Passive Radar using the Universal Software Radio peripheral

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Much interest and research is currently being pursued in the development of a multi-static Passive Coherent Location Radar System.

This Project provides the ground work for the development of such a system. It has been built by exploiting the Software Radio Paradigm and using open source hardware and software tools in the form of USRP and GNU Radio.

Key Objectives

1 Characterise the Receiver

Define the performance and sensitivity of the USRP and the TV receiver module and make improvements to the GNU Radio development modules code in identified relevant areas

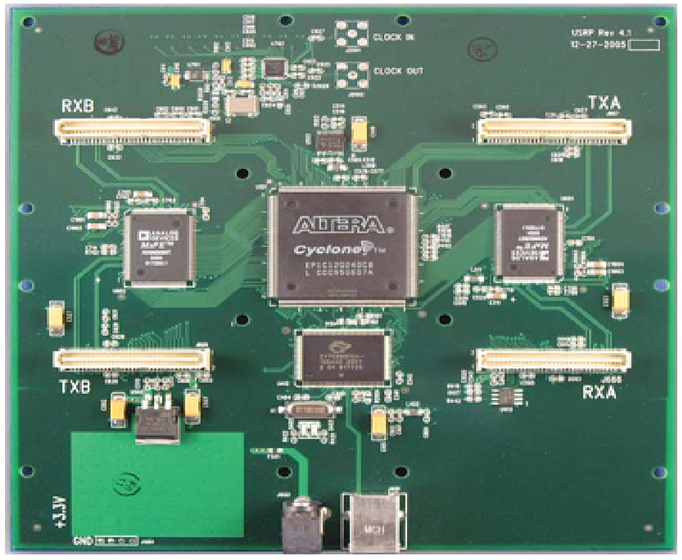

Fig 1. USRP [3]

2 Ambiguity Functions

Use Gnu Radio development tools and the USRP to produce and measure the ambiguity functions of "non-cooperative" illuminators, broadcasting FM transmissions and to comment on their form and usefulness.

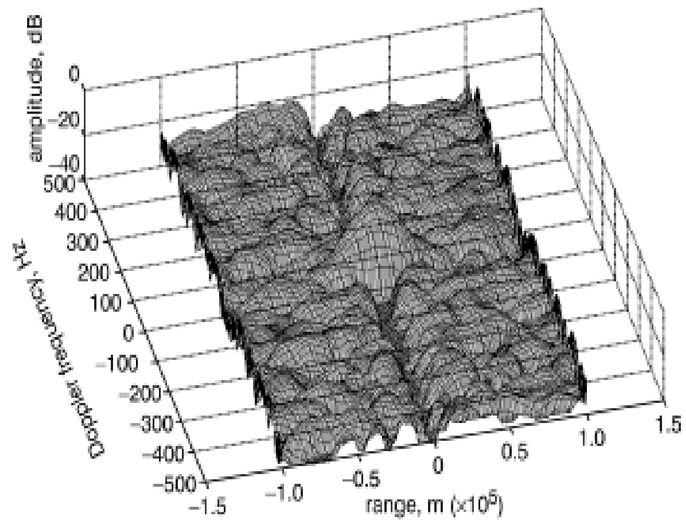

Fig 2. Range and Doppler ambiguities. [1]

3 Multiple Receivers

Investigate the challenges associated with the use of multiple modules and multiple USRP boards as coherent receivers and make relevant recommendations to address these challenges.

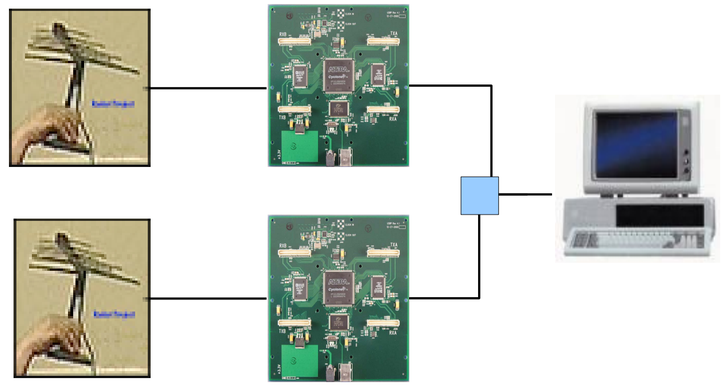

Fig 3. Multiple board System setup

•*Key References:*
•[1] Griffiths and Baker
•[2] P.E Howland
•[3] http://www.gnuradio.org

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