Optima-B

GPS navigation terminals deception jamming (spoofing) transmitter

Deception of navigation receivers of airborne and ground-based platforms by generating a false navigation field based on radiation, in real time, of spoofing signals equivalent to real GPS signals.


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Main functions

- real-time shaping and radiation of radio frequency signals with the characteristics and parameters similar to GPS navigation system signals in a specified location of the navigation receivers spoofed;

- signal shaping is provided by automatic inputting of the currently active data:

  - almanac;

  - ephemeris;

  - GPS time;

  - required (false) coordinates of navigation receiver;

- In accordance with the data input, the most optimal (visible) satellites are automatically selected and their parameters are used for spoofing GPS signals.
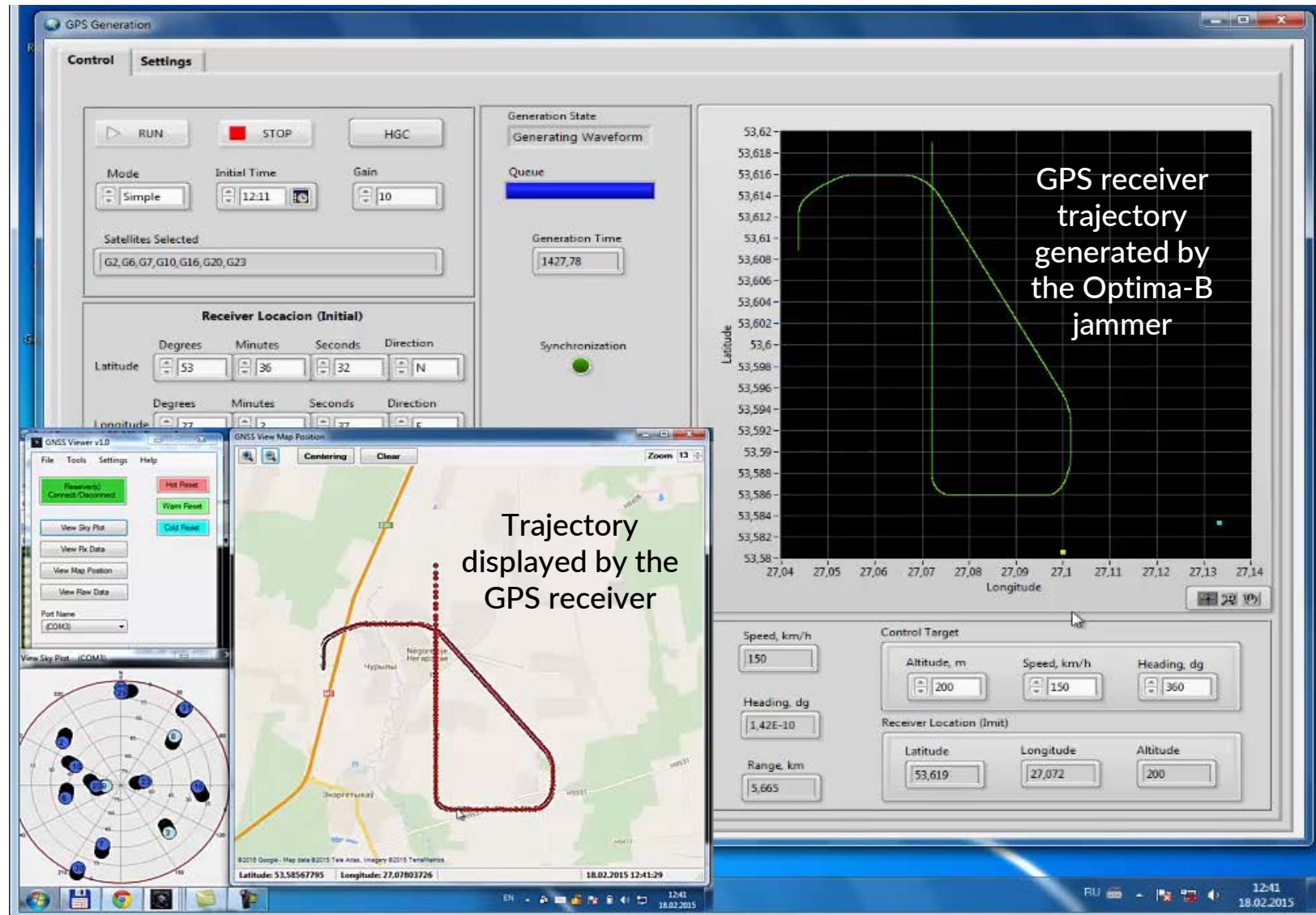

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Employment modes

- pulling aerial or ground-based platforms off their track by generating and varying a false navigation field in the area of location of such platforms (the transmitter emits signals with false coordinates assigned and dynamically altered by the operator;

- protection of a sensitive facility against multicopters by generating a false navigation field around the protected objective (the transmitter continuously emits signals with false coordinates, without involvement of the operator; the multicopters land or drop at the edge of the false navigation field cupola).
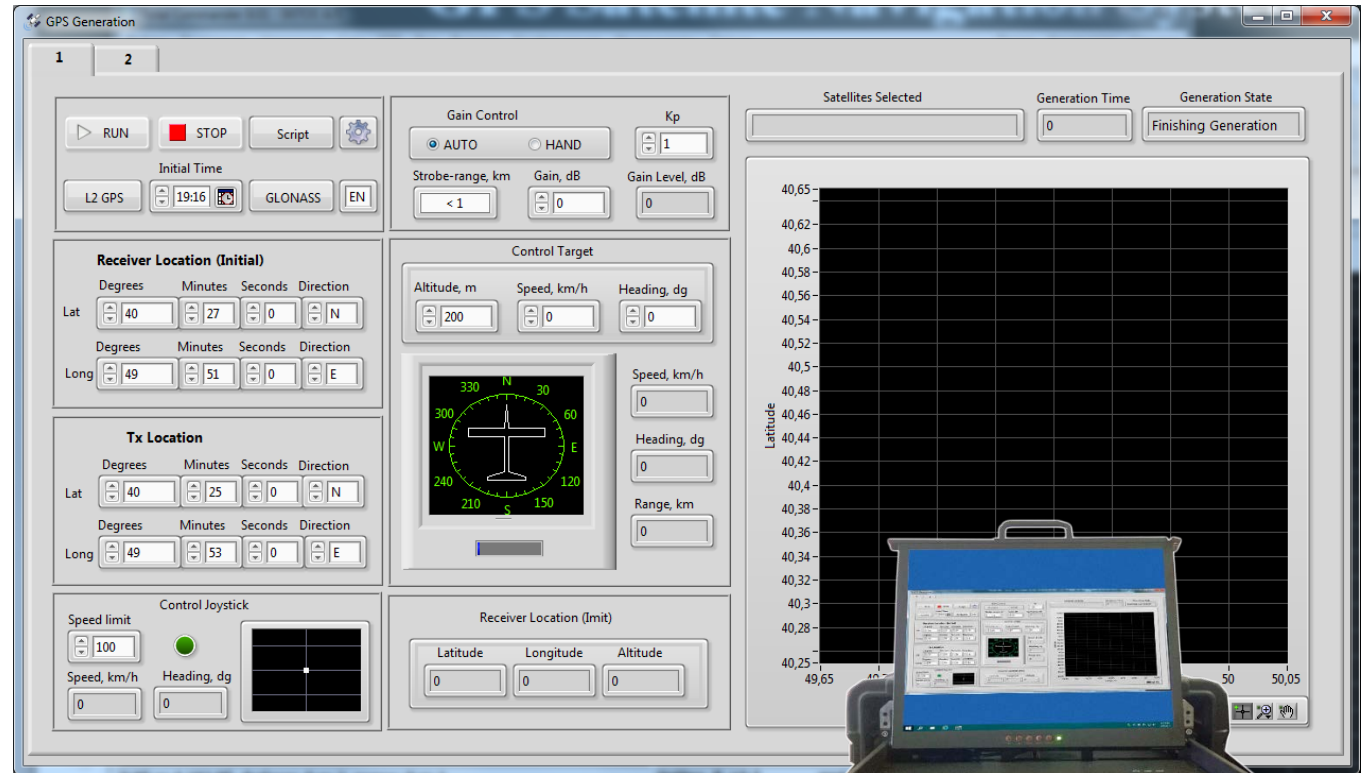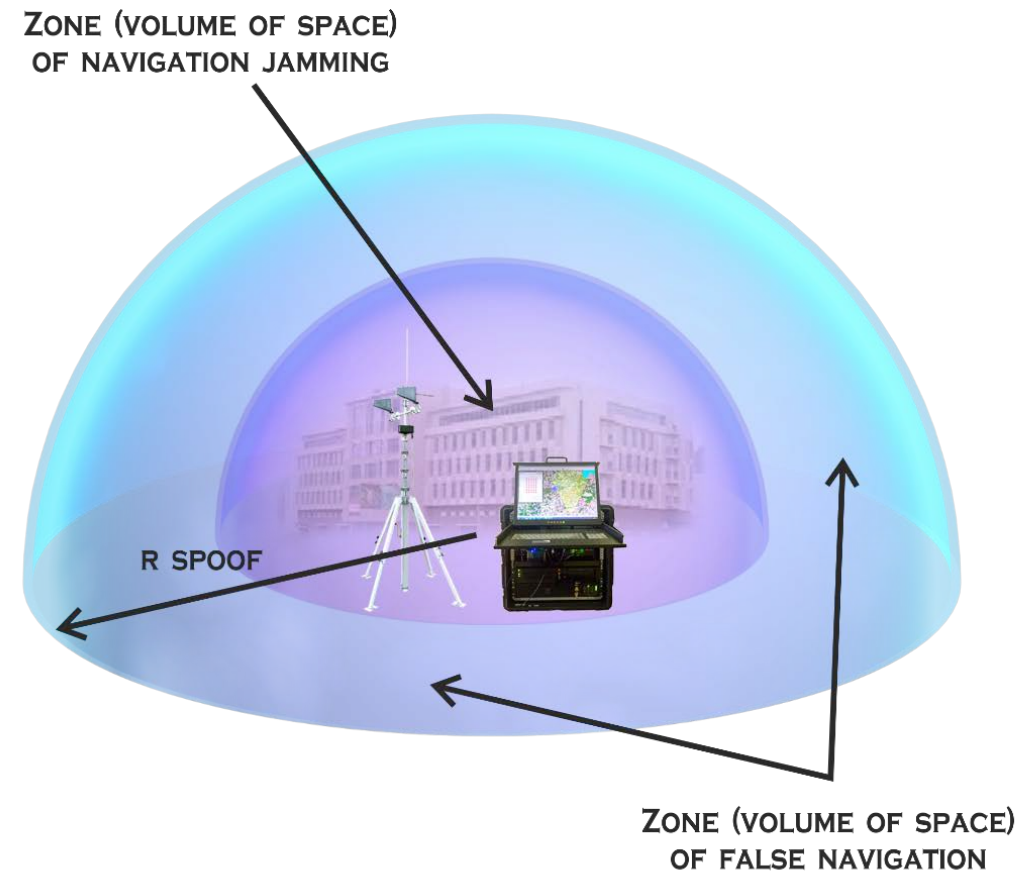
Signal shaping is implemented on the basis of the automatically generated almanac and ephemeris files, the GPS time and required coordinates of the navigation receiver. In accordance with the data input, the system models a visible satellite constellation for the given point in the terrain and, analyzing the parameters of each satellite for the assigned GPS time, selects the most optimal satellites and uses their data for simulation of GPS signals. In shaping the deception signals, movement of the target along an assigned track with assigned speed can be simulated.

GPS receiver trajectory generated by the Optima-B jammer

Trajectory displayed by the GPS receiver

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Protection of strategic facilities

1. Installing the antenna system on a building's rooftop.

2. Installing the hardware case-container in a room.

3. Software inputs:

   - coordinates of any airport;

   - spoofing zone radius (generation of spoofing) Rspoof .

4. The transmitter generates GPS navigation signals matching the coordinates of the designated airport. GLONASS satellite navigation signals are concurrently jammed.

5. The software and the transmitter operate automatically without Operator's involvement for unlimited time.

ZONE (VOLUME OF SPACE) OF NAVIGATION JAMMING

R SPOOF

ZONE (VOLUME OF SPACE) OF FALSE NAVIGATION

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Protection of strategic facilities

Operational effect:

- a false navigation field is generated over the protected facility within Rspoof radius (the radius is set by the Operator within the limits of 0 to 20 000 m);

- all mass-produced multicopters such as DJI Phantom 2, 3, 4; Inspire; Mavic; Matrice; Walkera Voyager 3, etc., are pre-programmed for inhibited flight in the areas of airfields (the coordinates of airports are part of the multicopters' firmware), which is why on entry into an inhibited coordinates zone, multicopters descend or drop (depending on the multicopter's software);

- the facility hosting an "Optima-B" is thus protected from multicopters by a false navigation field cupola..

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Specifications

Working frequencies	L1 (1575,42 MHz) and L2 (1227,6 MHz)
Jamming GLONASS system receivers	provided
Spoofing range	Up to 40 km
Simulated GPS satellites	Up to 12
Output power automatic tuning range depending on victim object distance	30 dB

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