

**GPS Jamming Detector**

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**Document Change History**

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| 04/19/2015 | 1st | GPS Jamming Detector Test Plan | Chi King Wong | Devin Lorenzen |
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**Test Plan**

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# Introduction

## Purpose

This document describes the plan for testing the GPS signals jamming detection prototype. It provides test personnel with the necessary approach to validate that each process performs correctly and that the requirements of the system have been satisfied. This test plan will provide the following:

* The test scope, focus areas and objectives
* The test responsibilities
* Detail the approach and strategy for testing of the solution
* Describe the planning, test case preparation and scheduling, including resource requirements
* Explain the execution, results documentation and review of the testing
* Provide the test cases which will be executed for this testing effort
* Any risks, issues, assumptions and test dependencies
* The test schedule and major milestones
* The test deliverables

## Scope

The document mainly targets the GPS jamming detection test that will be conducted jamming detection algorithm prototype testing and validating data in report output as per Requirements Specifications provided by Rohde & Schwarz.

# Functional Testing (Software):

## Load Testing:

|  |  |
| --- | --- |
| 1. **Test Objective:** | * Ensure data input and output process function properly and without data corruption.. |
| 1. **Technique:** | * Inspect the data to ensure input and output data properly, or review the returned data to ensure that the correct data was retrieved. |
| 1. **Completion Criteria:** | * All input and output data processes function as designed and without any data corruption. |
| 1. **Special Considerations:** | * Have to be careful when read and interleaved data and must verify that we are specifying the right number of bits in the data. |
| 1. **Test Approach(s):** | * Compare FFT plot in MatLab to plot in XML file |
| 1. **Test Pass / Fail Criteria:** | * Pass |
| 1. **Test Date:** | * March 01, 2015 |
| 1. **Responsibility:** | * Ben Wilson |

## Performance Testing:

|  |  |
| --- | --- |
| 1. **Test Objective:** | * Ensure algorithm is processing and functioning properly. |
| 1. **Technique:** | * Execute each use case, use case flow, or function, using valid and invalid data, to verify the following: * The expected results occur when valid data is used. * The appropriate error/warning messages are displayed when invalid data is used. |
| 1. **Completion Criteria:** | * All planned tests have been executed. All identified defects have been addressed. |
| 1. **Special Considerations:** | * FFT size is dependent on chirp rate. Monte Carlo simulation could be used to set threshold. |
| 1. **Test Approach(s):** | * Algorithm was tested on the given jammer capture. |
| 1. **Test Pass / Fail Criteria:** | * Pass |
| 1. **Test Date:** | * May 01, 2015 |
| 1. **Responsibility:** | * Ben Wilson |

## Test Bench Testing:

|  |  |
| --- | --- |
| 1. **Test Objective:** | * Ensure the test bench meets the requirement. |
| 1. **Technique:** | * Review signal’s attenuation and noise level. |
| 1. **Completion Criteria:** | * Data have been executed and tested on functioning testing. |
| 1. **Special Considerations:** | * N/A |
| 1. **Test Approach(s):** | * Attenuate signal from peak power to noise floor stepping by user input determine jammer is present. |
| 1. **Test Pass / Fail Criteria:** | * Pass |
| 1. **Test Date:** | * May 20, 2015 |
| 1. **Responsibility:** | * Hanjae Noh |

# Functional Testing (Hardware):

## Load Testing:

|  |  |
| --- | --- |
| 1. **Test Objective:** | * Ensure data input and output process function properly and without data corruption. * Test the highest load that the system can accept while still functioning properly. |
| 1. **Technique:** | * Inspect the data to ensure input and output data properly, or review the returned data to ensure that the correct data was retrieved. |
| 1. **Completion Criteria:** | * All output data is not returned with the correct data due to technical complexity. |
| 1. **Special Considerations:** | * Output data is corrupted in occasionally. |
| 1. **Test Approach(s):** | * N/A |
| 1. **Test Pass / Fail Criteria:** | * Fail |
| 1. **Test Date:** |  |
| 1. **Responsibility:** | * Edward Sayers |

## Performance Testing:

|  |  |
| --- | --- |
| 1. **Test Objective:** | * Ensure algorithm implementation is processing and functioning properly. * Monitor system performance during normal to high usage and compare to expected benchmarks detailed in the requirements. These benchmarks should be included in the performance listed in the design requirements. |
| 1. **Technique:** | * Execute each use case, use case flow, or function, using valid and invalid data, to verify the following: * The expected results occur when valid data is used. * The appropriate error / warning messages are displayed when invalid data is used. |
| 1. **Completion Criteria:** | * All planned tests have not been executed. |
| 1. **Special Considerations:** |  |
| 1. **Test Approach(s):** |  |
| 1. **Test Pass / Fail Criteria:** | * Pass |
| 1. **Test Date:** |  |
| 1. **Responsibility:** | * Edward Sayers |

# User Acceptance Testing:

## Test Risks / Issues

Risk Identification should be fulfilled before System Test can commence. Test planners should be aware of:

* When perform a test of read and interleaved data and must verify that we are specifying the right number of bits in the data.
* Vague, unclear or un-testable requirements.
* Misunderstanding of requirements.

## Items to be Tested / Not Tested

|  |  |  |  |
| --- | --- | --- | --- |
| **Item to Test** | **Test Description** | **Test Date** | **Responsibility** |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
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## Test Approach(s)

* All major system functionality testing should be tested at least once.
* Confirm the test conditions, cycles, and plans based on functional requirements.
* Review reports needed for tracking System Testing, update if necessary.

## Test Regulatory / Mandate Criteria

## Test Pass / Fail Criteria

* All test cases complete?

## Test Entry / Exit Criteria

This section describes the general criteria by which testing commences. Different features/components may have slight variation of their criteria, in which case, those should be mentioned in the report.

# Testing Tools

The following tools will be used for testing:

| **Tool** |
| --- |
| Matlab |
| Computer |
| Xilinx Zedboard Zynq 7000 FPGA |
| Xilinx Vivado Design Suite |
|  |

# Test Milestones and Schedule*.*

| Milestone | Planned End Date | Actual End Date | Resource |
| --- | --- | --- | --- |
| Matlab Algorithm | 05/21/2015 | 05/23/2015 |  |
| FPGA Implementation | 05/22/2015 | 05/23/2015 |  |
| Functional Test | 05/23/2015 | 05/25/2015 |  |
|  |  |  |  |
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