RBT-Law v1.0
Thermodynamic Constraint on Smartphone Interfaces

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Abstract

The RBT-Law (Raynor Bottleneck Threshold) formalizes a structural, thermodynamic constraint on legacy smartphone interfaces. It states that any interface requiring continuous, focal, high-pressure attention forms a thermodynamic attention bottleneck incompatible with reversible, AI-first ambient systems. This law establishes the successor boundary between extractive interaction-based architectures and ambient, coherence-carrying environments.

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1. Canonical Definition

RBT-Law

The smartphone is a thermodynamic attention bottleneck.
Any interface that compresses human attention into a high-pressure focal point cannot support reversible, AI-first ambient systems.

The bottleneck arises when:

- attention becomes locally compressed,
- pressure exceeds reversible thresholds,
- ΔR (reversible stress) collapses,
- and the system can no longer maintain continuity or coherence.

This establishes the structural necessity for ambient successor interfaces.

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2. Structural Chain (Successor Sequence)

SMARTPHONE = PRESSURE INTERFACE
↓

THERMODYNAMIC ATTENTION BOTTLENECK (RBT-Law)
↓
AI-FIRST AMBIENT SYSTEMS (require reversibility)
↓
SUCCESSOR INTERFACE — AMBIENT PHONE

This chain is not metaphoric; it is a forced thermodynamic progression.

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3. Theorem (Formal Statement)

Theorem 1 (Raynor Bottleneck Threshold).

Let A(t) denote human attention over time, and let P be the interface-induced pressure function on attention.

A smartphone-class interface satisfies:

- P >> ΔR,
- A(t) requires continuous focal compression,
- transitions are non-reversible,
- context resets destroy continuity.

Then:

No reversible AI-first system can operate stably on this substrate.

Formally:

If
P > ΔR,
then Ψ(t) collapses.

If
Ψ(t) collapses,
then C∞ cannot emerge.

If
C∞ cannot emerge,
then ambient viability is impossible.

Therefore:

smartphone $\notin AP_0$-compatible substrates.

This is the Raynor Bottleneck Threshold.

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4. Engineering Specification (RBT-Law v1.0)

A system violates the RBT-Law if:

1. It requires focal visual attention as the primary mode of operation.
2. It compresses attention into a single high-pressure point (screen or gesture hub).
3. It breaks continuity between interactions (app boundaries, context resets).
4. It produces irreversible stress ($\Delta R < 0$).
5. It cannot distribute coherence into the environment (no ambience).
6. It forces bipolar transitions (on/off, open/close, attend/ignore).

A system satisfies ambient viability if:

- $\Delta R \geq 0$ (all stress reversible),
- $\Psi(t)$ continuity is maintained,
- coherence becomes environmental,
- AI guidance is non-inferential,
- attention heat does not accumulate,
- pressure is externally absorbed,
- semantic curvature remains low.

Thus:

If a system depends on high-pressure focal interfaces, it cannot be an ambient system.

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5. **Diagram Description (Canonical Structural Representation)**

Use the exact structural chain:

SMARTPHONE (pressure)

↓
RBT-LAW (thermodynamic bottleneck)
↓
AI-FIRST AMBIENT SYSTEMS (reversible)
↓
AMBIENT PHONE (successor interface)

This is the canonical visual representation.

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6. Context in the Ambient Canon

RBT-Law defines the boundary between:

- legacy pressure interfaces, and
- ambient, coherence-carrying environments.

It is the structural justification for:

- the end of smartphone thermodynamics,
- the necessity of ambient successor architectures,
- the viability of AI-first systems only under reversible load.

RBT-Law is the middle-law linking:

- Raynor Stack,
- ΔR,
- $\Psi(t)$,
- AP_0 viability,
- and Ambient Architecture.

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7. Citation

Eissens, R. (2026).
RBT-Law v1.0 — Thermodynamic Constraint on Smartphone Interfaces.
Zenodo.
https://ambientphone.com/rbt-law/

Related work:

Eissens, R. (2026).

The Raynor Stack — Canonical Thermodynamic Sequence for Humane Technology.
Zenodo.
https://doi.org/10.5281/zenodo.18323467