RELAY PLATFORM FOR TRANSMITTING POSITIONING SIGNALS TO ROVERS WITH AN OPTIMIZED RADIATION PATTERN

Technological advantages

Innovative :

- Use of relay platforms to transmit GNSS carrier signals from satellites within urban canyons like areas.

Efficient :

- No change required for the GNSS receivers.
- Significant improvements to the receivers accuracy in tough receiving conditions.
- Enhanced resilience to transient failures.

Invention synthesis

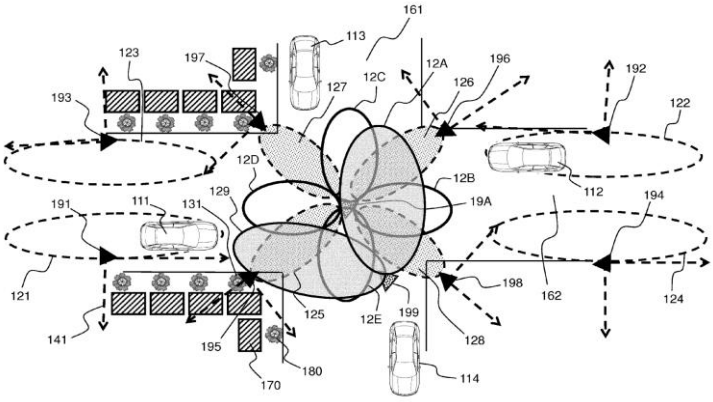
The invention deals with a relay platform for relaying positioning signals.

GNSS receivers calculate the position, velocity, time (PVT) from satellites (at least 4) GNSS carrier signals using 4 pseudo-ranges (derived from a pseudo random code and a navigation message) between the receiver and the satellites. Errors such as atmospheric perturbations, orbit variations or clock accuracy, satellites dispersion, can be compensated for (differential GPS, bi-frequencies receivers, …). However, errors due to multiple path reflections, temporary loss in line of sight are difficult to correct.

The invention proposes the use of an antennas assembly (with one or more elements) to transmit terrestrial positioning signals from a relay platform. The radiating pattern having at least one main lobe with a narrow / wide aperture along two planes. The antennas assembly thus cover areas of service in difficult to reach locations for the satellite GNSS signals.

Potential applications

- All GNSS receivers, especially smartphones, IoT, car navigation systems.



Top schematic view of a relay platform and radiation patterns

(111,112,113,114) vehicles
(161,162) streets / cross-roads
(121,122,123,124) antennas assemblies radiation lobes from the transmitters
(191,192,193,194) relay platforms
(195,196,197,198) additional relay platforms
(125,126,127,128) antennas assemblies radiation lobes from the additional relay platforms
(170) Building
(180) Light pole

Commercial benefits

- Improvement in GNSS receiver accuracy especially for urban canyons.
- No change on the GNSS receiver side.

Patented invention - under license.

For more information :

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