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GPS is fragile.

The fix is already in the air.

Azimuth is a decentralized network of passive receivers that turns existing cell tower, TV, and FM broadcasts into a GPS-independent positioning layer. No transmitting. No licensing. Just listening.

[Start a Node](#)[Full Whitepaper →](#)

The Problem

The world runs on a signal weaker than Wi-Fi — by a factor of 20 billion

GPS underpins air traffic control, financial timestamps, power grids, autonomous vehicles, and the daily lives of billions. The signal arriving at your phone is 10^{-16} watts. A \$30 jammer kills it across a city block. Spoofing diverts aircraft across hundreds of kilometers. Indoors, it doesn't work at all.

\$1B

\$30

0%

Estimated daily cost of a US GPS outage (NIST, 2019)

Cost of a jammer that denies GPS across a city block

GPS signal available indoors, underground, or in urban canyons

Why Not Build New Transmitters?

Because regulations and physics won't let you

The obvious alternative — decentralized ground-based transmitters at low frequency — fails on three fronts: regulatory incompatibility across jurisdictions, catastrophic antenna inefficiency at permitted sizes, and positioning precision three orders of magnitude worse than GPS.

Factor	LF Transmitter DePIN	Azimuth (SoOP)
License needed?	Varies by country	Never — receive-only
Works in US + EU?	No — EU bans radiating	Yes — all jurisdictions
Antenna efficiency	~0.1%	>90%
Useful bandwidth	10 kHz	10–400 MHz
Position accuracy	~300 m – 3 km	10–100 m, improving
Nodes for US coverage	4–8 million	~10,000

Key Insight

The signals you need for positioning are already everywhere — cell towers, TV stations, and FM transmitters blanket the world at power levels 60–100 dB stronger than GPS. The missing piece isn't the signal. It's the network of receivers.

How Azimuth Works

Listen. Measure. Position.

Azimuth nodes passively receive timing data from broadcasts already in the air. Multiple signal types are fused for accuracy and coverage no single source can match.



Listen

Your SDR node passively receives LTE, 5G, digital TV, and FM broadcasts — all carrying precise timing information.



Measure

The daemon extracts timestamps via TDOA algorithms and builds a radio fingerprint of your location's signal environment.



Earn

Observations flow to the network. Better coverage, more signals, and higher uptime earn more rewards through Proof of Observation.

4

Signal classes: LTE/5G, DTV, FM, LEO satellites

0 W

Transmitted power — purely passive, zero interference

∞

Jurisdictions where receive-only is legal (all of them)

Node Tiers

Start free. Scale from there.

Four hardware tiers let you enter at any level — starting at zero cost. Every tier earns; higher tiers produce higher-quality data and earn proportionally more.

Free

Tier 0 — Mobile

Android Observer App

Turn your existing Android phone into an Azimuth node at zero cost. Collects cell tower survey data, GNSS measurements, and WiFi

signals. [Download the APK.](#)

~\$30

Tier 1 — BYOD

Coming Soon

RTL-SDR V4 Dongle

Plug into any PC. Install the daemon. Start earning. Covers 500 kHz to 1.7 GHz — enough for LTE, FM, and DTV signals. NTP timing.

~\$150–250

Tier 2 — Dedicated

Coming Soon

GPS-Disciplined Standalone

Purpose-built unit with nanosecond-class timing, outdoor antenna, and 24/7 unattended operation. Higher data quality, higher rewards.

~\$400–600

Tier 3 — Array

Future

Multi-Channel Coherent SDR

5-element antenna array with TDOA + Angle-of-Arrival capability. Interferometric direction-finding. Premium tier rewards.

Token Economy

Earn by observing. Spend by querying.

The Azimuth token connects node operators who generate data with applications that consume it. Proof of Observation rewards useful work — real radio measurements that make the network more accurate.

Earn

Node operators earn tokens for verified signal observations. Rewards scale with coverage value, signal diversity, timing quality, and uptime.

Spend

Apps query the network for positioning fixes, radio environment maps, GNSS integrity monitoring, and historical signal data.

Nodes in underserved areas earn more — your value to the network is defined by where you are, not just what hardware you run. Unlike storage or bandwidth DePINs, positioning nodes are geographically irreplaceable.

Reward Mechanics

Rewards are calculated per observation using multiplicative factors that balance geographic expansion, data quality, and fair distribution.

Base Points

Each tier earns fixed base points per observation:

T0

1

T1

3

T2

8

T3

15

Hex Freshness

First to observe a new H3 hex? Earn up to 3× base. Saturated hexes drop to 0.1×. The network rewards explorers, not followers.

Saturation Decay

Network-wide per-tier logarithmic decay: as more nodes of the same tier come online, each node's share decreases via $1/(1+k \cdot \ln N)$. Higher tiers decay more slowly, rewarding hardware investment.

Density Cap

Per-hex, same-tier limit: rewards scale as $1/\sqrt{N}$ within each hex. Hard cap at 10 same-tier nodes per hex — beyond that, additional nodes earn zero. Growth goes outward, not inward.

Collision & RTK

30-minute latecomer suppression prevents reward sniping. Nodes with RTK GNSS (centimeter-level self-positioning) earn a 1.5× bonus on all observations.

The signals are already there. Azimuth listens.

Start with the free Android app — or add an SDR dongle when Tier 1 launches.

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