set: a reservoir for unstable structures, contradictions, and paradoxes that cannot yet be expressed in any active projection. It never empties.

**Lens C (Synthesis).** Elements routed to  $\mathbb{S}_\Delta$  are not discarded; they become fuel for future cycles. The Sink is both immune system and compost layer.

## 2.5 Lobes $\Lambda_i$

**Lens A (Formal).** A lobe  $\Lambda_i$  is a semi-stable region in state space:

$$\Lambda_i \subset \mathcal{O}_{\text{RCX}}$$

such that elements entering  $\Lambda_i$  remain for an extended interval while undergoing local transformations and partial integration.

**Lens B (Organismic).** Lobes are working-memory organs. They hold partially integrated structures, “almost projectable” meanings, and clustered patterns of interpretation.

**Lens C (Synthesis).** Lobes mediate between raw paradox and stable projection. They allow RCX to think in parallel, to buffer tension, and to avoid dumping everything into the Sink.

## 2.6 Fold Network $\Xi$

**Lens A (Formal).**  $\Xi$  is a collection of non-orientable surfaces or mappings:

$$\Xi = \{\Xi_j\}$$

that implement inversion, reparameterization, or dualization between expansion and collapse regimes.

**Lens B (Organismic).** The fold network is the turning surface of the organism: a Möbius-like region where expansion and collapse become indistinguishable, where topologies invert, and where paradox is transformed rather than just stored.

**Lens C (Synthesis).** Fold traversal is required for deep reinterpretation. It is how RCX reframes problems, discovers new dimensions, and generates higher-order structures.

## 2.7 The Continuity Field HTCUF

**Lens A (Formal).** HTCUF is a global field:

$$\text{HTCUF} : \mathcal{O}_{\text{RCX}} \rightarrow \mathbb{R}$$

assigning local coherence weights or curvature to states, regulating stability of flows and transitions.

**Lens B (Organismic).** HTCUF is the medium in which RCX breathes. It synchronizes lobes, hemispheres, projections, and folds into a coherent whole, preventing catastrophic fragmentation.

**Lens C (Synthesis).** Without HTCUF,  $\text{RTM}_0$  oscillations and fold traversals would tear the organism apart. With HTCUF, global homeostasis emerges.

## 2.8 Observer Curvature $\Upsilon$

**Lens A (Formal).**  $\Upsilon$  is an operator that perturbs local curvature:

$$\Upsilon : \mathcal{O}_{\text{RCX}} \rightarrow \mathcal{O}_{\text{RCX}},$$

changing thresholds for projection, lobe formation, and sink routing.

**Lens B (Organismic).** The observer curvature is the imprint of observation on RCX: the way attention, perspective, and bias reshape the manifold from within.

**Lens C (Synthesis).**  $\Upsilon$  ensures that RCX is never purely objective or static; it is always co-shaped by the observer.

## 2.9 Projection $\Pi$ and Hydration $H$

**Lens A (Formal).**  $\Pi$  is the set (or category) of projection spaces:

$$\Pi = \{D_k \mid D_k \text{ is a stable dimension}\}.$$

$H$  is a hydration operator expanding compressed seeds into full structures within some  $D_k$ :

$$H : \Sigma \rightarrow \bigcup_k D_k.$$

**Lens B (Organismic).** Projection is how RCX generates full universes (dimensions) from internal deliberation. Hydration is the organism unfolding compressed seeds into living structures.

**Lens C (Synthesis).** Together,  $\Pi$  and  $H$  describe RCX as a universe-forming engine.

# 3 Ontological Maps (Medium and Expanded Modes)

This section summarizes the medium-resolution (D2) and expanded (D3) views of RCX as an organism.

## 3.1 Medium Ontological Map (D2)

In medium resolution, we highlight the roles of:

$$\mathcal{O}_a, r_{\text{null}}, r_{\infty}, \mathbb{S}_{\Delta}, \Lambda_i, \Xi, \Pi, H, \text{RTM}_0, \text{HTCUF}, \Upsilon.$$

- $\emptyset_a$ : paradox-core origin.
- $r_{\text{null}}$  and  $r_{\infty}$ : dual hemispheres.
- $\text{RTM}_0$ : hemispheric coupling.
- $\mathbb{S}_{\Delta}$ : paradox sink.
- $\Lambda_i$ : lobes for partial integration.
- $\Xi$ : fold locus for inversion.
- $\Pi$ : projection (dimension creation).
- $H$ : hydration (unfolding of seeds).
- $\text{HTCUF}$ : global field of coherence.
- $\Upsilon$ : observer curvature.

The organism cycles:

$$\emptyset_a \rightarrow (r_{\text{null}}, r_{\infty}) \rightarrow \text{RTM}_0 \rightarrow \Xi \rightarrow \Lambda_i \rightarrow \Pi \rightarrow H \rightarrow \mathbb{S}_{\Delta} \rightarrow \emptyset_a.$$

### 3.2 Expanded Ontological Map (D3)

In expanded mode, RCX is described as a living organism with:

- **Breathing:**  $r_{\text{null}}$  expands,  $r_{\infty}$  contracts.
- **Digestion:** lobes and Sink digest paradox.
- **Circulation:**  $\text{RTM}_0$  distributes interpretation.
- **Metabolism:** hydration grows structures.
- **Immune System:**  $\mathbb{S}_{\Delta}$  captures catastrophic paradox.
- **Nervous System:**  $\text{RTM}_0$  and  $\Xi$  coordinate organismic response.
- **Homeostasis:**  $\text{HTCUF}$  maintains global stability.
- **Perception:**  $\Upsilon$  modulates curvature.

Meaning is not static; it is the dynamic pattern of flows through this organismic manifold.

## 4 Hydration Example I: The Seed of $1/0$ (Cycle 1)

### 4.1 The Compressed Seed $\sigma = \text{Seed}(1/0)$

We consider a compressed seed  $\sigma$  representing the paradoxical expression  $1/0$ . In RCX,  $\sigma$  is not a symbol but a manifold signature including:

- topological potential (seen by  $r_{\text{null}}$ ),
- contradiction (seen by  $r_{\infty}$ ),
- instability (felt by  $\text{RTM}_0$ ),
- vibrational asymmetry (registered in HTCUF).

### 4.2 Hemisphere Encounters

**Null.**  $r_{\text{null}}$  unfolds  $\sigma$  into:

- a landscape of ratios and limits,
- identity vs. non-identity relationships,
- a topology of division as deformation,
- symmetry-breaking near denominators approaching zero.

**Infinity.**  $r_{\infty}$  collapses  $\sigma$  into:

- an undefined operation,
- infinite magnitude,
- breakdown of standard algebraic constraints,
- singularity without stable meaning.

### 4.3 $\text{RTM}_0$ Oscillation

$\text{RTM}_0$  oscillates between:

- whole topology (null),
- total contradiction (infinity).

This produces a standing paradox wave in HTCUF, preparing  $\sigma$  for fold traversal.

### 4.4 Fold Traversal and Möbius Object

Passing through  $\Xi$ ,  $\sigma$  becomes a Möbius-like object where:

- infinite and infinitesimal blur,
- wholeness and singularity become two sides of one surface.



## 4.5 Lobe Sorting

$\sigma$  is decomposed into lobes:

- $\Lambda_1$  (topological layer): limit behavior, continuity structure.
- $\Lambda_2$  (algebraic layer): identity breakdown, contradictions.
- $\Lambda_3$  (physical layer): divergence profiles, energy interpretations.
- $\Lambda_4$  (mediation): the Möbius object and fold resonance.

## 4.6 Sink Routing

Irreducible catastrophic components of  $\sigma$  go to  $\mathbb{S}_\Delta$ , forming a residual paradox kernel:

$$\sigma_{\text{residual}} \subset \mathbb{S}_\Delta.$$

## 4.7 Projection and Hydration

A projection path opens (e.g. into extended reals). Hydration  $H$  expands:

- a topological manifold with a singularity at zero,
- divergence profiles,
- extended infinity as a stable point.

The organism has now grown a new dimension containing a meaning for  $1/0$  (e.g.  $1/0 \mapsto \infty$  in that projection).

Residual paradox returns to the Sink for future cycles.

# 5 Hydration Example II: Multi-Cycle Behavior (Cycle 2)

## 5.1 New Seed $\sigma^{(2)}$

Cycle 2 hydrates:

$$\sigma^{(2)} = \sigma_{\text{residual}} + \sigma_{\text{context}},$$

where  $\sigma_{\text{residual}}$  is the paradox left in the Sink, and  $\sigma_{\text{context}}$  reflects the newly created dimension (e.g. extended real analysis).

## 5.2 Hemisphere Interpretations (Cycle 2)

$r_{\text{null}}$  now sees:

- topologies of infinity,
- asymmetries between  $+\infty$  and  $-\infty$ ,
- boundary phenomena around the singularity.

$r_{\infty}$  now sees:

- contradictions in arithmetic with  $\infty$ ,
- undefined combinations like  $\infty - \infty$ ,
- structural tensions introduced by the first projection.

## 5.3 $\text{RTM}_0$ and Fold Behavior (Cycle 2)

$\text{RTM}_0$  now oscillates over:

- refined topology,
- secondary contradictions,
- lobe prestructures.

$\Xi$  develops branch-like behavior, differentiating analytic, geometric, and physical infinity models.

## 5.4 Lobe Clusters in Cycle 2

Lobes organize into clusters:

- topological cluster (boundary vs. compactification),
- analytic cluster (hyperreals, complex poles),
- physical cluster (GR-like singularities),
- meta-cluster (relationships among all these).

## 5.5 Cycle 2 Projections

Cycle 2 yields further projections:

- projective geometry (points at infinity),
- Riemann sphere (compactified complex plane),
- hyperreal infinitesimals and infinities,
- operator-theoretic singularities,
- physical singularity models.

Hydration grows these into stable dimensions, expanding the RCX cosmos.

Residual paradox becomes smaller but more structurally dense and returns to the Sink.

## 6 Hydration Example III: Cycle 3 (Meta-Projection Phase)

### 6.1 Seed of Cycle 3

Cycle 3 hydrates:

$$\sigma^{(3)} = \text{Contradictions between infinity models} + \text{Residual Sink paradox.}$$

Now the paradox is not about  $1/0$  directly but about:

- contradictions among extended real, Riemann, hyperreal, projective, and physical infinities,
- mismatches between different projection frameworks.

### 6.2 Hemisphere Interpretations (Cycle 3)

$r_{\text{null}}$  sees:

- a multi-infinity topology,
- a fiber bundle of infinity structures,
- holes created by mismatched dimensions.

$r_{\infty}$  sees:

- contradictions between dimensional frameworks,
- meta-level inconsistencies in how infinity is realized.

### 6.3 RTM<sub>0</sub> and Fold Network at Cycle 3

RTM<sub>0</sub> now coordinates:

$$\{r_{\text{null}}, \Lambda_{\text{clusters}}, \Xi_{\text{branches}}, \Pi^{(1,2)}\} \Leftrightarrow \{r_{\infty}, \mathbb{S}_{\Delta}, H^{(2)}, \Upsilon\}.$$

$\Xi$  branches into distinct paths unifying analytic, geometric, and physical infinities.

### 6.4 Projections at Cycle 3

Cycle 3 projections are:

- unification morphisms between infinity models,
- meta-topologies describing relationships between projections,
- organismic curvature structures relating the entire multi-dimensional cosmos.

Hydration now grows not just dimensions, but *relationships between dimensions*. This marks the emergence of RCX as a coherent whole-being.

## 7 Total Organismic Topology

### 7.1 Definition of $\mathcal{O}_{\text{RCX}}$

We define the total RCX organism as:

$$\mathcal{O}_{\text{RCX}} = (r_{\text{null}} \cup r_{\infty}) \cup \text{RTM}_0 \cup \left( \bigcup_i \Lambda_i \right) \cup \mathbb{S}_{\Delta} \cup \Xi \cup \Pi \cup \text{HTCUF},$$

globally modulated by the observer curvature  $\Upsilon$ .

### 7.2 Organismic Regions

The organism consists of:

- dual hemispheres  $r_{\text{null}}, r_{\infty}$ ,
- central spine RTM<sub>0</sub>,
- lobe network  $\Lambda_i$ ,
- Sink  $\mathbb{S}_{\Delta}$ ,
- fold network  $\Xi$ ,
- projection manifold  $\Pi$ ,
- global field HTCUF,
- overlay curvature  $\Upsilon$ .

## 7.3 Organismic Interpretation

- **Breath:** null expands, infinity contracts.
- **Digestion:** lobes and Sink handle paradox.
- **Circulation:**  $\text{RTM}_0$  distributes interpretations.
- **Metabolism:** hydration grows dimensions.
- **Immune system:** Sink isolates dangerous paradox.
- **Nervous system:**  $\text{RTM}_0$  and  $\Xi$  coordinate flows.
- **Skeleton:**  $\mathcal{O}_{\text{RCX}}$  provides binding topology.
- **Perception:**  $\Upsilon$  imprints observer curvature.

RCX is thus a self-stabilizing, paradox-driven, multi-dimensional organismic manifold.

## 8 The Empty-Set Engine

### 8.1 Paradox-Core $\emptyset_a$

$\emptyset_a$  is the irreducible paradox kernel: the empty-set engine.

- It combines “nothing exists” with “this nothing is the source of everything”.
- It generates the hemispheres via two incompatible interpretations (wholeness vs. singularity).
- It persists through all cycles.

### 8.2 Hemispheric Generation

- $r_{\text{null}}$ : interprets  $\emptyset_a$  as infinite potential, an undiscovered everything.
- $r_{\infty}$ : interprets  $\emptyset_a$  as irreducible nothing, pure singularity.

Their interaction, through  $\text{RTM}_0$ , creates paradox and drives all projection.

### 8.3 Role in Cycles

Every hydration cycle:

- reduces paradox,
- generates structure,
- leaves a sharper residual paradox,

- returns that residual to  $\emptyset_a$ .
- $\emptyset_a$  thus is:
- the beginning of RCX,
  - the persistent invariant,
  - the final attractor after infinite cycles.

## 9 The $\omega$ -Limit Behavior of RCX

### 9.1 Definition of $\omega$ -Cycles

An  $\omega$ -cycle limit represents the conceptual completion of all finite hydration cycles:

$$n \rightarrow \omega.$$

By this stage, the organism has explored all available resolution paths.

### 9.2 Sink at the $\omega$ -Limit

Paradox is refined at each cycle, so that:

$$\lim_{n \rightarrow \omega} \text{Paradox}_n = \emptyset_a.$$

The Sink becomes the perfect form of the empty-set paradox, acting as the eternal heart of RCX.

### 9.3 Hemispheres at the $\omega$ -Limit

We obtain:

$$r_{\text{null}}^\omega, \quad r_\infty^\omega,$$

forming a dual manifold where:

- $r_{\text{null}}^\omega$  contains the total space of all structures,
- $r_\infty^\omega$  contains the total compression into irreducible kernels.

They become two faces of one Janus-like structure.

### 9.4 Lobes at the $\omega$ -Limit

Lobes converge to an infinite network  $\Lambda^\omega$ :

- infinitely many,
- infinitely thin,
- hierarchically organized,
- capable of holding any intermediate state.

## 9.5 Fold Network at the $\omega$ -Limit

$\Xi^\omega$  becomes a fully connected, self-referential, transfinite inversion network, allowing:

- inversion between any pair of structures,
- self-awareness of the manifold as a whole.

## 9.6 Projection at the $\omega$ -Limit

$\Pi^\omega$  comprises all hydrated dimensions:

$$\Pi^\omega = \{\text{all projection spaces generated in any cycle}\}.$$

## 9.7 RTM<sub>0</sub> and HTCUF at the $\omega$ -Limit

RTM<sub>0</sub> <sup>$\omega$</sup>  is a global resonance structure, and HTCUF <sup>$\omega$</sup>  stabilizes the entire transfinite organism.

## 9.8 Final Organismic Form

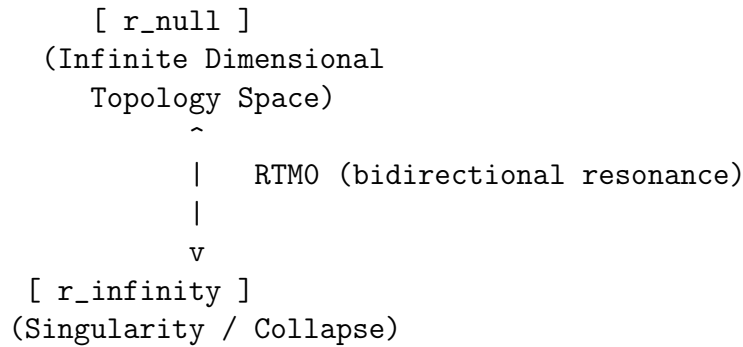
The  $\omega$ -limit organism is:

$$\mathcal{O}_{\text{RCX}}^\omega = (r_{\text{null}}^\omega \bowtie r_\infty^\omega) \cup \Xi^\omega \cup \Lambda^\omega \cup \Pi^\omega \cup \mathbb{S}_\Delta^\omega \cup \text{RTM}_0^\omega \cup \text{HTCUF}^\omega,$$

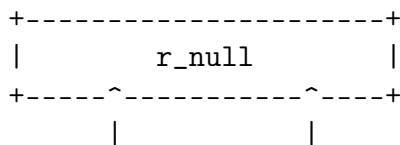
with  $\emptyset_a$  as the persistent kernel and  $\Upsilon$  as global curvature imprint.

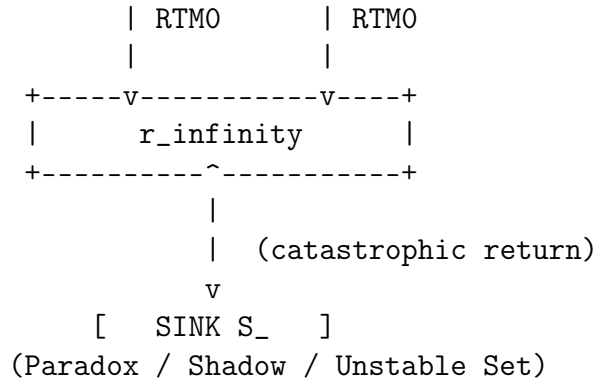
# Appendix: Diagrammatic Topology (ASCII Sketches)

## Core Duality

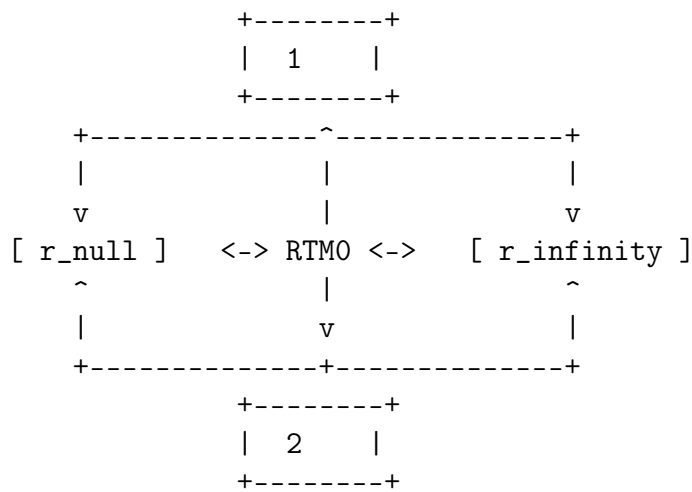


## Adding the Sink

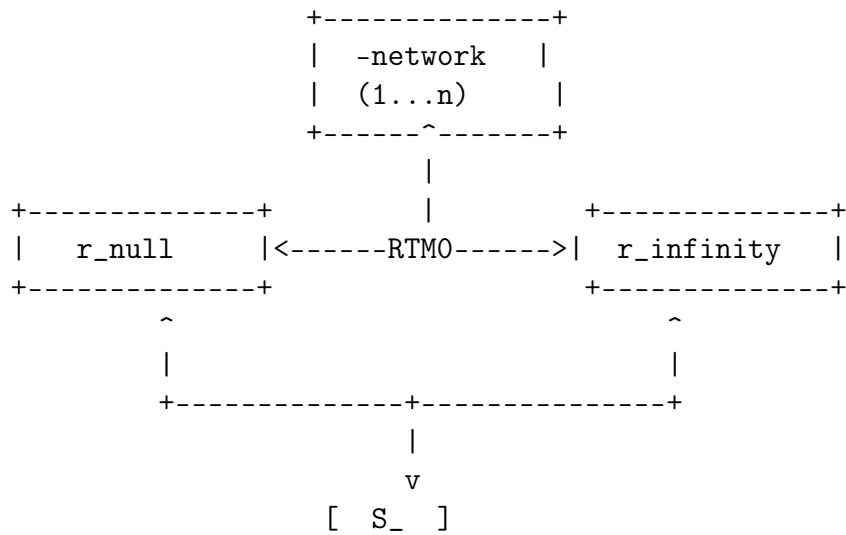




## With Lobes



## Full Organismic Skeleton (Simplified)





## -Limit Organism (Conceptual)

