

Need For PRS

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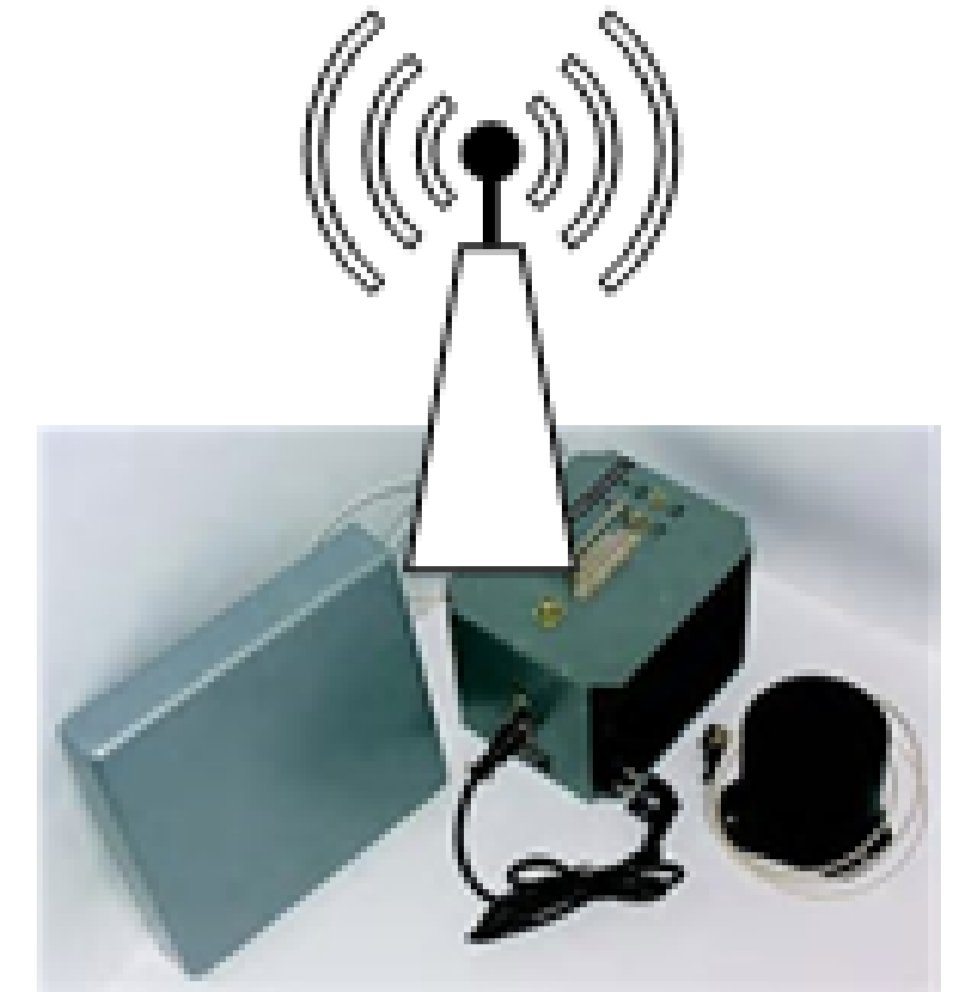
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Creating flexible artificial satellites in the sky in the form of drones and signal generators as payload. Drone positions are precisely measured with a tachymeter.



Transmitted signals can be tested under jamming or spoofing.



Jammer/spoofing



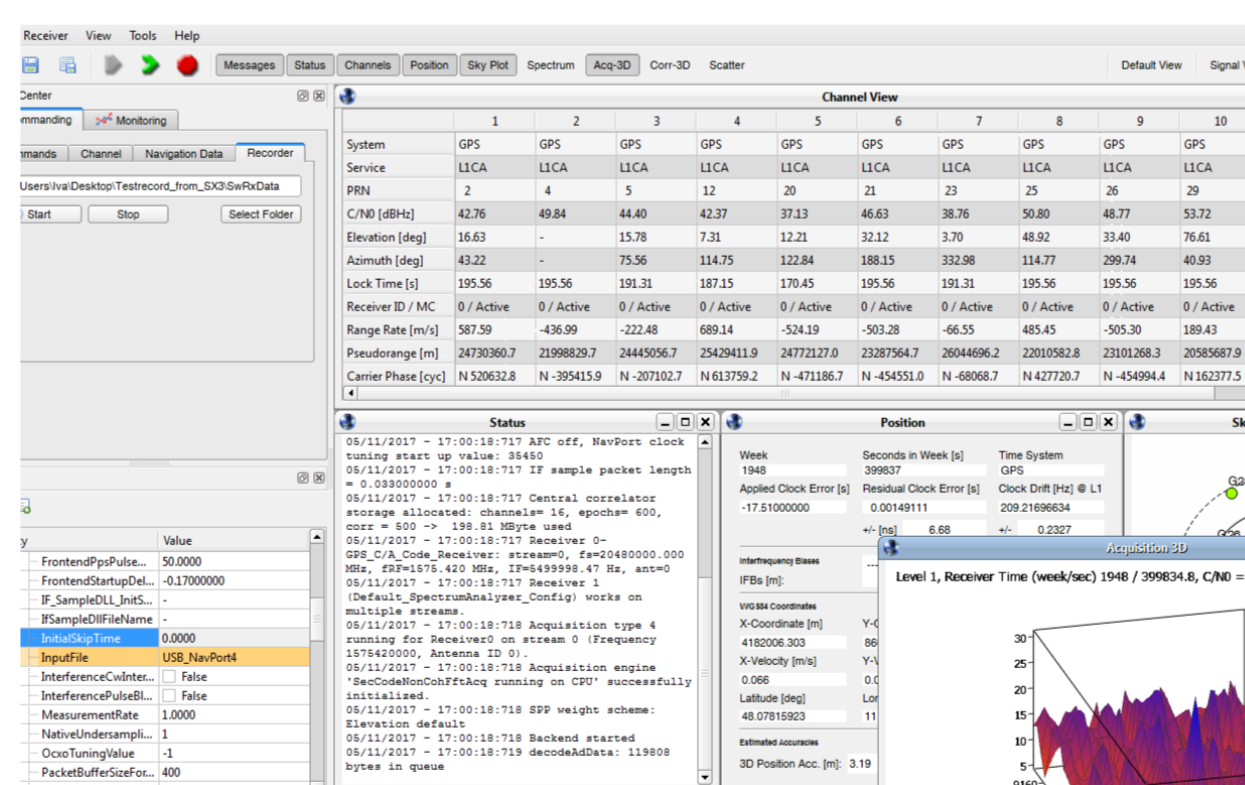
Signal transmission is done with the NI USRP 2950R and a helical antenna. The signals are generated with the onboard FPGA, which allows broadband signals in real-time.

Our goal is to investigate the robustness of Galileo PRS-like-signals and possible future PRS-signals against jamming, spoofing and interference. Therefore an autonomous testbed is developed. Also real signals with an official PRS-receiver will be tested.



The signals can be received by different antennas and front-end combinations at various positions. Synchronization of multiple antennas at different buildings is realized with fiber optic links.

Analysis of the GNSS signals with the further developed Musnat software receiver, which can track PRS-like signals. Real signals will be tracked with an official PRS-receiver.



Recording of the received signals with the SX3 software.

Objectives

- Investigation of the robustness of possible future PRS signals, PRS-like signals and real PRS signals against jamming, spoofing and interference
- Finding applications which can benefit from PRS
- Investigating mobile radio as a safety critical application, which uses open GNSS for time synchronization, for the vulnerability to spoofing attacks
- Investigating the PRS techniques stand-alone and server-based
- Cost-value ratio and effort estimation of a change to PRS

Future testbed upgrades

- Additional pseudolites on poles
- More drones for constellation simulation
- Multi frequency setup
- Interference suppression unit
- Receiver optimization