

ANALYSIS OF METHODS FOR JAMMING AND COUNTER JAMMING GPS SIGNAL

A. Fellner (2), J. Sulkowski (1), A. Grzybowski (1), P. Trómiński (1), P. Zadrag (1)
(1) Air Force Institute of Technology, Warszawa, Poland,
(2) Silesian University of Technology, Gliwice, Poland

The Air Force Institute of Technology in the framework of scientific research is implementing the project, which aims to develop methods for jamming of signal from the GPS system and develop algorithms and methods to counter jamming. The results of tests created two pilot solutions which will fulfill two main goals – signal interference and counter jamming. The project in it's first phase entails the development of methods for spoofing a GPS signal and sending:

- a) issued geographic coordinates different from the original ones,**
- b) jammed GPS signals, which will unable to determine to determine real coordinates on a jammed receiver.**

During the research, measurements were made using two receivers Septentrio PolaRx3e, Trimble GeoXH handheld receiver, antenna dedicated Septentrio PolaNT, Trimble Zephyr and directional antenna. Article presents results of measurements made in a series of experiments designed to determine an optimal configuration for generating a signal interference.

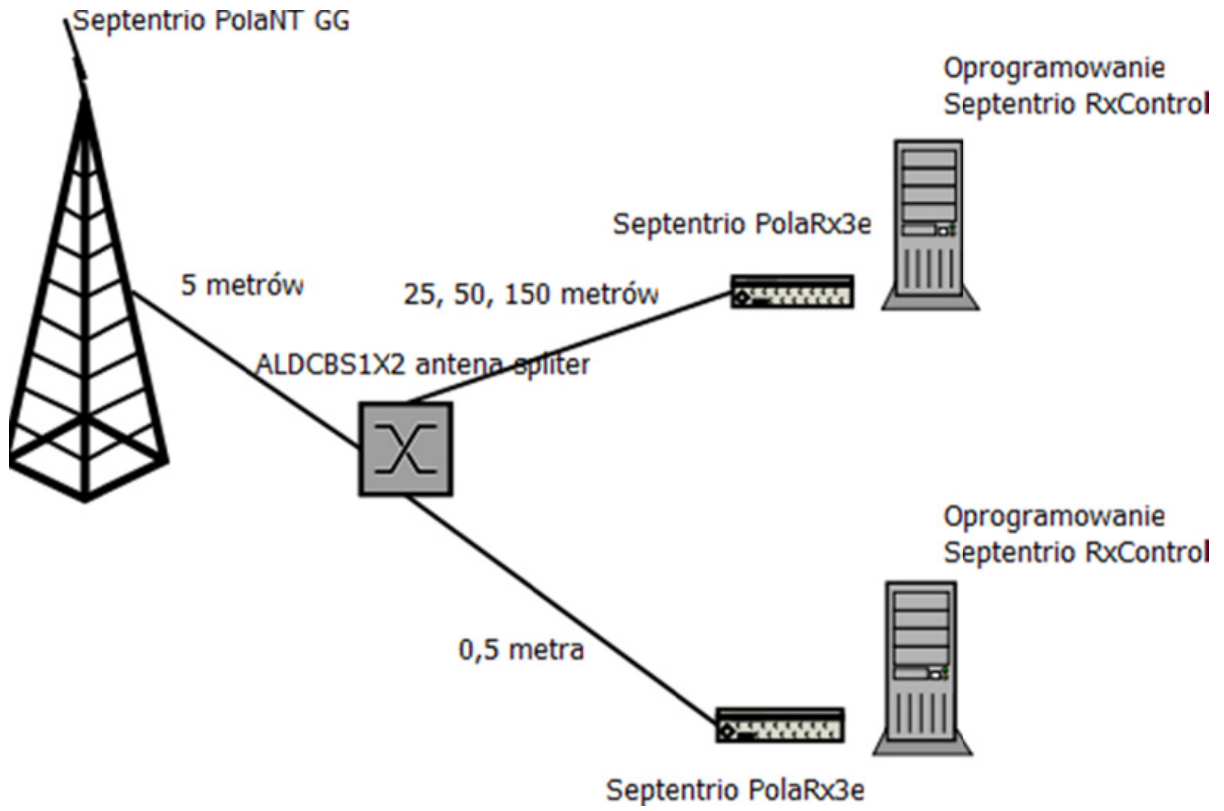


Fig. 1. Schema of test apparatus.



Fig. 2. Jamming antennas.

First session. Antenna with 35 meters away.

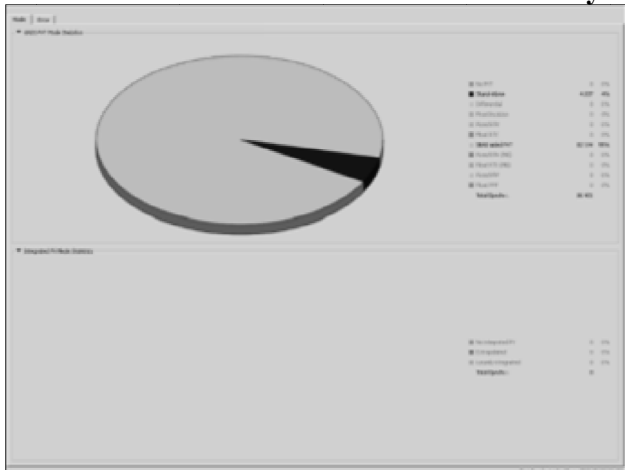


Fig. 3. Statistic Plot.

Second session. Antenna with 10 meters away.

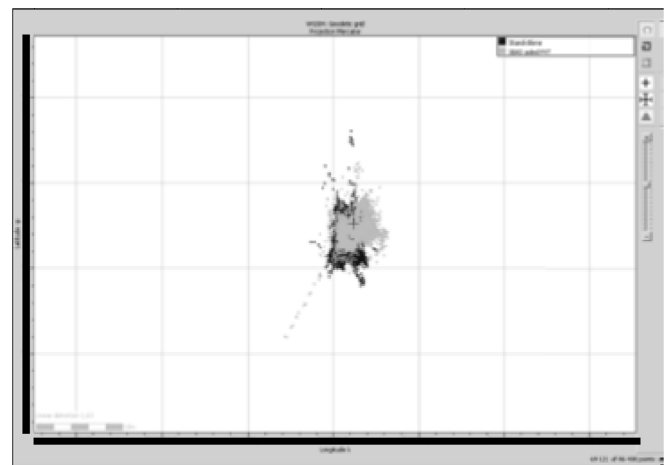
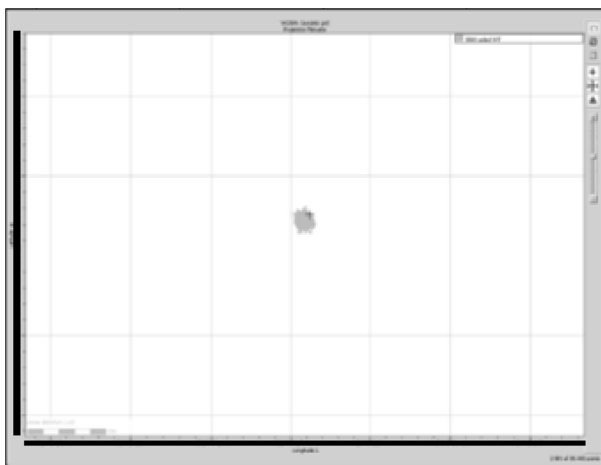
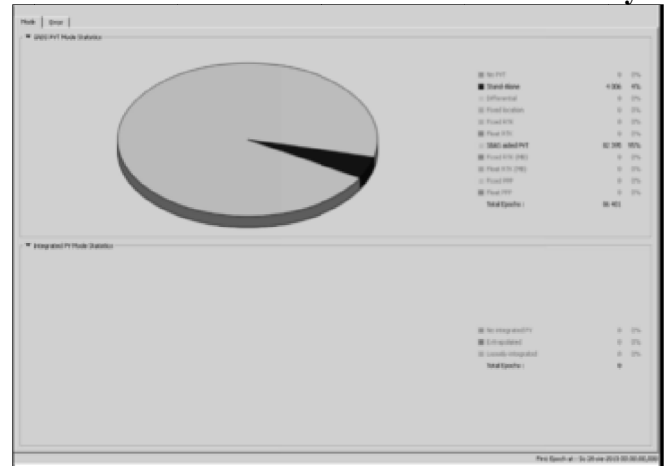


Fig. 4. Planimetric Plot.

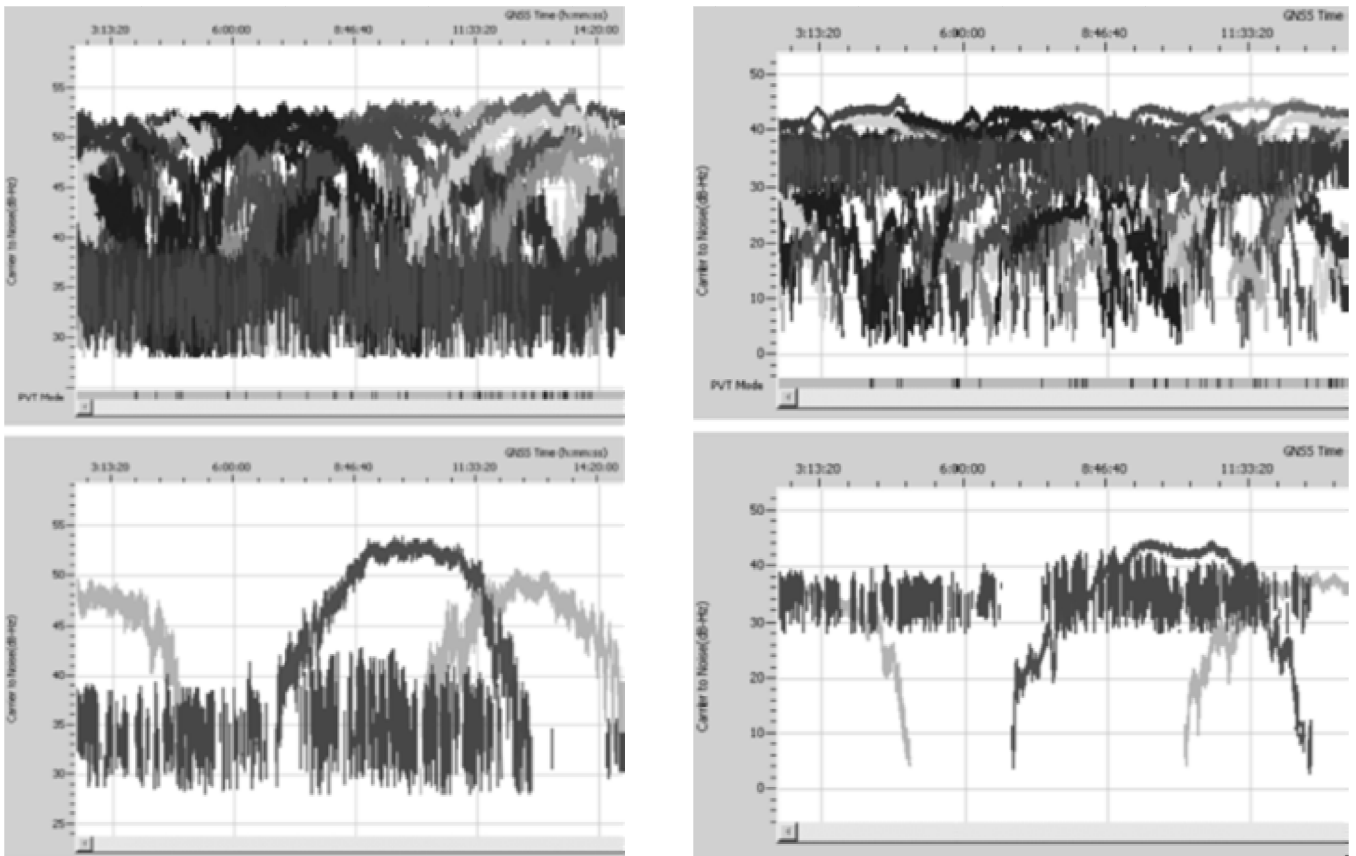


Fig. 5. Carrier to Noise Plot.

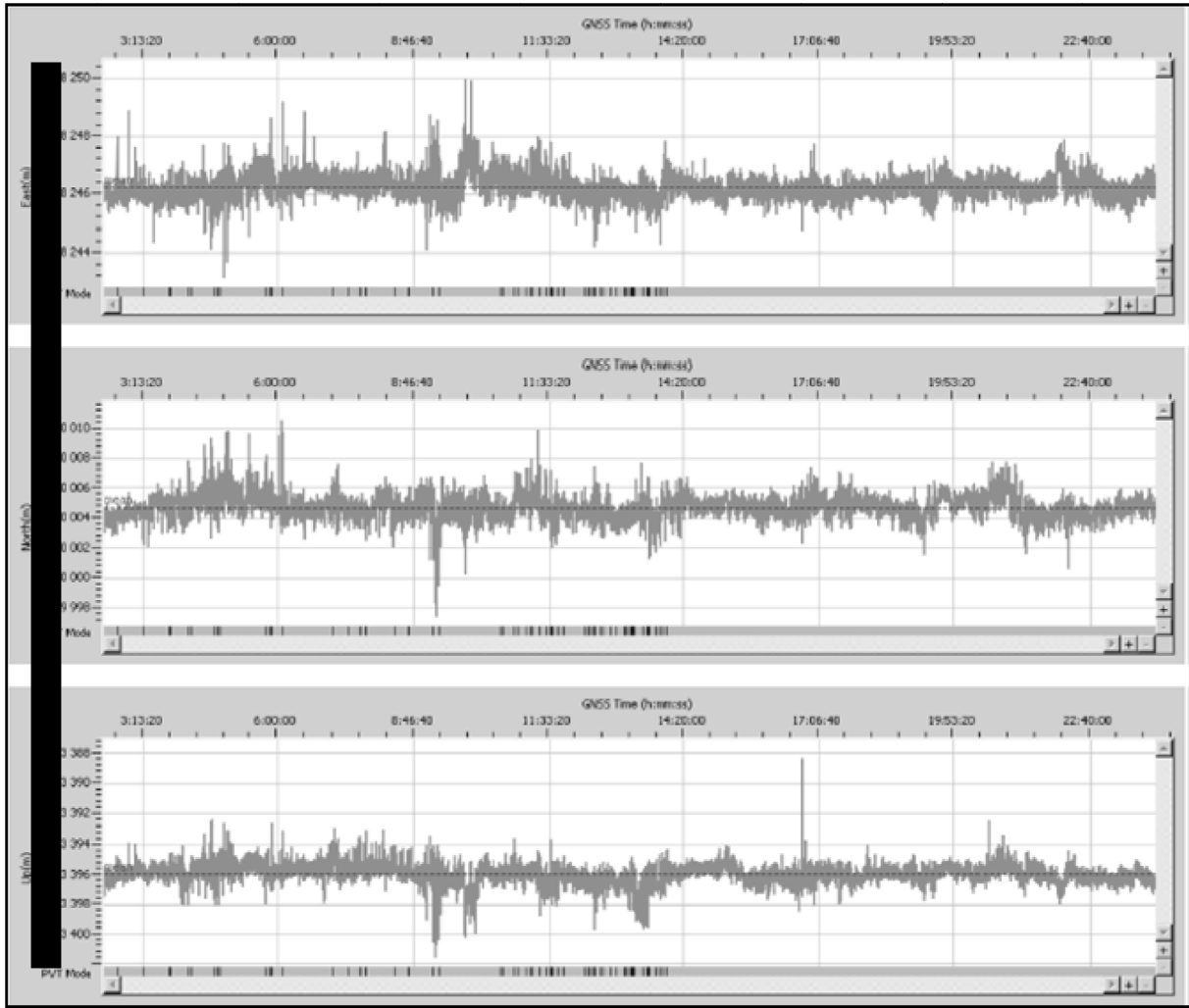


Fig. 6. Up, North, East error plot, first session, antenna with 35 meters away.

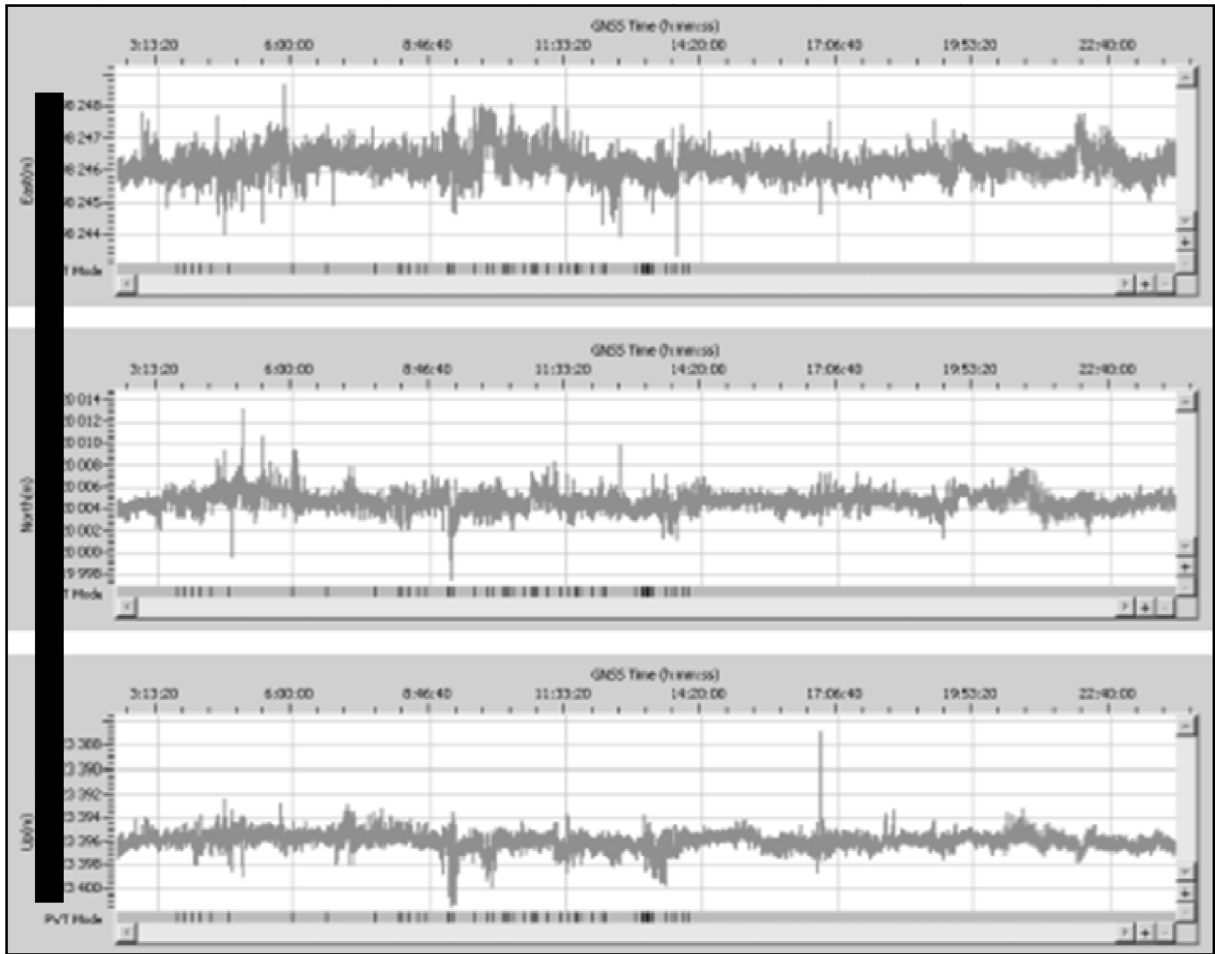


Fig. 7. Up, North, East error plot, first session, antenna with 10 meters away.

All data on geodetic coordinates were removed for safety reasons.